MINE DEVELOPMENT ASSOCIATES

MINE ENGINEERING SERVICES

Technical Report and Updated Preliminary Feasibility Study: Hasbrouck and Three Hills Gold-Silver Project Esmeralda County, Nevada

Prepared for

WEST KIRKLAND MINING, INC.

Effective Date: September 1, 2016

Report Date: September 14, 2016

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1.0 EXECUTIVE SUMMARY

1.1 Introduction

Mine Development Associates ("MDA") has prepared this Technical Report and updated Preliminary Feasibility Study ("PFS") on the Hasbrouck gold-silver project, located in the state of Nevada, at the request of West Kirkland Mining Inc. ("WKM"), a Canadian corporation publicly traded on the TSX Venture Exchange (TSX: WKM). This report supersedes the Technical Report and PFS of Tietz et al. (2015). In January, 2014, WKM entered into an agreement with Allied Nevada Gold Corp. ("Allied") to acquire up to a 100% interest in Allied's Hasbrouck and Three Hills properties in Esmeralda County, Nevada. WKM's subsidiary, WK Mining (USA) Ltd., subsequently completed the acquisition of an initial 75% interest in the Hasbrouck and Three Hills properties from subsidiaries of Allied Nevada Gold Corp. ("ANV") on April 24, 2014. On September 11, 2014 WK Mining (USA) entered into a mining lease-to-purchase agreement with Eastfield Resources (USA) Inc., covering 7 patented mining claims that became part of the Three Hills Property. Total consideration to be paid over the life of the lease is CDN$280,000, of which CDN$155,000 has been paid. On June 19, 2015, Allied announced that the United States Bankruptcy Court for the District of Delaware had approved the sale of Allied's exploration properties and related assets (excluding the Hycroft operation) to Clover Nevada LLC ("Clover Nevada"), a wholly-owned subsidiary of Waterton Precious Metals Fund II Cayman, LP ("Waterton"), which included a 25% interest in the Hasbrouck project. The sale did not materially affect the contractual rights of WKM and WKM holds the title to the Hasbrouck properties. In this report the term WKM is used to refer to both West Kirkland Mining Inc., and WK Mining (USA), interchangeably.

The purpose of this Technical Report and updated Preliminary Feasibility Study is to provide an updated economic analysis for the Hasbrouck project, comprised of the Hasbrouck gold-silver deposit and the nearby Three Hills gold deposit. Project economics are improved, compared to the 2015 PFS, resulting from reduced estimates of capital and operating costs, and a slightly increased gold recovery at the end of the mine life. Changes in the current PFS include

- A reduction in diesel price;
- Detailing of Three Hills construction schedule;
- Deferment of the Three Hills gold plant and toll processing of carbon;
- Use of refurbished crushing and conveying equipment;
- Water sourced from wells instead of the town of Tonopah;

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- Added gold recovery assumed during drain down of heap-leach pads;
- Reclamation and bond recalculation; and
- Metal price increase.

This report and the estimates provided herein have been prepared in accordance with the disclosure and reporting requirements set forth in the Canadian Securities Administrators' National Instrument 43-101 ("NI 43-101"), Companion Policy 43-101CP, and Form 43-101F1, as well as with the Canadian Institute of Mining, Metallurgy and Petroleum's "CIM Definition Standards - For Mineral Resources and Reserves, Definitions and Guidelines" ("CIM Standards") adopted by the CIM Council on May 10, 2014.

The Hasbrouck project comprises the Three Hills Mine and the Hasbrouck Mine. WKM made the strategic decision shortly after acquiring the properties in April, 2014, to permit each mine separately in order to accelerate permitting the Three Hills Mine under an Environmental Assessment, and to reduce the initial expenditure on permitting to just that necessary for the project to commence at the Three Hills Mine.

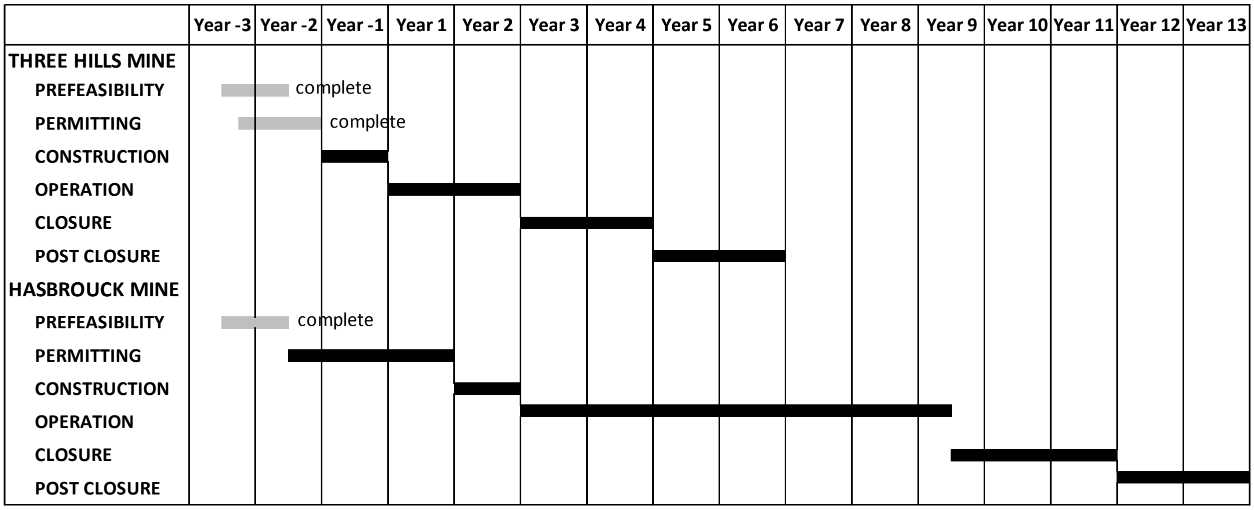
WKM started work on permitting the Three Hills Mine in June, 2014, with the final permit issued in June, 2016 (Table 1.1).

Table 1.1 Three Hills Mine – Key Permit Acquisition Schedule
(from WKM, 2016)

KEY PERMITS		
PERMIT/APPROVAL	**AGENCY**	**Issued**
Decision Record/Finding of No Significant Impact (DR/FONSI)	US Bureau of Land Management	2015-11-25
New Class I Air Quality Operating Permit to Construct (OPTC)	NV Bureau of Air Pollution Control	2016-06-07
New Class II Air Quality Operating Permit (AQOP)	NV Bureau of Air Pollution Control	2016-06-07
Mercury Operating Permit to Construct (MOPTC)	NV Bureau of Air Pollution Control	2016-06-07
Reclamation Permit (NRP)	NV Bureau of Mining Regulation and Reclamation	2015-12-03
Water Pollution Control Plan (WPCP)	NV Bureau of Mining Regulation and Reclamation	2015-10-31

Permitting the Hasbrouck Mine has commenced and is planned to proceed concurrently with constructing and operating the Three Hills Mine, thereby allowing permits for the Hasbrouck Mine to be in hand when needed as shown in Figure 1.1 below. Year -2 and -3 occur prior to construction of the mine, and for this study those costs are consider to be sunk costs. Most of these activities have been completed to date. Year -1 represents the initiation of the project and when pre-production activities will commence.

Figure 1.1 Hasbrouck Project Schedule



Acquiring key permits for the Hasbrouck Mine is expected to take 33 months and $3 million. The nature of the permitting process does not allow accurate estimates of time and money; the amounts allowed in this study are considered conservative given the straightforward nature of the Hasbrouck Mine and recent experience of permitting similar operations in Nevada. The cost and time might be more than estimated, but are more likely to be less.

WKM commenced the process for obtaining permits for the Hasbrouck Mine by commissioning Enviroscientists Inc. to perform base-line botany studies in 2014 and 2015. A class III cultural survey was performed by Western Cultural Resource Management in 2011 with no findings that would have a negative impact on the project.

The Hasbrouck Mine plan presented in this report will require the typical amount of permitting for a mining operation in Nevada, including the completion of an Environmental Impact Statement ("EIS"). There appear to be no biological, cultural, hydrological, or geochemical issues that would otherwise delay or disrupt the timely process of applications for development.

There are no known environmental issues at either property that would be expected to have a material impact on WKM's ability to extract the mineral resources.

1.2 Access, Property Description and Land

The Hasbrouck gold-silver project includes two separate deposits, Hasbrouck and Three Hills, located in the northern portion of Esmeralda County, Nevada. The Three Hills deposit is located approximately 1 mile west of the town of Tonopah and is accessed via county-maintained roads from the northwest end of Tonopah and from US Highway 95 some 3 miles south of Tonopah. U.S. Highway 6 passes 1.25 miles north of the Three Hills deposit, and is a major east-west transportation corridor through central Nevada. The Hasbrouck deposit is located approximately 5 miles by road south of the town of Tonopah, and is accessed directly off U.S. Highway 95. U.S. Highway 95 is the main north–south transportation corridor through central Nevada and passes immediately to the west of the Hasbrouck deposit.

Elevations of the p roperties vary between 5,600ft and 6,300ft. The principal physiographic features of both the Hasbrouck and Three Hills deposits are prominent hills that rise 200-700ft off the valley floor. Vegetation in the area consists of sagebrush and other desert plants on the lower slopes and valleys. Trees are absent from the properties (including yucca brevifolia). The climate is semi-arid.. Average annual precipitation is 5 inches, which accumulates through winter snows and, to a lesser extent, summer thunderstorms.

The Three Hills deposit is covered by 13 patented claims and 100 unpatented lode claims occupying a total of approximately 1,967 acres in Sections 2, 3, 4, 5, 8, 9, 10 and 11, T2N, R42E, and Sections 33 and 34, T3N , R42E of the Mount Diablo Base and Meridian. The Hasbrouck deposit is covered by 28 patented mining claims and 583 unpatented mining claims occupying an area of approximately 10,750 total acres within Sections 1, 2, 3, 4, 5, 9, 10, 11, 12,13,14, 15,16, 21, 22, 23 and 24, T1N, R42E, Sections 6, 7, 18, 19 and 20, T1N, R43E, and Sections 27, 28, 29, 32, 33, 34, and 35, T2N, R42E of the Mount Diablo Base and Meridian.

All unpatented claims are located on U.S. federal land managed by the Battle Mountain District of the U.S. Bureau of Land Management ("BLM"). The unpatented claims are registered and recorded with the BLM, Esmeralda and Nye Counties as appropriate, but have not been surveyed by a mineral land surveyor. Mineral tenure is held in the name of WK Mining (USA) Ltd., which is a wholly-owned subsidiary of WKM. At the time of writing this report WKM had completed a transfer of the properties into an LLC, with a date of recordation in Nye County of September 9, 2106 and a date of recordation in Esmeralda County of September 12, 2016. At present 100% of the LLC is held by WKM. All required payments have been made to the appropriate authorities and the claims are in good standing.

Patented and unpatented claims at the Hasbrouck and Three Hills deposits are subject to mineral production royalties of between 2% and 4% net smelter return ("NSR"). At the Hasbrouck deposit, 19 of the patented claims and three of the unpatented mining claims are subject to a mineral production royalty of 4% NSR. The remaining 9 patented mining claims and 256 of the unpatented mining claims are subject to a mineral production royalty of 2% NSR.

1.3 History

Silver and gold mineralization was first discovered on Hasbrouck Mountain in 1902. Early mining exploited the Kernick vein, which was worked on a small scale through the mid-1920s. The early miners completed about 6,500ft of adits and 1,000ft of raises and recorded production of 740 tons of ore that grossed $10,406. A large, near-surface, low-grade gold-silver deposit was outlined by Cordex Exploration following surface and underground sampling, geologic mapping, rotary drilling and metallurgical testing conducted in 1974-1975 and 1980. During the 1980s and 1990s Franco-Nevada, FMC, Euro-Nevada, and Corona successively drilled the property before Newmont merged with Euro-Nevada in 2002 and took control of the property. Newmont vended the property to Vista Gold in 2003. Allied Nevada gained control of Hasbrouck when it was formed as a spin-off company from Vista in 2007. Allied Nevada conducted surface mapping, geochemical sampling, drilling, data verification, metallurgical studies, CSAMT and gravity surveys, and completed a preliminary economic assessment which is superseded by the 2015 PFS and this technical report. In 2014 WKM carried out geologic mapping, surface sampling, drilling and a structural geologic interpretation. WKM also conducted a re-interpretation of geophysical data obtained by previous operators.

Modern exploration at Three Hills began in 1974 when Cordex Exploration obtained the property. During the 1970's, 1980's and 1990's, Cordex, Saga Exploration, Echo Bay, Gexa Gold, Coeur D'Alene Mines, Eastfield Resources, and Euro-Nevada carried out various campaigns of surface mapping, sampling, geophysical surveys and drilling. Newmont acquired control of Three Hills via their merger with Euro-Nevada and subsequently sold the property to Vista Gold in 2003. Vista did not conduct exploration at Three Hills; the property was part of the spin-off to Allied Nevada in 2007. Allied Nevada initiated exploration at Three Hills in 2012. Drilling in 2012 and 2013 was focused on expanding known mineralization. During 2014 WKM performed geologic mapping, sampling, a gravity survey, drilling and detailed structural analysis at Three Hills.

1.4 Geology and Mineralization

The Three Hills deposit, located in the Tonopah Mining District, is a low-sulfidation, epithermal gold deposit, and occurs in a zone of pervasive silicification within the outcropping Siebert Formation immediately above and along the contact with the underlying Fraction Tuff. Mineralization occurs in discontinuous, irregular 0.05in to 0.5in wide veinlets, vein stockworks, and erratic breccia veins of chalcedony and quartz. Oxidation has destroyed sulfide minerals within the deposit. The currently drill-defined extent of mineralization is approximately 1,000ft east–west by 2,700ft north–south with a maximum depth of 500ft. Mineralization remains open at depth, down-dip to the east along the Siebert/Fraction Tuff contact.

The Hasbrouck deposit is a low-sulfidation, epithermal gold–silver deposit located in the western portion of the Divide Mining District. Host rocks are primarily tuffs and sediments of the Siebert Formation with limited mineralization within the underlying Fraction Tuff. An erosional remnant of silica sinter, deposited during hot spring activity, has been mapped near the top of the mountain. Gold and silver mineralization consists principally of 0.1in to 1.0in wide, discontinuous silica-pyrite veinlets, sheeted veinlets and stockworks, all closely associated with larger, but erratic bodies of hydrothermal breccia. Sulfide minerals have been largely oxidized. Mineralization is accompanied by strong pervasive silicification, with associated adularia and pyrite, and has a known extent of 2,800ft east–west by 2,400ft north–south, with a maximum depth of 900ft. Mineralization is open at depth and to a limited extent to the northwest and east.

1.5 Drilling

For Three Hills, the current database includes 291 drill holes with a total of 88,199ft of historical drilling performed from 1974 through 2013. During 2014, WKM drilled 3 diamond-core holes and 11 reverse-circulation ("RC") holes. The diamond-core holes were drilled within the Three Hills gold-silver deposit to obtain samples for geotechnical studies. The 2014 RC holes were drilled mainly to expand the eastern and down-dip portions of the Three Hills resource. It is MDA's opinion that the 2014 RC holes do not materially affect the current resource estimate due to their locations and therefore have not been included in the current resource database. The drilling does show that the deposit is open to the east, and more drilling may add more resources in this area.

The current database for the Hasbrouck deposit contains a total of 216,760ft of historical drilling completed by five companies from 1974 through 2012. This includes 28,606ft of diamond-core drilling in 43 holes, and 188,154ft of RC and conventional rotary drilling in 274 holes. During 2014, WKM completed 4,150ft of RC drilling in 14 drill holes at the Hasbrouck deposit. All of the 2014 holes are external to the estimated mineral resources and are not included in the current database.

1.6 Sample Preparation, Analyses and Security

MDA has evaluated the available information for historical sample preparation methods, analytical procedures and sample security. MDA concludes that the sampling, assaying, and security procedures used at Three Hills and Hasbrouck have followed industry standard procedures, and are adequate for the estimation of the current mineral resources.

1.7 Data Verification

MDA completed a full audit of the Allied 2010-2013 drill data at Three Hills and Hasbrouck for the current resource estimate. QA/QC data are not available for drilling conducted before 2010. MDA has reviewed the available QAQC data and the assessments of that data made by Wilson (2014) and references therein, including Prenn (2003) and Prenn and Gustin (2003, 2006). MDA agrees with the conclusions of these preceding studies and considers the assay data to be adequate for the estimation of the current mineral resources.

1.8 Metallurgical Testing

Column-leach and bottle-roll cyanide extraction tests indicate that mineralization comprising the Three Hills and Hasbrouck gold-silver deposits is amenable to cyanide heap leaching. An average gold recovery of 79.0% is estimated for Three Hills mineralization based on expected run-of-mine (“ROM”) (no crushing) particle sizes. An additional 2.5% gold recovery is forecast during the final drain down of the Three Hills Mine heap-leach facility. Silver contents are low and recovery of silver has not been estimated, but is expected to be negligible.

Testing of material from the Hasbrouck deposit has shown that gold recoveries increase with decreasing particle size and also vary with the stratigraphic hosts to the mineralization. An average gold recovery of 75.8% has been estimated for mineralization in the lower Siebert unit, and an average gold recovery of 61.0% has been estimated for mineralization in the upper Siebert. Silver recovery has been estimated to average 11% for both units. These recoveries assume primary jaw crushing and secondary cone crushing, followed by tertiary high-pressure grinding-roll crushing. An additional 1.5% gold recovery is forecast during the final drain down of the Hasbrouck Mine heap-leach facility.

Increased gold recovery of 2.5% and 1.5% during drain-down of heap-leach pads at the Three Hills and Hasbrouck Mines, respectively, was included in this study. These values were derived from the gold recovery-time curves at each mine. Drain-down recovery is generally not included in economic studies, but recovery during drain-down is in fact realized at most leaching operations. While there is a risk that the full drain-down recovery will not be realized in actual production, recognizing gold recovered during drain-down is considered valid and appropriate in this case.

1.9 Mineral Resources Estimate

The modeling and estimation of the mineral resources at the Hasbrouck Project were completed under the supervision of Paul Tietz, a qualified person with respect to mineral resource estimations under NI 43-101.

To complete the resource estimation for the Three Hills deposit, the drill data were evaluated statistically, geology and gold mineral domains were interpreted on east-west oriented cross sections spaced at 100-foot intervals that span the extents of the presently defined deposit, and the gold mineral domains were refined on north-south oriented long sections spaced at 20-foot intervals. The final modeled gold mineral domains were then coded into a 20ft x 20ft x 20ft block model and used to constrain the gold grade estimation. Grade estimation was by Inverse Distance Cubed ("ID3"). The effective date of the Three Hills resource estimate is August 5, 2014.

The Three Hills deposit gold resources, at the reported 0.005oz Au/ton cutoff grade, are inclusive of estimated reserves and are summarized in Table 1.2 (effective date: August 4, 2014).

Table 1.2 Three Hills Reported Mineral Resources (0.005oz Au/ton Cutoff)

Class	Tons	oz Au/ton	oz Au
Indicated	10,897,000	0.017	189,000
Inferred	2,568,000	0.013	32,000

Note: rounding may cause apparent inconsistencies

To complete the resource estimation for the Hasbrouck deposit, the drill data were evaluated statistically, geology and gold and silver mineral domains were interpreted on cross sections spaced at 50- and 100-foot intervals that span the extents of the presently defined deposit, and the mineral domains were refined on level plans spaced at 10-foot intervals. The final modeled mineral domains were then coded into a 20ft x 20ft x 20ft block model and used to constrain the gold and silver grade estimations. Grade estimation was by Inverse Distance Squared ("ID2"). The effective date of the Hasbrouck deposit resource estimate is November 3, 2014.

The Hasbrouck deposit gold and silver resources, at the reported 0.006oz AuEq/ton cutoff grade, are inclusive of estimated reserves and are summarized in Table 1.3 (effective date: November 3, 2014). The gold-equivalent ("AuEq") grade is calculated using the individual gold and silver grades of each block, along with a gold price of $1,300.00 per ounce gold and a silver price of $22 per ounce silver. The AuEq grade calculation includes an approximate 4:1 difference in gold versus silver recovery in the proposed heap-leach processing scenario.

Table 1.3 Hasbrouck Deposit Reported Mineral Resources (0.006oz AuEq/ton Cutoff)
oz AuEq/ton = oz Au/ton + (oz Ag/ton x 0.000417)

Class	Tons	oz Au/ton	oz Au	oz Ag/ton	oz Ag
Measured	8,261,000	0.017	143,000	0.357	2,949,000
Indicated	45,924,000	0.013	595,000	0.243	11,147,000
M+I	54,185,000	0.014	738,000	0.260	14,096,000
Inferred	11,772,000	0.009	104,000	0.191	2,249,000

Note: rounding may cause apparent inconsistencies

1.10 Mineral Reserves Estimate

MDA has used Measured and Indicated resources as the basis to define reserves for both the Three Hills and Hasbrouck deposits, which together compose the Hasbrouck project. Open-pit mining was selected as the mining method. Reserve definition was done by identifying ultimate pit limits using economic parameters and pit optimization techniques. The economic parameters used for pit optimization are presented in Table 1.4.

Table 1.4 Pre-Feasibility Economic Parameters

	Three Hills	Hasbrouck	
Mining	$ 2.00	$ 2.00	$/ton Mined
Crushing & Stacking	NA	$ 3.20	$/ton Processed
Leaching	$ 2.33	$ 1.30	$/ton Processed
G&A Cost per Ton	$ 0.42	$ 0.42	$/ton Processed
Refining - Au	$ 5.00	$ 5.00	$/oz Au Produced
Refining - Ag	NA	$ 0.25	$/oz Ag Produced
Royalty	4%	4%	NSR

Crushing and stacking costs do not apply to Three Hills because Three Hills ore will be processed using ROM leaching.

Silver was not used to generate value in Three Hills because there are no stated silver resources for that deposit. For the Hasbrouck deposit, the value from silver was calculated with constant silver to gold ratio based on $1,250/oz Au to $18.00/oz Ag prices. Gold and silver recoveries were applied based on initial estimates provided by Herb Osborne of H.C. Osborne and Associates, the Qualified Person responsible for Section 13.0. Table 1.5 shows the recoveries used for each deposit.

Table 1.5 Metallurgical Recoveries

	Gold	Silver
Three Hills	79.0%	NA
Hasbrouck Upper Seibert	61.0%	11.0%
Hasbrouck Lower Seibert	75.8%	11.0%

The ultimate pit limits were determined using prices of $1,250 and $18.00 per ounce of gold and silver respectively. The ultimate pit was selected on Whittle discounted evaluations using a 5% discount rate and a processing limit of 5,400,000 tons per year. The gold price used for the Hasbrouck project cash-flow calculation was $1,275 per ounce gold and $18.21 per ounce silver. MDA believes that the pit designs resulting from the initial analysis are well within reason.

Pit designs were created using 20ft bench heights for mining. This corresponds to the resource model block heights. Because the resource models have been diluted to the block grades, MDA considers the block size to be reasonable with respect to dilution and equipment anticipated to be used in mining, and believes that this represents an appropriate amount of dilution for statement of reserves.

Proven and Probable reserves for the Three Hills and Hasbrouck deposits are shown in Table 1.6 and Table 1.7, respectively. Total Proven and Probable reserves for the entire Hasbrouck project are shown in Table 1.8. These reserves are shown to be economically viable based on the Hasbrouck project cash flows and MDA believes that they are reasonable for the statement of Proven and Probable reserves.

Table 1.6 Three Hills In-Pit Probable Reserves

	K Tons	oz Au/ton	K Ozs Au
Probable	9,653	0.018	175

Three Hills Proven and Probable reserves were defined using a 0.005 oz Au/t cutoff

Table 1.7 Hasbrouck In-Pit Proven and Probable Reserves

Upper Siebert	K Tons	oz Au/ton	K Ozs Au	oz Ag/ton	K Ozs Ag
Proven	1,301	0.020	26	0.387	504
Probable	5,576	0.016	89	0.260	1,452
Proven & Probable	6,877	0.017	114	0.284	1,955
Lower Siebert					
Proven	4,942	0.021	101	0.417	2,058
Probable	23,798	0.016	372	0.275	6,555
Proven & Probable	28,740	0.016	473	0.300	8,614
Total Hasbrouck					
Proven	6,242	0.020	127	0.410	2,562
Probable	29,374	0.016	461	0.273	8,007
Proven & Probable	35,617	0.017	588	0.297	10,569

Hasbrouck upper Siebert Proven and Probable reserves were defined using a 0.008 oz Au/t cutoff
Hasbrouck lower Siebert Proven and Probable reserves were defined using a 0.007 oz Au/t cutoff

Table 1.8 Total Hasbrouck Project In-Pit Proven and Probable Reserves

	K Tons	oz Au/ton	K Ozs Au	oz Ag/ton	K Ozs Ag
Proven	6,242	0.020	127	0.410	2,562
Probable	39,028	0.016	635	0.205	8,007
Proven & Probable	45,270	0.017	762	0.233	10,569

Some summation discrepancies may be noticeable to minor rounding issues

1.11 Mining Methods

The Hasbrouck project PFS includes mining at both the Three Hills Mine and the Hasbrouck Mine. These are planned as open-pit, truck and loader operations. Access roads were included in the pit and waste rock storage area designs, which were considered suitable for the type of equipment used. Waste rock storage areas were designed to contain the rock waste associated with the reserves. One main waste rock storage areas was identified for Three Hills and 2 additional waste rock storage areas were designed for Hasbrouck. Safety berms were designed between the designed pits and dumps and US Highway 50 to contain any material that may try and roll off of the mining site.

The PFS has been based on contract mining. Only Proven and Probable reserves were used to schedule mine production, and Inferred resources inside of the pit were considered as waste.

Three Hills production schedules have been completed based on a 15,000tpd production requirement for the ROM heap-leach pad. Detailed monthly schedules were created for the construction period based on construction requirements for heap-leach over-liner and fill material requirements defined by NewFields. In total, 504,000 cubic yards (702,000 tons) of waste rock is scheduled for construction purposes.

Ore placed on the pad at Three Hills Mine had a lag time applied so that gold production was not assumed at time of placement. The schedule assumed that the operational recovery of 79% would take up to 8 months. Drain-down recovery of 2.5% was assumed during the 12 months after final operational recovery was achieved.

Hasbrouck Mine production schedules were completed based on a 17,500tpd production requirement. Mining at Hasbrouck was assumed to start during the second year of production for the project. Little pre-stripping is required as ore is located near the surface, though waste rock is mined early to provide construction fill material.

A lag time in gold recovery was applied to ore placed on the heap-leach pad. The schedule assumed that the full recovery of recoverable gold placed on the pad would take up to 8 months. Upper Siebert ore was assigned a 55.6% operational recovery and lower Siebert was assigned a 76.6% operational recovery. Both ore types were assigned 11% recovery for silver. Drain-down gold recovery of 1.5% was assumed during the 24-months after operational recovery was achieved. No drain-down recovery of silver was assumed.

It is anticipated that the contractor will have between 60 and 80 operators and staff involved with the operation. It has been assumed that the contractor will work 12 hour shifts, 2 shifts per day, 7 days per week. Other mine personnel will be maintained by the owner for general activities, including mine supervision, engineering, surveying, geology, and ore control.

All mining is anticipated to be above the water table, so no dewatering wells will be required. Storm water that enters the pit will be handled by allowing for sumps in the pit as needed. Any excess water that doesn't naturally infiltrate into the ground will be placed in water trucks using a portable pump and then used for dust control on haul roads.

1.12 Mineral Processing

The Hasbrouck project will utilize two separate heap-leach facilities to be located approximately 5 miles apart. The Three Hills Mine will be constructed and operated first, and will be a 15,000 ton per day, ROM operation, utilizing conventional, cyanide heap leaching of ore stacked on a single use pad. Gold will be leached with dilute cyanide solution and recovered from the solution using a carbon adsorption circuit. Loaded carbon will be processed offsite by "toll-stripping" where the carbon is stripped of metal in a desorption-recovery plant and returned for re-use along with the doré product. If required, loaded carbon may also be processed by "ashing" where carbon is smelted directly to produce doré bars.

The Hasbrouck Mine will be constructed after production commences at the Three Hills Mine so as to be ready to produce when Three Hills Mine ceases production, and will be a 17,500 ton per day heap-leach operation utilizing conventional heap leaching of crushed ore stacked on a single-use pad. Crushing will be performed in three stages: mined ore will pass first through a primary jaw crusher and a secondary cone crusher, and then through a high-pressure grinding-roll unit. Agglomeration with cement will be required prior to stacking of ore on the heap. Gold and silver will be leached with a dilute cyanide solution and recovered using a carbon adsorption-desorption-recovery ("ADR") process to produce doré bars.

1.13 Project Infrastructure -Water, Power and Buildings

Water for both the Three Hills and Hasbrouck Mines is planned to be obtained from wells that will be drilled near each mine. HDPE pipelines will be installed from the wells to a 500,000 gallon water storage tank at each site. These tanks will store water for use as process make-up and fire water. No potable water supply will be installed at Three Hills Mine, potable water being obtained from the town of Tonopah water system. A potable water system will be installed at Hasbrouck Mine. This requires obtaining a water right to appropriate groundwater. Water rights are available for lease or purchase from 2 mining companies and a local land owner.

Electrical power at the Three Hills Mine will be supplied by a generator fueled by liquefied natural gas. Power at the Hasbrouck Mine will be supplied by NV Energy, the regional power distribution company. An overhead powerline will be installed connecting the switching station to the Hasbrouck Mine.

The estimated connected load at the Three Hills mine site (not including the laboratory which is to be located in Tonopah) is 0.9 MW, with an average draw of 0.6 MW.

At the Hasbrouck Mine the attached load for the water supply system, the crushing system, the conveying and stacking system, the ADR plant and ancillary equipment is estimated to be 6.5 MW, with an average draw of 4.1 MW.

Diesel-fired backup generators will be installed in the process area at each mine site to provide emergency power.

Administration, safety, mine operations, warehouse, assay laboratory (to be located in Tonopah), process buildings, and process maintenance buildings are planned for the Hasbrouck project. During the time that Three Hills Mine will be operated, buildings in Tonopah will be rented. During the time the Hasbrouck Mine will be operated, three trailers of double- and triple-wide sizes will be installed for offices, safety, and conference and training purposes.

A full service laboratory will be established, sized to process 100 solid samples per day and 150 solution samples per day. The laboratory will be installed in a building that is to be rented in the town of Tonopah.

The process shop and warehouse at the Three Hills Mine will be a single, 2,900 ft^2 steel building located near the CIC adsorption circuit. The process shop and warehouse at Hasbrouck will be a 3,430 ft^2 steel building located near the ADR plant.

The reagents storage building at the Hasbrouck Mine will be 1500 ft^2. The ADR plant will be a steel building approximately 145ft x 42ft x 44ft high. An additional section approximately 14ft x 25ft x 20ft high for the caustic area will be attached to the ADR section. The refinery will be approximately 79.5ft x 44.5ft x 22.75ft high, and will share a wall with the ADR building. The refinery area will contain a secure space for a safe.

1.14 Environmental Studies, Permitting and Social Impact

Mineral exploration at both the Three Hills Mine and the Hasbrouck Mine is authorized by the U. S. Bureau of Land Management ("BLM") under multiple Notices, each of which authorizes up to five acres of disturbance and is bonded with the BLM. Existing disturbances and bond amounts for each Notice are shown in Table 1.9.

Table 1.9 Existing Disturbance and Notices for the Hasbrouck Project

Notice #	Disturbance Acreage	Bond Amount
NVN-91216	4.88	$ 65,450.00
NVN-89964	1.84	$ 14,033.00
NVN-89750	4.53	$ 18,758.00

On purchasing the properties in 2014, WKM chose to permit the Three Hills and Hasbrouck Mines separately in order to take advantage of the fact that the Three Hills Mine could be permitted under the relatively short and simple environmental assessment process rather than the much longer environmental impact statement process that would have been required if the two mines had been permitted as one operation. This decision resulted in key permits to construct and operate the Three Hills Mine being obtained by June 2016. Work on permitting the Hasbrouck Mine has been ongoing since 2014 to ensure that permits for Hasbrouck Mine will be in hand to allow continuous production Three Hills Mine comes to an end.

WKM is in the process of acquiring permits for the Hasbrouck Mine and anticipates this will take up to 2 years and cost $3 million. A Plan of Operations will be submitted for the Hasbrouck Mine when operational and baseline surveys are complete and operations and design for the project are at a level where a Plan Application can be developed to the necessary level of detail.

The review and approval process for the Plan by the BLM constitutes a federal action under the National Environmental Policy Act ("NEPA") and BLM regulation. Thus, for the BLM to process the Plan Application the BLM is required to comply with NEPA and prepare either an Environmental Assessment ("EA"), or an Environmental Impact Statement ("EIS").

1.15 Capital and Operating Costs

MDA has authored Section 21.0, Capital and Operating Costs, with subsections for Process Capital and Process Operating costs provided by KCA. NewFields has provided inputs for Processing Capital and also some input to Infrastructure Capital Costs, which are included in the Other Capital Costs (Section 21.9).

Initial capital at the start of the project for the startup of Three Hills Mine is estimated to be $46,742,000, which includes working capital of $4,864,000. Growth capital is $90,556,000 attributed to the startup of Hasbrouck Mine, and sustaining capital is $10,560,000, including the return of working capital. A summary of capital costs is shown in Table 1.10.

Table 1.10 Hasbrouck Project Capital Cost Summary

Direct Costs	**Units**	**Initial**	**Growth**	**Sustaining**	**Total**
Pre-Production	K USD	$ 5,813	$ 190		$ 6,003
Mining	K USD	$ 184	$ 77	$ 127	$ 388
Plant and Recovery	K USD	$ 8,073	$ 38,313	$ -	$ 46,386
Leach Pads	K USD	$ 7,617	$ 10,048	$ 9,348	$ 27,012
Ponds and Site Infrastructure	K USD	$ 1,948	$ 2,910	$ -	$ 4,858
Water Supply	K USD	$ 1,740	$ 3,030	$ -	$ 4,770
Roads	K USD	$ 1,013	$ 1,039	$ -	$ 2,052
Light Vehicles	K USD	$ 490	$ 113	$ 336	$ 938
Site and Administration	K USD	$ 47	$ 77	$ -	$ 124
Safety & Security	K USD	$ 82	$ 5	$ 10	$ 97
Owner's Capital	K USD	$ 6,383	$ 10,506	$ (2,247)	$ 14,642
Total Direct Costs	K USD	$ 33,389	$ 66,308	$ 7,573	$ 107,270
Indirect Costs					
Initial Fills	K USD	$ 146	$ 1,764	$ -	$ 1,910
Indirects	K USD	$ 1,229	$ 2,615	$ 421	$ 4,265
EPCM	K USD	$ 1,466	$ 5,465	$ 514	$ 7,445
Newmont Buyout	K USD	$ -	$ 1,000	$ -	$ 1,000
Total Indirects	K USD	$ 2,841	$ 10,844	$ 935	$ 14,620
Contingencies					
Mining (15%)	K USD	$ 550	$ 30	$ -	$ 579
Plant and Recovery (20%)	K USD	$ 1,760	$ 7,560	$ -	$ 9,320
Leach Pads (15% - 25%)	K USD	$ 1,142	$ 2,512	$ 2,337	$ 5,991
Roads, Ponds, Water, and Infrastructure (25%)	K USD	$ 1,145	$ 1,697	$ -	$ 2,842
Other (15%)	K USD	$ 1,050	$ 1,605	$ (285)	$ 2,370
Total Contingency	K USD	$ 5,647	$ 13,404	$ 2,052	$ 21,103
Total Capital Cost	K USD	$ 41,878	$ 90,556	$ 10,560	$ 142,993
Working Capital	K USD	$ 4,864	$ (4,864)	$ -	$ -
Total Capital w/ Working Capital	K USD	$ 46,742	$ 85,692	$ 10,560	$ 142,993

Mining and re-handle operating costs were estimated by MDA based on first principle costs plus the addition of the contractor's assumed recovery of mining capital and profit margin of 15%. Processing operating costs were estimated by KCA. General and administrative costs and Nevada net proceeds tax were estimated by MDA. Reclamation costs were estimated by Enviroscientists Inc. and Paul Sterling using BLM reclamation cost estimate spreadsheets.

The total cost per ton processed for all ore is $8.33. Table 1.11 shows a summary of the operating cost estimate.

Note that Table 1.13 shows an operating cost of $8.43 per ton based on the World Gold Council Adjusted Operating Cost definition. This apparent discrepancy is due to inclusion of silver credits and exclusion of reclamation costs in the World Gold Council definition.

Table 1.11 Operating Cost Summary

		K USD	USD per ton Processed
Three Hills	Mining Cost	$ 30,670	$ 3.18
	Process Cost	$ 24,575	$ 2.55
Hasbrouck	Mining Cost	$ 130,943	$ 3.68
	Process Cost	$ 139,963	$ 3.93
	Re-handle	$ 2,340	$ 0.07
Total	Mining Cost	$ 161,613	$ 3.57
	Process Cost	$ 164,538	$ 3.63
	Re-handle	$ 2,340	$ 0.05
	G&A Cost	$ 20,621	$ 0.46
	Reclamation - Three Hills	$ 3,419	$ 0.35
	Reclamation - Hasbrouck	$ 5,519	$ 0.15
	Nevada Net Proceeds Tax	$ 19,201	$ 0.42
	Net Operating Cost	$ 377,251	$ 8.33

1.16 Economic Analysis

MDA completed an economic analysis based on the cash flow developed from the production schedule and the capital and operating costs previously discussed. Table 1.13 shows a summary of key information for the Hasbrouck project. The life-of-project after-tax net present value is $120,384,000 using a 5% discount rate. The payback period is 3.11 years and the internal rate of return is 43%. These values are based on 100% of the project; WKM has a 75% interest in the project and has the right to make an offer on the remaining 25%.

Hasbrouck Project economic results are shown in Table 1.12.

Table 1.12 Hasbrouck Project Economic Results

Pre-Tax Payback Period	Years	2.95
After-Tax Payback Period	Years	3.11
Pre-Tax Net Present Value	5%	$145,282
	8%	$118,546
	10%	$103,544
Pre-Tax Internal Rate of Return	IRR	49%
After-Tax Net Present Value	5%	$120,384
	8%	$ 97,387
	10%	$ 84,484
After-Tax Internal Rate of Return	IRR	43.2%

Table 1.13 Hasbrouck Project Highlights Based on 100% of the Project

	Units	Three Hills Mine	Hasbrouck Mine	Total Hasbrouck Project
PROJECT STATISTICS				
HEADGRADE	oz Au/ton - g Au/t	0.018 - 0.62	0.017 - 0.57	0.017 - 0.58
Ore	million tons	10	36	45
Annual Ore	million tons	5	6	6
Processing Rate	tons per day	15,000	17,500	15,986
Stripping Ratio	waste:ore	0.9	1.1	1.1
Contained Metal				
Gold Grade	oz Au/ton - g Au/t	0.018 - 0.62	0.017 - 0.57	0.017 - 0.58
Silver Grade	oz Ag/ton - g Ag/t	NA	0.297 - 10.17	0.233 - 8.00
Gold Equivalent Grade (1)	oz AuEq/ton - g AuEq/t	0.018 - 0.62	0.017 - 0.59	0.017 - 0.59
Gold	kOz	175	588	762
Silver	kOz	NA	10,569	10,569
Gold Equivalent (1)	kOz	175	610	784
Recoverable Metal				
Gold Recovery	%	81.5%	74.0%	75.7%
Silver Recovery	%		11.0%	11.0%
Gold	kOz	142	435	577
Silver	kOz	NA	1,163	1,163
Gold Equivalent ($1,275/$18.21)	kOz	142	452	594
Average Annual Gold Production	kOz	69	71	71
Averge Annual Silver Production (2)	kOz	NA	194	194
Average Annual AuEq Production	kOz	69	74	74
Gold Price	US$/oz	$ 1,275	$ 1,275	$ 1,275
Silver Price	US$/oz	NA	$ 18.21	$ 18.21
CAPITAL				
Initial Capex	US$ million	$ 47		
Growth Capex	US$ million		$ 83	
Sustaining Capex	US$ million		$ 13	
LOM Capex	US$ million			$ 143
Contingency (included)	US$ million	$ 6	$ 15	$ 21
Contingency (included)	%	14%	19%	17%
OPERATING COST				
Adjusted Operating Cost per Ton of Ore (3)	US$/ton ore	$ 7.40	$ 8.71	$ 8.43
Mining	US$/ton ore	$ 3.18	$ 3.74	$ 3.62
Processing	US$/ton ore	$ 2.55	$ 3.93	$ 3.63
G&A	US$/ton ore	$ 0.44	$ 0.46	$ 0.46
Other (4)	US$/ton ore	$ 1.23	$ 0.58	$ 0.72
Adjusted Operating Cost (3)	US$/oz Au net of by-products	$ 502	$ 714	$ 661
All-in Sustaining Cost (5)	US$/oz Au net of by-products	$ 544	$ 774	$ 717
Mine Life	year	1.7	7.1	8.8
PROJECT ECONOMICS				
NPV (5%) - after tax	US$ million			$ 120.4
IRR - after tax	%			43%
Payback Period	year			3.1

Notes:
(1) Gold equivalent calculations are made using the ratio of recovered silver / gold and metal prices.
(2) Silver production is averaged over the Hasbrouck Mine life only
(3) World Gold Council - Adjusted Operating Costs include:
On-site mining and G&A, royalties and production taxes, permitting and community cost related to current operations, 3rd party smelting, refining and transport costs, stock-piles and inventory write-downs, site-based non-cash remuneration, operational stripping costs and by-product credits.
(4) Other category includes royalties, production taxes, permitting, refining, and by-product credit
(5) World Gold Council All-in Sustaining Costs includes:
Adjusted Operating Costs (above) plus corporate G&A, reclamation & remediation—accretion & amortization, expenditures sustaining exploration and study costs, capital exploration, capitalized stripping and sustaining capital.
(6) World Gold Council - All-in Sustaining Costs includes:
Adjusted Operating Costs (above) plus corporate G&A (including share-based remuneration), reclamation & remediation - accretion & amortization (on-site), sustaining exploration and study costs, sustaining capital exploration, capitalized stripping and sustaining capital expenditure.
(7) Project economics are presented for 100% of the project which is jointly owned by WKM (75%) and Waterton Precious Metals Fund(25%).
(8) Some totals may not sum properly due to rounding.

1.17 Comparison of 2016 PFS to 2015 PFS

Table 1.14 shows a comparison between the 2015 PFS and the current, 2016 PFS, and the relative impacts on the NPV (5%), IRR, initial capital, and life-of-mine (“LOM”) cash flows. The NPV in this study is higher by $45 million, the largest factors in producing this difference being the higher metal prices used in the study and assumptions for drain-down recovery of gold. The next largest differences are the reduction of mining costs due to lower fuel prices, followed by savings on water costs by sourcing water from water wells instead of the Tonopah city water assumed in the 2015 PFS.

Table 1.14 Economic Comparisons – 2015 PFS vs 2016 PFS

Item	NPV (5%) (US $M)	IRR (%)	Initial Capital (US $M)	LOM Cash Flow (US $M)	Payback (years)
2015 Prefeasibility Study	**$75**	**25.6%**	**$54**	**$117**	**3.7**
Impact on After Tax					
Changes Made in 2016 PFS					
Diesel Cost Reduced	$7	2.3%	$0	$10	
Pre-Production Mining Cost Increased	$1	-0.6%	$5	$1	
Gold Plant Deferred (2 Years)	$1	2.3%	-$6	$0	
Refurbished Crushing & Conveying Plant	$3	1.6%	$0	$4	
Water Sourced from Wells	$7	7.1%	-$1	$3	
Gold Recovered During Drain Down Recognized	$10	1.7%	$0	$15	
Reclamation Bond Amounts Recalculated	$0	0.3%	-$2	$0	
Metal Price Increased ($1,275/$18.21 vs $1,225/$17.50)	$19	5.2%	$0	$24	
Other *	-$3	-2.4%	-$4	-$2	
Summed Changes Made in 2016 PFS	**$45**	**17.6%**	**-$8**	**$55**	
2016 Prefeasibility Study	**$120**	**43.2%**	**$47**	**$171**	**3.1**

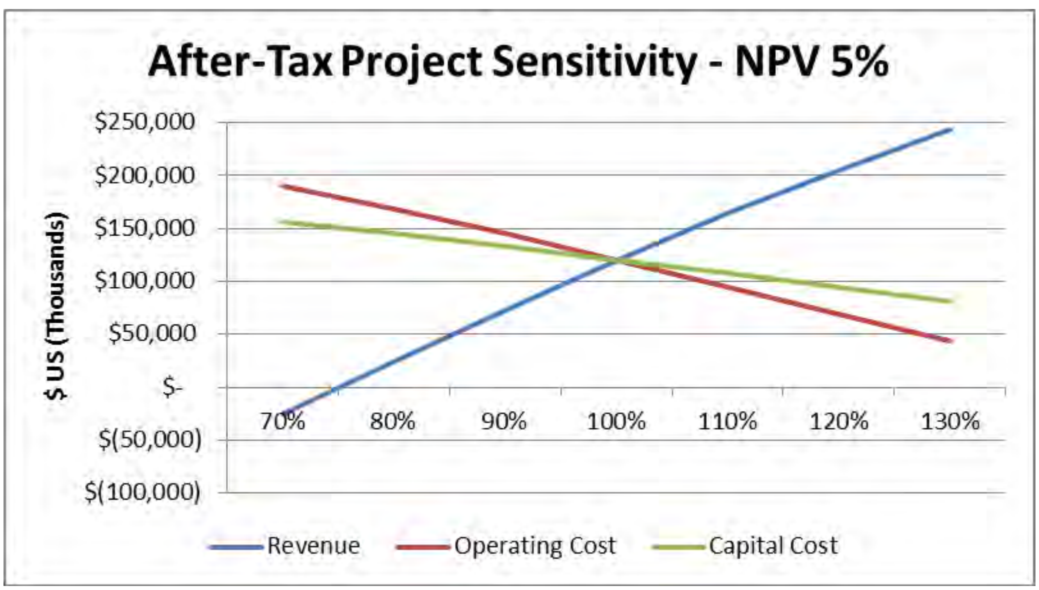
1.18 Project Sensitivity

Project sensitivities were analyzed with respect to gold price, revenues, operating costs, and capital costs. As with most precious metal projects, the Hasbrouck project is most sensitive to gold price and revenue. Table 1.15 shows the sensitivity analysis by gold price. Figure 1.2 shows the project sensitivity to changes in revenue, operating costs, and capital costs graphically.

Table 1.15 After-Tax Project Sensitivity

	After Tax Sensitivity - Metal Price (K USD)					
Au Price	Undisc. CF	NPV 5%	NPV 8%	NPV 10%	IRR	Ag Price
$ 1,000	$ 36,130	$ 16,779	$ 8,124	$ 3,313	12%	$ 14.29
$ 1,050	$ 61,589	$ 36,237	$ 24,870	$ 18,530	18%	$ 15.00
$ 1,100	$ 86,063	$ 54,971	$ 41,009	$ 33,204	24%	$ 15.71
$ 1,150	$ 110,847	$ 73,937	$ 57,345	$ 48,057	30%	$ 16.43
$ 1,200	$ 135,024	$ 92,477	$ 73,332	$ 62,603	35%	$ 17.14
$ 1,225	$ 147,164	$ 101,779	$ 81,350	$ 69,896	38%	$ 17.50
$ 1,250	$ 159,305	$ 111,082	$ 89,369	$ 77,190	41%	$ 17.86
$ 1,275	**$ 171,446**	**$ 120,384**	**$ 97,387**	**$ 84,484**	**43%**	**$ 18.21**
$ 1,300	$ 183,587	$ 129,687	$ 105,406	$ 91,778	46%	$ 18.57
$ 1,350	$ 207,174	$ 147,764	$ 120,992	$ 105,958	51%	$ 19.29
$ 1,400	$ 230,210	$ 165,393	$ 136,179	$ 119,768	56%	$ 20.00
$ 1,500	$ 275,060	$ 199,698	$ 165,723	$ 146,628	65%	$ 21.43

Figure 1.2 After-Tax Project Sensitivity



1.19 Risks and Opportunities

MDA has identified a number of external and internal risks and opportunities that may affect the economics of the Hasbrouck project.

External Risks

- The project's economic viability is generally at risk from changes in external factors which would lead to increases in input costs (construction costs, operating costs), or a fall in the price of gold or silver which would reduce revenue.
- A decrease in gold or silver price would not only reduce revenue, but would also reduce the amount of economically minable ore as a decrease in metal prices would result in a higher cut-off grade Under the current gold price environment, the reserves are considered robust.
- While no environmental and permitting risks are currently identified, and permits are in-hand for the Three Hills Mine, this is an area where risk to cost and schedule generally exist. Typical environmental and permitting risks include items being discovered on the project site such as sensitive or endangered botany, or cultural artifacts, which would have the effect of extending schedules, increasing permitting costs, and potentially making permitting impossible at the Hasbrouck Mine.

Internal Risks

- Current drill spacing is adequate and there is a low risk of a decrease in resources due to additional drilling and subsequent re-modeling and re-estimations.
- The project's economic viability is generally at risk from internal factors such as poor construction or operational execution resulting in construction and commissioning cost and schedule over-runs, scope creep, and increased operating costs. This is mitigated by supplying management to oversee construction.
- Should the metallurgical efficiencies and reagent consumption rates assumed in this study not be generally achieved, the project would not achieve the economic performance predicted in this study.
- There is a risk that permeability in a full-scale heap leach at Three Hills Mine will be inadequate, based on testing done on a bulk sample by KCA in 2014. The particle size distribution of ROM ore will be coarser than that tested, and the risk of poor permeability at full-scale is deemed to be low. It is not possible to be certain about percolation through ROM ore as no compacted permeability test equipment exists capable of handling material of this particle size. The risk of low percolation rates can be mitigated by performing field permeability tests on ROM ore during the early phase of mining and making appropriate adjustments to methods of stacking and leaching. Thus, during initial leaching operations at Three Hills, percolation will be closely monitored to observe the percolation rate, allowing early adjustments to be made as necessary. Early adjustments include installing intermediate drains in the heap at various elevations as the heap grows in height. While this would increase costs somewhat, it is a viable and proven technique

which can be implemented simply and quickly should percolation decrease to unacceptable rates as stacking height increases.

- Predicted gold recovery from Three Hills ore is based on the results of a column-leach test on material that was somewhat finer than ROM ore is expected to be. The expected gold recovery predicted by the test could therefore be biased high. This risk is deemed to be low, given the flat Three Hills particle size/gold recovery curve.
- This study contemplates using certain pieces of mobile crushing and screening equipment at the Hasbrouck Mine that will tend to have a fall-off in availability and higher maintenance costs over time when compared to non-mobile equipment. Thus the availability factor in this study may have been overstated. This risk can be mitigated by increasing the robustness of foundations that mobile equipment will be mounted on to approximate those of non-mobile equipment.
- Increased gold recovery of 2.5% and 1.5% from drain down of heap-leach pads at the Three Hills and Hasbrouck mines, respectively, was included in this PFS. This type of recovery is generally not included in economic studies, but additional recovery is realized in most leaching operations. There is a risk that the full drain-down recovery will not be realized in actual production.
- If the current off-site toll carbon processor cannot handle all the loaded carbon, then the operating costs will increase due to the higher cost of selling the loaded carbon to an ashing refiner.
- Fuel price used in this study for contract mining is $1.70 per gallon. However, if the cost of fuel rises, mining costs will be adversely affected.
- Geotechnical studies are preliminary at Hasbrouck Mine and additional drilling is recommended to raise the level of certainty for final pit slope angles. There is a risk that additional geotechnical studies might result in flatter pit slopes than used in this study, which would have an adverse impact on costs and reserves. This risk is considered minimal because a large portion of the mining is above the crest of the ultimate pit.
- Contract mining costs are based on first principle costs estimated by MDA and adjusted to include a contractor return on capital and profit. These costs have not been vetted by contractors. This risk needs to be mitigated by obtaining contractual costs through competitive bidding by qualified mining contractors.
- Finding and keeping the skilled employees required to operate the Hasbrouck project might prove challenging, given its rural location. Inadequate staffing would tend to increase operating costs by reducing operating efficiencies and increasing repair and maintenance costs. Recruiting costs might be higher than predicted.

Opportunities

- Additional drilling along the periphery of the Hasbrouck and Three Hills deposits has the potential to extend the resources to the east and west at the Hasbrouck Mine, and to the east and southeast at the Three Hills Mine. Such expansion could improve the project economics by reducing waste, extending the LOM and increasing overall revenues.

- Additional drilling could also result in reclassification of resources from Inferred to Indicated, and from Indicated to Measured. Within the 2 pits there are 3.3 million tons of Inferred resources that are currently treated as waste. Any upgrade of Inferred material to Indicated or higher classification, could improve the project economics by increasing ore tonnage and reducing waste tonnage, extending the LOM and increasing overall revenues.
- Engaging contractors more closely in the mine planning and design might result in identifying cost-reductions.
- Mining costs may be reduced by WKM deciding to operate the mine using their own equipment and employees, thus avoiding paying the contractor's profit. The increase in initial and sustaining capital for mining equipment might be mitigated by leasing equipment.
- Additional geotechnical studies might result in pit slopes being steepened, leading to a smaller amount of waste rock to be mined per ton of ore. Geotechnical information gained from mining operations at Three Hills may help geotechnical understanding of the Hasbrouck mine in common geotechnical domains, which may allow for further steepening of the Hasbrouck Mine pit slopes.
- HPGR crushing and micro-fracturing performance might be understated in the laboratory due to the very short time that samples take to be crushed by the laboratory-scale HPGR, typically measured in seconds or, for larger samples, several minutes. Such short runs do not allow time to optimize HPGR settings. It is expected that under steady-state running at full-scale, fine tuning of crushing parameters, such as the amount of choke feeding, recirculation, roll rotation speed, and roll closing force, will result in greater efficiency in crushing and micro-fracturing which in turn will result in higher gold and silver recovery than indicated by laboratory scale tests.
- The HPGR model selected for this study was a first-pass choice. A larger machine would allow a greater amount of recirculation which would result in a finer product size and consequently a greater recovery of gold and silver.
- Bottle roll tests on HPGR crushed lower Siebert material may have understated gold recovery relative to gold recovery that could be expected from column leach tests, perhaps by an amount similar to the 6% increase demonstrated with upper Siebert ore. The 2% allowance made for this effect in this study might therefore be too low.
- Faster gold recovery from solution, and hence more efficient operation, might be achieved at the Hasbrouck Mine by increasing the number of carbon columns in the adsorption plant from 5 to 6.
- Additional metal recovery from both the Three Hills and Hasbrouck mines might occur beyond the leach cycle time assumed in this study.
- The overall design of the crushing and screening plant presented in this study is a first-pass design and was not reviewed by other equipment suppliers. The opportunity exists to optimize the crushing and screening plant general arrangement and individual components, with the help of other equipment suppliers' input. Areas that are especially

targeted for review include the configuration of grizzlies at the primary crusher (both static and vibrating), and conveyor layouts to and from the secondary crushers.

- A pug mill was included in the Hasbrouck Mine process plant to address the concern that the HPGR might produce "cake" rather than granular particles, which might occur when there is sufficient clay-sized material and moisture in the HPGR feed. Caked material would tend to reduce agglomeration and access of solutions to the ore once place in the heap. Planning to pass all crushed ore through the pug mill, as has been assumed in this study, is conservative as in reality the pug mill will only be required under moist conditions when clay is present in the ore, which is a small percentage of the time; for the majority of the time ore can by-pass the pug mill, with mixing of cement and ore being achieved at the various conveyor transfer points. Reducing the operating time of the pug mill would reduce operating costs.
- The various construction and capital equipment costs used in this study are based on budget costs obtained from one source in each case. It is possible that lower costs might be achieved by competitive bidding.
- The earthworks component of civil construction might be performed in part, or all, by mining equipment. This could reduce construction costs as mining equipment tends to operate at lower unit costs than civil equipment. Additionally, using mining equipment might eliminate the need for mobilization and de-mobilization of construction equipment, which would offer further cost savings.
- Predicted consumption of cyanide at the Three Hills and Hasbrouck mines was based on data from column leach tests using 500 ppm NaCN concentrations. It is common in many heap leach operations to utilize a lower cyanide concentration than predicted by laboratory-scale testing. Typical field concentrations can be in the range of 125-250 ppm where the ore is relatively free of significant cyanide-consuming constituents. Actual consumption may be lower than has been assumed in this study; a lower cyanide concentration would lead to lower operating costs.
- It may be possible to reduce operating costs by optimizing crew rotations and hours.
- Mobile equipment has been included in the Hasbrouck crushing circuit design. A thorough review of the crushing system using stationary equipment could identify possible design changes that could result in lower operating costs.

1.20 Recommendations

WKM does not intend to complete additional studies or testing in advance of commencing construction and operation at the Three Hills Mine.

MDA makes the following recommendations for studies in advance of commencing construction and operation at the Hasbrouck Mine as shown in Table 1.16.

Table 1.16 Hasbrouck Mine Studies Recommendations

Hasbrouck Mine Metallurgy Test Work	$ 390,000
Hasbrouck Mine Geotechnical Work	$ 360,000
Total Recommended Budget	**$ 750,000**

The estimated costs of the recommendations total $750,000. Additional exploration drilling is not included in the immediate production recommendations. However, Three Hills will benefit from additional drilling to the east and northeast of the main deposit in the future, and there is potential for resource expansion along trend to the west and east at Hasbrouck.

2.0 INTRODUCTION AND TERMS OF REFERENCE

Mine Development Associates ("MDA") has prepared this Technical Report and updated Preliminary Feasibility Study ("PFS") on the Hasbrouck gold-silver project, located in the State of Nevada, at the request of West Kirkland Mining Inc. ("WKM"). This update builds on MDA's 2015 PFS Technical Report titled "*Technical Report and Preliminary Feasibility Study: Hasbrouck and Three Hills Gold-Silver Project Esmeralda County, Nevada*" ("2015 PFS") by Tietz et al. (2015). On April 12, 2016 WKM announced "The Company is updating modelled project costs to reflect current contractor rates and oil prices and is actively investigating several opportunities for synergies with other similar scale projects or Nevada domiciled deposits and operations". As presented in this PFS, the principal changes from the 2015 PFS are: a reduction in diesel price; detailing of Three Hills construction schedule; deferment of Three Hills gold plant and toll processing of carbon; use of refurbished crushing and conveying equipment; water sourced from wells instead of the town of Tonopah; added gold recovery assumed during drain down of heap-leach pads; reclamation and bond recalculation; and metal price increase.

WKM is listed on the Toronto Venture Exchange ("TSX.V") under the symbol "WKM". In January, 2014, WKM announced it had entered into an agreement with Allied Nevada Gold Corp. ("Allied") to acquire up to a 100% interest in Allied's Hasbrouck and Three Hills gold-silver properties (the "Hasbrouck Project"). WKM subsequently has announced that its subsidiary WK Mining (USA) Ltd. completed the acquisition of an initial 75% interest in the Hasbrouck Project. On September 11, 2014, WK Mining (USA) entered into a mining lease to purchase agreement with Eastfield Resources (USA) Inc., covering 7 patented mining claims that became part of the Three Hills Property. Total consideration to be paid over the life of the lease is CDN$280,000, of which CDN$30,000 has been paid. On June 19, 2015, Allied announced that the United States Bankruptcy Court for the District of Delaware had approved the sale of Allied's exploration properties and related assets (excluding the Hycroft operation) to Clover Nevada LLC ("Clover Nevada"), a wholly-owned subsidiary of Waterton Precious Metals Fund II Cayman, LP ("Waterton"), including Allied's 25% interest in the Hasbrouck project. The sale does not materially affect the contractual rights of WKM and WKM holds the title to the Hasbrouck properties. In this report the term WKM is used to refer to both West Kirkland Mining Inc., and WK Mining (USA), interchangeably.

This report has been prepared to comply with the disclosure and reporting requirements set forth in the Canadian Securities Administrators' National Instrument 43-101 ("NI 43-101"), Companion Policy 43-101CP, and Form 43-101F1, as well as with the Canadian Institute of Mining, Metallurgy and Petroleum's "CIM Definition Standards - For Mineral Resources and Reserves, Definitions and Guidelines" ("CIM Standards") adopted by the CIM Council on May 10, 2014.

Gold and silver mineralization occurs at the Three Hills and Hasbrouck deposits in high-level, low-sulfidation, hot spring-type epithermal systems. Technical Reports by Prenn (2003, 2006) and Prenn and Gustin (2003, 2006) have provided previous descriptions of the two deposits separately. An earlier description of the Three Hills deposit was given by Hardy (1996). The two deposits have also been described jointly in Technical Reports by Flint et al. (2012), Wilson (2014), and, most recently, by Tietz et al. (2015).

2.1 Project Scope and Terms of Reference

The purpose of this Technical Report is to present an updated Preliminary Feasibility Study ("PFS") of the Hasbrouck gold-silver project for WKM, with improved project economics based on more detailed, reduced estimates of capital and operating costs, and a slight increase in gold recovery at the end of the mine life. This report has been prepared by Thomas L. Dyer, P.E., Senior Engineer for MDA and Paul Tietz, C.P.G., Senior Geologist for MDA, with contributions from Herbert C. Osborne of Osborne and Associates, Ryan T. Baker, Principal Engineer with NewFields Mining Design & Technical Services, LLC, and Carl E. Defilippi, Senior Engineer for Kappes, Cassiday & Associates. The Mineral Resources were estimated and classified under the supervision of Mr. Tietz to the standards and requirements stipulated in NI 43-101. The PFS was prepared under the supervision of Mr. Dyer. Mineral Reserves have been estimated and classified for this report under the supervision of Mr. Dyer to the standards and requirements stipulated in NI 43-101. Mr. Dyer and Mr. Tietz are Qualified Persons under NI 43-101. There is no affiliation between Mr. Dyer, Mr. Tietz, Mr. Osborne, Mr. Baker and Mr. Defilippi and WKM, except that of independent consultant/client relationships.

The scope of this study included a review of pertinent technical reports and data provided to the authors by WKM relative to the general setting, geology, project history, exploration activities and results, methodology, quality assurance, interpretations, drilling programs, and metallurgy. MDA has relied on the data and information provided by WKM for the completion of this report. Mr. Tietz visited the Hasbrouck and Three Hills properties on July 25, 2014. The site visit followed inspections in June, 2014 of project drill core stored at Allied's Hycroft Mine near Gerlach, Nevada, and at Kappes Cassiday and Associates in Reno, Nevada. During the site visit, Mr. Tietz reviewed the project geology and drill locations with project personnel. Mr. Dyer visited the Hasbrouck project on May 1, 2014, and inspected drill core in June, 2014 with Mr. Tietz at Kappes Cassiday's facility. Mr. Defilippi and Mr. Baker conducted site visits at Hasbrouck and Three Hills on May 1, 2014, at which time they inspected the properties and pertinent local infrastructure. Mr. Osborne has not visited the site. MDA has made such independent investigations as deemed necessary in the professional judgment of the authors to be able to reasonably present the conclusions discussed herein.

The authors have relied almost entirely on data and information provided by WKM and previous companies involved with the project. The authors have reviewed much of the available data, made a site visit, and have made judgments about the general reliability of the underlying data. Where deemed either inadequate or unreliable, the data were either eliminated from use or procedures were modified to account for lack of confidence in that specific information. MDA has made such independent investigations as deemed necessary in the professional judgment of the authors to be able to reasonably present the conclusions discussed herein.

The effective date of this Technical Report and the PFS is September 1, 2016, which is the date of the revised cash-flow model as described in WKM's September 1, 2016 press release on the project economics. The Three Hills resource database has an effective date of July 15, 2014 while the effective date of the Three Hills resource estimate is August 4, 2014. The Hasbrouck deposit resource database has an effective date of October 15, 2014 while the effective date of the Hasbrouck deposit resource estimate is November 3, 2014. A total of 14 holes at Three Hills and 14 holes at Hasbrouck were drilled by WKM in late 2014, and this information has been reviewed by MDA. It is MDA's opinion that WKM's 2014 drilling would not materially change the resource estimates and is not material to the conclusions of the PFS. For this reason the 2014 resource databases have not been updated to include the WKM drilling of 2014.

2.2 Frequently Used Acronyms, Abbreviations, Definitions, and Units of Measure

In this report, measurements are given in Imperial units, except where the original information was reported in metric units. Assays have been reported in the manner in which they were received; all early work is in Imperial units (troy oz/short ton), and more recent work is reported in ppm.

Currency, units of measure, and conversion factors used in this report include:

Linear Measure		
1 centimeter	= 0.3937 inch	
1 meter	= 3.2808 feet	= 1.0936 yard
1 kilometer	= 0.6214 mile	
Area Measure		
1 hectare	= 2.471 acres	= 0.0039 square mile
Capacity Measure (liquid)		
1 liter	= 0.2642 US gallons	
Weight		
1 tonne (metric)	= 1.1023 short tons	= 2,205 pounds
1 kilogram	= 2.205 pounds	

Currency Unless otherwise indicated, all references to dollars ($) in this report refer to currency of the United States.

Frequently used acronyms and abbreviations

3-D	three dimensional
AA	atomic absorption spectrometry
Ag	silver
As	arsenic
Au	gold
Bi	bismuth
BLM	United States Department of the Interior, Bureau of Land Management
BMRR	Bureau of Mining Regulation and Reclamation
C.P.G.	Certified Professional Geologist
CN	cyanide
Cu	copper
cuft	cubic feet
F	Fahrenheit
ft	feet
G&A	general and administrative

g	grams
g/t	grams per tonne
gal	gallons (US)
gal/h	gallons (US) per hour
GCL	geosynthetic clay liner
gpm	gallons (US) per minute
GPS	Global Positioning System
Hg	mercury
HDPE	high-density polyethylene
HPGR	High-pressure grinding roll
ICP	inductively coupled plasma method of analysis
in	inches
K	thousands
km	kilometer
lb	pound or pounds (2,000lb to 1 ton, 2,204.6lb to 1 tonne)
IRR	internal rate of return
kwh	kilowatt hour
LOM	life of mine
m	meter
M	mesh
Ma	million annum
MDA	Mine Development Associates, the authors of this Technical Report
mil	one thousandth of an inch (0.0254mm)
NaCN	sodium cyanide
NDEP	Nevada Division of Environmental Protection
NPV	net present value
NSR	net smelter return
oz	troy ounce (12oz to 1 pound)
oz/ton	troy ounce per short ton (used in metallurgical tables)
opt	troy ounce per short ton (used in historical drilling assays and resource estimates)
Oz	troy ounce (12oz to 1 pound)
Ozs	troy ounces
P70	crushed to 70% passing through a specified screen size.
P80	crushed to 80% passing through a specified screen size.
Pb	lead
P.E.	Professional Engineer
PFS	Preliminary Feasibility Study
ppb	parts per billion
psig	pounds per square inch at gauge
ppm	parts per million (1ppm to 0.0292oz/ton)
QA/QC	quality assurance/quality control
RC	reverse circulation drilling method
ROM	run of mine
Se	selenium
st	short ton, used in metallurgical test result tables
Tl	thallium

T	short ton (imperial) 2,000lb
ton	short ton (imperial) 2,000lb
t	metric ton (tonne)
tonne	metric ton
Tpd	(short) tons per day
TPD	(short) tons per day
Tph	(short) tons per hour
USD	currency of the United States
USGS	United States Geologic Survey
Zn	zinc

3.0 RELIANCE ON OTHER EXPERTS

The authors are not experts in legal matters, such as the assessment of the legal validity of mining claims, private lands, mineral rights, and property agreements. The authors rely on information provided by WKM as to the title of the unpatented mining claims and private mineral rights comprising the Hasbrouck project, the terms of property agreements, and the existence of applicable royalty obligations. Sections 4. 2 and 4.3 are based on information provided by WKM, and the authors offer no professional opinions regarding the provided information.

The authors did not conduct any investigations of the social-economic issues associated with the Hasbrouck gold-silver project, and the authors are not experts with respect to these issues. MDA has relied on WKM to provide full information concerning the legal status of the company and related companies, as well as current legal title and material terms of all agreements relating to the property.

The authors are not experts with regard to environmental permitting or liabilities. For Section 4.4 and Section 20.0 on Environmental Studies, Permitting and Social or Community Impact MDA has relied on Mr. Richard Delong, President of Enviroscientists Inc., an environmental permitting and government relations consultancy, who provided expertise to WKM for environmental and permitting issues. Mr. Richard DeLong is a Certified Environmental Manager and a Licensed Professional Geologist. Mr. Paul Sterling, a consultant to WKM, has provided WKM with information on reclamation costs.

Although MDA is not an expert with respect to any of the above factors, MDA is not aware of any unusual environmental, permitting, legal, title, taxation, socio-economic, marketing, or political factors that may materially affect the Hasbrouck mineral resources or reserves as of the date of this report.

4.0 PROPERTY DESCRIPTION AND LOCATION

The authors are not experts in land, legal, environmental, and permitting matters. This Section 4 is based on information provided to the authors by WKM. The authors present this information to fulfill reporting requirements of NI 43-101 and can express no opinion regarding the legal or environmental status of the Hasbrouck project.

4.1 Location

The Hasbrouck project includes the Three Hills and Hasbrouck gold and silver deposits, located 2 miles west and 5 miles south of Tonopah, Nevada, respectively (Figure 4.1). Tonopah is an historic mining town in south-central Nevada, approximately 4 hours by car southeast of Reno, and 3 hours northwest of Las Vegas, Nevada.

The topographic maps covering the project area are the Mount Butte, Klondike and Mud Lake 7.5 minute quadrangles, Nevada, at 1:24,000-scale, published by the U.S. Geologic Survey. The approximate center of the Hasbrouck deposit is at latitude 37°59’32” North and longitude 117°16’0” West, and the approximate center of the Three Hills deposit is at latitude 38°3’46” North and longitude 117°15’44’ West.

4.2 Land Area

WKM has acquired a 75% interest in the Hasbrouck gold-silver project in Nevada from subsidiaries of Allied Nevada Gold Corp. The project consists of two deposits: Three Hills and Hasbrouck. The Three Hills deposit (Figure 4.2) is covered by 13 patented claims and 100 unpatented lode claims (Appendix A) occupying a total of approximately 1,967 acres in Sections 2, 3, 4, 5, 8, 9, 10 and 11, T2N, R42E, and Sections 33 and 34, T3N , R42E of the Mount Diablo Base and Meridian. Each claim within the property boundary is identified by 2 by 2in by 4ft wood posts marked with a scribed aluminum tag as required by Nevada statutes. The claims have not been surveyed by a mineral land surveyor, but they are registered and recorded with the U.S. Bureau of Land Management (“BLM”), Esmeralda and Nye Counties.

The Hasbrouck deposit (Figure 4.3) is covered by 28 patented and 583 unpatented lode mining claims occupying an area of approximately 10,750 acres (Appendix A). All claims are located on U.S. federal land managed by the Battle Mountain District of the BLM. The claims are in a contiguous block that is located in Sections 1, 2, 3, 4, 5, 9, 10, 11, 12,13,14, 15,16, 21, 22, 23 and 24, T1N, R42E, Sections 6, 7, 18, 19 and 20, T1N, R43E, and Sections 27, 28, 29, 32, 33, 34, and 35, T2N, R42E of the Mount Diablo Base and Meridian. Each claim within the property boundary is identified by 2 by 2in by 4ft wood posts marked with a scribed aluminum tag as required by Nevada statutes. The claims have not been surveyed by a mineral land surveyor, but they are registered and recorded with the BLM, Esmeralda and Nye Counties.

Current holding costs for unpatented mining claims are $155 Maintenance Fee per claim, each year to the BLM, and $12.00 Intent to Hold Fee per claim, each year to Esmeralda County. WKM has provided documentation that all federal fees to maintain the claims for another year have been paid through September 1, 2017. County fees and taxes for both the patented and unpatented claims have been paid in full to Esmeralda and Nye Counties through November, 1, 2017. WKM maintains title insurance on the properties.

Figure 4.1 Hasbrouck Project Location Map

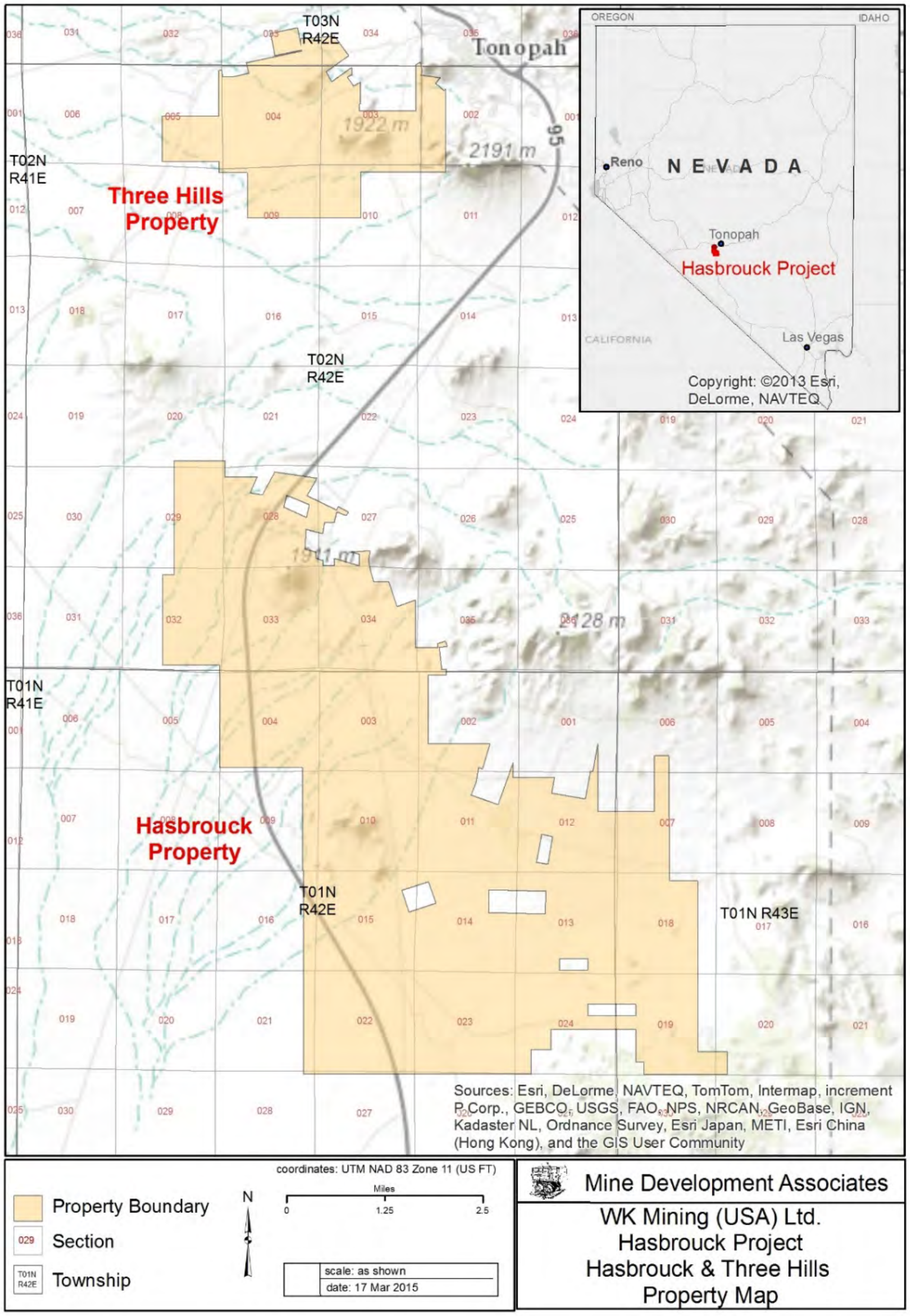


Figure 4.2 Land Status Map of the Three Hills Property
(Land data provided by West Kirkland Mining, 2014)

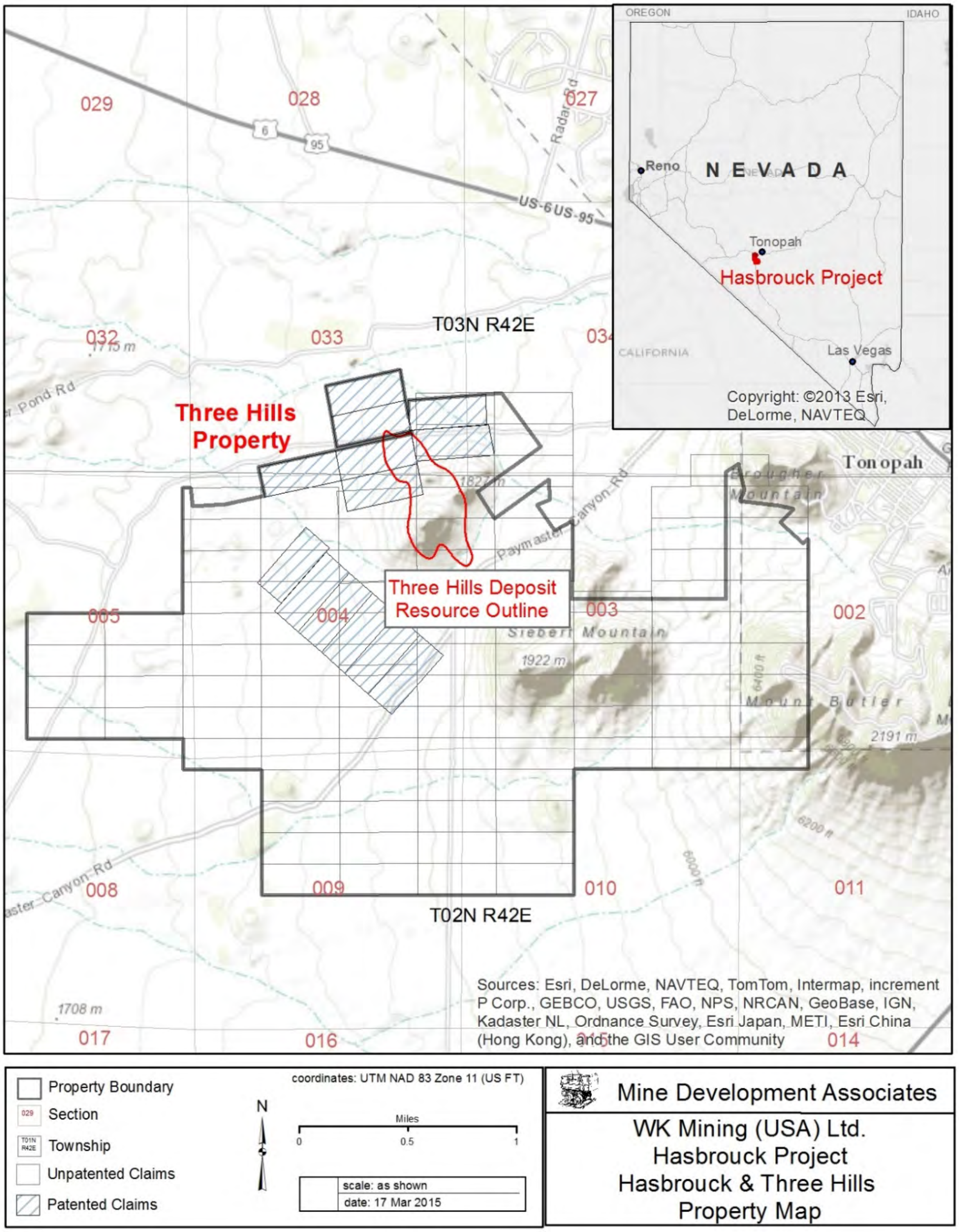
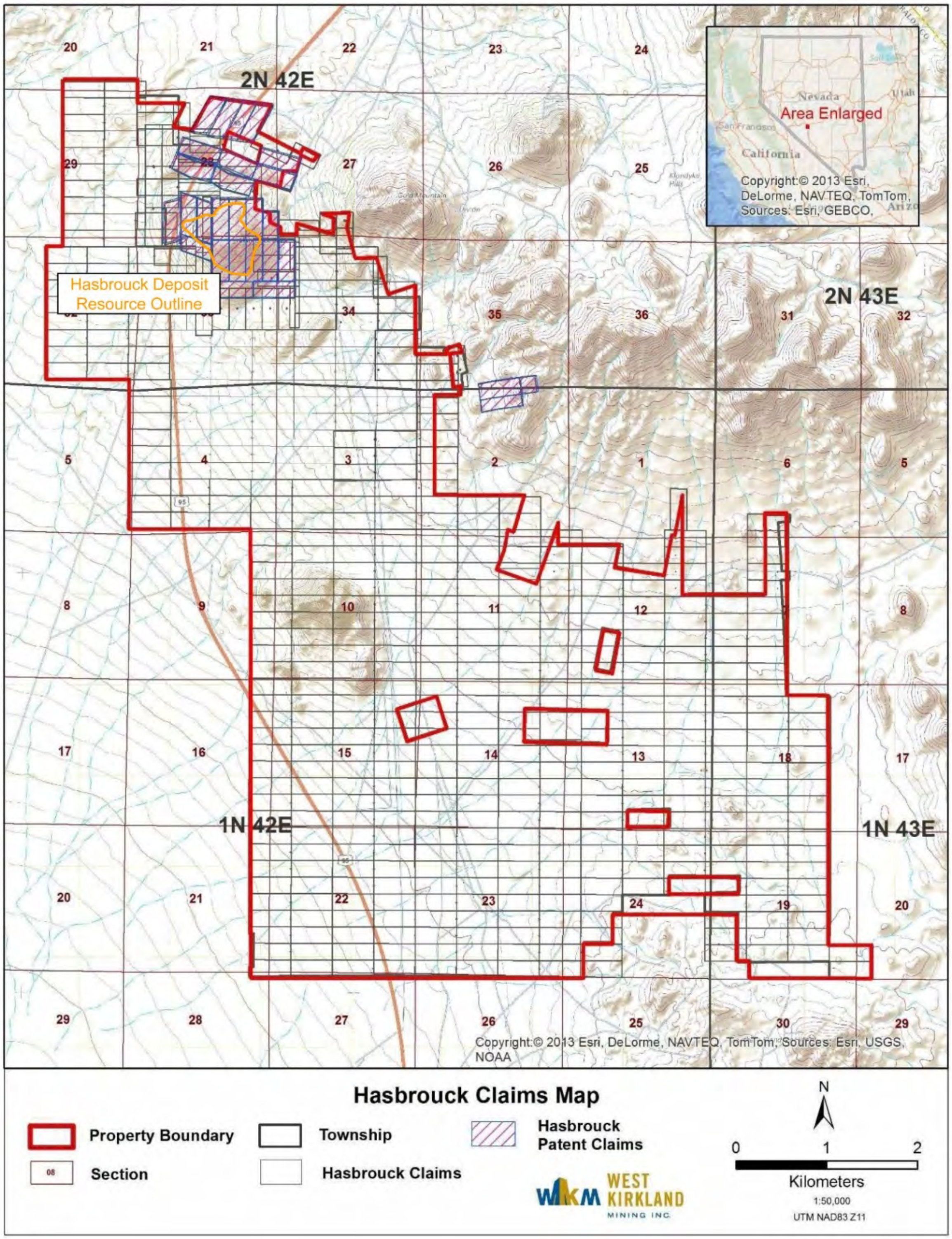


Figure 4.3 Land Status Map of the Hasbrouck Deposit Area
(Land data provided by West Kirkland Mining, 2014)



4.3 Agreements and Encumbrances

WKM's subsidiary WK Mining (USA) Ltd. ("WK") has finalized and executed a Purchase and Sale Agreement (the "PSA") with Allied to acquire the Hasbrouck and Three Hills properties. WK has paid both the deposit and initial payment with total consideration having been paid to Allied being $20,000,000. Title to the properties has been transferred to WK.

On September 11, 2014 WK entered into a mining lease to purchase agreement with Eastfield Resources (USA) Inc., covering 7 patented mining claims that became part of the Three Hills Property. Total consideration to be paid over the life of the lease is CDN$280,000, of which CDN$155,000 has been paid.

On June 19, 2015, Allied announced that the United States Bankruptcy Court for the District of Delaware had approved the sale of Allied's exploration properties and certain related assets (excluding the Hycroft operation) to Clover Nevada LLC ("Clover Nevada"), a wholly-owned subsidiary of Waterton Precious Metals Fund II Cayman, LP ("Waterton"), which included the 25% interest in the Hasbrouck project.

Pursuant to the PSA, WKM has the option of making an additional $10,000,000 payment (the "Final Payment") on or before October 22, 2016 (the "Final Payment Deadline"). If WKM pays the Final Payment to Waterton, and Waterton accepts the payment in accordance with the terms and conditions of the PSA, it will acquire the remaining 25% interest in the properties resulting in it owning a 100% interest in the properties.

If WKM does not make the Final Payment to Waterton on or before the Final Payment Deadline, or if WKM offers payment and Waterton chooses to decline the Final Payment, the properties shall be transferred into a limited liability company (the "LLC") with WKM retaining a 75% interest in the LLC and Waterton retaining 25% interest in the LLC. Upon entering the LLC both parties will be responsible for their share of the costs on a pro rata basis with Waterton's share of the costs accruing and payable in full 30 months after the signing of the PSA. At the time of writing this report WKM had completed a transfer of the properties into an LLC, with a date of recordation in Nye County of September 9, 2016 and a date of recordation in Esmeralda County of September 12, 2016. At present 100% of the LLC is held by WKM. WKM has no work commitments, but the project is subject to certain underlying royalties as described below.

The Hasbrouck property patented and unpatented claims are also subject to a purchase agreement between Vista Nevada and Newmont Capital Limited ("Newmont"), which was executed on May 23, 2003. This agreement covers both the Hasbrouck and the Three Hills deposits. Terms of the purchase agreement included a $50,000 cash payment on signing (completed), $200,000 or the equivalent in Vista Gold shares one year after signing (completed), and $500,000 upon commencement of commercial production on the property. An additional payment of $500,000 shall accrue if the average gold price over any three-month period of commercial production exceeds $400/oz.

Newmont held a one-time election to enter into a joint venture on the property. During 2010, Allied achieved the threshold trigger and Newmont elected not to enter into a joint venture and retained an NSR royalty of 2% on the Hasbrouck property.

For the Three Hills deposit, all claims are subject to a mineral production royalty of between 2% and 4%. Fifteen of the unpatented claims are subject to a mineral production royalty of 4% NSR. The remaining 85 unpatented claims and 3 of the patented claims at Three Hills are subject to a mineral production royalty of 2% NSR. The remaining 8 patented claims are subject to a mineral production royalty of 4% NSR.

At the Hasbrouck deposit, 19 of the patented claims and three of the unpatented mining claims are subject to a mineral production royalty of 4% of the net smelter returns ("NSR"). The remaining 9 patented mining claims and 256 of the unpatented mining claims are subject to a mineral production royalty of 2% NSR. The remaining 327 unpatented mining claims are not subject to a royalty.

4.4 Environmental Considerations

Enviroscientists Inc., an environmental permitting and government relations consultancy, provided the following information on environmental liabilities and permitting. WKM's U.S. subsidiary, WK, conducted the most recent exploration at Hasbrouck and Three Hills, and environmental permits were in WK's name.

4.4.1 Environmental Liabilities

Current environmental liabilities at the Hasbrouck and Three Hills deposits are limited to exploration drill roads and pads. Current bonding is in place to support this work, associated with multiple Notices authorized by the BLM for less than 5 acres of disturbance each. Existing disturbances and bond amounts for each Notice are shown in Table 4.1. Other than reclamation obligations, which consist of re-contouring and re-vegetating exploration drill roads and sites, there are no known environmental liabilities associated with the recent exploration activities conducted at the Hasbrouck and Three Hills deposits by Allied and WKM.

Table 4.1 Existing Disturbance and BLM Notices for the Hasbrouck Project

Notice #	Disturbance Acreage	Bond Amount
NVN-91216	4.88	$65,450.00
NVN-89964	1.84	$14,033.00
NVN-89750	4.53	$18,758.00

The Tonopah district is the center of extensive mining and exploration activity that has occurred over the past 110 years. Old workings and prospects are located throughout the Hasbrouck and Three Hills deposit areas. Contamination may occur in association with historic surface and underground workings, or from former operators in relation to drill pads and sumps where chemicals or oils may have collected.

4.4.2 Permits Required

The Three Hills Mine is permitted; all key permits are in hand with the last state air quality permit having been issued in June, 2016. Certain minor permits are still required, but obtaining them is routine and without risk.

Permitting for the Hasbrouck Mine commenced in 2011 when a cultural survey was performed. Biology base-line studies were performed in subsequent years. Work on permitting the Hasbrouck Mine is ongoing. A Plan of Operation for Hasbrouck Mine will be submitted to the BLM when operational and baseline surveys are complete and operations and design for the project are at a level where a Plan of Operation application can be developed to the necessary level of detail.

The review and approval process for the Hasbrouck Mine Plan of Operation by the BLM constitutes a federal action under the National Environmental Policy Act ("NEPA") and BLM regulations. Thus, for the BLM to process the Plan application, the BLM is required to comply with NEPA and prepare either an Environmental Assessment ("EA"), or an Environmental Impact Statement ("EIS"). The BLM will determine the level of NEPA to perform for the proposed Hasbrouck Mine following the submittal and acceptance of the Plan application. It is anticipated that an EIS will be required for the proposed Hasbrouck Mine.

The county, state, and federal permits required prior to commencement of mining operations for both the Three Hills and Hasbrouck mines are shown in Table 4.2.

Table 4.2 Operating Permits Required

Permit	Issuing Agency
Plan of Operations	Bureau of Land Management
Rights-of-Way	Bureau of Land Management
Reclamation Permit	NDEP Bureau of Regulation and Reclamation
Air Quality Operating Permit	NDEP Bureau of Air Pollution Control
Mercury Air Operating Permit	NDEP Bureau of Air Pollution Control
Water Pollution Control Permit	NDEP Bureau of Regulation and Reclamation
Artificial Pond Permit	Nevada Department of Wildlife
Dam Safety Permit	Nevada Division of Water Resources
Hazardous Material Storage Permit	Nevada State Fire Marshal
County Road Maintenance Agreement	Esmeralda and Nye Counties

4.5 Easements for Local Infrastructure

At the Hasbrouck Mine, both U.S. Highway 95 and the former U.S. Highway 95 have Right of Way boundaries and are immediately adjacent to the deposit. WKM has ascertained that mining in proximity to Highway 95 is viable and that relocating U.S. Highway 95 in order to exploit the Hasbrouck deposit is not required. Blasting will at times be subject to the requirements and constraints of the Nevada Department of Transportation, which include halting traffic flows for up to 20 minutes periodically.

A north-south buried fiber optic cable, owned by AT&T Inc., runs along the eastern boundary of the Hasbrouck Mine, just to the west of, and approximately parallel to, the old U.S. Highway 95. After consulting with AT&T Inc., WKM has determined that relocation of the buried cable will not be necessary.

At the Three Hills Mine another section of the same buried fiber optic cable runs north-south through the eastern portion of the Three Hills deposit and will require relocation for mining to take place. At a meeting with AT&T in Reno, Nevada, AT&T provided the opinion that it is practical to relocate the fiber optic cable. Subsequently AT&T have provided budget costs and schedule for such a move.

5.0 ACCESSIBILITY, PHYSIOGRAPHY, CLIMATE, LOCAL RESOURCES AND INFRASTRUCTURE

The information in this section has been modified from the Technical Reports completed in 2014 and 2015 (Wilson, 2014; Tietz et al. 2015).

5.1 Access

The Three Hills property is one mile southwest of Tonopah and is accessed via county-maintained roads from the northwest end of Tonopah (Paymaster Canyon Road) and on an un-named county-maintained road from the south. The deposit is approximately five miles north of the Hasbrouck deposit.

The Hasbrouck property is six miles south of Tonopah, Nevada, and will be accessed by a turn-out off U.S. Highway 95. U.S. Highway 95 passes through the property approximately 0.25 miles west of the Hasbrouck deposit and is an all-weather, all-season roadway suitable for commercial semi-trailer traffic.

U.S. Highway 95 is the main north–south transportation corridor through central Nevada and passes 2.25 miles east of the Three Hills deposit, and immediately to the west of the Hasbrouck deposit. U.S. Highway 6 passes 1.25 miles north of the Three Hills deposit, and is a major east-west transportation corridor through central Nevada. Both of the above provide all-weather, all-season access for commercial semi-trailers. Both highways pass through Tonopah, Nevada.

5.2 Physiography

Elevations of the properties vary between 5,600ft and 6,300ft. The principal physiographic features of the Hasbrouck and Three Hills properties are prominent hills that rise 200-700ft off the valley floor. This includes Hasbrouck Mountain, the core of the Hasbrouck deposit, which rises 700ft from the valley plain to a peak of 6,300ft. The principal physiographic features of the Three Hills property are the cluster of hills known as Three Hills, which rise 200ft from the valley floor to an elevation of about 6,100ft.

Vegetation in the area is typical of south-central Nevada and consists of sagebrush and other desert plants on the lower slopes and valleys. Trees are absent. Shadscale, white sage, and greasewood occur with sagebrush on the drier slopes and hills.

5.3 Climate

The climate is semi-arid. Average annual precipitation is 5 inches, which is accumulated through winter snows and, to a lesser extent, summer thunderstorms. The evaporation potential greatly exceeds the precipitation on an average annual basis in the area, creating a negative water balance which is addressed in Section 17.1.9.3. There are large temperature variations recorded for the Tonopah area, with an annual range of -12° F to 105° F, with the average temperatures being 23° F in winter and 73° F in summer. On average, 150 days per year are frost-free. Snow depths in winter are generally minimal on the property as storms are fairly intermittent and winter daytime high temperatures often exceed 32° F. The overall climate will permit production operations year round, although freezing winter temperatures need to be considered in the design of any heap leach processing system.

5.4 Local Resources and Infrastructure

5.4.1 Human Resources, Accommodation, and Amenities

The towns of Tonopah (population 2,500) and Goldfield (population 300) are within easy driving distance of the properties and have basic amenities, medical services, housing, apartments, commercial and office space for rent and for sale, and lots for sale. The residents of these two communities comprise an experienced work force with historical and recent ties to mining operations in Nevada. Taken together, these locations can provide living areas for employees and it is expected that residents of Tonopah and Goldfield will form a significant portion of the workforce.

5.4.1.1 Electrical Power

An existing 55 kV power line, owned by NV Energy, a state-wide energy provider and the sole option for grid power for the project, transects the west side of the Hasbrouck deposit. Recent discussions with NV Energy indicate that after certain modifications are made there will be sufficient capacity to support the planned project requirements.

5.4.1.2 Raw Water Supply

Raw water is defined as water, other than potable water, that will be required and be used by the project. It includes water for construction purposes, make-up water for mineral processing, water for dust control on mine roads, and any other sundry uses. The quantity of water required is estimated at between 350 and 500 gpm.

A primary source of raw water is from a well or wells, which would be installed close to each deposit. This would involve obtaining a water right to appropriate groundwater, which might be a new water right acquired from the state engineer on application, or by purchase or lease of an existing water right.

Raw water is also available from the Tonopah Public Utility ("TPU"), which has offered to sell water to the project. TPU has the necessary water permits and infrastructure in the form of wells, pumps, pipelines and tanks to meet the project's needs, and is legally entitled to do so.

5.4.1.3 Potable Water

Potable water for Three Hills Mine will be sourced from TPU as the intention is to locate administration and the assay laboratory in Tonopah.

Potable water for Hasbrouck Mine will be sourced from a water well installed close to the mine. A certified water supply system will be required in this case. A water right will also be required.

5.4.2 Mining Infrastructure

Both the Three Hills and Hasbrouck properties have adequate space to develop infrastructure for mine operations. This includes siting of the heap-leach facilities, waste rock storage areas, process buildings, workshops, etc.

6.0 HISTORY

This section describes exploration at Hasbrouck and Three Hills prior to acquisition by WKM and is largely taken from Wilson (2014), as presented in Tietz et al. (2015).

6.1 Three Hills Exploration History

Modern exploration in the Three Hills area started in 1974 when Cordex obtained the property and completed sampling and mapping in the project area. Cordex drilled 14 rotary holes in 1978, intersecting gold mineralization in most of the holes. Saga Exploration leased the property and, between 1983 and 1988, completed 33 air track and 28 reverse-circulation ("RC") drill holes. Two of the air track holes and 5 of the RC holes drilled by Saga are not included in the current database. Echo Bay leased the property in 1988 and completed an additional 77 reverse circulation drill holes during the next two years. During the period 1991 to 1995, Gexa Gold and Coeur D'Alene Mines completed sampling and metallurgical studies on the property and Gexa drilled two short diamond-core holes.

In 1995 the Eastfield Resources Ltd./Prism ("Eastfield") partnership optioned the property from Coeur D'Alene Mines, who had acquired the property by way of settlement of receivership of Gexa Resources, and completed additional drilling and testing on the property between 1995 and 1997. A number of geophysical studies (including magnetics and induced polarization) were completed, as well as geochemical sampling over a regular grid. A total of 19 soil lines, spaced 300-400ft apart were completed. Eastfield's induced polarization ("IP") survey was made over an area north of the Three Hills Deposit, with 12.3 line miles completed. Oxidation levels in the area are of sufficient depth to make it difficult to detect sulfide mineralization. No strong features were recognized. The Eastfield magnetic data has been useful in defining linear fault features and major lithology breaks.

A Master's thesis research project was completed by R. Thompson during the 1996 and 1997 exploration seasons at Three Hills. The thesis work included study of thin sections, whole rock geochemistry, and x-ray diffraction studies of the alteration mineralogy (Tregaskis and Garratt, 1998). Additionally, some samples were analyzed for gold, silver, arsenic, antimony, mercury, molybdenum, and occasionally copper, lead, and zinc. Arsenic, antimony, molybdenum, and mercury concentrations are elevated in the limonitic Siebert Formation over a widespread area in the northern portion of the Three Hills area.

Geologic mapping at Three Hills was completed by R. Thompson and S. Tregaskis (1997-1998). This mapping remains as the guide for exploration in the area.

Coeur D'Alene Mines sold the Three Hills property to Euro-Nevada, which subsequently merged with Newmont. Eastfield terminated their option agreement and returned the property to Newmont after the year 2000 exploration season.

On May 23, 2003, Vista executed a purchase agreement with Newmont Capital, which included both the Hasbrouck and the Three Hills properties. The terms of this agreement are detailed in

Section 4.3. Vista did not conduct exploration at Three Hills until the spin-off of Allied Nevada Gold Corp.

Allied initiated exploration at Three Hills in 2012 and drilled 17 RC holes that year, focused on expanding known mineralization. The best hole was TH12R-015, which returned 66m of 3.33 g/t Au. An additional 8 core holes were drilled for metallurgical samples and condemnation in 2013.

Allied identified a total of 312 rock-chip samples taken in the Three Hills area during exploration between 1974 and 2012. The bulk of the samples are channel samples taken from three road cuts and a 225ft adit. Allied was able to spatially locate and validate assay data for 204 of these samples. Rock-chip samples range from < 0.005 to 5.69ppm Au and <0.20 to >100ppm Ag. Approximately 70% of the samples were also analyzed for geochemistry, including Ba, Hg, Mn, As, Mo, and Sb. The Eastfield soil data were not located by Allied.

6.1.1 Hasbrouck Exploration History

Silver and gold mineralization was first discovered on Hasbrouck Mountain in 1902. Early mining exploited the Kernick vein, which was worked on a small scale through the mid-1920s. The only recorded production from Hasbrouck is 740 tons of ore by the Tonopah Hasbrouck Mining Company in 1923 and 1924 (Couch and Carpenter, 1943) that grossed $10,406. The early miners completed about 6,500ft of adits and 1,000ft of raises.

In 1974 Cordex completed detailed surface and road cut sampling, vertical conventional rotary drilling, geologic mapping, sampling of surface and underground workings, a mineral resource estimate, and metallurgical test work. The claims were relinquished at the end of 1975, but subsequently re-acquired in 1980. During the 1980 work program, Cordex undertook detailed underground sampling of the principal workings, including the Ore Car, Main, South, and Northeast adits. A total of 191 underground samples were collected over a total length of 3,862ft. One surface and two underground bulk samples were collected for metallurgical test work. In total, drilling by Cordex from 1974–1980 comprised 25 rotary drill holes (9,760ft) and one of the 1974 rotary drill holes was deepened using core drilling (959ft of core). A large, low-grade gold–silver deposit was outlined based on these activities. The current resource database excludes 3 of the Cordex drill holes due to uncertain collar locations.

Geological mapping of the Hasbrouck deposit area was undertaken as part of a Master's degree thesis research (Graney, 1985). The mapping defined multiple structural orientations and a number of breccia bodies believed to represent the controlling features of precious metal mineralization, primarily the east–west-trending Kernick vein zone.

Franco-Nevada optioned the property from Cordex in 1985, drilled 30 vertical RC drill holes (10,145ft), and completed metallurgical test work. A mineral resource and "mineable reserve" estimates (not in accordance with NI 43-101) were performed in 1986. The Franco-Nevada drilling succeeded in expanding and better defining the Hasbrouck deposit.

FMC optioned the property in 1988 and drilled 76 RC angle and vertical drill holes (34,255ft) and undertook additional metallurgical test work. The FMC program consisted primarily of definition and infill drilling, including a small zone of tightly-spaced shallow drilling on a 15ft x 25ft grid. Mineral resource and "mineable reserve" (in accordance with not NI 43-101) estimations were performed in 1988. FMC also completed an E-Scan geophysical survey over a portion of the deposit, and drilled two deep RC drill holes to test a geophysical anomaly which had been interpreted as a possible high-grade feeder zone to the known mineralization. No such zone was intersected in the drilling. Four of the RC drill holes (1,160ft) were sited on the Silver King claim, north of Hasbrouck Mountain, but no anomalous gold or silver values were returned.

Following FMC's relinquishment of their interest in the property in 1990, Euro-Nevada completed a 19 line-kilometer CSAMT geophysical survey and reconnaissance surface rock chip surveys to the north, east, and southeast of Hasbrouck. A number of geochemical and geophysical targets that were considered prospective for gold mineralization were developed from this work.

Corona optioned the property from Euro-Nevada in 1992 and drilled two RC drill holes (1,210ft) to the north of Hasbrouck Mountain, in the area of the Eliza Jane patented claim. The drill holes intersected broad zones of anomalous gold, silver and molybdenum mineralization. Corona also updated the "mineable reserve" (not in accordance with NI 43-101) estimate for the Hasbrouck deposit.

Homestake acquired Corona in 1993 and vended their interest in the Hasbrouck property to Prime Equities International Corporation ("Prime") in the same year. Based on the information currently available to WKM, neither Homestake nor Prime completed any substantive work on the project.

Euro-Nevada regained 100% interest in the property in 1993 and further refined the target exploration concepts that had been developed in 1990 and 1991. In 1996, Euro-Nevada completed an 18 hole RC drilling program (17,670ft) that tested these targets, which were aligned in a northwest-trending belt that passed to the north, east and southeast of Hasbrouck Mountain. Targets were identified by geophysical or geochemical anomalies, the presence of favorable alteration, structures and structural intersections, and favorable stratigraphy. The drilling failed to identify any new zones of significant gold or silver mineralization, but anomalous gold–silver values were encountered, typically over restricted down hole widths. The best results were returned from drilling in the area of the Eliza Jane patented claim.

Newmont took control of the Hasbrouck deposit by way of their merger with Euro-Nevada in 2002. Newmont then vended the property to Vista Gold on May 23, 2003. Allied Nevada assumed control of the property when Allied was floated as a spin-off company from Vista in 2007.

From 2010 to 2013, work completed by Allied included surface mapping, systematic geochemical sampling, several drill campaigns, data verification, metallurgical studies, a CSAMT geophysical program, regional gravity survey, and reinterpretation of the spatial geology, and completion of a preliminary economic assessment which is no longer relevant due to obsolescence of input costs and subsequent drilling.

Data collected prior to Allied's interest, including drill hole and surface sample data, have been located in variable grids, including truncated State Plane, and UTM NAD27 Zone 11. Allied converted these data to UTM NAD83 Zone 11 using Corpscon6. Elevation data have been based on the NGVD29 vertical datum. Field data collected by Allied utilized the UTM NAD83 Zone 11 coordinate grid system.

The greater Hasbrouck deposit was re-mapped at a scale of 1:6,000 by Allied personnel in 2011. Re-mapping by Allied personnel led to a re-interpretation of the structural framework and the relationship of various structural orientations to mineralization. In general, the stratigraphic interpretations have been retained from the previous mapping.

Selected road-cuts were systematically channel sampled by Allied on 10-ft nominal lengths with the goal of identifying structural patterns to mineralization. A total of 677 samples were collected by Allied and submitted to ALS Chemex in Reno, Nevada for precious metal and multi-element analysis. Numerous zones of outcropping mineralization were identified. Multiple structural zones were also highlighted as either mineralized, or as boundaries to mineralization.

Two geophysical surveys were undertaken by predecessors of Allied. These data were not available to WKM.

An E-SCAN (multi-directional resistivity) survey was completed over Hasbrouck Mountain in 1988 and reinterpreted in 1998. The scan shows a resistive cap at the top and at the Saddle Knob, as well as generally matching a mapped silicified northwest structural trend on the south side. A northwest linear on the north slope at Hasbrouck is also suggested by the survey. Resistive near-vertical zones were noted in the report that crudely match similar resistive zones defined in a later CSAMT survey by Allied (see below). The reprocessed color plan view files were found to generally match the near surface resistivity detailed in the later CSAMT. The 1988 E-Scan survey lacked the detail of Allied's later CSAMT.

A CSAMT survey for the areas north and south of Hasbrouck Mountain was completed in 1990. Except for a line run at the southern base of Hasbrouck Mountain (Wright, 2011a), the 1990 survey does not cover the main project. The southern line suggests a continuation to the south of a mapped fault (East Fault) under cover.

Allied completed a CSAMT survey in 2011 over Hasbrouck Mountain consisting of 11.5 line kilometers at 100 meter station spacing (Wright, 2011b). The survey identified a strong resistor in the Fraction Tuff on the eastern portion of the mountain. Drill intercepts confirm that the anomaly is likely a locally welded portion of the Fraction Tuff. The strong silicification in the upper Siebert units on Hasbrouck Mountain was outlined, and possible feeder faults are evident in the CSAMT images. The Saddle Fault Zone and the East Fault show as 'breaks' between resistive masses. The images match the mapped resistive northwest trending zones on the south and northern part of Hasbrouck. Drill testing of the upper portion of these zones confirmed the CSAMT resistivity model.

In 2010, Allied completed two gravity surveys: one over Hasbrouck proper, and a contiguous survey to the south of the Hasbrouck Mountain (Wright, 2010). Subsequently, a gravity survey was completed over the southern portion of the Hasbrouck claim block, with 729 new gravity data stations added contiguous to the 2010 gravity surveys (Wright, 2011a). This 2011 survey was combined with the previous surveys into a master gravity plot, and structural interpretations derived from the surveys were incorporated into the exploration and mapping efforts.

Regional gravity patterns indicate a strong northwest lineament, overprinted by north-south and northeast linears. This gravity signature has been interpreted as evidence of the Walker Lane shear zone, along with transverse faults. Hasbrouck Mountain lies on the northern edge of a major gravity linear (Wright, 2010, 2011a).

Drilling by Allied from 2010 through 2012 included 128 RC holes (117,093ft) and 43 diamond-core holes (28,606ft). Most of the drilling was focused on resource definition and expansion, but also included significant core drilling to provide material for metallurgical test work. The 2012 drilling was located at the Silver King and Mastif targets, both of which are external to the Hasbrouck deposit resource.

6.2 Historical Mineral Resource Estimates

This section has been largely summarized and modified from Wilson (2014), who noted that the historic estimates provide historical perspective regarding the range of estimates produced using different data, methods, and assumptions. These historic mineral resource estimates are superseded by the current mineral resource estimate described in Section 14.0 and are not to be relied on.

6.2.1 Historical Three Hills Estimates

Historic resource estimates for the Three Hills deposit, performed by Echo Bay, GEXA Gold and Eastfield Resources in 1988 through 1996, were summarized by MDA (Prenn, 2006) and are presented in Table 6.1. MDA believes that none of these historic estimates were prepared in full compliance with the provisions of National Instrument 43-101. They are included for historical completeness and should not be relied upon, and are superseded by the current resources estimated in Section 14 of this report.

Table 6.1 Historical Three Hills Resource Estimates: 1988 through 1996
(from Prenn, 2006)

Company	Method	Year	Cut-off oz Au/t	Tons 000's	Grade oz Au/t	oz Au 000's
Echo Bay	Section	1988	0.01 0.02	2,051.9 1,271.8	0.027 0.035	55.4 44.5
Echo Bay	Section	1988	0.01 0.02	7,357.0 3,526.0	0.026 0.036	191.0 127.0
Echo Bay	Polygon	1988	0.01 0.02	6,700.0 2,750.0	0.023 0.039	155.0 107.0
Echo Bay	Section	1990	0.01 0.02	6,450.0 3,180.0	0.026 0.036	167.7 114.5
Gexa	ID3	1991	0.01 0.02	4,203.4 1,894.3	0.021 0.029	88.3 54.9
Eastfield/Prism (MDA)	ID3	1996	0.01	6,286.0	0.023	144.6

In 2003 and 2006 MDA noted that some of the material estimated for the 1996 resource was not inside in Vista's property boundary for Three Hills. MDA subtracted the material outside the property boundary to update the 1996 resource estimate, but no additional drilling had been done that was considered material to the Three Hills resource (Table 6.2). MDA used a bulk density of 15.0ft^3/ton, based on an average of 19 drill core samples from the 1996 Eastfield drilling.

Table 6.2 Historic Three Hills Resource Estimate 2003 and 2006
(Prenn, 2006)

	Indicated			Inferred		
Cutoff oz Au/t	Tons 000's	oz Au/t	Oz Au 000's	Tons 000's	oz Au/t	Oz Au 000's
0.000	5,744.0	0.023	133.8	1,855.0	0.001	1.3
0.010	5,736.0	0.023	133.6	10.6	0.015	0.2
0.015	4,754.0	0.025	120.2	1.4	0.034	0.0
0.020	3,180.0	0.030	96.6			
0.030	1,132.0	0.041	46.5			

The most recent historic estimate of mineral resources at Three Hills was presented in the Technical Report by Wilson (2014), utilizing Allied's geologic model and a drilling database reported to contain 287 holes drilled from 1974 through 2012. Table 6.3 summarizes the 2014 estimate of resources at Three Hills.

Table 6.3 Summary of 2014 Estimated Resources, Three Hills
(Feb 21, 2014, 0.005 opt Au Cutoff; from Wilson, 2014)

Category	Tons (000's)	Gold opt	Silver opt	AuEq opt	Gold (000 oz)	Silver (000 oz)	AuEq (000 oz)
Measured	1,091	0.023	N/A	N/A	25	0	25
Indicated	7,413	0.017	N/A	N/A	126	0	126
Measured & Indicated	**8,504**	**0.018**	**N/A**	**N/A**	**151**	**0**	**151**
Inferred	11,002	0.014			154		154

AuEq calculated AuEq= Au + (Ag/57.14)

6.2.2 Historical Hasbrouck Estimates

Resource and reserve estimates for the Hasbrouck deposit performed prior to 2003 by various operators were summarized by Prenn and Gustin (2003) and are presented in Table 6.4. MDA believes that none of these historical estimates were prepared in full compliance with the provisions of National Instrument 43-101. They are included for historical completeness and should not be relied upon, and are superseded by the current resources estimated in Section 14 of this report. The following notes apply to some of the estimates:

1. The Cordex and FMC estimates were prepared in-house.
2. Bechtel, Inc. prepared the estimates for Franco-Nevada.

Table 6.4 Historical (Non-43-101) Resource and Reserve Estimates for the Hasbrouck Deposit Prior to 2003 (0.020 oz Au/ton cutoff)

Company	*Category* as reported	*Year*	*Tons* *(x 10^6)*		*Grade Au (oz/ton)*	*Grade Ag (oz/ton)*	*Ounces Gold*	*Ounces Silver*
Cordex	*"Geologic Reserve"*	*1975*	*5.0*		*0.040*	*0.7*	*200,000*	*3,500,000*
Franco-Nevada	*"Geologic Reserve"*	*1986*	*7.7*		*0.036*	*0.7*	*277,000*	*5,390,000*
FMC	*"Geologic Reserve"*	*1988*	*10.2*		*0.038*	*0.41*	*388,000*	*4,180,000*
Franco-Nevada	*"Mineable Reserves"*	*1986*	*3.16*		*0.038*	*0.61*	*120,000*	*1,930,000*
FMC	*"Mineable Reserves"*	*1988*	*1.90*		*0.045*	*0.50*	*85,000*	*950,000*
Corona	*"Mineable Inventory"*	*1989*	*4.2*		*0.036*	*n/a*	*151,000*	

MDA is unaware of any of the companies listed in Table 6.4 having undertaken density measurements on the mineralized rocks at Hasbrouck. The only tonnage factor used that is known to MDA is 12 cubic feet per ton of ore, which was applied by Bechtel in the Franco-Nevada estimations and is likely a best-guess estimate. MDA concludes that generalized, unsupported tonnage factors were probably used in the historical estimations.

The Franco-Nevada "Geologic Reserve" was defined by a block model with 20ft x 20ft x 20ft blocks that were estimated using 20-foot vertical composites of drill assays and geostatistical techniques. The "Mineable Reserves" includes those portions of the "Geologic Reserve" that were defined by drill holes with approximately 100-foot spacing and that were encompassed in a pit with 45º slopes (Bechtel, 1986). The pit appears to have been placed on a best-fit basis to include the highest grade composites; economic parameters do not appear to have been used to generate the pit.

No information regarding the parameters or methods used in the Cordex and Corona (Barnett, 1989) estimations was reviewed by MDA. The Euro-Nevada "Mineable Reserves" were defined by drilling at approximately 100ft to 150ft spacing. The FMC "Mineable Reserves" estimate used assumed prices of $450/oz gold and $6.50/oz silver, and recoveries of 49% for gold and 9% for silver. MDA knows of no other parameters used in the "Mineable" estimations of Euro-Nevada, FMC and Corona.

In 2003 MDA estimated the Hasbrouck gold and silver resources at the request of Vista Gold, conforming to the CIM standards and definitions of 2000 (Prenn and Gustin, 2003). The 2003 MDA estimate is shown in Table 6.5. An updated Technical Report for Vista was provided by MDA in 2006, but no new technical data were available. The 2003 resource estimate remained unchanged in the 2006 updated MDA report (Prenn and Gustin, 2006).

Table 6.5 2003 and 2006 Historic MDA Resource Estimate for the Hasbrouck Deposit

INDICATED RESOURCES					
		GOLD		SILVER	
Cut-off (oz Au/ton)	Tons (1000's)	Grade (oz Au/ton)	Ounces	Grade (oz Ag/ton)	Ounces
0.01	20,300	0.023	459,000	0.32	6,464,000
0.02	8,100	0.034	277,000	0.45	3,663,000
0.03	3,100	0.051	160,000	0.6	1,876,000
0.04	2,000	0.06	121,000	0.64	1,291,000
0.05	1,100	0.073	81,000	0.7	784,000
0.08	280	0.108	31,000	0.85	242,000
0.10	130	0.131	17,000	0.82	110,000
0.15	27	0.174	4,700	0.61	16,000
INFERRED RESOURCES					
		GOLD		SILVER	
Cut-off (oz Au/ton)	Tons (1000's)	Grade (oz Au/ton)	Ounces	Grade (oz Ag/ton)	Ounces
0.01	8,200	0.021	172,000	0.19	1,589,000
0.02	2,300	0.035	83,000	0.25	592,000
0.03	1,000	0.052	52,000	0.33	333,000
0.04	760	0.057	43,000	0.31	235,000
0.05	410	0.068	28,000	0.27	110,000
0.08	70	0.102	7,200	0.17	12,000
0.10	44	0.111	4,900	0.14	6,000
0.15	0	0	0	-	-

Allied prepared an up-dated resource estimate and Technical Report and Preliminary Economic Assessment ("PEA") in accordance with NI 43-101 utilizing a November, 2011 database that incorporated drilling done by Allied in 2010 and 2011 (Flint et al., 2012). A bulk density of 2.4 tonnes per cubic meter was applied by Flint et al. (2012), apparently based on the 5 mineralized rock samples analyzed for bulk density by MDA in 2003 (Prenn and Gustin, 2006). The Allied

2012 resource estimate used ordinary kriging and gold-equivalent cut-off grades for the reporting of Inferred-only Resources as summarized in Table 6.6

Table 6.6 2012 Hasbrouck Inferred Resource Estimate at Various Cut-off Grades
Flint et al. (January, 2012)

Cut-Off AuEq opt	Tons	Au opt	Au Oz	Ag opt	Ag oz	AuEq opt	AuEq oz
0.005	**128,608,197**	**0.009**	**1,157,474**	**0.228**	**29,322,669**	**0.013**	**1,671,907**
0.006	111,187,572	0.010	1,111,876	0.247	27,463,330	0.015	1,667,814
0.007	96,298,939	0.011	1,059,288	0.264	25,422,920	0.016	1,540,783
0.008	83,597,819	0.012	1,003,174	0.283	23,658,183	0.017	1,421,163
0.009	73,192,760	0.013	951,506	0.300	21,957,828	0.019	1,390,662
0.010	**64,634,418**	**0.014**	**904,882**	**0.316**	**20,424,476**	**0.020**	**1,292,688**
0.011	57,391,006	0.015	860,865	0.331	18,996,423	0.021	1,205,211
0.012	51,208,442	0.016	819,335	0.346	17,718,121	0.022	1,126,586
0.013	45,762,953	0.017	777,970	0.361	16,520,426	0.023	1,052,548
0.014	40,832,277	0.018	734,981	0.376	15,352,936	0.024	979,975
0.015	36,819,290	0.019	699,567	0.391	14,396,342	0.025	920,482
0.016	33,357,756	0.019	633,797	0.406	13,543,249	0.026	867,302
0.017	29,793,687	0.020	595,874	0.421	12,543,142	0.028	834,223
0.018	26,958,523	0.021	566,129	0.436	11,753,916	0.029	781,797
0.019	24,368,890	0.022	536,116	0.452	11,014,738	0.030	731,067
0.020	22,213,157	0.023	510,903	0.466	10,351,331	0.031	688,608
0.025	12,940,980	0.027	349,406	0.551	7,130,480	0.037	478,816
0.030	7,939,904	0.032	254,077	0.632	5,018,019	0.043	341,416
0.035	4,835,234	0.037	178,904	0.715	3,457,192	0.050	241,762
0.040	2,917,621	0.044	128,375	0.812	2,369,108	0.058	169,222

Following WKM's acquisition of the Hasbrouck project from Allied in early 2014, an updated mineral resource estimate and Technical Report were prepared in accordance with NI 43-101 by Wilson (2014), incorporating 37 RC holes drilled in the Hasbrouck deposit by Allied in 2012. A summary of the 2014 resource estimate is presented in Table 6.7.

Table 6.7 Summary of 2014 Hasbrouck Resource Estimate from Wilson (2014)
Cut-off Grade = 0.005opt AuEq

Category	Tons (000 tons)	Gold opt	Silver opt	AuEq opt	Gold (000 oz)	Silver (000 oz)	AuEq (000 oz)
Measured	14,686	0.014	0.307	0.019	206	4,509	285
Indicated	55,002	0.011	0.248	0.015	605	13,640	844
Measured & Indicated	**69,688**	**0.012**	**0.260**	**0.016**	**811**	**18,149**	**1,128**
Inferred	58,921	0.007	0.189	0.010	412	11,136	607

AuEq calculated AuEq= Au + (Ag/57.14)

6.3 Historical Production

Although mining took place prior to 1900 in the vicinity of Tonopah, most of the production from the area took place between 1900 and 1920. Silver and gold mineralization was first discovered on Hasbrouck Mountain in 1902. Early mining exploited the Kernick vein, which was worked on a small scale through the mid-1920s. The recorded production from Hasbrouck comprises 740 tons of ore produced by the Tonopah Hasbrouck Mining Company in 1923 and 1924 that grossed $10,406 (Couch and Carpenter, 1943). The early miners excavated about 6,500ft of adits and 1,000ft of raises.

No production figures are available for the Three Hills deposit. Production from the Three Hills deposit may have included minor amounts of gold mined from several adits and shafts in the area.

7.0 GEOLOGIC SETTING AND MINERALIZATION

This section has been taken from the Technical Reports of Prenn and Gustin (2006), Wilson (2014) and sources therein, and remains unchanged from Tietz et al. (2015).

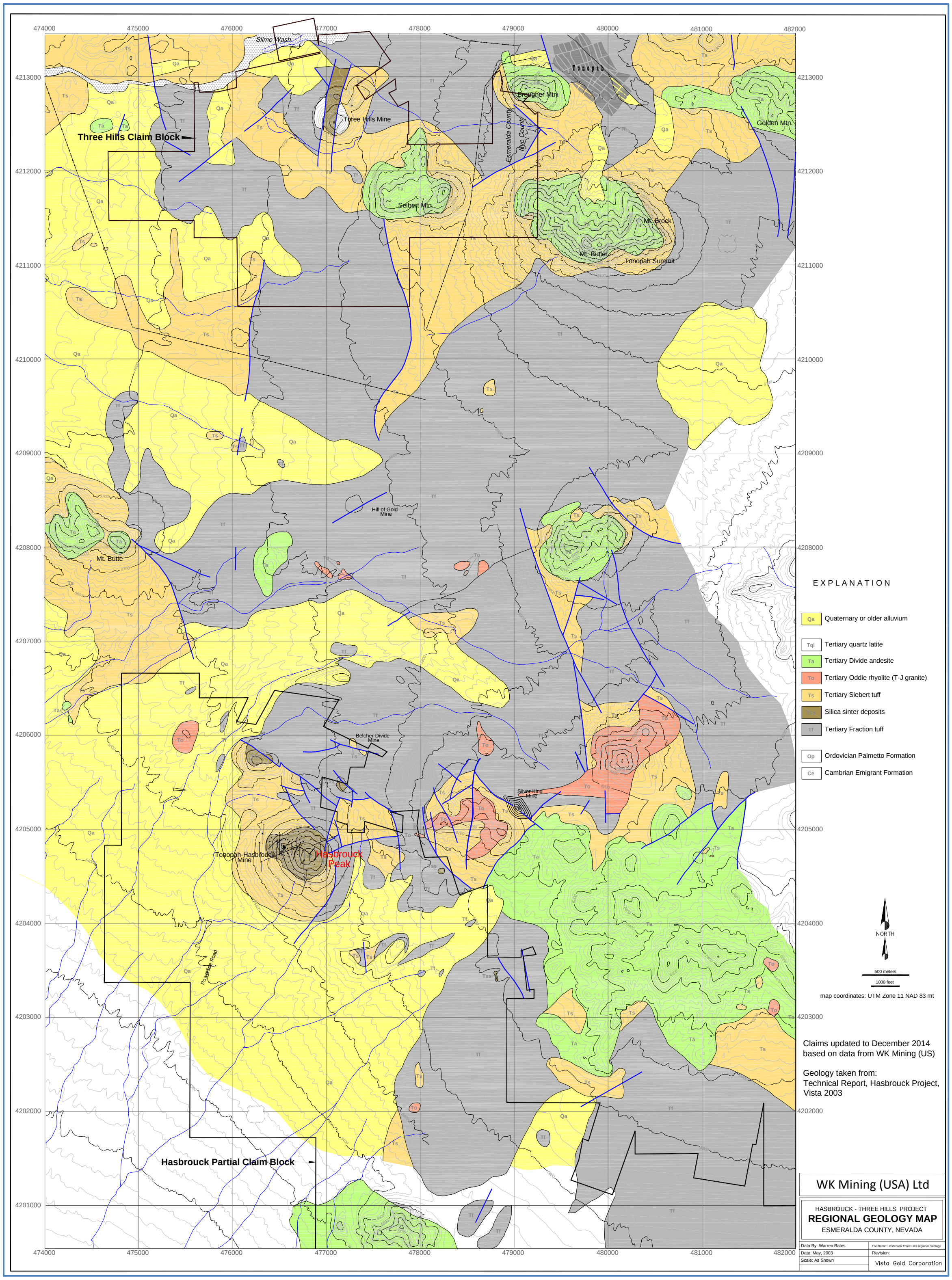
7.1 Geologic Setting

7.1.1 Regional Geology

The Three Hills and Hasbrouck properties are located in the western portions of the Tonopah and Divide mining districts, respectively, which are characterized by exposures of Tertiary volcanic and volcano-sedimentary rocks. The Divide district is believed to be related to a caldera collapse and dome-field setting (Graney, 1985). Both Tonopah and the Divide districts lie along the east margin of the Walker Lane belt, a northwest-trending province in western Nevada and eastern California (Stewart, 1988) that includes numerous epithermal precious metal deposits, many of which are related to Tertiary volcanic rocks. Prominent northwest-trending strike-slip faults and related north-south to northeast trending normal faults characterize much of the Walker Lane belt.

The Tertiary volcanic rocks of the Divide district have been assigned to the Mizpah Formation, West End Rhyolite, Fraction Tuff, Siebert Formation, Divide Andesite and Oddie Rhyolite, all of Miocene age (Bonham and Garside, 1974; Bonham and Garside, 1979). The older West End and Mizpah formations have been drilled along the northeast of the Three Hills area, and are the principal hosts to mineralization at Tonopah. These units have not been encountered at depth under Three Hills or the Hasbrouck deposit. Overlying these is the Fraction Tuff, believed to have been derived from eruptions related to the collapse of an Early Miocene caldera centered on the area. Subsequent Basin-and-Range extensional faulting led to the deposition of fluvial and lacustrine sedimentary units of the Siebert Formation, which are intercalated with air-fall and thin ash-flow tuffs. Flows and domes of the Brougher Rhyolite, overlie the Siebert, forming high hills and peaks. This unit is only known from outcrop exposures near Three Hills, and has not been encountered in drilling. Dikes and domes of the Oddie Rhyolite intrude the earlier units and are interpreted to be genetically related to the mineralization in the Divide district and at Three Hills. The Divide Andesite, variously described as high level intrusions or flows, is thought by some to be post-mineralization (e.g., Snyder, 1990). A regional geologic map of the Three Hills and Hasbrouck project area is shown in Figure 7.1.

Figure 7.1 Regional Geologic Map of the Three Hills and Hasbrouck Area, Nevada
(modified from Prenn and Gustin (2006))



7.1.2 Project Geology

7.1.2.1 Three Hills Deposit Geology

The major rock types within the Three Hills property are, from oldest to youngest, the Mizpah Formation, Fraction Tuff, Siebert Formation, the Oddie Rhyolite and the Brougher Rhyolite. The Siebert Formation unconformably overlies the Fraction Tuff and both are intruded by the Oddie Rhyolite. The majority of the deposit lies in the Siebert Formation.

The Mizpah Formation ranges from trachyandesite to dacite, consisting of up to 700ft of porphyritic lava flows, dikes, lahars, and andesitic volcanoclastics. It is commonly altered hydrothermally, with quartz-sericite-adularia alteration associated with the main stage veins in the Tonopah district. The Mizpah Formation does not crop out in the project area, but can be found in an uplifted block to the east. It is the predominant host rock for Ag-Au vein mineralization in the Tonopah district, and westward extensions of the vein systems have been intercepted by drilling in the Three Hills property. K-Ar dating of the adularia associated with the mineralization at Tonopah ranges from 19-18 Ma.

The Fraction Tuff has been divided into two compositionally similar members; the Tonopah Summit and the King Tonopah Members. The Tonopah Summit Member is typically a poorly welded, quartz latite to rhyolite, lithic tuff. The King Tonopah Member is a welded rhyolitic, lithic, crystal tuff. K-Ar dates range from 21.5 to 17 Ma for both of the members, but do not clearly define stratigraphy between the two. Alteration is widespread in the Fraction Tuff, and it hosts silver veins and gold mineralization in the Three Hills area.

The overlying Siebert Formation is a sequence of volcaniclastic siltstones, sandstones, tuffs, and conglomerates deposited in fluvial and lacustrine conditions. Rapid facies changes are common in the formation. It has been broken down into two units in the project area: a thin bedded fine-grained tuff, and a coarse-grained volcaniclastic unit. The coarser, more permeable sandstones and conglomerates of the volcaniclastic unit are the preferred hosts for gold mineralization at Three Hills. K-Ar age dating suggests the Siebert ranges between 17-13 Ma in age. The upper parts of the Siebert are likely part of the regionally extensive Mid- to Late-Miocene Esmeralda Formation.

The Oddie Rhyolite is a pinkish-grey, weakly porphyritic, biotite-bearing high-silica rhyolite. It is almost always hydrothermally altered, and is associated with mineralization at Three Hills where domes appear to have proximal lapilli ejecta aprons that formed part of the Siebert Formation. K-Ar dating of the biotite has given an age of 16.9-16.4 Ma

Structure in the project area reflects effects of the Walker Lane dextral strike-slip faulting, superimposed on the Basin and Range extensional block faulting. The ages of the structures are between 26-16 Ma. The Walker Lane strike-slip faulting dominates and trends northwest, developing northeast and north-south trending extensional structures. The Basin and Range block faults trend north-south and form horsts and grabens bounded by high-angle normal faults that flatten to low-angle listric faults at depth. These high-angle faults are a control on the mineralization in Three Hills, where they cut the Siebert Formation, dropping the Siebert to the east, against Fraction Tuff to the west.

At the center of the property the "Three Hills" consist of the north, south, and east hills. Geologic mapping by Thompson (1999) shows the east hill is capped by Brougher Rhyolite, which appears to lie directly over the Siebert Formation as a flow (Figure 7.4). Oddie Rhyolite intrudes along north-south structures in the area and occurs as dikes, flows and flow domes. The west side of the south hill contains a flow that intruded along the main fault bounding the mineralization. Several smaller plugs are noted in outcrop and drilling to the east. A minor amount of mineralization has been drilled in the Oddie flows along the western edge of the hills.

The north and south hills are underlain by ash-flow, air-fall and water-lain tuffs and epiclastic sediments of the Siebert Formation. These volcanic and epiclastic units generally dip 30° to 40° to the east, immediately under the two hills, then become west dipping to flat lying under the east hill. The Siebert contains an upper portion dominated by epiclastic sediments and a lower portion containing various lithic, crystal and lapilli ash-flow units with interbedded epiclastic sediments. This is the dominant host for mineralization at Three Hills. The underlying Fraction Tuff is a secondary host to mineralization.

Historic drilling in the northeast portion of the area has encountered West End Rhyolite and Mizpah Andesite at depth. The West End Rhyolite is described as an irregular sill that has intruded the Mizpah Andesite. Drilling is limited, although thin zones of mineralization have been noted in both units. A geological map of the Three Hills area is included as Figure 7.2. An east-west cross-section looking north through the deposit is shown in Figure 7.3, and Figure 7.4 is a north-south cross-section looking west through the deposit.

Figure 7.2 Geologic Map of the Three Hills Deposit Area
(Modified from Thompson (1999) by WKM, 2015)

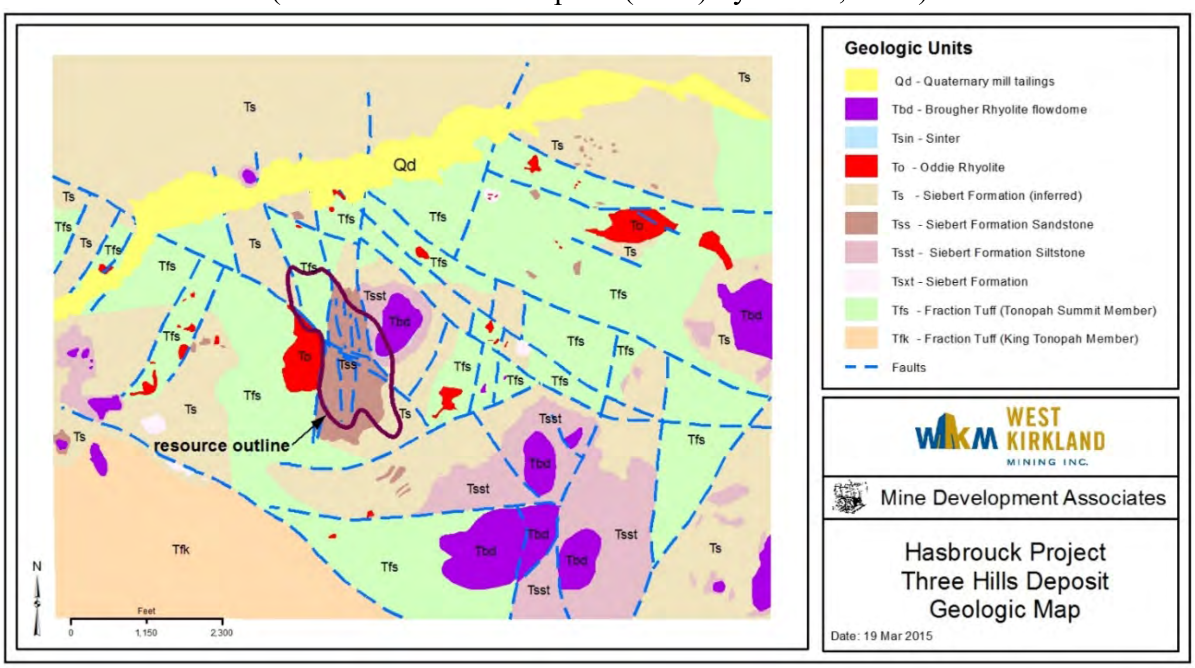


Figure 7.3 Three Hills East-West Cross-section 13821570 Looking North

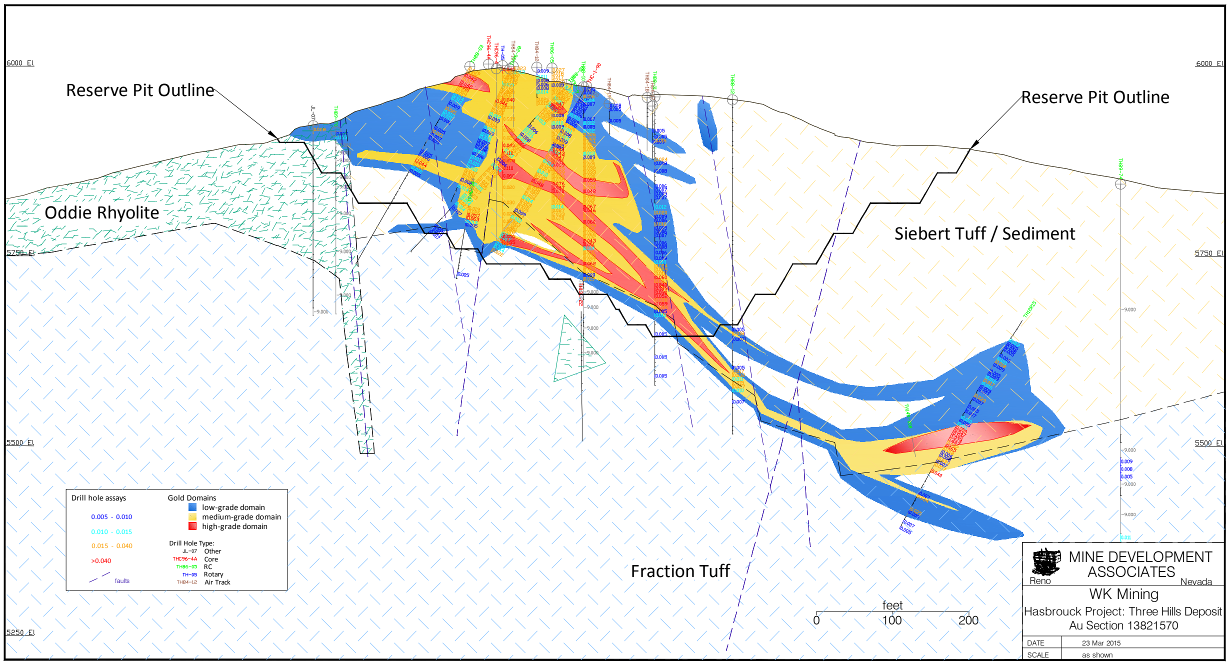
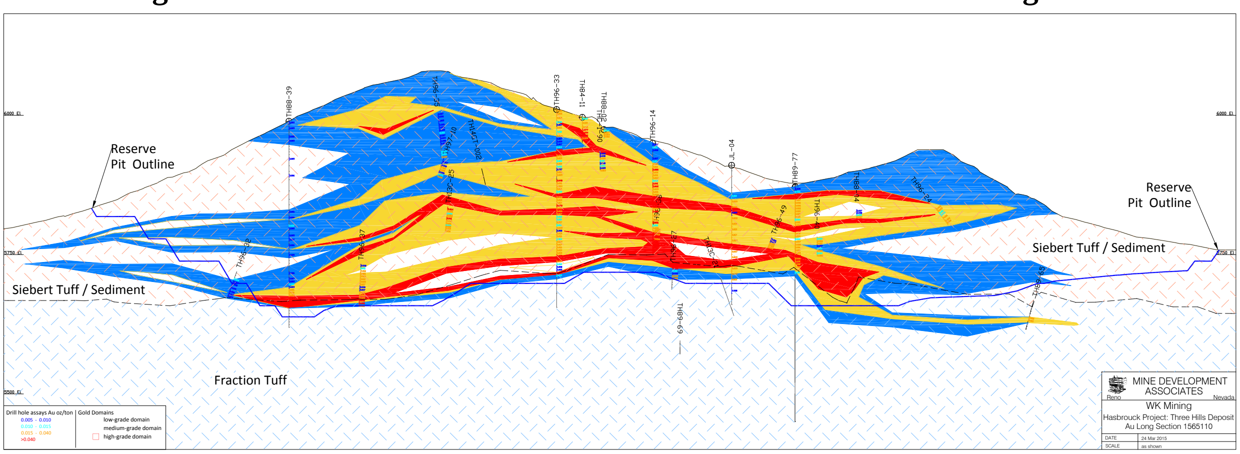


Figure 7.4 Three Hills North-South Cross-section 1565110 Looking West



7.1.2.2 Hasbrouck Deposit Geology

Details of the geology are provided by Graney (1985), who mapped Hasbrouck Mountain in detail and studied the alteration mineralogy as part of a Master's thesis supported by Cordex. The bulk of the topographic high of Hasbrouck Mountain (also known as Hasbrouck Peak) is underlain by ashflow, air-fall and waterlain tuffs and volcaniclastic sediments of the Siebert Formation. According to Graney's surface mapping, these volcanic and volcaniclastic units generally dip 10 to 40 degrees to the west and southwest, with the average dip being 20 degrees to the west. As at Three Hills, the upper portion of the Siebert Formation at Hasbrouck is dominated by epiclastic sediments, mostly sandstones and conglomerates of volcanic origin. Graney mapped several occurrences of chalcedonic sinter deposits, produced during hot spring activity, near the summit of the mountain. Hydrothermal breccias are exposed in various areas, especially along the western and northern slopes of Hasbrouck Mountain, generally to the north (in the hanging wall) of the Kernick structure. The lower portion of the Siebert Formation at Hasbrouck consists of various lithic, crystal and lapilli ash-flow units with interbedded epiclastic sediments. The Siebert Formation is underlain by the Fraction Tuff, which is exposed along the eastern base of Hasbrouck Mountain. The Fraction Tuff in this area is composed of lithic-rich ash flow tuff. Fluvial sandstones and conglomerates occur in the Siebert Formation immediately above the Fraction Tuff. The Fraction Tuff dips 40 degrees to the west (Graney, 1985).

Graney (1985) has mapped a series of generally north- to northeast-trending normal faults that cut Hasbrouck Mountain and are interpreted by Graney to be post-mineral structures. Most of these structures have displacements on the order of 100ft or less. The mineralized Kernick structure, which was the focus of historic underground production at Hasbrouck, trends roughly east-west across the western ridge of Hasbrouck Mountain and is reported to dip to the north at angles of 50 to 70 degrees (Graney, 1985).

Remapping of Hasbrouck Mountain by Allied's geologists led to a re-interpretation of the structural framework and the relationship of various structural orientations to mineralization (Figure 7.5, Figure 7.6, and Figure 7.7). High-angle faults mapped on Hasbrouck Mountain can generally be grouped into three orientations, north-south, N20°-35°E, and N40° – 60° W (Carter, 2011; Kunkel, 2012). North-south faults are the most prominent and appear to offset all other fault orientations (Figure 7.5). Offsetting relationships observed in outcrop of the northeast fault sets and northwest fault sets is equivocal.

Figure 7.5 Geologic Map of the Hasbrouck Deposit
from Wilson (2014)

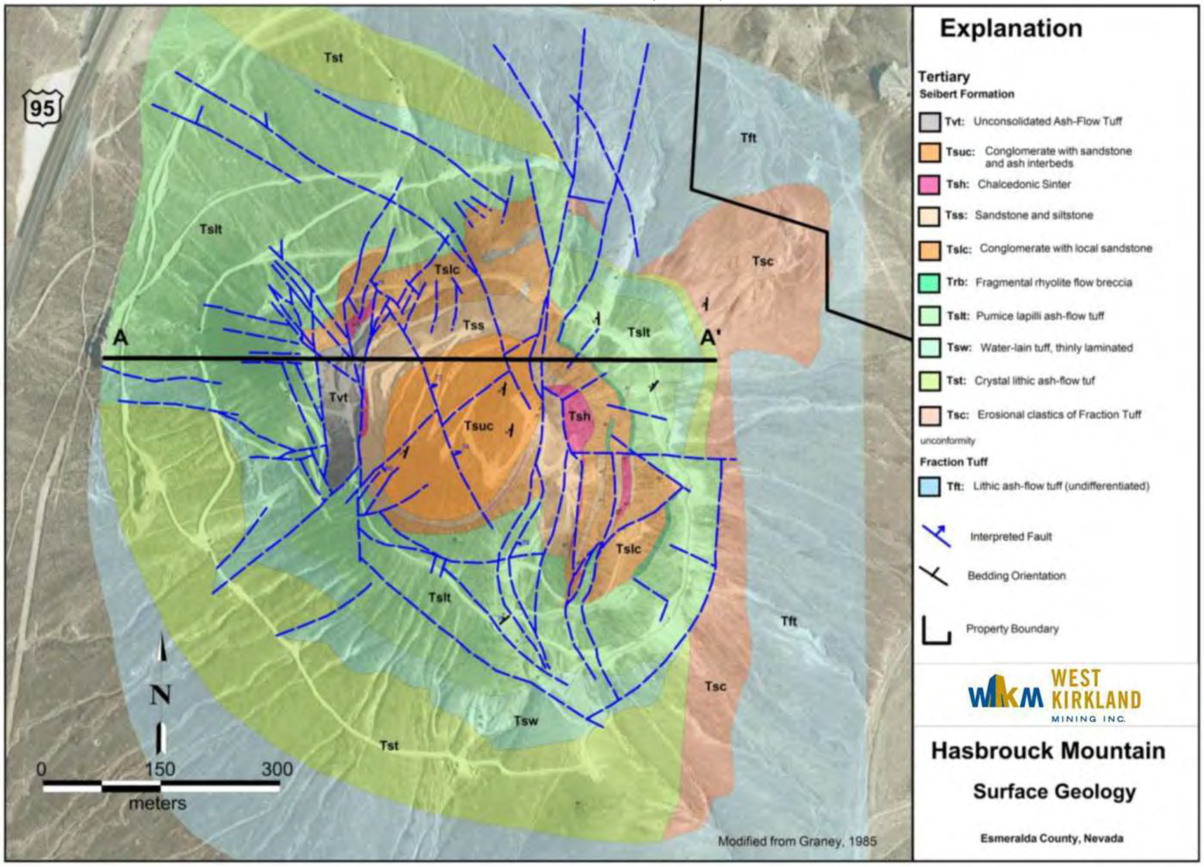


Figure 7.6 East-West Cross-section Hasbrouck Deposit
from Wilson (2014), looking north

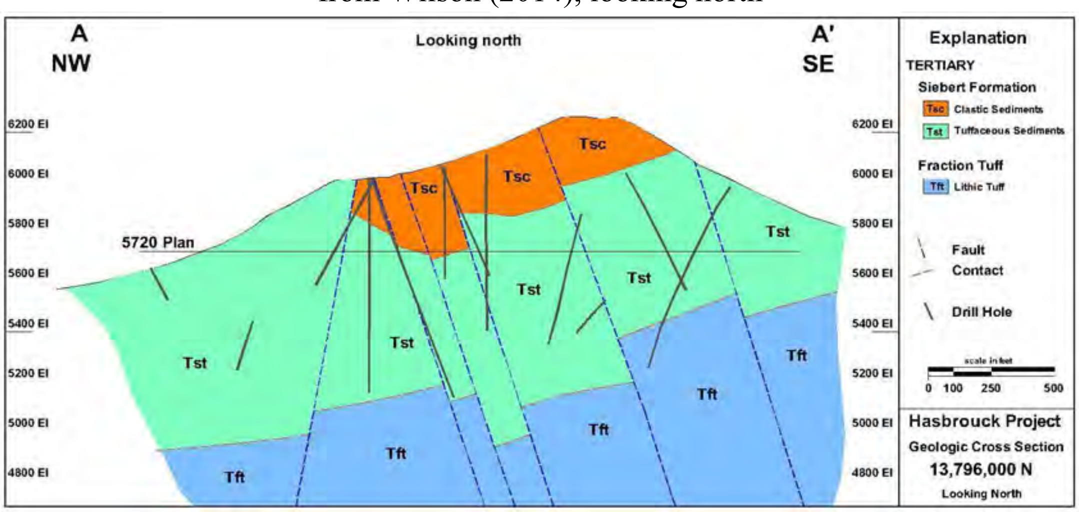
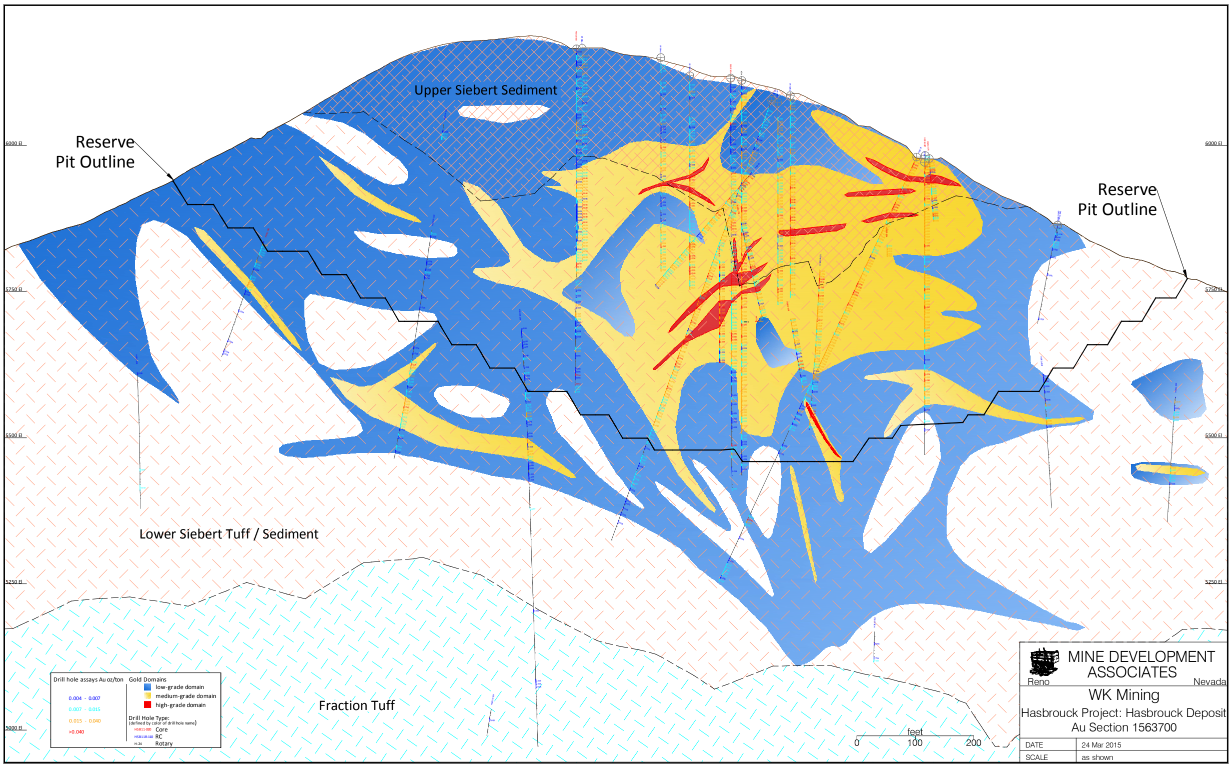


Figure 7.7 Hasbrouck Deposit North-South Au Section 1563700 Looking West



North-south faults are typically very high angle and may dip both to the east and west creating a series of horsts and grabens. Apparent normal offset appears to be on the order of several tens of feet to 100ft, but local evidence suggests there is also a strike-slip component. Northeast trending faults appear to be moderate to high-angle, dipping both to the northwest and southeast. Mapped northwest trending faults are more cryptic and discontinuous, typically forming broad, brecciated, steeply dipping zones.

7.2 Mineralization

7.2.1 Three Hills Mineralization

The drill-defined extent of Three Hills gold mineralization is approximately 1000ft east–west by 2700ft north–south with a maximum depth of 500ft along the down-dip eastern edge of the deposit. Mineralization remains open at depth to the east and southeast along the Siebert-Fraction contact.

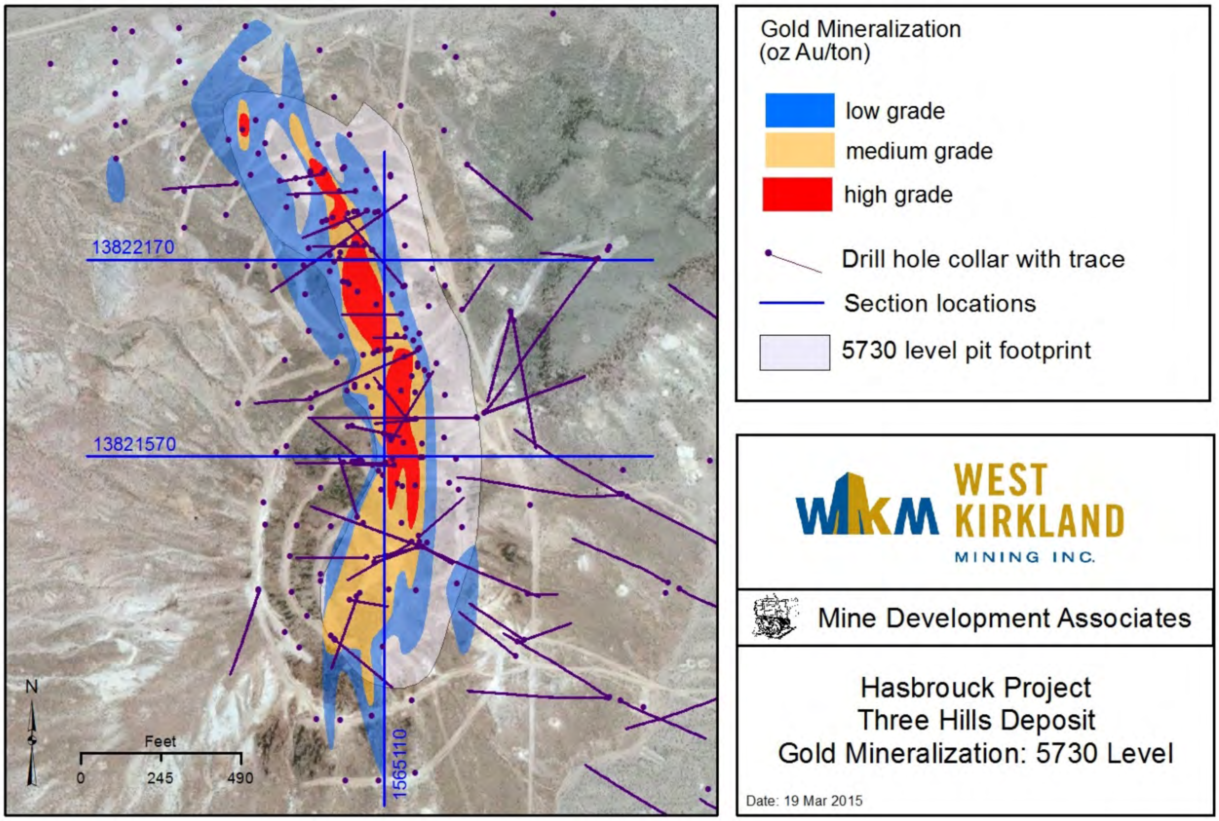
Gold mineralization at Three Hills is commonly associated with areas of higher permeability lithologies, rock unit contacts, and structural features. Previous authors have described the mineralization as “disseminated” though examination of outcrops and drill core shows the higher gold grades associated with discontinuous, irregular 0.05- to 0.5inch-wide veinlets, vein stockworks, and erratic breccia veins of chalcedony and quartz. Lower gold grades in the top of the south hill are found in zones of grey to brown chalcedony, and hydrothermal breccia veins and pipes. Figure 7.8 presents a level plan at the 5730ft elevation showing gold mineralization.

Tregaskis and Garratt (1998) describe the mineralization as being "intimately related" with alteration at Three Hills. The main resource is situated within a broad zone of pervasive silicification in the Siebert Formation and the upper 10-30ft of the Fraction Tuff. The contact between these two units contains consistently higher grades of gold and is more commonly argillized than silicified. The contact zone between the Siebert and Fraction controls mineralization lateral to the core of the deposit.

Hydrothermal fluids precipitated adularia, and quartz as the stable alteration assemblage such that the bulk of the mineralization occurred in rocks with cloudy adularized feldspar crystals, bipyramidal quartz crystals, quartz overgrowths, occasional preserved biotite flakes, and a silicified matrix. Argillic alteration (illite ± montmorillonite) forms an envelope around the silicified and mineralized zones, and along the Siebert–Fraction contact. Subsequent to mineralization the Three Hills deposit has been pervasively oxidized and Tregaskis and Garratt (1998) proposed that the gold was initially precipitated with pyrite that has now oxidized to goethite, hematite, and/or jarosite. Thompson (1999) proposed that the potassic alteration was a relatively early event and produced brittle rock that was later fractured by Walker Lane faulting.

Thompson (1999) mapped a series of Walker Lane structures oriented approximately N45W. The amount of strike slip movement is generally unknown, but is believed to have resulted in development of northeast and north-south trending extensional faults. These high angle structures form a series of horsts and grabens at the center of the property. Displacement along the north-south extensional faults ranges from 10- 500ft. The Three Hills deposit appears to be bounded by north-south faults and the western-most fault has been interpreted as a conduit for the emplacement of Oddie Rhyolite.

Figure 7.8 Three Hills Level Plan 5730 Elevation



7.2.2 Hasbrouck Mineralization

Hasbrouck mineralization has a 2,800ft east–west by 2,400ft north–south areal extent, with a maximum depth of 900ft. Mineralization is open at depth and to a limited extent to the north and east.

Precious metals mineralization at the Hasbrouck deposit is concentrated within the Siebert Formation, stratigraphically below the chalcedonic sinter horizons that outcrop near the peak of Hasbrouck Mountain (Graney, 1985). The overwhelming bulk of mineralization lies within the Main zone, a west-northwest-trending zone underlying Hasbrouck Mountain and parallel to the Walker Lane, while the smaller, east-west-trending, South zone occurs along the south flank of Hasbrouck Mountain approximately 700ft to the south of the Main zone. Weakly mineralized, sub-parallel structures occur between the Main and South zones.

The Kernick structure, which was the focus of historic underground at Hasbrouck, strikes roughly east-west across Hasbrouck Mountain and dips to the north. The majority of the mineralization in the deposit occurs in the hanging wall of the structure with the highest gold grades associated with 0.05- to 1.0inch wide, generally near-vertical, discontinuous silica-pyrite veinlets, sheeted veinlets and stockworks, all closely associated with multiple, larger and coalesced, but erratic bodies of hydrothermal breccias. Stratigraphic control, whereby the porous volcaniclastic units are preferentially mineralized, is prevalent throughout the deposit, but is especially evident in many of the moderate-grade zones (0.01 to 0.05 oz Au/ton) along the peripheries of the deposit. This stratigraphic control has been commonly cited by geologists of the various companies involved at Hasbrouck in the past (e.g., Graney, 1985).

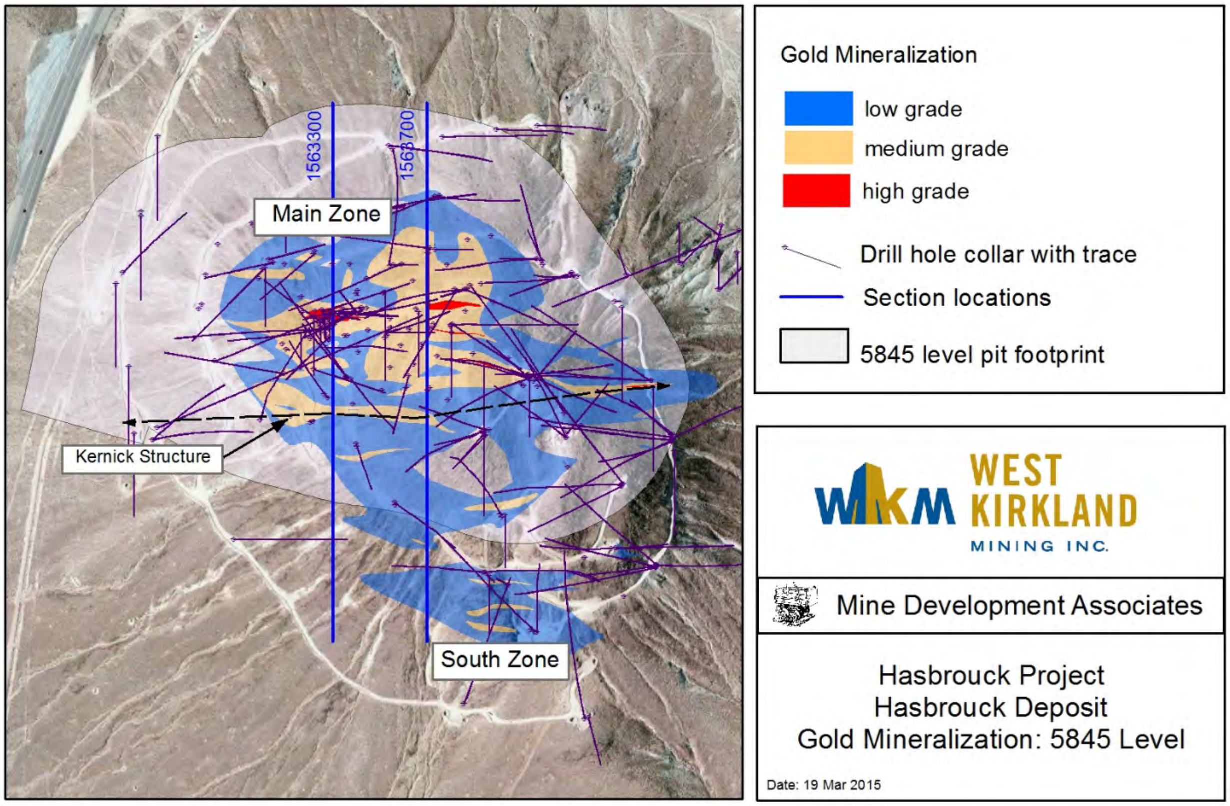
The Kernick structure served to focus higher-grade zones, although other such zones occur somewhat irregularly throughout the mineralized body in the hanging wall of the structure. A minor amount of mineralization lies in the footwall of the Kernick structure, along what are interpreted to be smaller, subsidiary structural zones.

The mineralization at Hasbrouck is accompanied by strong pervasive silicification, with associated adularia and pyrite, within the volcaniclastic rocks and lapilli tuff units of the upper Siebert Formation (Graney, 1985). Argillic alteration, characterized by the presence of illite and montmorillonite, forms an envelope around the silicified and mineralized zones.

Gold occurs as electrum, as inclusions in pyrite and in goethite derived from the partial to complete oxidation of pyrite, and within siliceous gangue minerals (Graney, 1985; Hazen, 1989). Silver occurs in the native state and in argentite (Wittkopp, 1982). Silver is also intimately associated with iron oxides derived from the oxidation of silver-rich sulfide minerals that occurred as inclusions in pyrite (Wittkopp, 1982).

Hasbrouck mineralization is primarily characterized as structurally-controlled, with secondary lithologic control. West-northwest and northeast fault orientations localize higher-grade mineralization (+0.05 oz Au/ton) with lower grade material occurring as halos and straddling the clastic and tuffaceous package contact within the Siebert Formation. North-south faults appear to be late-stage or offset mineralization. Mineralization remains open at depth along the intersection of the cross-cutting structural fabrics. However, deeper drilling into the Fraction Tuff has yet to intersect significant mineralization. Figure 7.9 presents a level plan at the 5,845ft elevation showing gold mineralization.

Figure 7.9 Hasbrouck Deposit Level Plan 5845 Elevation



Brecciated veins associated with northwest structures are dark gray to brick-red in color, and 0.05–20 inches in width. The breccia fragments are monolithic, and float in the silica matrix. Outcropping veins have the appearance of jasperoid, and strike parallel to the northwesterly-trending structural fabric. This vein type has been encountered in core holes. Banded quartz veins range from 0.05inches to as much as several inches in width. These veins parallel local structural trends, and consist of cream–white to tan to brown colored parallel bands from <0.05–0.5 inches in width. Veins have been noted in outcrop to undulate, and follow the outer trace of large blocks of fractured rock. A vein swarm trending northeast was noted to dip both to the east and west, but not to offset each other. Stockwork quartz–sulfide veins are typically up to 0.5inch in width. Silica occurs as gray or clear quartz selvages, with a center line of sulfides (typically oxidized). Occasionally, oxidized sulfides form selvages about the veins. Rare euhedral pyrite has been noted in some veins. Veins cross cut each other, and form a crude orthogonal set. Native gold in the form of small grains was noted in one vein along the center oxidized sulfide line.

Hydrothermal breccia zones contain diffuse silica flooding that crudely defines large vein zones. This silica is typically a medium brown color and has alternating bands of lighter and darker silica. The bands enclose and sometimes cross-cut breccia fragments. Veins in breccia zones often contain rock or vein fragments from rock units different than the surrounding rock, indicating transport. Vein margins may be planar, colloform, or crenulated.

8.0 DEPOSIT TYPES

The section has been modified from Prenn and Gustin (2006), Wilson (2014), and sources therein, as presented by Tietz et al. (2015).

Hasbrouck Mountain represents an erosional remnant of a Miocene geothermal system that produced epithermal precious metals mineralization in a hot springs environment. Examples of this type of deposit include the McLaughlin deposit in California and the Crowfoot-Lewis (Hycroft) and Hog Ranch deposits in Nevada, as well as Ladolam–Lihir deposits in Papua New Guinea. In common with these larger examples, gold and silver mineralization at Hasbrouck appears to have been emplaced at very shallow depths, and is associated with young hot spring-related systems with siliceous sinter deposits. In addition, the mineralized zones are typically associated with silica ±adularia replacement of volcaniclastic host rocks. These types of deposits contain characteristically low concentrations of both total sulfide minerals and base metals.

The Three Hills deposit is also considered to be a low-sulfidation, epithermal, volcanic-hosted precious-metals system. The bulk of the mineralization is within silicified portions of the Siebert Formation and along the Fraction Tuff/Siebert contact, associated with hydrothermal breccias, discontinuous narrow veins, sheeted vein zones and stockworks. Hydrothermal fluids circulated through faults and fractures until reaching the more permeable horizons of the Siebert Formation where they spread laterally, depositing gold and silver minerals.

A description for low-sulfidation epithermal deposits in general is modified below from Panteleyev (1996). Low-sulfidation epithermal deposits form within high-level, non-marine hydrothermal systems, which vary in crustal depths from about 3,280ft, to surficial hot spring settings. Host rocks range from volcanic rocks to sedimentary units. Calc-alkaline andesitic compositions predominate as volcanic rock hosts, particularly for the more base-metal rich, intermediate sulfidation subclass, but many deposits occur in more felsic units within terranes of bimodal volcanism and extensive subaerial ashflow deposits. A less common, but economically significant association is with alkalic intrusive rocks and shoshonitic volcanic rocks. Clastic and epiclastic sediments in volcanic basins and structural depressions are the principal non-volcanic host rocks.

Mineralization in the near-surface, epithermal environment takes place in and beneath hot springs, and the slightly deeper underlying hydrothermal conduits. At greater crustal depth, mineralization can occur above, or peripheral to porphyry (and possibly skarn) mineralization. Normal faults, margins of grabens, coarse clastic caldera moat-fill units, radial and ring dike fracture sets, and hydrothermal and tectonic breccias can act as hydrothermal fluid channeling structures. Through-going, branching, bifurcating, anastomosing and intersecting fracture systems are commonly mineralized. Mineralization commonly forms where dilatational openings and cymoid loops develop, typically where the strike or dip of veins change.

Epithermal precious-metal deposits are in some cases zoned vertically, over about an 800–1,200ft interval, from a base metal poor, Au–Ag-rich top, to a relatively Ag-rich base metal zone and an underlying base metal-rich zone grading at depth into a sparse base metal, pyritic zone. From surface to depth, metal zones grade from Au–Ag–As– Sb–Hg-rich zones, to Au-Ag-Pb-Zn–Cu-rich zones, to basal Ag–Pb–Zn-rich zones.

Silicification is the most common alteration type with multiple generations of quartz and chalcedony, which are typically accompanied by adularia and calcite. Pervasive silicification in vein envelopes is in many cases flanked by sericite–illite–kaolinite assemblages. Kaolinite-illite–montmorillonite ± smectite can form adjacent to veins; kaolinite–alunite (advanced argillic alteration) may form along the tops of mineralized zones, above the paleo-water table. Propylitic alteration dominates at depth and along the deposit margins.

Mineralization characteristically comprises pyrite, electrum, gold, silver, and argentite. Other minerals can include silver sulphosalt and/or selenide minerals, chalcopyrite, sphalerite, and galena. Tellurides, roscoelite and fluorite are abundant in alkalic rock hosted systems, which may include significant molybdenite as an accessory mineral.

9.0 EXPLORATION

This section is taken from Tietz et al. (2015). WKM's subsidiary, Mining (USA) Ltd., completed the acquisition of an initial 75% interest in the Hasbrouck and Three Hills properties from subsidiaries of Allied on April 24, 2014. WKM subsequently conducted a limited exploration program in 2014. No exploration work was done in 2015 or 2016, through to the effective date of this report.

9.1 Three Hills Exploration

WKM performed geologic mapping, sampling, a gravity survey and detailed structural analysis at Three Hills during 2014. A total of 27 surface rock-chip samples were collected and assayed at ALS Chemex gold, silver and 45 major-, minor- and trace-elements. The gravity survey was completed by Magee Geophysical Services in June, 2014. Gravity measurements were conducted at 164 gravity stations spaced on a 200m by 200m grid over the western two thirds of the property. In addition, WKM extracted a 20-ton bulk sample of mineralized rock for testing of run of mine type metallurgical recoveries.

During 2014, after completion of MDA's resource estimate as reported in Section 14.0, WKM drilled 3 diamond-core holes and 11 RC holes for a total of 9,077ft of drilling at the Three Hills property (see Section 10.7). The diamond-core holes were drilled within the Three Hills gold-silver deposit to obtain samples for geotechnical studies. The 2014 RC holes were drilled mainly to expand the eastern and down-dip portions of the Three Hills resource. MDA has reviewed the 2014 drill results and it is MDA's opinion that the 2014 RC holes do not materially affect the resource estimate and therefore have not been included in the current resource database.

9.2 Hasbrouck Deposit Exploration

At Hasbrouck Mountain WKM carried out geologic mapping, surface sampling and a structural geologic interpretation. A sequence of 36 continuous rock-chip samples were taken from a road cut within the resource and assayed at ALS Chemex for gold, silver and 45 major-, minor- and trace-elements. The results confirmed mineralization at the surface between drill holes. Approximately 52 surface rock-chip samples were collected from the northeast flank of Hasbrouck Mountain and assayed for gold, silver and 45 major-, minor- and trace-elements at ALS-Chemex. The results from these samples led WKM to identify a zone of east-west mineralized structures northeast of the Hasbrouck resource. This zone was later tested with RC drilling during WKM's 2014 drilling campaign (see below and also Section 10.2). WKM also conducted a re-interpretation of geophysical data obtained by previous operators.

A total of 4,150ft of reverse-circulation drilling in 14 holes was performed by WKM at Hasbrouck Mountain during 2014. All of the drilling was done to the south, southeast, north and northeast of the current resource, for condemnation and to discover mineralization that may extend beyond the current resource. Eight of the RC holes were drilled northeast of the resource to test the east-west structures identified with the 2014 surface rock-chip sampling. The 2014 drilling is widely spaced, outside of, and does not materially affect the estimated resources; as such, it has not been included in the current resource database.

During 2014 WKM extracted a 2-ton bulk sample of mineralized rock for testing in a high-pressure grinding roll ("HPGR") comminution scenario (see Section 13.0).

10.0 DRILLING

This section remains unchanged from Tietz et al. (2015). Drilling at the Hasbrouck project has taken place at two separate properties: the Three Hills property and the Hasbrouck Mountain ("Hasbrouck") property. From 1974 through 2014, 6 companies have drilled in the vicinity of the estimated resources at Hasbrouck Mountain, and 7 companies have drilled at Three Hills, for a project database of approximately 319,396 in 638 drill holes (Table 10.1). This includes the drilling done in 2014 by WKM.

The earliest drilling was with conventional rotary methods, but the majority of the drilling has been by reverse-circulation methods as summarized in Table 10.2 and Table 10.3 for the current databases used for the resources estimated in this report. Drill spacing for the Three Hills estimated resources is generally 75-100ft but can be less than 50ft within the center of the deposit. Drill spacing for the Hasbrouck resources is generally 100-150ft but can be less than 50ft within the center of the deposit.

Table 10.1 Summary of Drilling in the Hasbrouck Project

Year	Company	Area	Holes	Feet
1974 - 1980*	Cordex	Hasbrouck Mtn	25	10,629
1974	Cordex	Three Hills	14	5,055
1985	Franco-Nevada	Hasbrouck Mtn	30	10,156
1984 - 1988	Saga Exploration	Three Hills	59	6,715
1988	FMC	Hasbrouck Mtn	76	34,255
1988 - 1989	Echo Bay	Three Hills	72	24,420
1990	Gexa Gold	Three Hills	2	508
1992**	Corona Gold	Hasbrouck Mtn	2	1,210
1991 - 1997	Eastfield-Prism	Three Hills	119	38,822
1996	Euro-Nevada	Hasbrouck Mtn	18	17,670
2010 - 2012	Allied Nevada	Hasbrouck Mtn	171	145,699
2012 - 2013	Allied Nevada	Three Hills	25	12,679
2014***	West Kirkland	Hasbrouck Mtn	14	4,150
2014***	West Kirkland	Three Hills	14	9,077
		TOTALS	**641**	**321,045**
*includes three holes not in resource database due to uncertain locations				
** external to resources, not in current Hasbrouck resource database				
***drilled after resource completion; not used in current estimate				

Three Cordex holes are not included within the Hasbrouck resource database due to uncertain collar locations. They are included in the project-wide drill totals for completeness.

The two RC drill holes drilled by Corona in 1992 are located well to the north of Hasbrouck. Due to their location, these latter holes are not included in the current Hasbrouck database (see Section 10.2) but are included in the project totals for completeness.

The locations of drill holes in the vicinity of the Three Hills estimated resources are shown in Figure 10.1, and Figure 10.2 shows the locations of drill holes in the vicinity of the Hasbrouck estimated resources.

Figure 10.1 Drill-Hole Location Map for the Three Hills Area

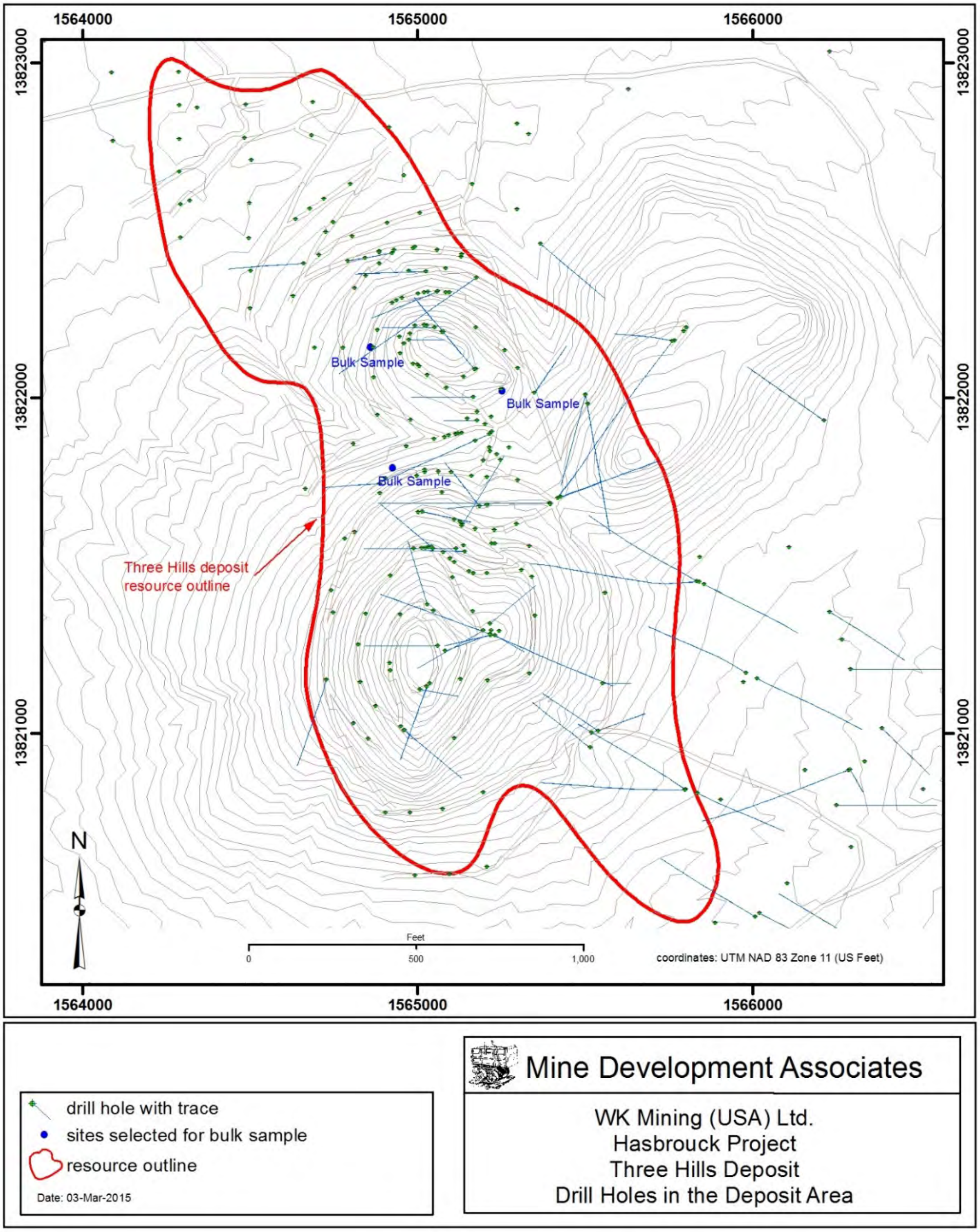
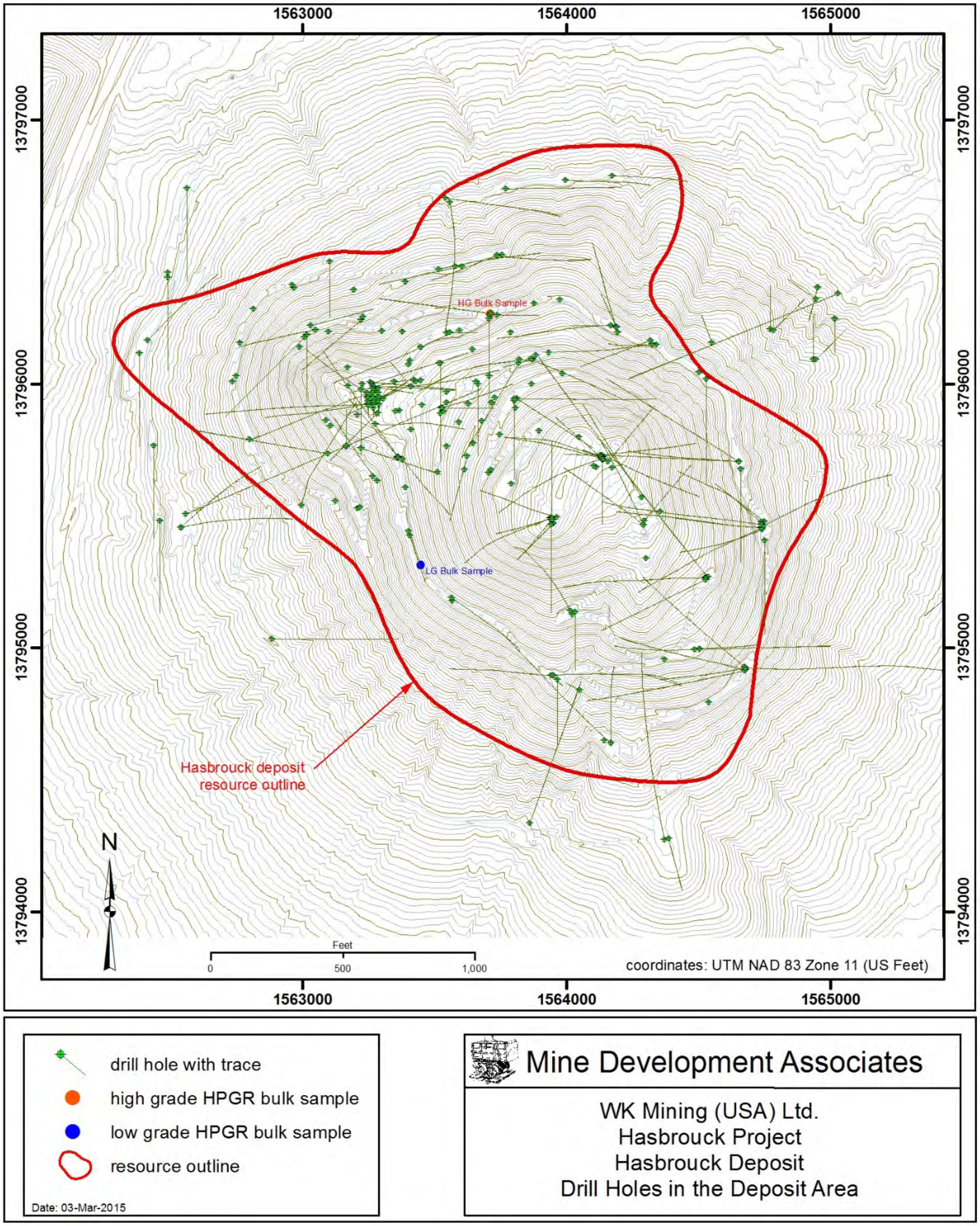


Figure 10.2 Drill-Hole Location Map for the Hasbrouck Mountain Area



10.1 Drilling at Three Hills

Drilling used for the estimation of gold resources at Three Hills is summarized in Table 10.2. The current resource database includes 291 drill holes for a total of 88,199ft of historic drilling completed from 1974 through 2013. Drilling and sampling procedures used prior to 2012 are not well known. Most of the drilling was completed by RC drilling and most of these holes did not intersect water. In 1974, Eklund Drilling completed holes using a Gardner Denver 15W drill rig. Drilling in 1996 and 1997 included that done by Hackworth Drilling of Elko Nevada, using a Schramm C-560 RC drill rig, with a nominal 5.5 in hole size, predominately using a down the hole hammer. Some drilling with tricone drill bits in difficult rock was mentioned in the reports. No information is available for drill sample recovery prior to 2012.

Table 10.2 Summary of Drilling in the Vicinity of Three Hills

Year	Company	Type	Holes	Feet
1974	Cordex	rotary	14	5,055
1984	Saga Exploration	air-track	31	1,560
1985	Saga Exploration	RC	15	2,060
1986	Saga Exploration	RC	8	1,475
1988	Echo Bay	RC	40	12,335
1989	Echo Bay	RC	37	13,705
1990	Gexa Gold	core	2	508
1991	Eastfield-Prism	unknown	31	5,312
1996	Eastfield-Prism	RC	56	20,160
1996	Eastfield-Prism	core	8	1,395
1997	Eastfield-Prism	RC	24	11,955
2012	Allied Nevada	RC	17	9,170
2013	Allied Nevada	core	8	3,509
	Totals		**291**	**88,199**
2014*	West Kirkland	RC	11	7,200
2014*	West Kirkland	core	3	1,877
**drilled after resource completion; not used in current estimate*				

Little is known about the sampling methods for holes prior to 1996, however, for the most part dry samples were collected from dry RC drilling, sampled continuously down-hole on 5ft intervals. The initial sampling by Cordex in 1974, and by Saga Exploration in 1984, was from conventional rotary drilling generally sampled on 10ft intervals.

A total of 10 core holes were drilled on the property prior to 2012. Only the first two core holes completed by Echo Bay were logged, split, and sampled for assays. Of the eight core holes drilled by Eastfield/Prism, only portions of two holes were split (THC96-1 and THC96-6), while the rest of the Eastfield/Prism core drilling was used for metallurgical tests. The Eastfield/Prism hole THC96-4A is included within the database though, besides the collar location, there is no other drill information within the database; the depth is noted as zero and there are no assays.

The digital database includes lithology codes for 221 of the 266 pre-2012 drill holes. The missing lithology data is from the 1991 Eastfield-Prism drilling (a total of 31 holes) along with a few holes from the various other drill campaigns.

The assay labs used by Cordex included Hunter, Union, and Rocky Mountain Geochem. All of the Eastfield/Prism work was completed at Chemex Labs. Most of the assays are inferred to have been completed using fire assay techniques (Prenn, 2003, 2006).

10.1.1 Drilling at Three Hills by Allied Nevada

Allied Nevada drilled 17 RC holes in 2012, focused on expanding known mineralization. During 2013 Allied Nevada drilled 8 core holes for metallurgical samples and condemnation. Drilling in 2012 and 2013 totaled 12,679ft.

10.1.2 Drilling at Three Hills by West Kirkland Mining

In the fall of 2014, WKM completed 11 RC holes and 3 diamond-core holes for a total of 9,077ft of drilling at Three Hills. The core holes were drilled within the estimated resource to obtain samples for geotechnical studies such as pit-slope planning. First Drilling Group USA conducted the core drilling with a track-mounted LF90 drill. PQ and HQ diameter core was recovered by triple tube methods with a 5ft core barrel.

The 2014 RC holes were drilled for resource expansion mainly in the eastern, down-dip portion of the estimated resource and are mainly east of the proposed open-pit extents. Boart Longyear performed the RC drilling with the same track-mounted MPD 1500 drill rig that was used at Hasbrouck in 2014. Drill bits of 5.5in diameter were used and samples were extracted through a conventional interchange as a continuous wet slurry on 5ft intervals.

The 2014 WKM drill data were received by MDA after completion of the current resource estimate. MDA reviewed the data and determined that the 2014 drilling would have no material impact on the resource estimate or proposed open-pit mine design.

10.1.3 Collar and Down-hole Surveys at Three Hills

Early collar locations were estimated from placement on topographic maps. The locations of the 1996 and 1997 drill hole collars, and some earlier drill hole locations, were surveyed in 1996 and 1997 by Haskew Engineering, of Goldfield, Nevada. A Nevada State Plane survey grid was placed over Three Hills in 1996 by Haskew Engineering, of Goldfield, Nevada. Haskew Engineering provided drill hole collar surveys, claim corner surveys, and other location surveys for the remainder of the 1996 and 1997 drill seasons.

The 2012-2013 Allied Nevada drill hole collar locations were surveyed by a Professional Land Surveyor, Haskew Engineering of Goldfield, Nevada. WKM's 2014 drill hole collar locations were initially measured with hand-held GPS. After completion each hole collar was marked in the field with a brass tag and then surveyed professionally by Haskew Engineering.

No downhole survey records are available for the pre-2012 drilling, nor were any mentioned in the reports. International Directional Services ("IDS") conducted down-hole directional surveys of the majority of the 2012-2013 drill holes using gyroscopic tools. Measurements were reported at 50ft intervals. WKM's 2014 drill holes with depths greater than 300ft were also down-hole surveyed by IDS and directional data were reported at 50ft intervals.

10.1.4 Summary of Drilling Results at Three Hills

It is MDA's opinion that the drilling and sampling methods used at Three Hills follow industry standard procedures, and are appropriate methods to adequately interpret the geology and mineralized zones. There is a lack of downhole survey data for the pre-2012 drilling, though this risk is mitigated since these holes are generally shallow and most were drilled vertically.

10.2 Drilling at Hasbrouck Mountain

Drilling used for the estimation of gold-silver resources at Hasbrouck Mountain is summarized in Table 10.3. For the purposes of this report, drilling performed at Hasbrouck Mountain from 1974 through 2012 is considered historical. Drilling contractors and types of drill rigs employed in the 1974 through 2012 historic drill campaigns are summarized in Table 10.4.

Table 10.3 Summary of Drilling in the Vicinity of Hasbrouck Mountain

Year	Company	Type	Holes	Feet
1974	Cordex	rotary	22	8,980
1985	Franco-Nevada	RC	30	10,156
1988	FMC	RC	76	34,255
1996	Euro-Nevada	RC	18	17,670
2010	Allied Nevada	core	14	7,613
2011	Allied Nevada	RC	92	97,163
2011	Allied Nevada	core	29	20,994
2012	Allied Nevada	RC	36	19,930
	Totals		**317**	**216,761**
2014*	West Kirkland	RC	14	4,150
*drilled after resource completion; not used in current estimate				

Table 10.4 Historic Drilling Contractors and Rig Types
from Flint et al. (2012)

Campaign	Contractor	Rig Type
Cordex	Eklund Drilling Company	G.D.15W
	Anaconda Drilling Company	Ingersoll Rand T-4
	Unknown	C.P. 650
	Joy Drilling Company	Joy-22
Franco-Nevada	Eklund Drilling Company	TH-60
FMC	Unknown	unknown
Corona	Brown and Root	D25K truck mount
Euro-Nevada	DeLong Construction and Drilling	unknown
Allied Nevada	Tonatec Drilling	LF70
	National EWP Drilling	LF90, AC CT14
	Leach Drilling	D40
	Layne Drilling	Explorer 1500

Cordex focused its drilling in the northwest portion of the Hasbrouck Mountain. Drilling was reportedly by open rotary methods. From 1974–1980, Cordex drilled a total of 25 rotary drill holes (9,760ft) and one of the 1974 rotary drill holes was deepened using core drilling for an additional 959ft of drilling. The current resource database excludes 3 of the Cordex drill holes, including the deepened core hole, due to uncertain collar locations.

Holes H-1, 2 and 3 were drilled dry, without injecting any drilling fluids. Anaconda Drilling Company drilled H-1 and H-2 with an Ingersoll Rand T-4 rig. H-3 was drilled by a second contractor, unknown to MDA, who utilized a C.P. 650 rig. The remainder of the program was drilled by Eklund Drilling Company with a G.D.15W rig. Eklund injected water, detergent and other drilling fluids in an attempt to improve sample recoveries from those achieved by previous contractors. Cordex geologists completed fairly detailed geologic logs for each of the drill holes; MDA was provided with copies of logs for 21 of the holes.

Franco-Nevada and FMC continued with step-out drilling on Hasbrouck Mountain in the mid-1980s. Franco-Nevada drilled 30 vertical holes within the MDA resource model extents. The injection of foam and other drilling fluids is occasionally noted on the geologic logs, as is the medium of sample return (wet or dry). Intervals of no recovery are also noted. Eklund Drilling Company was contracted and used a TH-60 drill rig for this program.

MDA is not aware of what drilling company or drill rig was used in 1988 FMC program. The F88-series of holes within the MDA resource model extents were drilled to infill and expand upon holes drilled by the previous operators, while the T-series holes comprise a closely spaced drill pattern in the western portion of the MDA resource model extents. Fourteen of the T-series holes consist of 100-foot holes that were drilled on a 15 x 20 foot grid. The other T-hole lies on the grid and was drilled to a depth of 500ft. A total of 29 of the F88-series holes were angle holes, with angles varying from -45 to -75 degrees. With the exception of two holes drilled to the north, these angle holes were drilled in a southerly direction. The T-series holes were uniformly drilled at -60 degrees due south. The FMC geologic logs for the F88-series of holes provided to MDA are very summary in nature, and no comments on drilling methods are included. Intervals where no samples were collected due to lack of recovery are noted, but further specifics on recoveries are lacking. MDA was not provided with logs of any type for FMC's T-series of holes.

In 1996, following an 8 year hiatus in exploration, Euro-Nevada focused on drill targets outside of the known Hasbrouck resource area and was largely unsuccessful. The 1996 Euro-Nevada program was drilled by DeLong Construction and Drilling, but the type of drill is not known. Angle and vertical holes were drilled to cut various targets along a NW-SE trending belt that passes to the north, east and southeast of Hasbrouck Mountain, so that none of the holes lie within the MDA resource model extents. The geologic logs do not comment on sample recoveries, presence or absence of groundwater, drilling problems, etc., nor do the Euro-Nevada internal reports in MDA's possession.

No historic drill chips are available for inspection. Allied Nevada personnel and geologic consultants working for Allied Nevada, reinterpreted pre-2010 historic drill logs and recorded their reinterpretations in Allied's hand-written logging format. The hand-written reinterpretations were subsequently entered into an Excel spreadsheet. The following are comments on the pre-2010 historic geologic logs as stated by Flint et al. (2012):

- Cordex geologists completed fairly detailed geologic logs for each of the drill holes, and included lithology and alteration details;
- Franco-Nevada drill logs from the 1985 drill program (FN85-series) included lithology and localized alteration recorded primarily in a graphical format with minor associated text. Intervals of no recovery are noted;
- The FMC geologic logs for the F88-series of holes are summary in nature, with minimal geologic and alteration data recorded. No recovery data noted. Logs for the T-series drill holes have not been located;
- Poor-quality photocopies of the geologic logs from the Corona drilling are available; no comments on recoveries or sample quality recorded; and
- Geologic logs from the 1996 Euro-Nevada program denote lithology and alteration, but do not comment on sample recoveries, presence or absence of groundwater, or drilling problems.

MDA does not have information on drill bit diameters, drill sample weights, sample recoveries, and specific sampling methods for most of the pre-2010 historic drilling. Ground conditions at Hasbrouck, especially in the upper 300ft of the deposit, present difficult drilling conditions to both RC and core drilling techniques. These problematic ground conditions include clay alteration, highly fractured ground, voids, variable lithology and alteration, existing dump material and faults. As a result, RC and core recovery can be low in the upper portions of the deposit. As noted by Prenn and Gustin (2003, 2006):

- Sample recovery was a continual problem throughout the Cordex drilling program due to the highly fractured nature of the silicified rock;

- Sample recovery problems in the Franco-Nevada program were common, caused by lost circulation, open voids and the necessity of wet sampling due to the injection of water and additives;
- Geologic logs from the FMC drill programs describe intervals where no samples were collected due to lack of recovery; and
- Geologic logs from the Euro-Nevada drill programs do not provide information regarding sample recoveries, wet or dry samples, etc.

Both angled and vertical drill holes were completed. Dips of the drill holes typically range from -90° to -45°, with historic drill holes predominantly drilled at -90°. Drill hole depths ranged from 100 to 1,700ft. Few details are available for logging and sampling procedures used by the various operators from 1974 through 1996. Drill sample intervals varied from 0.5ft to 30ft, but approximately 91% of the assays were done on 5ft intervals. Assays during this period were limited to gold and silver by fire-assay and atomic absorption methods (see Section 11).

10.2.1 Drilling At Hasbrouck by Allied Nevada

In 2010, Allied Nevada completed 14 diamond-core drill holes totaling 7,613ft (Table 10.3). These drill holes were designed to confirm the results of earlier historic drilling and to provide material for metallurgical test work. Allied Nevada initiated a more extensive core and RC drilling program in January 2011. During 2012, Allied Nevada completed 37 reverse circulation holes (20,010ft) focused on the Silver King and Mastif targets, located outside of the main Hasbrouck deposit. Thirty-six of the 2012 RC holes are included in the current resource database.

Reverse circulation drilling was accomplished with standard RC tools utilizing a crossover sub and wet sample collection in the upper portions of the hole. A center return tri-cone drill bit was used for intervals of significant ground water flow. Drill cuttings were collected continuously down the hole, with individual samples taken over 5ft intervals. Samples were submitted for assay, as collected on the rig, with standards, blanks and duplicates inserted into the sample sequence as described below in Section 11. The drill crews sequentially pre-numbered the sample bags, representing the footage interval sampled. The drill crews were provided with 20 slot chip trays, representing 100ft total per tray, and numbered each with hole number, and start and stop footage for the 5ft interval.

According to Wilson (2014) water injection was regulated to minimize the fluid return while maintaining sufficient flow for drilling and sample return. Allied Nevada geologists provided drill crews with 20 in x 24 in bags. Cuttings were collected as a continuous fraction of the return stream from the drill rig by way of a rotary 36 inch vane splitter. The splitter had vane covers that can be added or removed to provide the desired sample weight for each interval. The cuttings were diverted to a clean, 5 gallon, plastic bucket that contained a small amount of a polymer flocculent. When a bucket was full of water and sample, it was removed and allowed to settle while another bucket was placed under the sample spout. If the drilled material contained clay, more flocculent would be added to the settling bucket and the contents stirred. When the 5ft sample run was complete the last sample bucket was removed, and another clean bucket was placed under the spout. The previous interval buckets were carefully decanted and their contents poured into the 20in x 24in mesh sample bag within another bucket.

During drilling, a strainer was placed under the waste discharge spout to collect chips for the character chip tray and logging purposes. At the end of each run, the drill sampler filled the chip tray slot for the sample interval and discarded the rest. When freezing temperatures were expected the sample bags were placed on plastic sheets to prevent them from freezing to the ground and ripping when picked up. Sample bags were allowed to dry and drain at the drill site, or in a holding area near the sample processing facility.

Filled chip trays were field-checked for numbering accuracy during visits to the drill rig and collected by an Allied Nevada geologist for logging by use of a binocular microscope. Allied Nevada personnel and geologic consultants retained by Allied Nevada, logged all 2010 – 2012 core and reverse circulation drill cuttings on site for geologic and geotechnical parameters. Logs were hand-written and subsequently entered into an Excel spreadsheet. The log sheet was divided into two primary sections: geotechnical and geology. Geological data collected included information on lithology, structure, alteration, metallurgy, and veins.

Logging of alteration and metallurgical characteristics were based on a qualitative scaling of 0 to 3, with 0 denoting absent, 1 for weak, 2 for moderate, and 3 for strong. Basic geotechnical data were collected on each core hole drilled. Each core interval drilled was logged for total core recovery, total fractures, joint condition rating ("JCR"), and sum of all core lengths greater than four inches for rock quality designation ("RQD"). Hardness data were not collected. Core was digitally photographed by ALS Chemex technicians prior to being split for assay. The digital photographs were submitted to Allied Nevada on a series of DVDs.

Procedures used by Allied Nevada for sampling and assaying are given in Section 11. Assays were nearly entirely performed using 5ft samples. All drill samples were analyzed for gold and silver with a combination of fire-assay, atomic absorption and gravimetric methods. In addition, approximately 0.7% of Allied Nevada's drill samples were assayed for Ag, Al, As, Ba, Be, Bi, Ca, Cd, Co, Cr, Cu, Fe, Ga, Hg, K, La, Mg, Mn, Mo, Na, Ni, P, Pb, S, Sb, Sc, Sr, Th, Ti, Tl, U, V, W, and Zn using inductively - coupled plasma-emission and mass spectrometry ("ICP" and "ICP-MS"), with either 4-acid digestion or aqua-regia digestion.

10.2.2 Drilling At Hasbrouck by West Kirkland Mining

A total of 4,150ft of RC drilling in 14 holes was completed by WKM in 2014. These holes were drilled for condemnation and resource expansion purposes and are located south, southeast and north of the Hasbrouck resource.

The drill data were received by MDA after completion of the current resource estimate. MDA reviewed the data and determined that the 2014 drilling would have no material impact on the resource estimate or proposed open-pit mine design.

The drilling was performed by Boart Longyear using a track-mounted MPD 1500 drill rig with 5.5in diameter drill bits. Sample extraction was by conventional interchange with water injection to inhibit dust emissions. Samples were extracted as a continuous slurry on 5ft intervals, and split with a rotating vane wet splitter to approximately 7-8kg. Eight of the RC holes were drilled northeast of the resource to test east-west structures identified by surface rock-chip samples with anomalous geochemistry. Mineralization encountered in these holes is external to the resource and may be the subject of additional future drilling.

10.2.3 Collar and Down-hole Surveys at Hasbrouck Mountain

None of the pre-2010 historic drill-hole collars were originally surveyed. The Cordex and Franco-Nevada collar coordinates are rounded to the nearest 5 or 10ft, suggesting that they are not surveyed locations, and have been based on a drill hole location map constructed by Graney (1985) and subsequently augmented by FMC. The FMC holes are reported to the nearest 0.1ft, but it is not known if these were surveyed locations. In December 2010, Allied Nevada geologists re-established collar locations for as many pre-2010 historic drill holes as possible. Most locations had physical features on the ground (i.e. drill casing) and were marked by stakes and metal tags on the side of the drill road. These sites have also been corroborated by an historic drill collar map. Kevin Haskew, a Professional Land Surveyor with Advanced Surveying & Professional Services in Goldfield, Nevada, subsequently surveyed the collars using the NAD83 datum. Seventy-three pre-2010 historic drill holes were located and surveyed. The pre-2010 and Allied Nevada drill holes were converted to UTM in United States feet, which was used as a local mine grid. From late 2010 to present, Allied Nevada's mine surveyors located drill holes using accurate Global Positioning System ("GPS") equipment, reporting directly in UTM coordinates.

All of the Allied Nevada core hole collars were reportedly marked in the field by wooden lath and drill-hole collars were surveyed. The majority of Allied Nevada's holes were surveyed by a Professional Land Surveyor, but some holes were surveyed using hand held GPS devices, and some were located by measuring bearing and distance over short intervals from other surveyed holes.

No down-the-hole survey data were provided to MDA for any of the pre-2010 historic drill holes, so that constant dip angles are assumed in the database. This assumption is likely to introduce increasing error with increasing depth of the drill holes. The Euro-Nevada drill holes were apparently down-hole surveyed, but no data are available on survey methods or down-the-hole depths for which the surveys were performed. Eleven of the Allied Nevada core holes drilled in 2010 had down-hole surveys completed. The 2011 and 2012 holes were surveyed except in cases where poor ground conditions or other drilling difficulty prevented entering the hole with the survey tool. Allied Nevada's down-hole surveying was conducted by IDS technicians with gyroscopic tools lowered inside the drill string and projected to total depth when necessary. Measurements were reported at 50ft intervals.

WKM obtained collar locations for their 2014 RC drill holes with an initial measurement by hand-held GPS. After completion, each hole collar was marked with a brass tag; locations were then surveyed by a Professional Land Surveyor (Haskew Engineering). Down-hole directional surveys were performed for holes drilled to depths greater than 300ft. The directional surveys were done by IDS using gyroscopic methods; data were reported at 50ft intervals.

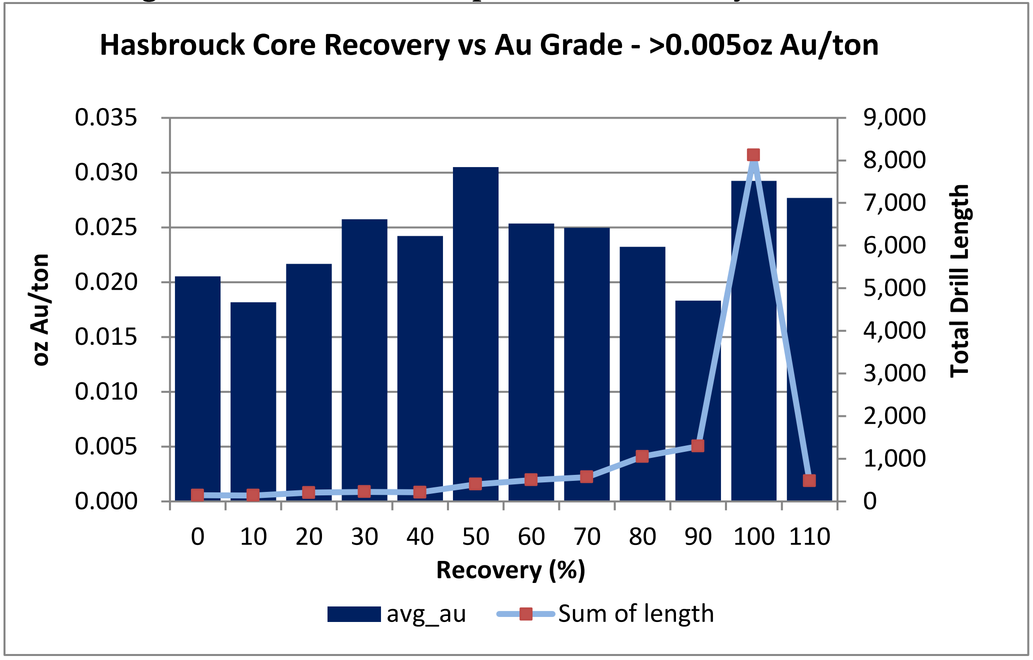
10.2.4 Core Recovery at Hasbrouck Mountain

Core recovery data are available for the Allied core drilling completed in 2010 and 2011. MDA reviewed the data set and the average core recovery for all Allied drill intervals is 89 percent, while average core recovery for those intervals assaying over 0.006 oz Au/ton is 90 percent. Over 60 percent of the core drilled has a core recovery of 100 percent, with a small percentage at greater than 100 percent, while approximately 7 percent of the total core drilled has recoveries less than 50 percent. The core is generally highly fractured within the mineralized horizons, and RQD measurements are typically low, averaging about 25 percent.

MDA checked the core recovery data against the core photos for six Allied core holes and observed that the Allied data recorded in the drill logs for these six core holes over-states core recovery by about 10 percent on average. If this observation holds true for all Allied core holes then average core recovery for the project would be 80-82 percent.

MDA analyzed the core recovery data to determine if there was a deposit-wide relationship between poor recovery intervals and changing gold grades. Figure 10.3 shows the average gold grades (blue vertical bars) and the total drill length (light blue line with orange data points) plotted in the vertical axis, while core recovery is plotted along the horizontal axis. The figure includes those mineralized intervals assaying greater than 0.005 oz Au/ton that occur within the current resource boundary. The core-recovery data have been separated into distinct bins for each ten percent increase in recovery. So the “70” value in the horizontal axis contains all data points which have core recovery values between 70 and 79 percent. All drill intervals with a recorded recovery percentage greater than 110 percent are included in the “110” recovery bin.

Figure 10.3 Hasbrouck Deposit Core Recovery versus Gold Grade



There is a sharp decrease in average gold grade associated with the initial drop in core recovery from 100 percent into the 90 percent range. Below 90 percent recovery, average gold grades gradually increase and then stay fairly level until core recovery drops below 30 percent where gold grades appear to again decrease. The small sample populations at the very low recoveries create some uncertainty in these observations.

Except for the average gold grades observed in the 50 percent recovery bin, core recovery loss is associated with a decrease in average gold grades. The sharp decrease in gold grade observed with just a small decrease in core recovery (from 100 percent to 90-99 percent core recovery) is likely due to the preferential loss of the gold-bearing fine and /or fracture-fill material occurring within silica veinlets cutting weakly mineralized wallrock. At lower core recoveries, both the fracture-fill material and the wallrock suffer core loss so average gold grades will increase as indicated in Figure 10.3

These results indicate that the gold assay values used in the resource estimate are potentially skewed low for those core intervals with less than 100 percent core recovery. This lends a conservative aspect to the current resource.

10.2.5 Summary of Drilling Results at Hasbrouck Mountain

It is MDA’s opinion that the drilling and sampling methods used at Hasbrouck follow industry standard procedures, and are appropriate methods to adequately interpret the geology and mineralized zones. There is a lack of downhole survey data for the pre-2010 drilling, though this risk is mitigated because these holes are generally shallow and were drilled vertically. Core recovery analyses indicates that the gold assay values used in the resource estimate are potentially skewed low for those core intervals with less than 100 percent core recovery. This lends a conservative aspect to the current resource estimate.

11.0 SAMPLE PREPARATION, ANALYSES, AND SECURITY

11.1 Historic Sample Preparation and Analyses

This section remains unchanged from Tietz et al. (2015). Information on the historic sample preparation, analytical laboratories and methods, as available, is summarized from MDA (Prenn and Gustin 2003, 2006; Prenn 2003, 2006, and sources therein), Flint et al. (2012) and Wilson (2014).

11.1.1 Three Hills Surface Samples

1974-1997:

MDA is not aware of records describing the sample collection procedures, sample preparation and assay methods used for surface sampling conducted by Cordex, Saga, Echo Bay, and Eastfield Resources. Prenn (2006) reported that the geochemical analysis of gold, silver, arsenic, antimony, mercury, molybdenum, and occasionally copper, lead, and zinc was completed on the property, and that approximately 550 rock samples were collected in 1996-1997 by Rodney Thompson for a Masters Thesis at Colorado School of Mines. MDA has no information about the sampling and preparation procedures, and the assay types or methods utilized.

2012-2013:

Sparse records indicate that Allied Nevada's surface samples were assayed by ALS Chemex, using fire-assay with atomic absorption finish for gold, and gravimetric finish for silver, as well as ICP-AES determinations for 35 major, minor and trace elements with aqua-regia digestion. Samples were crushed to <2mm, and a 1kg split was pulverized to 85% at <75 microns. Information is not available to MDA regarding sample collection procedures, or the use of standard, blank or duplicate samples.

11.1.2 Hasbrouck Surface and Underground Samples

1974-1996:

MDA knows very little of the sampling methods, sample preparation procedures and details of assay techniques employed on any of the programs undertaken at Hasbrouck prior to 2010. In 1980, Cordex sampled the Main, Ore Car, South, and Northeast adit underground workings. No details of the underground sampling program of Cordex are available to MDA, including sample size, exact sampling procedures employed, assay laboratory used, etc. Also not available to MDA, and possibly these no longer exist, are records documenting the sampling procedures, sample preparation and assay methods used for surface samples collected by Franco-Nevada, FMC and Corona during the 1980's. Surface rock samples collected by Euro-Nevada in the 1990's were largely analyzed by ALS Chemex with fire assay methods for gold, and ICP-AES methods for 32 elements, including silver. Details of Euro-Nevada's sampling procedures, sample preparation, and sample digestion are not available.

2010-2013:

Allied Nevada personnel collected 667 channel samples from selected road cuts (Flint et al., 2012). The samples were analyzed by ICP methods with 4-acid digestion at ALS Chemex for gold, silver, and as many as 34 major-, minor- and trace-elements. MDA has no information on procedures used for the sample collection and sample preparation. QAQC standards, blanks and/or duplicate samples were not inserted.

11.1.3 Three Hills Drilling Samples

1974-1997:

Laboratory and sample preparation procedures prior to the mid 1990's are unknown. Notes on drill logs from 1974 indicate that Union Assay Laboratories ("Union"; Denver), Rocky Mountain Geochemical Laboratories ("Rocky Mountain"; Reno), Humboldt Laboratory ("Humboldt"; location unknown), and Skyline Laboratory ("Skyline"; Tucson) were used, presumably for fire assays. Gold assays previous to 1996 appear to have been completed using a fire assay method, as indicated on some drill hole logs and on one assay sheet. Silver, when assayed for, was determined using atomic absorption methods with a lower detection limit of 0.2 ppm. MDA has no information about sample preparation procedures, or the use of standard, blank and duplicate samples. The 1988 drilling samples may have been assayed in Gexa's mine lab near Beatty, Nevada.

During 1996 and 1997 drilling samples were analyzed at the Chemex Laboratory, Reno Nevada. The preparation was a 0 to 3kg primary crush, then ring pulverization to <150 mesh. In 1996 and 1997 gold was determined by fire assays done with a 30g charge and atomic absorption finish. The lower detection limit was 5 ppb, with an upper limit of 10,000 ppb. Over limit results were re-assayed using a fire assay with gravimetric finish. Cold-cyanide, shake-leach gold analyses were completed on selected 1996 drill hole samples. MDA does not have information on the use of standard, blank and duplicate samples utilized in the 1996-1997 drilling at Three Hills.

2012-2013:

Allied Nevada's drilling samples during 2012-2013 were prepared and assayed by ALS in Reno, Nevada. RC drilling samples were crushed to 70% passing 2mm, and a 1 kg split was pulverized to 85% passing 75 µm. Core samples were logged and sample intervals were marked by Allied Nevada geologists prior to shipping the whole core to ALS in Reno, Nevada. The core was ½ sawn by laboratory personnel at the ALS laboratory facilities. According to Flint et al. (2012), Allied Nevada geologists marked the core with cutting guide lines to best divide the core in a representative manner where veins were visible. Otherwise, core was reportedly sawed perpendicular to bedding.

Gold was determined by cyanide leach and by fire assay with atomic absorption finish on 30g sub-samples. The lower detection limit was 0.005 ppm. In cases of gold "over limits" (> 0.29167 ounces per ton), the fire assay was repeated using a gravimetric finish. Silver was determined by atomic absorption after 4-acid digestion of a 0.5 g sub-sample. The lower detection limit for silver was 0.5 ppm. In cases of silver > 29.167 opt, silver was re-analyzed using a gravimetric finish.

Allied Nevada inserted standards into the RC sample stream at 80ft intervals prior to shipment to the assay laboratories. Pulped quartz blanks were inserted at variable intervals with the core samples. MDA is has no information on blanks that may, or may not, have been inserted with the RC samples. (see details in Section 12).

11.1.4 Hasbrouck Drilling Samples

1974-1996:

Information on sample preparation and analytical procedures for drill samples prior to 2010 is very limited, and nothing is known of the use of standard, blank and duplicate QAQC samples during this period. The Cordex RC drill hole assays were handwritten in the margin of the drill logs. During the 1970's, when Cordex operated the property, this was a common practice for Nevada projects. Cordex gold and silver assays were performed by Union; Denver, Rocky Mountain; Reno, Humboldt; location unknown, and Skyline; Tucson and were recorded in ounce per ton units. The assay method is presumed to be fire assay (fusion). The sample preparation and assay methodology used were not recorded in the information provided. Prenn and Gustin (2006) noted that the Union detection limits on all Cordex holes except for H-24, were 0.005 opt Au and 0.10 opt Au. Drill hole H-24 had a detection limit of 0.003 opt Au.

Franco-Nevada's drill sample assays were performed by Rocky Mountain. Sample preparation and assay methodology are not documented. MDA noted that the Rocky Mountain assays were performed as one-assay-ton fire assays, with detection limits of 0.005 opt Au and 0.10 opt Au; copies of the original assay certificates were provided to MDA (Prenn and Gustin 2006). Prenn and Gustin (2003, 2006) reported that Bechtel was contracted by Franco-Nevada to monitor the drilling, sampling, assaying and metallurgical test work, to ensure that the data collection "met the requirements for the preparation of a pre-feasibility study".

The FMC reverse circulation samples were analyzed by Intermountain Analytical by two-assay-ton fire assay and were hand-written in the margins of the lithology logs. Detection limits were 0.005 opt Au and 0.05 opt Ag (Prenn and Gustin 2003, 2006). The only available information on the Corona analytical methods is reported in Prenn and Gustin (2003, 2006). The Corona RC samples were analyzed by Barringer Laboratories, Inc. ("Barringer") for which copies of the original assay certificates have been provided to MDA. MDA observed that in contrast to the previous programs, which restricted the elements analyzed to gold and silver, Barringer analyzed gold by fire assay with an atomic absorption finish, and silver and molybdenum by atomic absorption. Detection limits were 2 ppb for gold, 0.1 ppm for silver and 1 ppm for molybdenum.

Chemex Labs Inc. ("Chemex"; location unknown) assayed the Euro-Nevada RC samples (Prenn and Gustin 2003, 2006). Gold analyses were by fire assay and atomic absorption finish, with a detection limit of 5 ppb. Silver was analyzed by atomic absorption, using an aqua regia digestion, with a detection limit of 0.2 ppm silver. Wilson (2014) reported that Quality Control data exist for the Euro-Nevada drilling program, but MDA did not review these data because these holes are external to the Hasbrouck resource area.

2010-2013:

Core samples were logged and sample intervals were marked by Allied Nevada geologists prior to shipping the whole core to ALS Minerals Laboratories ("ALS", Reno, Nevada; formerly ALS Chemex). According to Flint et al. (2012), geologists marked the core with cutting guide lines to best divide the core in a representative manner where veins were visible. The core was ½ sawn by laboratory personnel at the ALS laboratory facilities. As stated by Flint et al. (2012), "*samples are prepared from a split of 70% passing -3 mesh if pieces are too large to fit in the pulverizer, and further crushing of 70% passing - 10 mesh. A 2.2 pound split is taken and pulverized to 85% passing - 200 mesh.*"

Allied Nevada's RC drilling samples were prepared and analyzed at ALS in Reno, Nevada, and at Inspectorate Labs, Sparks, Nevada. ALS and Inspectorate Labs are ISO 9001:2000 registered laboratories. Samples were crushed to 70% passing 2 mm, and a 1 kg split was pulverized to 85% passing 75 µm.

Gold was determined by fire assay and atomic absorption finish on 30g sub-samples. The lower detection limit was 0.005 ppm. In cases of gold "over limits" (> 0.29167 ounces per ton or > 10 g/t), the fire assay was repeated using a gravimetric finish. Silver was determined by atomic absorption after 4-acid digestion of a 0.5 g sub-sample. The lower detection limit for silver was 0.5 ppm. In cases of silver > 29.167 opt, silver was re-analyzed using a gravimetric finish. During the last half of 2011, additional silver analyses by fire assay gravimetric methods were employed in the program. "Screen fire analyses" were completed for select high grade gold holes (HSB11-019, HSB10-001).

Gold and silver cyanide-leach assays were determined on select samples in 2010, and on most gold samples in 2011. The laboratory method used a 30g charge, subjected to a cyanide leach cycle including agitation for one hour. The solutions were then analyzed on an Atomic Absorption Spectrometer. The lower level of detection for silver was 0.5 ppm, and the gold lower detection limit was 0.03 ppm.

A small percentage of Allied Nevada's drill samples in 2010 and 2011 were also assayed by ALS using ICP-AES methods to determine 35 major, minor and trace elements with a 4-acid digestion.

A review of assay certificates indicates Allied Nevada inserted blanks as the initial sample for RC holes and then at approximately every 20 to 40 samples, without a fixed frequency. Standards were inserted into the RC sample stream every 18 to 20 samples, but not in all holes, prior to shipment to the assay laboratories. Duplicates were included at intervals of approximately every 20 samples, but not for all holes (see details in Section 12).

11.2 Sample Preparation and Analysis by West Kirkland

11.2.1 Surface Sampling by West Kirkland at Three Hills and Hasbrouck

Rock-chip samples collected at Three Hills and Hasbrouck were all prepared and analyzed at ALS in Reno, Nevada. Samples were crushed in their entirety to 70% at <2mm, then riffle split to obtain a 250g subsample. The 250g subsamples were pulverized to at least 85% at <75 microns. Gold was determined by fire-assay on 30g charges with ICP-AES finish. The lower detection limit for gold was 1ppb. Silver and 47 major, minor and trace elements were analyzed with ICP-AES-MS methods using 4-acid digestion.

WKM did not insert blanks and standard samples into the sample stream for rock-chip samples taken at Three Hills and Hasbrouck.

11.2.2 West Kirkland's Drill Samples at Three Hills and Hasbrouck

Core samples were logged and sample intervals of approximately 4in to 5ft lengths were marked by WKM geologists prior to shipment of the whole core to ALS in Reno, Nevada. The core was ½ sawn by laboratory personnel at the ALS laboratory facilities. Sample intervals of ½ core were crushed in their entirety to 70% at <2mm, then riffle split to obtain a 250g subsample. The 250g subsamples were pulverized to at least 85% at <75 microns. Gold was determined by fire-assay on 30g charges with ICP-AES finish. The lower detection limit for gold was 1ppb. Samples assayed at >1 g/t gold were re-assayed with atomic absorption finish. Silver and 47 major, minor and trace elements were analyzed with ICP-AES-MS methods using 4-acid digestion.

WKM's RC samples were split at the drill rig to approximately 17 to 20lb samples for shipment to ALS in Reno, Nevada. After drying, the RC samples were crushed in their entirety to 70% at <2mm, then riffle split to obtain a 250g subsample. The 250g subsamples were pulverized to at least 85% at <75 microns. Gold was determined by fire-assay on 30g charges with ICP-AES finish. The lower detection limit for gold was 1ppb. Samples assayed at >1 g/t gold were re-assayed with atomic absorption finish. Silver and 47 major, minor and trace elements were analyzed with ICP-AES-MS methods using 4-acid digestion.

For both core and RC drilling, WKM inserted blank, standard and duplicate samples into the drill sample stream at regular intervals. Details are given in Section 12.

11.3 Sample Security

No information is available for sample security procedures used during drilling from 1974 through 1997 at the Hasbrouck and Three Hills deposits. During 2010 through 2013 Allied Nevada personnel transported drill core on a daily basis from drill sites at Hasbrouck and Three Hills to the Allied Nevada logging facility in Tonopah, Nevada (Wilson, 2014). RC samples were retrieved from the drill rig and stored in sample bins or on pallets. Personnel and vehicles dispatched from the assay laboratories travelled to the logging facility and picked up the samples. Sample identification numbers and missing samples were verified by the site geologists prior to release of the samples to the assay lab personnel.

During 2014 sample security was maintained by WKM in the following manner:

- Core samples drilled at Three Hills were under the continuous supervision of WKM's geologists at the drill sites, and were then transported by WKM personnel to WKM's secure facility in Tonopah, Nevada. ALS personnel travelled to Tonopah, took custody of the samples from WKM personnel, and transported the samples to the ALS laboratory in Reno, Nevada.
- RC drilling took place on a day-shift only basis. RC samples were transported daily by WKM personnel to either a locked storage container, or WKM's fenced storage area in Tonopah. Samples were not left at the drill rig unattended during the night. ALS personnel travelled to Tonopah, took custody of the samples from WKM personnel, and transported the samples to the ALS laboratory in Reno, Nevada.

11.4 Summary Statement

It is MDA's opinion that the sampling, assaying, and security procedures used at Three Hills and Hasbrouck follow industry standard procedures, and are adequate for the estimation of the current mineral resources.

12.0 DATA VERIFICATION

This section is taken from Tietz et al. (2015). MDA conducted an audit of the Three Hills and Hasbrouck databases and compiled and analyzed available quality control/quality assurance ("QA/QC") data collected by Allied. No QA/QC data are available for pre-Allied drilling conducted before 2010.

12.1 Database Audit

The Three Hills and Hasbrouck databases provided to MDA by WKM are the same data as used in the previous 2014 resource estimate (Wilson, 2014). For the current resource estimate, MDA completed a full audit of the Allied 2010-2013 drill data at Hasbrouck and Three Hills (196 drill holes), comparing these data against original survey notes and assay certificates. The pre-Allied data were previously audited by MDA in 2003 and 2006 and the current database was compared against both these historical databases along with data compiled in 2010 by Allied.

In an effort to standardize the coordinate system, measurements and locations are expressed in US Survey feet, a change from International feet used in the Wilson 2014 estimate.

12.1.1 MDA Audit of pre-Allied Data

The pre-Allied analytical and geological (drill log) data had been previously verified by MDA for both the Hasbrouck (Prenn and Gustin, 2006) and Three Hills (Prenn, 2006) deposits. For the current resource estimate, MDA compared the previous MDA audited data, along with data compiled by Allied, against the databases provided by WKM as summarized below.

12.1.1.1 Pre-Allied Drilling Data for Three Hills

Collar Locations: There are no discrepancies between the WKM collar data and the previous databases.

The location of TH-13 is in question due to significant differences in the assay values and logged geology as compared with the adjacent drill holes. TH-13 remains in the database, but the assays were excluded from use in the resource estimate.

After reviewing additional historical data provided by Allied, the location of TH-01 was revised to reflect original survey data and locations noted on two plan maps.

The final drill depths for 17 drill holes were changed to reflect the current assay and geology data.

Downhole Survey: No discrepancies were noted in the downhole survey data between data sets. None of the pre-Allied drill holes were surveyed.

Assays: Eighteen assays were corrected in the Three Hills assay data received from WKM; thirteen of which are considered significant (>0.004oz Au/ton difference). The "less than detection" assays were also standardized as "0" within the current database, while over 700 sample intervals noted as "no sample" in the WKM database are actually less than detection values, and therefore have been changed to "0" in the current database.

12.1.1.2 Pre-Allied Drilling Data for Hasbrouck

Collar Locations: None of the pre-2010 drill-hole collars were originally surveyed; locations were based on drill maps and photos. In December 2010, Allied Nevada geologists re-established collar locations for as many pre-2010 historical drill holes as possible. Most locations had physical features on the ground (i.e. drill casing) and were marked by stakes and metal tags on the side of the drill road. These sites have also been corroborated by an historical drill collar map. Kevin Haskew, a Professional Land Surveyor with Advanced Surveying & Professional Services in Goldfield, Nevada, subsequently surveyed the collars using the NAD83 datum. Seventy-three pre-2010 historic drill holes were located and surveyed and all 73 holes showed material differences of up to 50ft in collar locations. The database provided to MDA by WKM included the new 2010 survey data.

MDA compared the 2010 survey data against the previous collar locations within the 2003 MDA database. The average x, y shift was 25ft in the Easting and 5ft in the Northing though the data showed variability of a fairly constant ± 10ft from these average values, with the occasional outlier of >25ft difference. To standardize the treatment of the pre-Allied drill collars within this current resource, this shift was used to convert the collar locations of the remaining 51 un-surveyed, pre-Allied drill holes.

Additional to the revisions to the 51 drill collars noted above, one collar location was corrected for a likely typographical error, and minor changes were made to the final depths of two drill holes.

Downhole Survey: No discrepancies were noted in the downhole survey data between data sets. None of the pre-Allied drill holes were surveyed

Assays: No material discrepancies were noted in the Hasbrouck assay data; the only differences noted pertained to decimal rounding differences.

12.1.2 MDA Audit of Allied Data

Collar Locations: MDA validated the Three Hills and Hasbrouck collar locations against the original collar survey data provided by Haskew Engineering. There were no discrepancies in the Three Hills collar data; 16 Hasbrouck holes had differences of greater than 5ft between the original survey data and the WKM database. The current Hasbrouck database was revised to match the original survey data.

Downhole Surveys: No material differences between the WKM database and original downhole surveys were observed. MDA added the downhole survey data for holes THC13-019 through THC13-023 which were missing from the WKM database.

Assays: No material errors were noted in the Three Hills and Hasbrouck gold assay data; only minor differences due to rounding were observed. Ninety-one silver values were corrected in the Hasbrouck database. The majority of these changes were due to the inclusion of cyanide-leach data instead of original fire assay values.

12.1.3 Database Audit Summary

MDA audited the Three Hills and Hasbrouck databases and believes that the data are adequate for use in the resource estimation and classification.

12.2 Site Visit

T. Dyer (MDA) visited the Three Hills and Hasbrouck project on May 1, 2014. P. Tietz (MDA) visited the Three Hills and Hasbrouck project office and field site on July 25, 2014. The latter site visit included a review of the Three Hills cross-section gold model in the Tonopah office and site visits to both Three Hills and Hasbrouck Mountain. Drill site and mineralization verification procedures were conducted, and core drilling/sampling procedures were appraised. The result of the site visit is that MDA has no significant concerns with the project procedures.

12.3 Quality Assurance/ Quality Control

Historic pre-2010 Programs

No quality control documentation has been found for the Cordex, Franco-Nevada, and FMC Hasbrouck drill campaigns, other than for check assays (see Section 12.5.4, below). Based upon the era of drilling for these campaigns (1974 to 1988) it is not unusual that no QA/QC program was employed. Quality control data exist for the Euro- Nevada drill holes, but because the Euro-Nevada drill holes were drilled outside the Hasbrouck Mineral Resource area, this data has not been evaluated.

Allied Nevada 2010 – 2013

Allied Nevada utilized standards, duplicates and check assays to evaluate the analytical accuracy and precision of the assay laboratory during the time the drill samples are analyzed. At both the Hasbrouck and Three Hills deposits, Allied Nevada submitted certified reference materials (“CRM”s) and blank samples in the project sample stream to monitor assay accuracy and possible contamination during sample preparation. The CRMs were obtained from Minerals Exploration and Environmental Geochemistry of Reno, Nevada (“MEG”) and had a range of gold and silver grades that were within the expected grade range for the deposit samples as summarized in Table 12.1. Data available to MDA indicates that duplicates were inserted with samples from 39 RC holes and 1 core hole drilled in 2011 at the Hasbrouck deposit. MDA has no information on what type(s) of duplicates were inserted, or how the duplicates were collected. Therefore, MDA has not evaluated this duplicate data.

Table 12.1 Summary of QA/QC Reference Materials for the Allied Nevada Drilling at Three Hills and Hasbrouck Deposits

StandardID	Source	Certified Gold Value PPM	1 SD PPM
A607003X	MEG	0.734	0.059
Cove 1	MEG	0.473	0.069
Cove 2	MEG	0.663	0.126
Cove 3	MEG	0.852	0.059
Cove 4	MEG	2.044	0.134
Cove 10	MEG	0.437	0.026
Cove 11	MEG	0.484	0.041
Cove 12	MEG	0.418	0.035
MEG-AU-09.01	MEG	0.687	0.073
MEG-AU-09.03	MEG	2.090	0.331
MEG-AU-09.04	MEG	3.397	0.407
S105003X	MEG	0.525	0.075
S107001X	MEG	0.234	0.016
S107005X	MEG	2.416	0.526
S107011X	MEG	9.262	0.868
S107020X	MEG	0.320	0.068

West Kirkland 2014

WKM's 2014 QA/QC program utilized blanks, standards and duplicate samples inserted with core and RC samples prior to shipment to ALS. These were inserted on a regular basis as shown in Table 12.2.

Table 12.2 West Kirkland QA/QC Sample Insertion Template

Position in Sample Sequence	QA/QC Sample Type
12	Blank
18	Standard 1
24	Duplicate
38	Duplicate
42	Blank
52	Standard 2
67	Blank
70	Duplicate
91	Standard 1
94	Standard 2
112	Blank
repeat	*as above*

MDA has not evaluated the WKM QA/QC data since these drill data are not included within the current resource estimate.

12.3.1 Three Hills Standards

Allied Nevada inserted CRM's obtained from MEG into the drilling sample stream prior to shipment of samples to the laboratory. CRM's were inserted at 80ft intervals in the RC sample stream, and at variable intervals of 80ft to 220ft in the core sample stream. Records indicate a total of 122 CRM's were inserted, 15 of which accompanied core samples in 2013. MDA has no assay results for the CRM's inserted with the 2013 core samples, and only gold assays for the 107 CRM's inserted with RC samples. The effective insertion rate for standards used by Allied at Three Hills is therefore 4%. A total of 13 CRM's returned gold values more than 2 standard deviations from the recommended average value. One of these corresponds well to the average value for a different CRM and may have been mislabeled. The remaining 12 failures represent a failure rate of 0.4% and were equally divided outside the upper and lower control limits.

Results for WKM's standards used in the 2014 drilling program at Three Hills have not been evaluated by MDA, because the 2014 drill holes are not included in the current resource estimate.

12.3.2 Hasbrouck Deposit Standards

Data available to MDA indicate that Allied Nevada inserted a total of 1,063 CRM's, or standards, into the sample stream for RC and core drilling at Hasbrouck Mountain during 2010, 2011 and 2012. Of these, 1,049 fire-assay atomic absorption results for gold, and 425 results for silver by atomic absorption are available, corresponding to 4.6% of Allied's drill hole gold assays and 1.9% of Allied's drill hole silver assays. The CRM's were inserted at roughly eighty foot intervals, in conjunction with quartz pulp blanks. According to Wilson (2014), in the original overall Allied Nevada assay data set, thirty two standards were mistakenly given a Quartz sample designation. The standard labels contained the correct standard name, and were hand notated with the Quartz designator. The values returned clearly represented the values for the standard printed on the label. The sample standard designator was corrected and the standards placed in the standards analysis data set.

Two cases were documented, and several additional cases were suspected, where the standard and quartz material, which were submitted together, were mixed together at the lab before analysis. The suspected cases were included in the standards failure statistics of Wilson (2014), who noted two cases in which the standard and quartz data had been swapped. Wilson reported these were corrected and data assigned to the proper data set.

Wilson (2014) reported a failure rate of 6.3% of the Allied Nevada CRM gold assays (greater than 2 standard deviations difference from the CRM recommended average value), but noted that the majority of the failures were within 5% of the over and under limits. MDA's review of the CRM gold data found no significant difference from that of Wilson (2014). 15 different, but in some cases, similarly named, CRM's were used. More than half of the failures had gold results that correspond well with other CRM's used in the program. MDA suspects, but can not demonstrate, that the majority of the failures are likely due to mislabeling or incorrectly entering the CRM names prior to shipment of samples to the laboratory.

MDA has not evaluated the 425 assays of CRM's for silver. The quantity of silver QA-QC control samples would appear to be a small. However, silver accounts for such a minor value in the estimated resource that MDA does not consider silver to be material to the estimate.

12.3.3 Three Hills Blanks

Records indicate that Allied Nevada inserted one or two quartz pulp blanks per hole with samples from the 2013 core drilling. However, MDA does not have the results, and notes that pulp blanks are not useful for monitoring contamination that could possibly occur during the crushing and pulverizing stages of the sample preparation.

12.3.4 Hasbrouck Deposit Blanks

Two types of blank samples were inserted in the Hasbrouck Mountain drill sample stream by Allied Nevada to monitor possible contamination: 1) blanks described as crushed landscaping granite, and 2) quartz pulps supplied by MEG. The crushed granite blanks were inserted at the start of each sample run to monitor possible contamination during sample preparation (Wilson, 2014). MDA has assay results for 63 crushed granite Blanks. Allied Nevada also inserted 345 quartz pulp blanks from MEG at approximately 80ft intervals, for which MDA has assay results for 227 cases. The total insertion rate for which MDA has gold assay results is 1.3% of Allied Nevada's Hasbrouck drilling samples. MDA considers the number of blanks to be on the low side, particularly because 78% were submitted as pulps and as such, do not monitor possible contamination during crushing and pulverizing.

MDA has no quantitative data on the expected gold concentration of the particular crushed granite used, but in MDA's experience such material typically contains less than 0.005g Au/t, which is the lower detection limit of the assay method. Values less than 3 times the lower detection limit are generally considered to be within the analytical uncertainty. 16% of the inserted granite Blanks assayed greater than 0.015g Au/t, and 7.9% assayed ≥0.050g Au/t. The two highest failures were inserted as two successive samples in hole HSB11-30 and returned 0.376 and 0.282g Au/t. These values correspond well with 2 different standards used by Allied Nevada. It is possible that these two significant failures could have been mislabeled standards, but MDA cannot exclude the possibility of some contamination in HSB11-30. If contamination has occurred in HSB11-30, it is not material on a deposit scale.

12.3.5 Historical Check Assays—Three Hills

At the Three Hills Deposit, MDA reviewed the data in 2003 and 2006, and determined that the correlation between check assays and samples from earlier drilling programs indicated no significant bias. No historic samples are available for re-assay. A total of 100 metallic screen assays were also completed. The average grade of these agreed closely with the original sample average grade, with the metallic assays being 3% lower on the average.

12.3.6 Historical Check Assays—Hasbrouck Deposit

At the Hasbrouck deposit Cordex sent 342 out of the total of 935 original Union Assay rotary drilling samples to Rocky Mountain Geochemical for check assays. Almost 75% of the original results that were equal to or greater than 0.025 oz Au/ton were checked. MDA does not know whether pulps, rejects or sample splits were analyzed in the check assays. As reported by Prenn and Gustin (2006) the original Union gold assays compare well with the Rocky Mountain check analyses at values up to 0.05 oz Au/ton. Union Assay values greater than 0.05 oz Au/ton, however, tended to be higher than the Rocky Mountain check assays. The Union silver assays were systematically higher than the Rocky Mountain check analyses.

The most complete check assay data available from the Cordex drilling program is for hole H-24. This was also the only Cordex hole that was sampled at 5-foot intervals. The Rocky Mountain check assays for H-24 are systematically lower than the Legend checks for both gold and silver. The Rocky Mountain and Legend analyses were performed on the same pulps. Legend and Union results compare well for both gold and silver, while the Rocky Mountain-Union comparisons for gold and silver in hole H-24 are fair, based on the limited data (Prenn and Gustin, 2006).

The systematic discrepancy in silver analyses between the primary Cordex assay lab, Union Assay, and the primary check assay lab, Rocky Mountain Geochemical, is a concern. Based on the limited H-24 check assay data, the Legend results support the original Union analyses. The apparent bias of Union Assay to higher gold values compared to Rocky Mountain at values greater than 0.05 oz Au/ton is also a concern. Legend H-24 check assays are systematically lower than Rocky Mountain, which again supports the original Union assays.

Franco-Nevada check assays were performed by Rocky Mountain Geochemical, who also performed the original assays. MDA does not know if the checks were done on the original pulps, rejects or sample duplicates. The gold checks compare well with the original assays, although the means differ significantly (0.039 oz Au/ton for the checks versus 0.031 oz Au/ton for the originals). If one sample is removed, however, the mean of the check assays lowers to 0.034 oz Au/ton, while the original mean remains unchanged. The silver assays also compare well, with most of the variation occurring in original assays between 0 and 0.5 oz Ag/ton.

Bechtel (1986) reported that Chemex Labs Ltd performed check assays on 50 rejects of the original Rocky Mountain samples for Franco-Nevada. The check assays averaged 0.037 oz Au/ton, compared to the original Rocky Mountain average of 0.040 oz Au/ton. Bechtel concluded that there was no significant bias in the assay data, and therefore considered the original Franco-Nevada assays to be reliable. MDA does not have the Chemex check assay data to review.

FMC drill cuttings were assayed for gold and silver by Intermountain Analytical using two-assay-ton fire assay (Cofer, 1989). Five-foot check samples were taken every 50ft and sent to Bondar-Clegg for gold + 17 element analyses. The results of these check samples are not known to MDA.

MDA lacks check assay data for the Cordex T-series holes and underground sampling, as well as the Corona and Euro-Nevada reverse circulation drilling programs.

Wilson (2012) reported that Allied Nevada obtained check assays for the 2010-2011 drilling at the Hasbrouck deposit. MDA does not have the check assay data, but Wilson (2012) concluded:

> "*In the Author's opinion the gold and silver assays from the 2010-2011 drilling campaign are acceptably accurate for use in mineral resource estimation. For the 2012 drill campaign, no check assays were completed at Hasbrouck, as the drilling was exploratory in nature and did not encounter large zones of mineralization.*"

12.3.7 MDA Check Assays – Three Hills

As part of the current study, and to bolster the existing Three Hills QA/QC data set, MDA collected 32 core-twin check samples from the 2013 Three Hills Allied core holes that are currently in storage. These samples consisted of the remaining half-core left after the initial sampling. The samples were sent to ALS Minerals in Reno, NV, and analyzed using the same fire assay methods as the original sampling/assaying program. The original assays averaged 0.081oz Au/ton while the check assays averaged 0.084oz Au/ton indicating no significant bias in the full data set. Though if the four highest grade sample pairs (>0.15oz Au/ton) are removed from the data set, there is an average 15% high bias in the check samples.

These results suggest that the Allied core hole gold assay values used in the resource estimate are potentially skewed low and therefore lends a conservative aspect to the current resource.

12.4 Summary Statement

MDA has reviewed the available QAQC data and the assessments of that data made by Wilson (2014) and references therein, including Prenn (2003) and Prenn and Gustin (2003, 2006). MDA agrees with the conclusions of these preceding studies and considers the assay data to be adequate for the estimation of the current Three Hills and Hasbrouck mineral resources.

13.0 METALLURGICAL TESTING AND MINERAL PROCESSING

The Hasbrouck Project involves a heap leach and absorption facility at each deposit. Conventional cyanide heap leaching will be utilized at both mines. The proposed extraction methods, process flow, and types of processing facilities are described in Section 17.0. Throughout this section the term "ore" is used in a processing and metallurgical context, to refer to the material being processed, and does not refer to an economic class of mineralized material.

Section 13.1 and Section 13.2 describe the types and extents of metallurgical tests performed by historical owners of both Three Hills and Hasbrouck. The metallurgical studies carried out by WKM in 2014 and 2015 are summarized in Section 13.3 and Section 13.4. Integrated summaries of metallurgical studies of the Three Hills and Hasbrouck mineralization are presented in Sections 13.5 and Section 13.6.

13.1 Three Hills Historical Metallurgical Testing

The earliest known metallurgical test of Three Hills material was in 1991; the report of this test has not been found. Records exist for 6 column leach tests and 42 bottle roll tests of surface and drill samples from the Three Hills deposit performed between 1991 and WKM's acquisition of the property in April, 2014. Historical and current metallurgical tests from 1996 through 2015 are listed in Table 13.1.

13.2 Hasbrouck Historical Metallurgical Testing

Previous technical reports mention metallurgical tests performed between 1975 and 1985; records have not been found for these. Records of metallurgical tests performed between 1986 and 1988, inclusive, exist and describe bottle rolls, agitation leach, vat leach, column leach, gravity tests, and flotation tests, which utilized drill cuttings and bulk surface and bulk underground samples. Pre-1989 work was not considered in this report as sample locations could not be verified. Since 1989 and up to WKM's acquisition of the property in April 2014, metallurgical tests were performed which could be used in assessing the project and which involved 70 column leach tests and 70 bottle roll tests performed on surface and drill samples. These later tests were carried out variously at McClelland Laboratories Inc. ("McClelland") in Sparks, Nevada, and at Kappes-Cassiday and Associates ("KCA"), in Reno, Nevada, as shown in Table 13.1.

13.3 Three Hills Metallurgical Testing Commissioned by West Kirkland

In 2014, metallurgical testing was performed at KCA to confirm recovery, leaching time, and percolation performance of run-of-mine ("ROM") mineralized material. This testing is summarized in Table 13.1.

13.4 Hasbrouck Metallurgical Testing Commissioned by West Kirkland

In 2014 and 2015, further metallurgical data were obtained by WKM, with studies focused on the relationship between particle size and host-rock lithologies to gold and silver recoveries from Hasbrouck ore (KCA, 2015). In particular, the use of HPGR for crushing of Hasbrouck ore was evaluated. This testing is summarized in Table 13.1.

Table 13.1 Summary of Process Test Work

Date	Owner	Laboratory	Report No.	Sample Source	Test Work Type	Summary of Results
THREE HILLS						
11 Nov 1996	Eastfield	McClelland	2335	Drill Core Composites	Bottle roll and column leach tests	Bottle Roll avg extraction; Au - 74% at 96 hr. Column avg extraction; Au - 85%, 1.5" crush, 103 days
30 Nov 1996	Eastfield	McClelland	2335	Drill Core Composite	Column leach tails tests for environmental characterization	Negligible deleterious material detected
13 Dec 1996	Eastfield	McClelland	2390	RC Chips	Bottle roll tests	Average extraction; Au - 76% in 24 – 48 hr.
2 Jun 2014	WKM	Wetlabs	1405390	Surface sample	Environmental characterization	Negligible deleterious material
10 Jun 2014	WKM	KCA	0140069-THB01-01	Bulk Sample sites for 48in Column Test	Cyanide shake tests	Recoveries in line with other tests at 3HM
23 Oct 2014	WKM	KCA	140083-THB04-01	Composites from 6 diamond drill holes	ABA and Total Metal Analysis	Negligible deleterious material detected
27 Oct 2014	WKM	KCA	0140137-THB08-01	Drill Core TH13C0022 and Bulk Surface Sample	Bottle rolls, cyanide shakes	Confirmed that bulk sample for 48in column test is representative of lithology, head grade, and metallurgical performance recovery of general ore body
19 Mar 2015	WKM	KCA	140082-THB03-02	Bulk Sample for 48in Column Test	ROM 48in column leach and bottle roll tests	Bottle Roll extraction at 96 hr; Au - 91%, 10# sizing Column extraction at 133 days; Au - 81%, ROM sizing

HASBROUCK						
Date	**Owner**	**Laboratory**	**Report No.**	**Sample Source**	**Test Work Type**	**Summary of Results**
8 Mar2012	Allied	McClelland	3536	Drill Core Composites	Bottle roll and column leach for gold & silver extraction	Bottle roll (-10 mesh) avg extractions; Au - 69%, Ag - 23% Column leach (3/4" & 3/8") avg extractions; Au - 61%, Ag - 12%
14 Mar 2012	Allied	McClelland	3465	Drill Core Composites	Bottle roll and column leach for gold & silver extraction	Bottle roll (-10 mesh) avg extractions; Au- 62%, Ag - 24% Column leach (3/4" & 3/8") avg extractions: Au - 51%, Ag - 12%
11 Jun 2014	WKM	Wetlab	1405636	Surface sample	Environmental characterization	Negligible deleterious material
18 Aug 2014	WKM	KCA	0140112-05HSB-01	Surface Samples	Bond Low Impact Crusher Work Index and Bond Abrasion	Crusher Work Index: 18.7 kWh/tonne Abrasion Index: 0.29
15 Jan 2015	WKM	McClelland	3948	Drill Core	Agglomeration, strength & stability	P80 3/8in crush, 5lb/ton cement is required to produce stable agglomerates.
5 Mar 2015	WKM	KCA	0140117-HSB07-01	Bulk Surface Sample	Cone Crusher and HPGR, Bottle Roll and Column Leach	Bottle roll (96 hr) – Au: Cone 35%, HPGR 49% Ag; Cone 19%, HPGR 30% Column leach (75 day) – Au; Cone 45%, HPGR 55% Ag: Cone 25%, HPGR 38%
9 Mar 2015	WKM	KCA	0140171-HSB11-01	Bulk Surface Sample	Compacted Permeability & Agglomeration on HPGR product	HPGR products are stable and permeable to 125ft depth when agglomerated with 5lb/ton cement.
1 Apr 2015	WKM	KCA	0140171-HSB12-01	Drill Core	Cone crusher versus HPGR product extractions Bottle rolls	Cone crushing - Au 47.3%, Ag - 14% HPGR crushing - Au 61.5%, Ag - 14%

13.5 Three Hills – Analysis of Test Results

The following sections present a summary compilation and analysis of all relevant metallurgical tests from the Three Hills deposit. Metallurgical work conducted in 1988 is not included here, as the source of the material used in those tests cannot be determined; it has been summarized by Prenn and Gustin (2006).

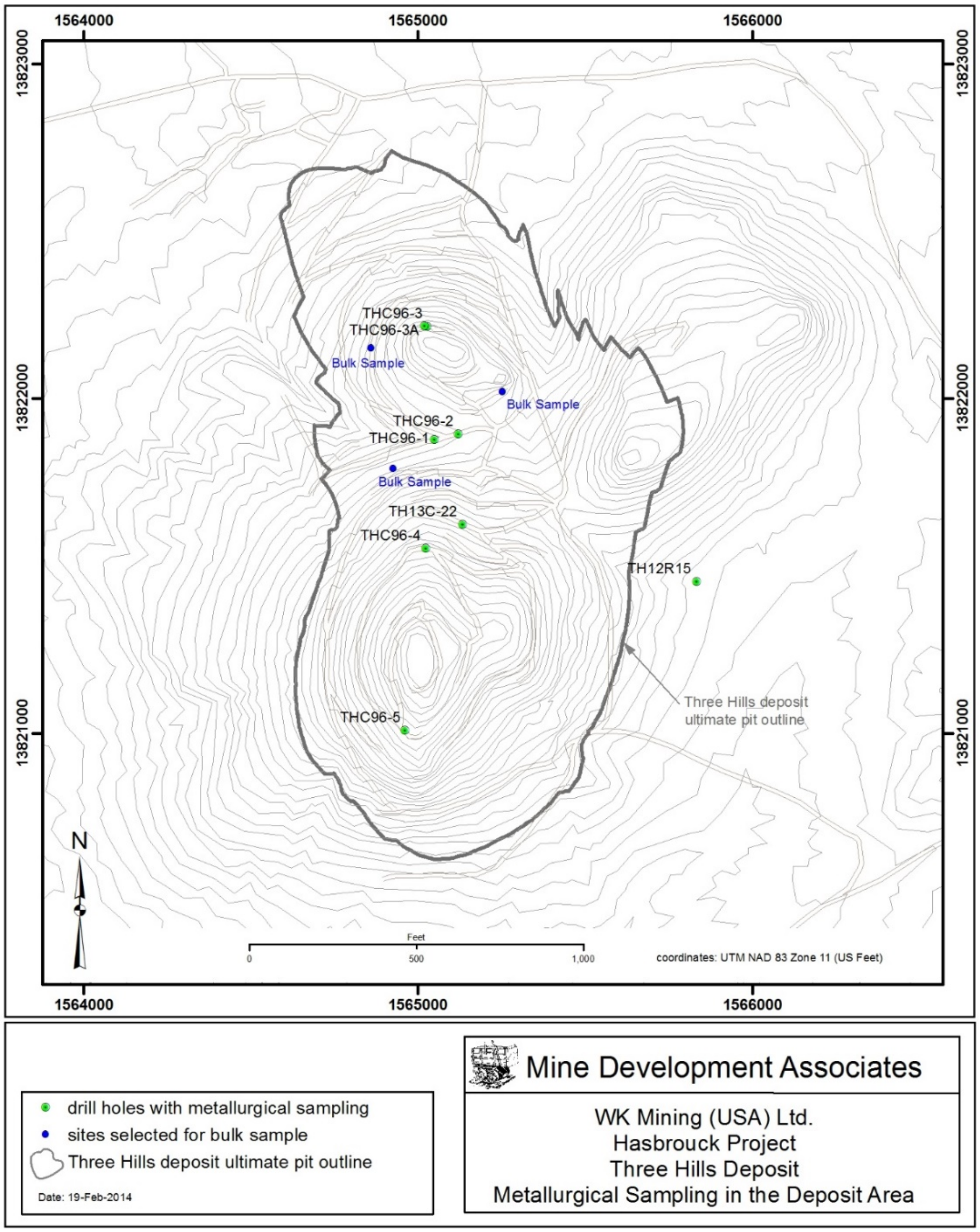
13.5.1 Three Hills - Ore Description

Three Hills ore is contained primarily in the Siebert Formation with limited mineralization in the underlying Fraction Tuff where it is associated with clay alteration. The Siebert Formation consists of interlayered siltstones, sandstones, conglomerates, and tuffs. The coarser, more permeable sandstones and conglomerates are generally pervasively silicified and are the preferred hosts for gold mineralization at Three Hills.

13.5.2 Three Hills - Sample Locations

Figure 13.1 shows the location of the 1996 and 2012 diamond drill holes and 2014 bulk sample locations where material was obtained for use in the 1996 and 2014 Three Hills metallurgical test work programs. The samples are spatially and stratigraphically representative of the ore planned to be processed.

Figure 13.1 Map Showing Locations of Metallurgical Test Samples



13.5.3 Three Hills - Bottle Roll Test Results

Bottle roll tests were completed in 1996 by McClelland, and in 2014 by KCA (report dated March, 2015), on composite samples from the Three Hills deposit. The materials were crushed and milled as necessary to produce various sizes to determine the effect of grain size on gold and silver extraction. The results are presented and summarized in Table 13.2.

Table 13.2 Three Hills Bottle Roll Test Results
(data from McClelland (1996A) and KCA (2015)

			Grade oz/ton			Consumption lb/ton		
Test	**Material**	**Size (inches)**	**Head**	**Tails**	**Extracted Au, %**	**NaCN**	**Lime**	**Report**
½ (THC96-1,2)	Three Hills	P80 1/4	0.041	0.014	68.2	0.16	5.3	11-Nov-1996
3 (THC96-3, 3A)	Three Hills	P80 1/4	0.025	0.006	73.9	0.10	4.4	11-Nov-1996
4 (THC96-4)	Three Hills	P80 1/4	0.024	0.006	75.0	0.10	4.9	11-Nov-1996
5 (THC96-5)	Three Hills	P80 1/4	0.009	0.002	77.8	0.16	4.5	11-Nov-1996
71051A	Three Hills	10 mesh	0.023	0.002	91.0	0.01	2.0	19-Mar-2015

Note: NaCN = sodium cyanide.

13.5.4 Three Hills – Column-Leach Test Results

Two series of column leach tests were performed on Three Hills material, one by McClelland in 1996 using composites of diamond drill core and one by KCA in 2014 using composites of a bulk surface sample. The McClelland tests used 6in diameter, 10ft high columns and tested material crushed to P70 1.5in. The KCA tests used a 4ft diameter, 22ft high column, and tested un-crushed P80 3.8in material collected from drill roads by a track-mounted excavator. Based on typical particle size distributions of ROM ore, this sample was considered to be slightly finer than can be expected of ROM material produced by blasting. The results are presented and summarized in Table 13.3.

Table 13.3 Three Hills Column Tests, Grades and Reagent Consumption
(data from McClelland (1996a) and KCA (2015)

Test	Material	Crush Size (inches)	Au Head Grade (oz/ton)	Au Tails (oz/ton)	Recovered Au (%)	NaCN lb/ton	Lime lb/ton	Report
½ (THC96-1,2)	Three Hills	P70 1.5	0.04	0.002	95	2.11	5	11-Nov-96
3 (THC96-3, 3A)	Three Hills	P70 1.5	0.026	0.003	88.5	3.1	5	11-Nov-96
4 (THC96-4)	Three Hills	P70 1.5	0.026	0.004	84.6	2.84	5	11-Nov-96
5 (THC96-5)	Three Hills	P70 1.5	0.01	0.003	70	3.2	5	11-Nov-96
71015	Three Hills	ROM (P80 3.8)	0.024	0.005	81	0.75	4	19-Mar-15

Drain-down volume and retained moisture were measured upon the completion of leaching. The results are summarized in Table 13.4 and Table 13.5.

Table 13.4 Three Hills ROM Column Testing Drain Down
(data from KCA, 2015)

KCA Test No.	Description	Sample Weight (kg)	Gallons Solution released/ton$_{dry\ ore}$	
71015	Bulk Material	11,991	24 hour	0.57
			48 hour	0.78
			72 hour	1.08
			96 hour	1.33
			120 hour	1.54
			144 hour	1.61
			168 hour	1.82

Table 13.5 Three Hills ROM Column Testing Retained Moisture
(data from KCA, 2015)

KCA Test No.	Description	Days Leached	Retained Solution, gal/ton$_{dryore}$
71015	Bulk Material	133	39.6

Tests predict the final drain-down moisture of the ROM material to be 14%.

13.5.5 Three Hills - Recovery versus Particle Size

The McClelland (1996a) column leach test results were studied for the effect of crush size on recovery (See Table 13.2, Table 13.3, Table 13.5 and Figure 13.2 and Figure 13.3).

Figure 13.2 Three Hills Head and Tail Screen Gold By Size Fraction

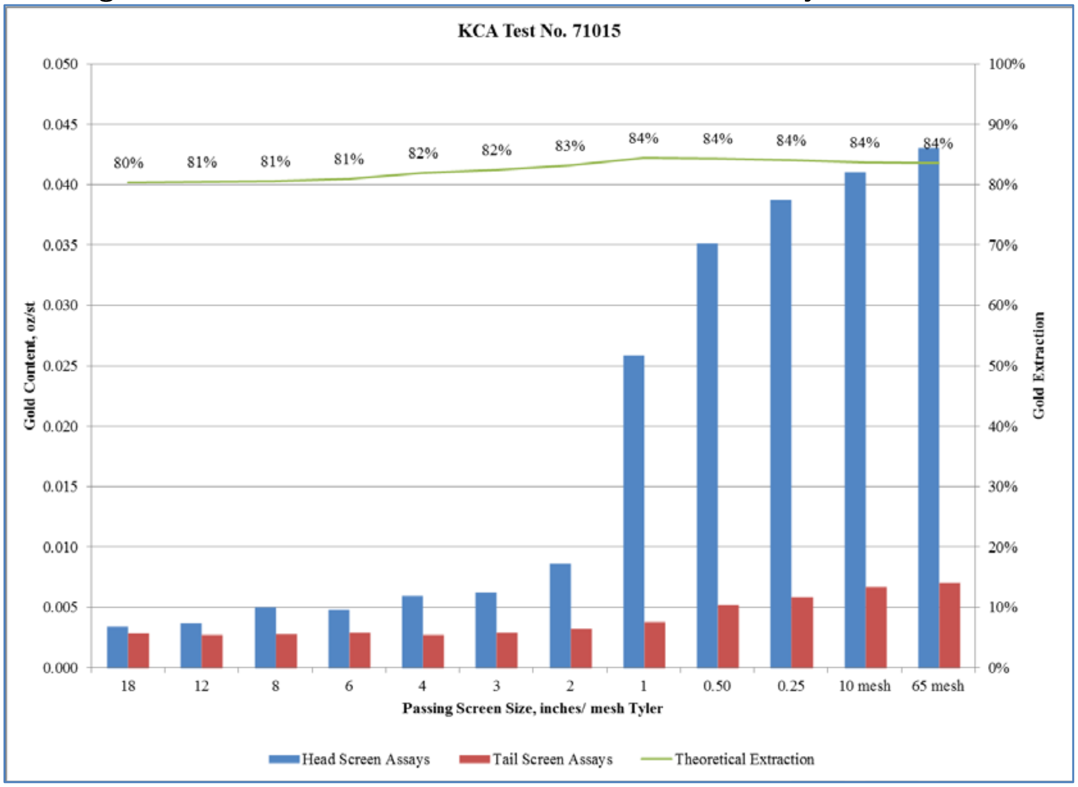
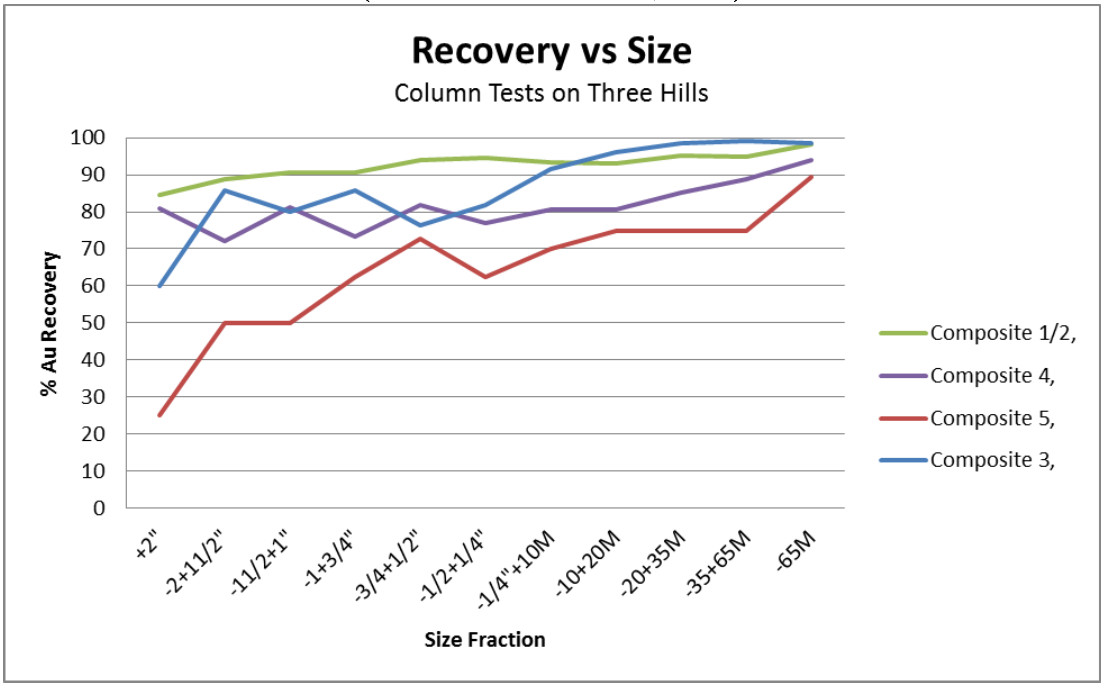


Figure 13.3 Three Hills Column Recovery by Size Fraction
(data from McClelland, 1996)



Results from the relatively small number of samples of this test indicate a weak increase in gold recovery with decreasing particle size. The strongest increase in gold recovery was observed in Composite 5 (Figure 13.3). The relatively low recovery from the +2in size fraction in Composite 5 compared to much higher recoveries from the other composites is due to lack of material in this size fraction and is therefore not considered representative.

The column tests performed by McClelland in 1996 achieved an average gold recovery of 84.5%, but used material crushed to a P70 of 1.5in, which is finer than the ROM sized material being considered at Three Hills. After a 2% operational discount, the relatively small 3.4% increase in recovery, which results from crushing to 1.5in, is not considered sufficient to offset the associated increase in capital and operating costs for crushing, and 79% recovery from an ROM leach is considered to be the most economic approach for this project. Consequently, Three Hills ore is planned to be leached without crushing, i.e. an ROM heap leach.

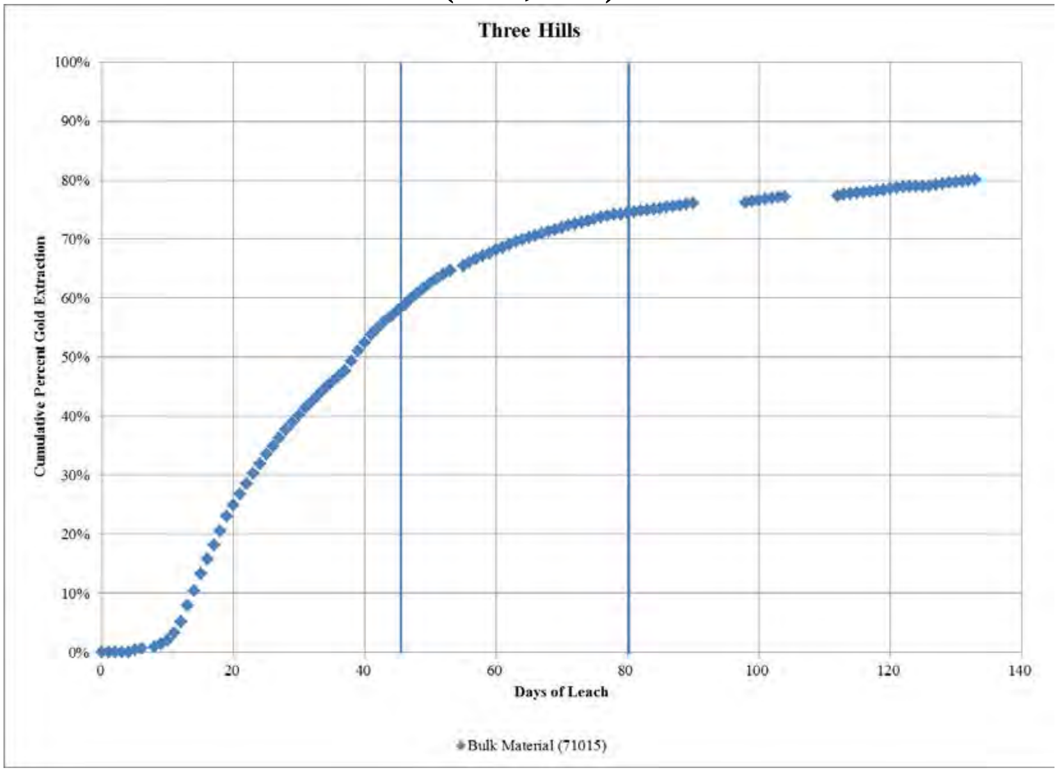
While KCA's 48in column tests in 2014 on P80 3.8in material may be used as a robust predictor of recovery from an ROM heap leach, it should be noted that the material used in this test was finer than expected from mining operations. Comparing the 48in column test results to the 6in column test results on Composites 2, 3, and 4 (81.0%, 88.5% and 84.6% gold recovery, respectively) leads to the conclusion that coarser ROM material will have a slightly lower recovery than that of the 48in column tests.

13.5.6 Three Hills - Leach Cycle Duration

Field leach cycle duration has been predicted using data from the 2014 KCA 48in column tests. Field leach durations are typically longer than the column leach durations due to solution application rates being lower and column leach mechanics of diffusion and displacement not precisely representing the flow of fluid of a heap. Generally, the greater the diameter of the column, the more closely it approximates to field leach times.

There are three distinct domains in a column leach curve. The "initial leach", the "bend" or "knee" and the "final tail out" as shown in Figure 13.4, using data extracted from Table 13.6.

Figure 13.4 48in Column Test Recovery vs. Time (KCA, 2014)



The column was leached/rinsed for a total period of 133 days at a rate of 0.0025 gpm/ft^2. Empirical formulas were used to relate column days to field days as shown in Table 13.6.

Table 13.6 Predicted Three Hills Field Leaching Times

Domain	Column Days	Empirical Factor	Predicted Field Days
Initial Leach	0-45	1.6	72
Bend/Knee	45-80	1.3	46
Final Tail	80-133	1.0	53
Predicted Leach Cycle Duration			**171**

13.5.7 Projected Recovery of Gold at Three Hills

The 48in column test performed by KCA in 2014 used material excavated from the surface with a P80 3.8in sizing and achieved a gold recovery of 81.1%, using slightly finer material than can be expected in a full-scale ROM operation. Thus the KCA test results indicate a slightly higher gold recovery than can be expected at full-scale due to the previously mentioned relationship of gold recovery increasing only weakly with decreasing particle size, and consequently a 2.1%

deduction is applied to account for this. This leads to a predicted operational gold recovery of 79% at Three Hills for ROM material.

Increased gold recovery of 2.5% during drain-down of the heap-leach pad at the Three Hills was included in this study. This was derived from the gold recovery-time curves. Drain-down recovery is generally not included in economic studies, but recovery during drain-down is in fact realized at most leaching operations. While there is a risk that the full drain-down recovery will not be realized in actual production, recognizing gold recovered during drain-down is considered valid and appropriate in this case.

13.5.8 Three Hills - Projected Consumption of Reagents

13.5.8.1 Three Hills Cyanide Consumption

The 2014 KCA ROM column test data were used to predict field cyanide consumption. In this test, 0.75 lb NaCN/ton was consumed. To address the difference between laboratory-scale columns and full-scale heap leach operations, the test value of 0.75 lb NaCN/ton was multiplied by 0.6, resulting in a prediction for full-scale heap leach cyanide consumption of 0.45 lb/ton. This factor is based on field experience of multiple similar heap-leach operations.

13.5.8.2 Three Hills Cement and Lime Consumption

Lime (“CaO”) will be required for pH control of the leaching solutions at Three Hills. Based on the lime consumed in the KCA (2014) ROM column test, lime consumption is predicted to be 4.0 lb/ton.

No cement will be required at the Three Hills heap leach.

13.5.9 Three Hills - Compacted Permeability Results

A reliable indication of the permeability to be expected when leaching Three Hills ROM material was gained from the solution flow rates through the 48in diameter, 22ft high column test performed by KCA in 2014. Solution wetted the entire sample and flowed satisfactorily throughout the test. This result provides a high degree of certainty that that permeability will acceptable through ROM material to a stacking height of at least 22ft.

Lab-scale compacted permeability tests were performed by KCA in 2014 on tailings material from the ROM 48in diameter column leach test, screened to -3in, this being the largest particle size that the KCA test equipment could handle. These tests indicated poor percolation which is believed to be due to the un-representatively high fines content of the test sample. Previous screen analyses of 1.5in crushed Three Hills ore showed a significantly smaller amount of fines than in the sample used in the foregoing test. It is probable that the lower percentage of fines in ROM ore from full-scale operations will allow fluid to percolate though the heap acceptably and as it did in the 22ft high column test.

For the foregoing reasons it is believed that the Three Hills heap will percolate acceptably in practice at its full 150ft planned height. But it is not possible to be certain as no compacted permeability test equipment exists capable of handling ROM-sized material. Thus, during initial leaching operations at Three Hills, percolation will be closely monitored to observe the percolation rate, allowing early adjustments to be made as necessary. Adjustments that can be made include installing intermediate drains in the heap at various elevations as the heap grows in height. While this would increase costs somewhat, it is a viable and proven work-around which can be implemented simply and quickly should percolation decrease to unacceptable rates as stacking height increases.

13.5.10 Three Hills Comminution Test Results

No comminution tests have been carried out on Three Hills ore as a ROM heap leach has always been envisaged for this mine. Since the first metallurgical studies were performed on Three Hills material, the relatively high recovery from coarse particle sizes and the low grade of the deposit have always suggested that an ROM heap leach would be the optimum process.

13.6 Hasbrouck Deposit Test Results

In 2014 and 2015, WKM commissioned tests at KCA to evaluate the relationships between particle size and recovery, host-rock lithology and recovery, and elevation and recovery. The use of an HPGR for crushing Hasbrouck Mine ore was evaluated. Metallurgical tests conducted prior to 1988 were summarized by Wilson (2014) and are consistent with results of later tests, but have not been included as the sample locations are not known. Metallurgical tests are summarized in Table 13.1

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13.6.1 Hasbrouck Deposit Ore Description

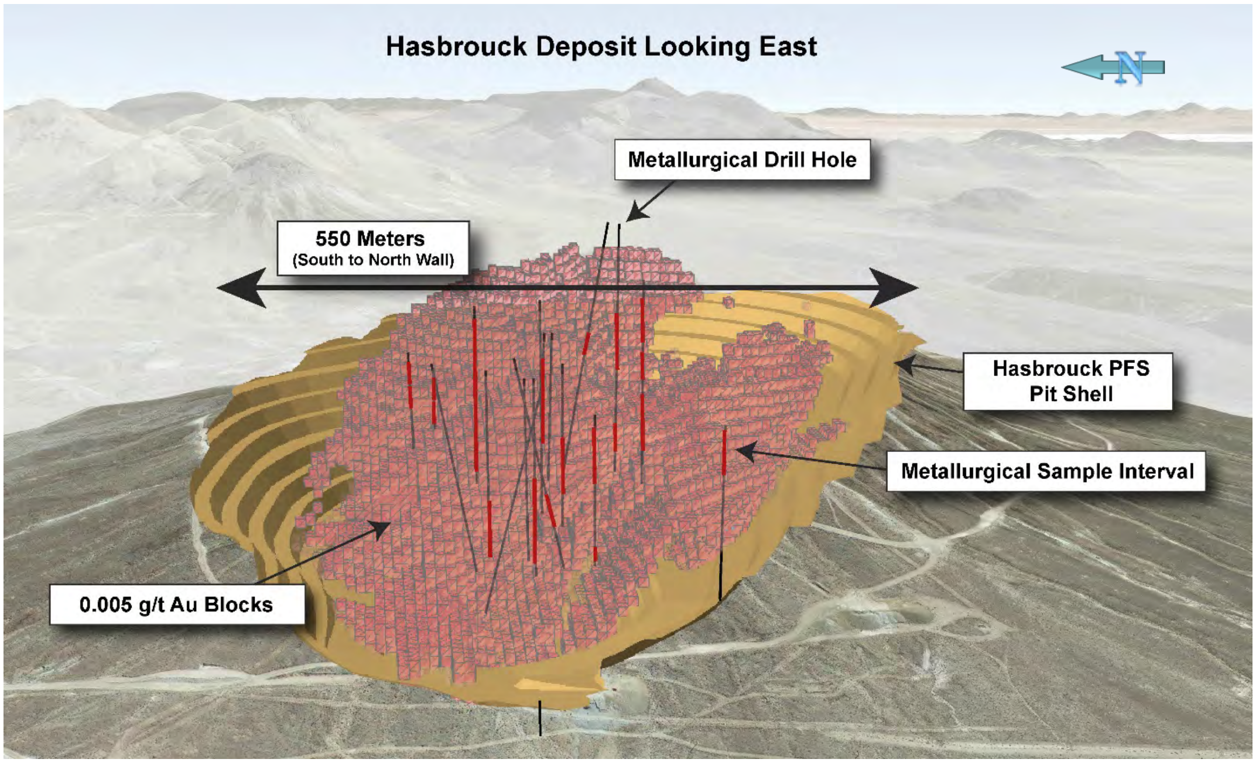
Hasbrouck Mine ores are contained in the Siebert Formation. The Siebert Formation is separated into two lithological packages, designated the upper Siebert and the lower Siebert. The upper Siebert is dominated by sandstones and conglomerates and is heavily silicified. The lower Siebert is dominated by lithic tuff with interbedded siltstones and sandstones. The contact between the upper and lower Siebert is gradational over a 50 to 100ft elevation range due to over-lapping lithologies between the two units. Post-depositional faulting has produced vertical offsets of the modeled contact of up to 100ft.

Previous owners of the Hasbrouck deposit identified a relationship between depth from original surface (elevation) and metal recovery. Re-analysis of the geological data in 2015 revealed that the relationship with recovery is with lithologies, rather than with elevation. WKM's work in 2015 further identified the relationship between stratigraphy and recovery. In particular, the bottle roll tests on HPGR products identified and quantified this relationship. WKM's bottle roll tests on HPGR crushed core resulted in gold recoveries of 65.4% and 74.5% being assigned to the upper and lower Siebert, respectively (see Section 13.6.11). During mining operations, geological mapping will be used in these zones to estimate the percentages of each type of ore sent to the plant for accounting purposes.

13.6.2 Hasbrouck Deposit - Sample Locations

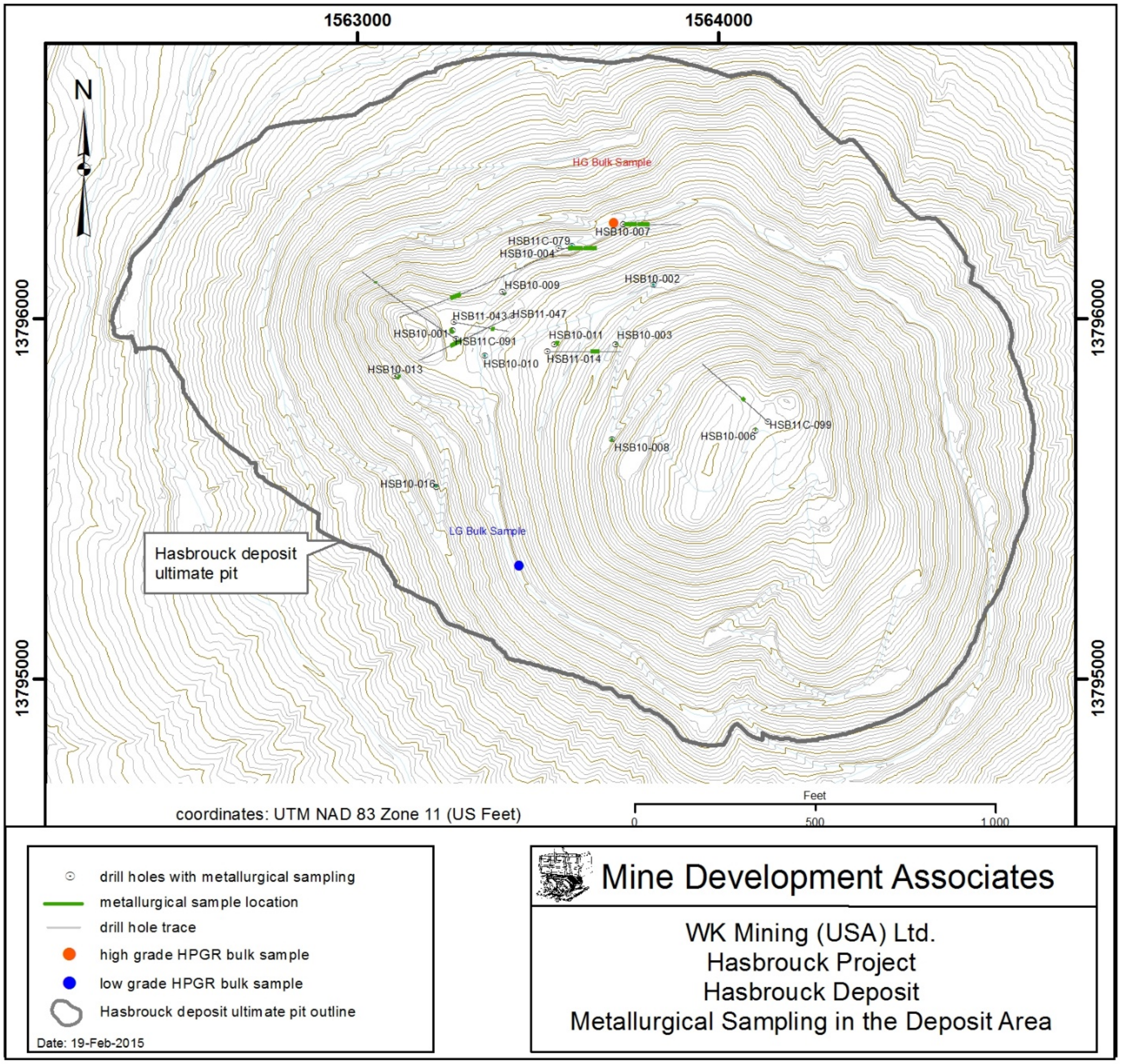
The locations of the core holes and intervals of drill samples used in the Hasbrouck metallurgical test work in 2012-2015 are shown in Figure 13.5. The locations of bulk surface samples are shown in Figure 13.6. The samples are considered to be spatially and stratigraphically representative of the ores to be processed.

Figure 13.5 Hasbrouck Deposit Drill-hole Metallurgical Samples 2012 – 2014,
(Perspective View Relative To Block Model and Proposed Pit; MDA 2016)



Note: Not to scale

Figure 13.6 Locations of 2012 – 2014 Hasbrouck Deposit Samples for Metallurgical Testing



13.6.3 Hasbrouck Deposit - Bottle Roll Test Results

Bottle roll tests were completed in 2012 at McClelland on composite samples from the Hasbrouck deposit and the data were reported by McPartland (2012) and Wright (2012). The materials were crushed and milled to various sizes to determine the effect of particle size on gold and silver extraction. A summary of the results is presented in Table 13.7 and details are given in Table 13.17 in Section 13.7.14.

Table 13.7 Summary of Hasbrouck Deposit Bottle Roll Test Results on Cone Crushed Material
(Data from McPartland, 2012 and Wright, 2012)

		Head Grade, oz/ton		Extraction, %		Consumption, lb/ton	
Material	**Size (mesh)**	**Au**	**Ag**	**Au**	**Ag**	**NaCN**	**Lime**
Hasbrouck	10M	0.024	0.56	65.9	23.2	0.14	2.4
Hasbrouck	200M	0.022	0.53	89.3	50.7	0.20	2.8

The results show a strong increase in gold recovery with decreasing particle size.

Detailed data that provide support to the summary tables presented above are presented Section 13.6.14 in Table 13.17, Table 13.18 and Table 13.19.

13.6.4 Hasbrouck Deposit - Column Tests

Allied Nevada commissioned 70 column tests performed by McClelland in 2012. Columns were loaded with composite samples from nine core holes representing the ore, sized at P80 3/4in and P80 3/8in sizes. Results are presented in Table 13.8.

Table 13.8 Hasbrouck Deposit Gold Recovery in Column Tests

(data from McClelland, 2012)

Job Number	Column Number	% Au Recovery		% Ag Recovery	
		-3/4"	-3/8"	-3/4"	-3/8"
3536	0	42.9	36.8	13.3	16.7
3536	1	38.1	52.4	8.0	12.0
3536	2	61.5	66.7	12.0	16.7
3536	3	64.7	72.2	3.7	7.4
3536	4	71.4	78.6	4.3	9.1
3536	5	36.4	45.5	19.2	18.8
3536	6	56.3	69.2	4.8	6.7
3536	7	67.9	66.7	7.1	12.5
3536	8	69.2	66.7	14.3	11.1
3536	9	84.6	80.0	10.5	8.2
3536	10	75.0	79.2	5.1	6.4
3536	11	55.9	66.7	5.0	6.6
3536	12	50.0	50.0	13.6	16.7
3536	13	64.7	75.0	6.8	10.9
3536	14	64.3	62.5	5.3	10.5
3536	15	40.0	26.7	16.3	23.1
3536	16	41.7	44.4	9.1	14.3
3536	17A	58.1	67.6	20.0	23.8
3536	17B	58.6	72.4	14.0	28.9
3536	18	85.7	90.0	8.3	15.7
3536 Average		***61.3***	***65.4***	***10.0***	***13.8***
3465	1	33.3	38.1	18.6	22.4
3465	2	50.0	61.1	13.9	23.9
3465	3	60.0	66.7	12.9	18.3
3465	4	73.0	65.3	8.3	12.7
3465	5	75.0	83.3	2.6	3.5
3465	6	23.1	28.6	6.9	12.1
3465	7	31.6	36.4	7.7	14.8
3465	8	36.4	45.0	14.9	23.4
3465	9	50.0	50.0	10.2	15.2
3465	10	73.0	70.3	16.2	20.0
3465	11	45.0	52.6	4.3	7.6
3465	12	40.0	46.7	7.8	12.7
3465	13	41.2	47.4	2.6	4.9
3465	14	30.5	47.2	5.1	8.8
3465	15	61.1	65.0	4.8	7.5
3465 Average		***48.2***	***53.6***	***9.1***	***13.9***

13.6.5 Hasbrouck Deposit – Gold Recovery by Size Fraction

2012 test data demonstrated that gold recovery increases strongly with decreasing particle size. A head and tail screen analysis was done on each column. Figure 13.7 and Figure 13.8 show the results of this head and tails screen analysis.

Figure 13.7 2012 Hasbrouck Deposit Column Leach Gold Recovery by Size Fraction
(Data from Wright, 2012)

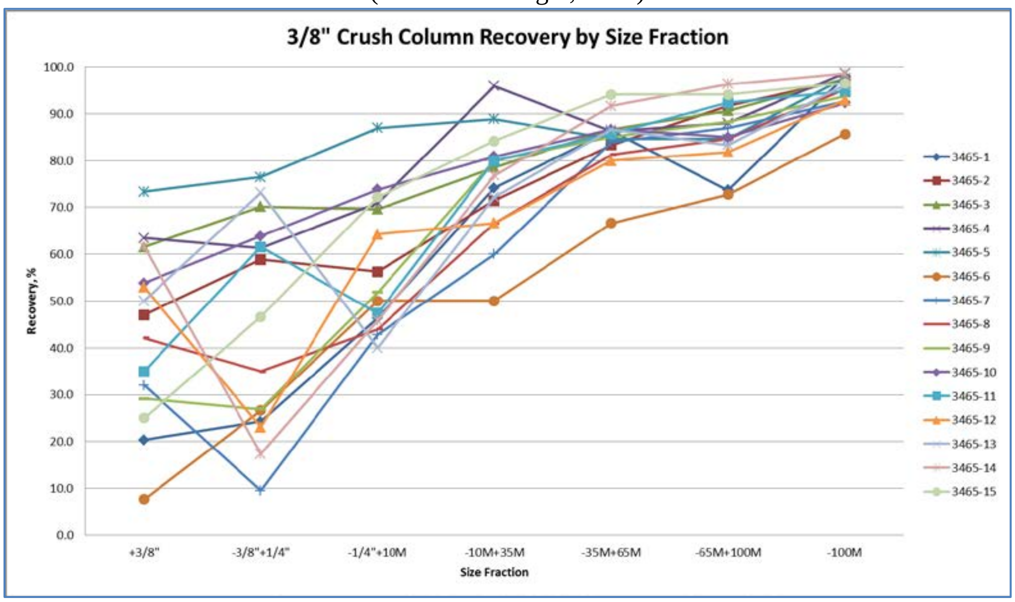
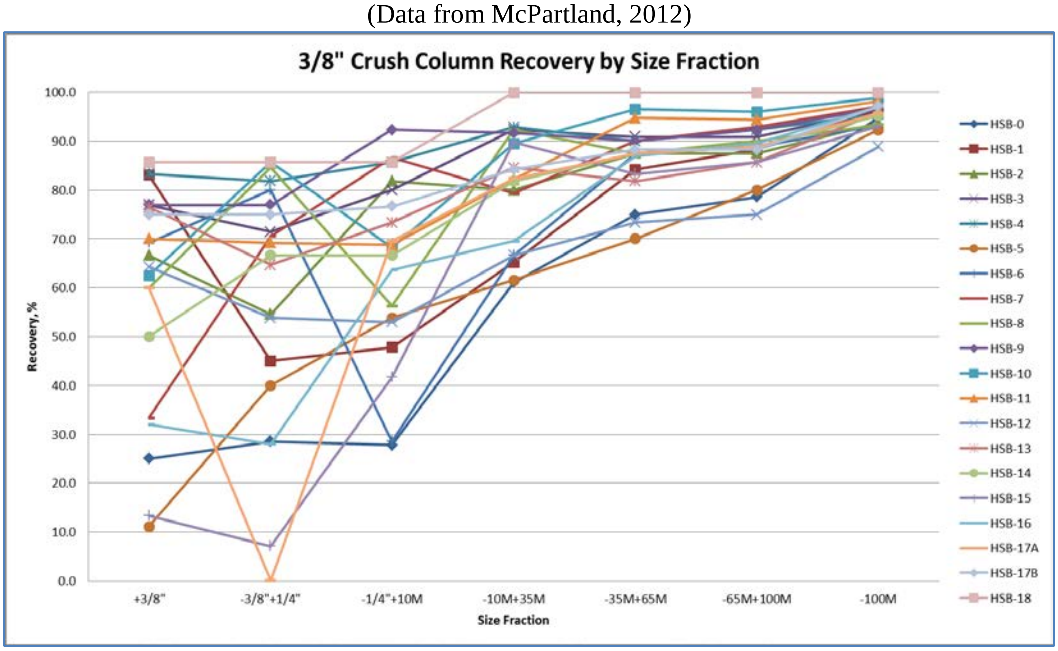


Figure 13.8 Hasbrouck Deposit Column Leach Gold Recovery by Size Fraction
(Data from McPartland, 2012)



The 2012 column leach data were studied to determine the relationship between particle size and recovery. As shown in Figure 13.7 and Figure 13.8, it is clear that gold recovery increases with decreasing particle size.

13.6.6 Hasbrouck Deposit - Gold and Silver Recovery by Lithology and Elevation

An analysis of test data indicated that the upper Siebert and lower Siebert have significantly different gold recoveries, but no significant difference for silver recoveries. Gold recovery increases slightly within each lithological unit as elevation decreases (Figure 13.9). Silver recovery within each unit decreases slightly as elevation decreases (Figure 13.10).

The difference in gold recoveries between the two Siebert stratigraphic units is most likely due to the degree of silicification of the ore. Pervasive silicification, hydrothermal brecciation, and siliceous veining are common within the upper Siebert volcaniclastic rocks. Silicification and veining are less pervasive and mineralization is more structurally controlled within the lower Siebert tuffaceous and fine-grained sedimentary rocks. Argillic alteration, characterized by the presence of illite and montmorillonite, forms an envelope around the silicified and mineralized zones and is most common in the lower Siebert tuffaceous rocks.

Figure 13.9 Hasbrouck Deposit Column Leach Gold Recovery by Stratigraphic Unit and Sample Elevation

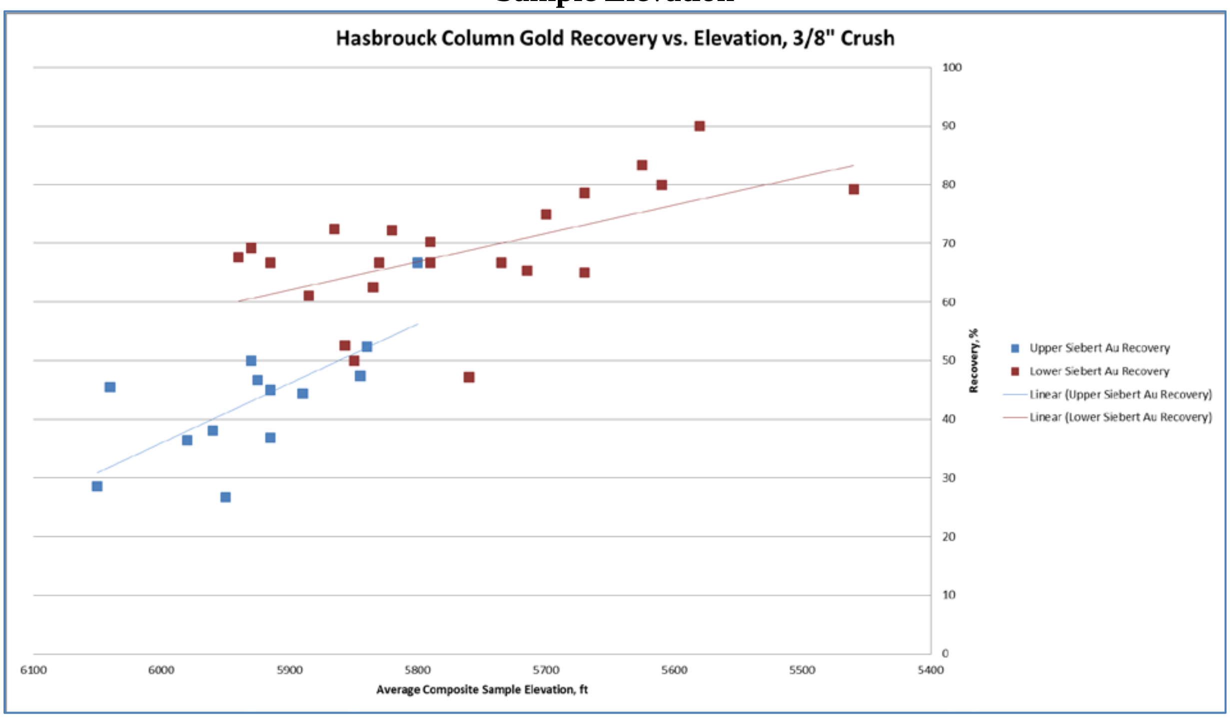
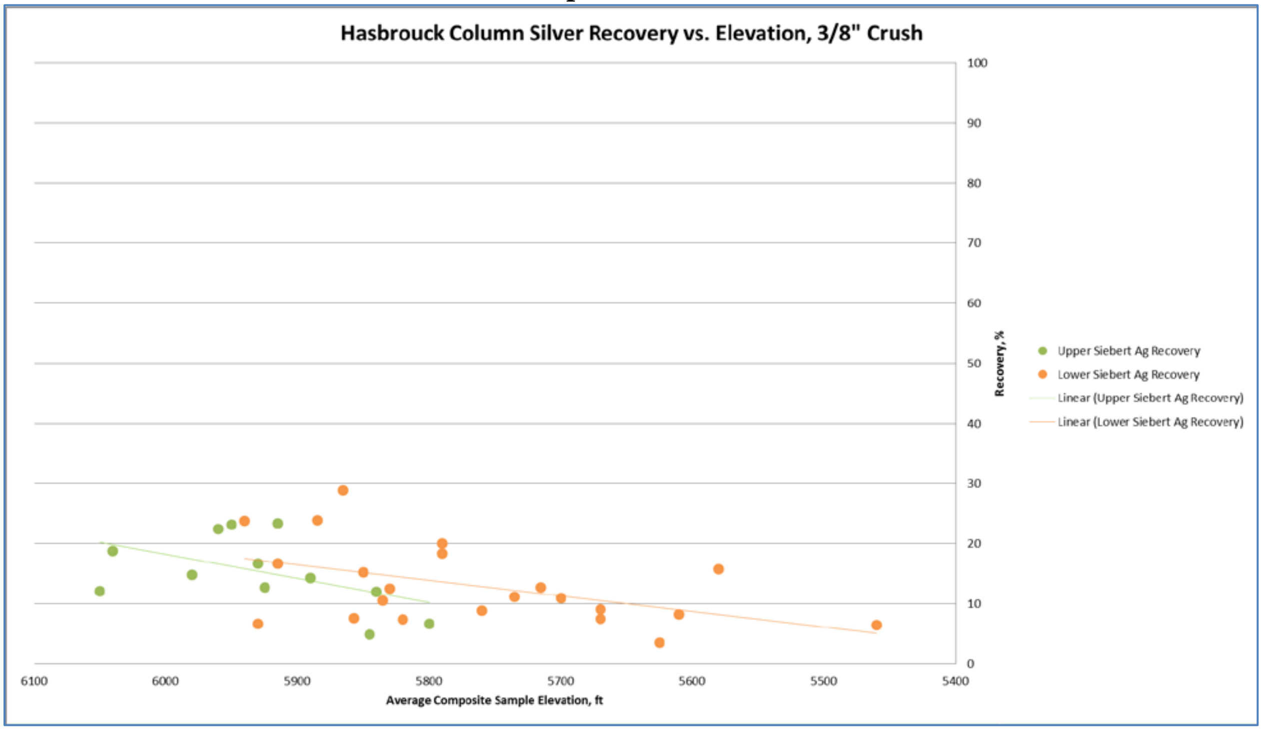


Figure 13.10 Hasbrouck Deposit Column Leach Silver Recovery by Stratigraphic Unit and Sample Elevation



13.6.7 Hasbrouck Deposit – High-Pressure Grinding-Roll Testing

Two series of HPGR tests were performed by KCA (2014) using a 15 ton per hour HPGR unit and a laboratory scale cone crusher. Surface samples from the Hasbrouck mineralization were used in this test which was designed to establish the difference in gold and silver recoveries between an HPGR and a conventional crusher (Figure 13.11).

The HPGR crushes the rock by applying high pressure to it by means of two counter-rotating tungsten-carbide studded rollers. Pressure applied to the rock is generated by hydraulic rams which force one roll towards the other; pressure may be varied to optimize the crushing process. Generally, higher pressure creates a finer product. Literature on the HPGR suggests that its crushing action selectively opens microfractures which allow cyanide access to planes of weakness in rock such as that found at Hasbrouck Mine.

Due to the way material flows through the HPGR, ore at the outer edges of the rollers is less contained and is subjected to lower forces than material that flows through the center. Consequently edge material is crushed less and in certain applications operators choose to recycle edge material to achieve more thorough crushing of HPGR product.

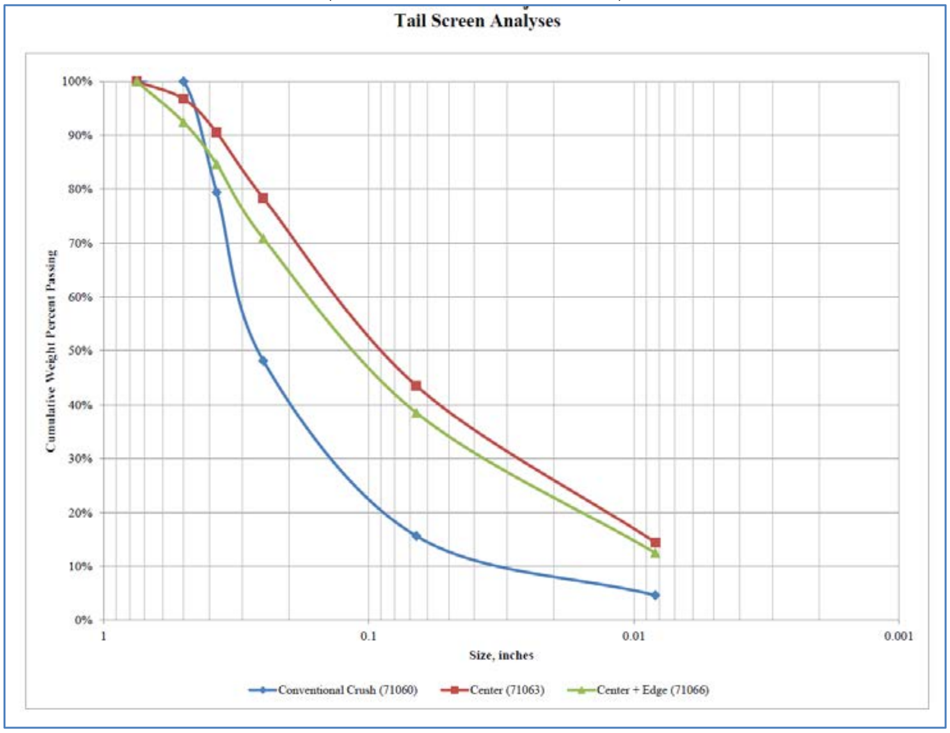
In both test series, based on manufacturer's experience at similar operations, between 20% and 25% of the HPGR edge material product was collected as it exited the machine. Splitting the HPGR product in this way was performed to quantify the difference in the amount of crushing experienced by center material relative to edge material, and the effect that this has on gold recovery. In Test Series 1, center-plus-edge material was tested in one column, while center-only material was tested in another. In Test Series 2, center material and edge material were collected and tested separately.

Figure 13.11 View of SMALLWAL HPGR unit at KCA Used for Testing Hasbrouck Samples

HPGR Test Series 1 was performed using a composite of samples taken from two surface locations (Figure 13.6). This sample consisted of approximately 80% upper Siebert and 20% lower Siebert material. It was cone crushed to P80 3/4in, assayed, and mixed to form a single 800kg composite sample, from which 50kg was separated and crushed by a conventional (cone) crusher to P80 3/8in, this being the smallest particle size that can be practically produced at full-scale by a conventional crusher. The remaining 750kg of the composite sample was crushed by the HPGR.

The particle size distributions of HPGR center, HPGR edge, and conventionally crushed p80 3/8in material are presented in Figure 13.12.

Figure 13.12 Hasbrouck Deposit HPGR versus Conventional-Crush Size Distributions
(Data from KCA, 2015)



Recoveries for all three crusher products from the Test Series 1 were determined in 75-day column tests, results summarized in Table 13.9.

Table 13.9 Hasbrouck Deposit HPGR Test Series 1 – Column Test Recoveries
(Data from KCA, 2015)

KCA Test ID	71060	71063	71066
Description	Conventional Crush	HPGR Center	HPGR Center + Edge
P80 - Crush Size (in)	0.38	0.26	0.32
Calculated Head Gold (oz Au/ton)	0.0243	0.0275	0.0247
Extracted Gold (oz Au/ton)	0.011	0.0151	0.0127
Weighted Avg. Tail Screen (oz Au/ton)	0.0133	0.0124	0.012
Extracted Gold (%)	45%	55%	51%
Calculated Head Silver (oz Ag/ton)	0.385	0.371	0.376
Extracted Silver (oz Ag/ton)	0.097	0.14	0.131
Weighted Avg. Tail Screen (oz Ag/ton)	0.288	0.231	0.245
Extracted Silver (%)	25%	38%	35%
Calculated Tail p80 Size (in)	0.38	0.26	0.32
Days of Leach	75	75	75
Consumption NaCN(lb/ton)	1.73	1.8	1.81
Addition Hydrated Lime (lb/ton)	0	0	1.01
Addition Cement (lb/ton)	4.04	4.06	4.03

HPGR Test Series 2 consisted of bottle roll tests performed on core samples from lower Siebert material, as Test Series 1 represented predominantly upper Siebert material. Material for this test was obtained from 4 diamond core holes (Figure 13.6). Core was conventionally crushed to P80 3/4in, and 5kg was split from each and conventionally crushed to P80 3/8in. The remaining P80 3/4in material was crushed with an HPGR. HPGR center and edge products were collected separately. No size distribution data were collected.

Bottle roll testing was done on splits from both HPGR test series. The bottle roll test results are summarized in Table 13.10 and Table 13.11

Table 13.10 Hasbrouck Deposit HPGR – Upper Siebert Bottle Roll Gold and Silver Recoveries

Description				Cone Crush			HPGR Center			
	Avg. Elev. ft	Siebert	Rock Type	Au Head oz/ton	Au Tail oz/ton	Au Recovery at 96 hr %	Au Head oz/ton	Au Tail oz/ton	Au Recovery at 96 hr %	Difference in HPGR vs Cone Crush Recovery %
Bulk Surface (Test 1)		Upper/Lower % (80/20)		0.026	0.017	35%	0.024	0.012	49%	14%
Description				Cone Crush			HPGR Center			
	Avg. Elev. ft	Siebert	Rock Type	Ag Head oz/ton	Ag Tail oz/ton	Ag Recovery at 96 hr %	Ag Head oz/ton	Ag Tail oz/ton	Ag Recovery at 96 hr %	Difference in HPGR vs Cone Crusher Recovery %
Bulk Surface (Test 1)		Upper/Lower % (80/20)		0.419	0.34	19%	0.402	0.283	30%	11%

Table 13.11 Hasbrouck Deposit HPGR – Lower Siebert Bottle Roll Gold and Silver Recoveries

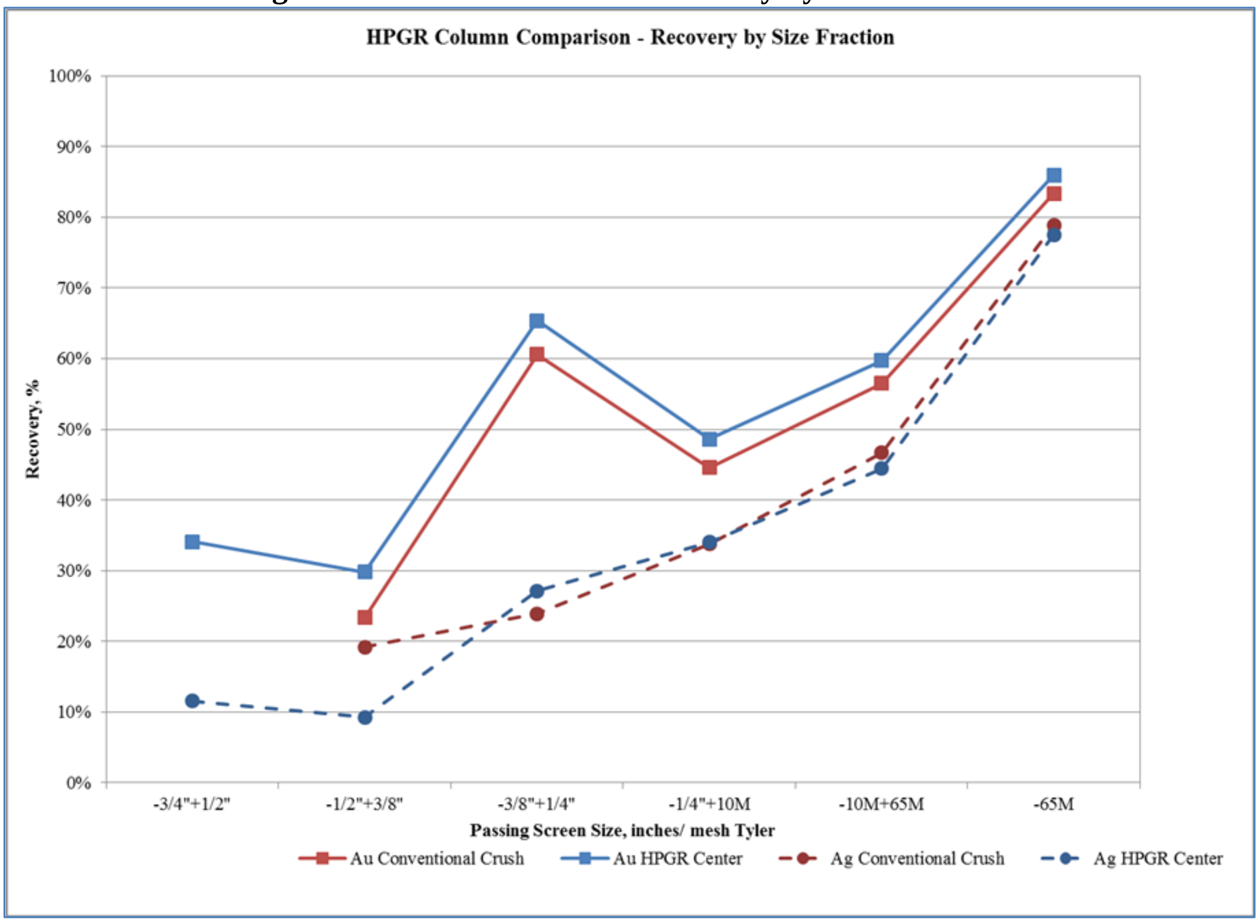
Description	Ave Elev. ft	Siebert	Rock Type	Cone Crush Au Head oz/ton	Cone Crush Au Tail oz/ton	Cone Crush Au Recovery at 96 hr %	HPGR Center Au Head oz/ton	HPGR Center Au Tail oz/ton	HPGR Center Au Recovery at 96 hr %	Difference in HPGR vs Cone Crush Recovery %
HSB11-043; 494'-532'	5520	Lower	Tsw	0.018	0.013	69%	0.019	0.004	78.00%	9%
HSB11C-079; 572'-627'	5500	Lower	Tsw	0.018	0.006	69%	0.02	0.006	71%	2%
HSB11C-091; 532'-541':550.5'-577'	5565	Lower	Tslt	0.019	0.005	74%	0.017	0.0037	78.00%	4%
HSB11C-099; 345'-386'	5900	Lower	Tslt	0.014	0.008	56%	0.011	0.004	67%	11%
Average										**6.40%**
Description	**Avg. Elev ft**	**Siebert**	**Rock Type**	**Cone Crush Ag Head oz/ton**	**Cone Crush Ag Tail oz/ton**	**Cone Crush Ag Recovery at 96 hr %**	**HPGR Center Ag Head oz/ton**	**HPGR Center Ag Tail oz/ton**	**HPGR Center Ag Recovery at 96 hr %**	**Difference in HPGR vs Cone Crusher Recovery %**
HSB11-043; 494'-532'	5520	Lower	Tsw	0.287	0.276	4%	0.283	0.266	6%	2%
HSB11C-079; 572'-627'	5500	Lower	Tsw	0.465	0.452	3%	0.468	0.442	6%	3%
HSB11C-091; 532'-541':550.5'-577'	5565	Lower	Tslt	0.163	0.152	7%	0.163	0.143	12%	5%
HSB11C-099; 345'-386'	5900	Lower	Tslt	0.292	0.248	15%	0.292	0.248	15%	0%
Average										**3.00%**

Note: Tslc = lower conglomerate in upper Siebert; Tsw = tuffaceous siltstone; Tslt = latitic tuff in lower Siebert.

Based on the above results using an HPGR is predicted to improve gold recoveries from the upper Siebert ore by 14% and by 6.4 % from the lower Siebert ore, relative to a cone crusher. There is no indication that HPGR crushing will significantly improve silver recovery.

While the differential in gold recovery was demonstrated by the results shown in Table 13.10 and Table 13.11 for the upper and lower Siebert, it should be noted these results were generated from bottle roll tests and as such are known to be less representative of the performance of a full-scale heap leach than column leach results. To adjust for this, the bottle roll recoveries for upper Siebert were compared to the column leach recoveries on similar material; 6% difference was noted. This 6% difference has been added to the bottle roll results to approximate column test results for the upper Siebert. This was not possible for the lower Siebert as no column data were generated for HPGR product.

Figure 13.13 HPGR Column Recovery by Size Fraction



The recovery from ore crushed in a full-scale HPGR has been predicted by using the column test data presented in Table 13.9, and the McPartland and Wright 2012 data. The higher gold recovery from ore crushed in an HPGR compared to a cone crusher is explained by two distinct mechanisms:

- Micro-fracturing; research done by others suggest this is due to the different crushing mechanism of an HPGR vs. a conventional crusher. Micro-fractures are created in the particles, allowing cyanide greater access to contained gold. Analysis of the Hasbrouck data suggests that this micro-fracturing effect might increase gold recovery by 4%.
- Smaller particle size; test data from crushing Hasbrouck material demonstrates that an HPGR with edge recycling will crush to P75 1/4in which results in 6% to 14% higher recovery than a conventional crusher at P80 3/8in crush.

To obtain maximum benefit from the finer crushing and microfracturing generated by an HPGR, the crushing circuit will be configured to recycle a certain percentage of edge material. Predicting gold recovery at full scale with recycling approximately 25% of edge material is achieved by factoring recovery from an HPGR center product recovery with that of a cone crusher and then applying to the historical data base of recoveries from conventionally crushed ore. In Table 13.10 and Table 13.11 the gold recoveries were normalized to a 96 hour leach by taking the fraction of leaching completed, based on solution assays, and multiplying that by the ultimate recovery.

13.6.8 Hasbrouck Deposit - Work Index and Abrasion Index Test Results

Standard comminution tests were performed on representative Hasbrouck deposit surface samples by ALS Metallurgy under the supervision of KCA. The materials were combined into a composite sample and subjected to a Bond Low Impact Crusher test and a Bond Abrasion test. Results are summarized in Table 13.12.

Table 13.12 Hasbrouck Deposit Bond Crusher Work Index and Abrasion Index
(Data from Albert, 2014)

KCA Sample No.	Description	Crusher Work Index Values kW-hr/MT	Crusher Work Index Values kW-hr/st	Abrasion Index Values A_i
71028	Hasbrouck	18.71	16.97	0.2856

Note - Comminution test work completed by ALS Metallurgy, Kamloops, BC Canada.

Results show that this material is hard to crush and moderately abrasive.

13.6.9 Hasbrouck Deposit - Agglomeration and Permeability Test Results

Agglomeration tests were performed to evaluate the need to agglomerate both conventionally crushed and HPGR crushed ore. Results are summarized in Table 13.13 and show that both the HPGR and conventionally crushed material will require cement addition for a heap lift height of 25ft.

Agglomeration tests were followed by compacted permeability tests, conducted under a compaction loading equivalent to a 125ft tall heap. Results of the compacted permeability tests are presented in Table 13.14.

Table 13.13 Hasbrouck Deposit Preliminary Agglomeration Testing

(Data from KCA, 2015)

KCA Test No.	71058 A	71058 B	71058 C	71058 D	71058 E	71058 F	71058 G	71058 H	71058 I	71058 J	71058 K	71058 L
Description	HPGR Composite, Conventionally Crushed				HPGR Composite, HPGR (Center Material)				HPGR Composite, Weighted Edge (24%) + Center (76%)			
Top Size of Material, inches	3/8"	3/8"	3/8"	3/8"	HPGR	HPGR	HPGR	HPGR	HPGR	HPGR	HPGR	HPGR
Dry Ore, kg	2	2	2	2	2	2	2	2	2	2	2	2
Cement, lb/ton	0	4	8	16	0	4	8	16	0	4	8	16
Water Added, mLs	0	77	79	92.5	0	86.5	62	80	0	157	122	125
Column Area, ft^2	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049
Initial Height, inches	11	10.5	10.25	10.5	8.25	9.5	10	10	8.5	9	10.25	10.75
Final Height, inches	11	10.5	10.25	10.5	8.25	9.25	10	10	8.5	9	10.25	10.75
pH on Day 3	8	10.1	10.7	11.1	7.8	10.9	11.2	11.2	7.9	9.2	9.2	10.8
pH Comment	Low	Good	Good	Good	Low	Good	Good	Good	Low	Low	Low	Good
% Slump	0%	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%
Slump Result	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Apparent Bulk Density, lb_{dry}/ft^3	97.99	102.66	105.16	102.66	130.65	116.53	107.79	107.79	126.81	119.77	105.16	100.27
Flow Out, gpm/ft^2	10.51	10.13	13.43	12.74	0.1	5.85	4.56	9.17	0.1	4.81	8.81	6.96
Flow Result	Pass	Pass	Pass	Pass	Fail	Pass	Pass	Pass	Fail	Pass	Pass	Pass
Visual Estimate of % Pellet Breakdown	N/A	<3	<3	<3	N/A	<3	<3	<3	N/A	<3	<3	<3
Pellet Result	N/A	Pass	Pass	Pass	N/A	Pass	Pass	Pass	N/A	Pass	Pass	Pass
Out Flow Solution, Color and Clarity	Light Brown & Cloudy	Colorless & Clear	Colorless & Clear	Colorless & Clear	Colorless & Clear	Colorless & Clear	Colorless & Clear	Colorless & Clear	Brown & Cloudy	Colorless & Clear	Colorless & Clear	Colorless & Clear
Solution Result	Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Fail	Pass	Pass	Pass
Overall Test Result	Pass	Pass	Pass	Pass	Fail	Pass	Pass	Pass	Fail	Pass	Pass	Pass

Table 13.14 Hasbrouck Deposit Compacted Permeability Test
(Data from KCA, 2015)

KCA Test ID	Description	Cement Added (lb/ton)	Effective Height (feet)	Flow Rate (gpm/ft^2)	Crush Size (inches)	% Pellet Breakdown	% Slump	Effluent Ave pH	Pass/Fail
71081 A	HPGR Crushed Center	9	125	2,389	0.3	<3	0	11.6	Pass
71081 B	HPGR Crushed Center	4	125	2,033	0.3	<3	0	11.1	Pass
71081 C	HPGR Crushed Center	2	125	2,488	0.3	<3	0	9.49	Pass

Results show that the agglomerates were stable and permeable with 4 lb/ton of cement. However, the pH of the effluent was low at a cement addition rate of 4 lb/ton, and thus 5 lb/ton cement is recommended to maintain pH above 10.5 in the heap.

13.6.10 Hasbrouck Deposit - Leach Cycle Time Results

The 2012 Hasbrouck column test results for the -3/8in, conventionally crushed materials were studied to estimate an average value for leach cycle duration. The column leach cycle results for gold extraction are shown in Table 13.15.

Table 13.15 Hasbrouck Deposit - Summary of Leach Cycle Duration Results for Gold
(Data from KCA, 2015)

			Bending Point				Recovery Complete		
Test	Crush	Description	S/O at Bend	Rec. at Bend	Lab Days	Field Days	Recovery	Lab Days	Total Days
P-2	-3/8"	HSB-0	0.55	16.3	7	51.1	35.8	49	100
P-4	-3/8"	HSB-1	1.02	34.8	13	95.2	51.0	45	140
P-6	-3/8"	HSB-2	1.02	51.7	13	95.0	64.2	44	139
P-8	-3/8"	HSB-3	0.61	50.6	8	57.2	70.6	49	106
P-10	-3/8"	HSB-4	0.70	56.4	9	65.4	76.4	65	130
P-12	-3/8"	HSB-5	0.54	24.5	7	50.3	43.6	49	99
P-14	-3/8"	HSB-6	0.55	42.3	8	51.0	68.5	49	100
P-16	-3/8"	HSB-7	0.71	49.3	9	66.3	66.7	40	106
P-18	-3/8"	HSB-8	0.55	49.3	7	51.6	66.7	34	86
P-20	-3/8"	HSB-9	0.47	54.7	6	43.6	78.0	50	94
P-22	-3/8"	HSB-10	0.53	54.2	7	49.8	79.2	47	97
P-24	-3/8"	HSB-11	0.53	43.0	7	50.0	66.7	50	100
P-26	-3/8"	HSB-12	0.54	25.7	7	50.2	50.0	42	92
P-28	-3/8"	HSB-13	0.77	58.1	10	71.7	74.4	66	138
P-30	-3/8"	HSB-14	0.69	43.1	9	64.6	62.5	40	105
P-32	-3/8"	HSB-15	0.78	16.7	10	72.8	26.7	36	109
P-34	-3/8"	HSB-16	0.45	25.2	6	42.5	44.4	50	93
P-36	-3/8"	HSB-17A	0.78	47.1	10	72.9	67.6	89	162
P-38	-3/8"	HSB-17B	0.78	56.2	10	72.5	72.4	68	141
P-40	-3/8"	HSB-18	0.78	77.0	10	72.9	87.0	53	126
P-2	-3/8"	3465-1	0.84	22.6	12	78.4	37.1	71	149
P-4	-3/8"	3465-2	0.65	37.8	9	61.0	58.3	58	119
P-6	-3/8"	3465-3	0.80	45.6	11	74.7	66.7	64	139
P-8	-3/8"	3465-4	0.71	44.0	10	66.7	65.3	77	144
P-10	-3/8"	3465-5	0.64	63.9	9	59.9	80.6	56	116
P-12	-3/8"	3465-6	0.58	17.1	8	53.9	26.4	50	104
P-14	-3/8"	3465-7	0.65	22.7	9	60.9	36.8	43	104
P-16	-3/8"	3465-8	0.58	29.0	8	54.7	45.0	39	94
P-18	-3/8"	3465-9	0.65	33.6	9	60.6	50.0	54	115
P-20	-3/8"	3465-10	0.63	52.7	9	59.1	70.3	62	121
P-22	-3/8"	3465-11	0.59	33.7	9	55.0	50.0	55	110
P-24	-3/8"	3465-12	0.53	32.0	8	49.4	44.0	35	84
P-26	-3/8"	3465-13	0.58	33.7	8	54.2	48.4	45	99
P-28	-3/8"	3465-14	0.73	33.4	11	68.4	46.8	75	143
P-30	-3/8"	3465-15	0.64	48.5	9	60.1	64.0	57	117

Note: " = inch; S/O = Tons Solution/Tons Ore; Rec. = gold recovery in percent;

Field leach duration has been predicted based on the 2012 McClelland 6in column tests. Experience teaches that field leach durations are typically longer than the column leach durations due to solution application rates being lower and column leach mechanics of diffusion and displacement not precisely representing the flow of fluid in that occur in a heap. Generally, the greater the diameter of the column, the more closely it approximates to field leach times.

There are three distinct domains in a column leach curve. The "initial leach", the "bend" or "knee" and the "final tail out". The leach duration results from the 2012 column tests were highly variable due to grade and lithology.

Leach cycle duration is predicted to be 115 days as shown in Table 13.16.

Table 13.16 Hasbrouck Deposit Leach Cycle Duration

Column Leach Domain	Column Days	Empirical Factor	Predicted Field Days
Initial leach	15	3.0	45
Bend/Knee	20	1.5	30
Final Tail	40	1.0	40
Predicted Leach Cycle Duration			115

Data from the large number of column leach tests on 3/8in crushed material provide a good basis for predicting the leach time required for the HPGR crushed material. The average leach time of all the 2012 column leach tests on conventionally crushed 3/8in material was 115 days. The 2014 column leach tests on HPGR crushed material were completed in 3in columns and were terminated at 75 days, i.e. before leaching was completed. These column tests were terminated at 75 days as the HPGR and conventionally crush material had both reached their "final tail" with a similar recovery rates (on a daily basis) and the difference in gold total gold recovery between the two products had been established. Based on the similarity at 75 days, it is predicted that HPGR crushed material will achieve complete gold recovery in the same time as the conventionally crushed material of 115 days.

13.6.11 Hasbrouck Deposit - Predicted Recovery of Gold and Silver

For upper Siebert material the 13 column leach tests performed by McPartland and Wright in 2012, on 3/8in, gold recovery from conventionally crushed material was predicted at 44.6%.

KCA's 2014 bottle roll tests on HPGR crushed upper Siebert material showed a 14% increase in gold recovery compared to a conventional crusher (Table 13.10). The data on upper Siebert material indicates that bottle roll tests under-report gold recovery by at least 6% compared to column leach test data. (Table 13.9 and Table 13.10). An experience-based deduction of -2.4% has been applied to laboratory-scale gold recovery predictions to represent what will occur at full scale. The operational gold recovery is therefore predicted to be 62.2% for ore hosted in the upper Siebert unit (i.e., 43%+14%+6%-2.4%).

For lower Siebert ore, 21 column leach tests performed by McClelland in 2012 on 3/8in conventionally crushed material gave an estimated average gold recovery of 70.2%. Bottle roll tests by KCA in 2014 indicated that using an HPGR will result in 6.4% higher gold recovery than a conventional crusher (Table 13.11). It is recommended that a deduction factor of -2% be applied to the laboratory-scale results for gold recovery to account for field conditions, resulting in a projected operational gold recovery of 74.6% (70.2%+6.4%-2%) for ore hosted in the lower Siebert unit. It should be noted that no comparative column tests are available to factor the bottle roll tests done on lower Siebert ore crushed in an HPGR as was possible for upper Siebert ore.

For upper Siebert ore, bottle roll tests understated the gold recovery by 6%, showing the potential for further tests to reveal a similar increase in recovery in the lower Siebert.

The mine plan put forward in this study has 81% of the ore tonnage coming from the lower Siebert and 19% from the upper Siebert. Thus a weighted average gold recovery of 72.2% is predicted for all ore contemplated in this study to be mined at the Hasbrouck Mine.

Silver recoveries do not appear to benefit from HPGR crushing. Tests on 3/8in, conventionally crushed material indicated that an average recovery of 13% silver could be expected from both the upper and lower Siebert. A -2% operational deduction factor is recommended to be applied to the laboratory-scale results to account for field conditions, resulting in a predicted 11% operational recovery of silver from the Hasbrouck ore.

Increased gold recovery of 1.5% during drain-down of the heap-leach pad at the Hasbrouck Mine was included in this study. This value was derived from the gold recovery-time curves. Drain-down recovery is generally not included in economic studies, but recovery during drain-down is in fact realized at most leaching operations. While there is a risk that the full drain-down recovery will not be realized in actual production, recognizing gold recovered during drain-down is considered valid and appropriate in this case.

13.6.12 Hasbrouck Deposit - Cyanide Consumption

The column leach test data were used to predict field consumption of cyanide at the Hasbrouck Mine. An average consumption of 3.29lb NaCN/ton was observed in the 2012 column leach tests on conventionally crushed material. The 2015 column leach tests on HPGR crushed materials consumed an average of 1.81 lb NaCN/ton, a slight increase compared to the conventionally crushed material in the same tests that consumed 1.73 lb NaCN/ton (KCA, March, 2015). Based on experience, consumption of cyanide during production is expected to be 40% of the KCA HPGR laboratory consumption results, or 0.75 lb NaCN/ton.

13.6.13 Hasbrouck Deposit - Cement and Lime Consumption

Cement will be required for agglomeration at Hasbrouck. Compacted permeability tests indicated that adding 4 lb/ton of cement to crushed ore will be sufficient to maintain stable and permeable agglomerates for a heap height of 125ft. However, the pH was slightly lower than optimal at this addition rate and so an addition rate of 5 lb/ton is projected for full-scale operations.

13.6.14 Hasbrouck Deposit - Detailed Results of Bottle Roll and Column Leach Tests

Detailed data that was used for the summary tables presented in Section 13.4 are given in Table 13.17, Table 13.18 and Table 13.19.

Table 13.17 Hasbrouck Deposit Bottle Roll Test Results

(Data from McPartland, 2012, Wright, 2012, and KCA, March, 2015))

						Head Grade, oz/ton		Extraction, %		Consumption lb/ton		
Test	**Description**	**Avg. Elev (ft)**	**Seibert Unit**	**Rock Type**	**Size**	**Au**	**Ag**	**Au**	**Ag**	**NaCN**	**Lime**	**Report**
CY-1	HSB-0	5915	Upper	Tsuc/Tss	10M	0.023	0.31	39.1	22.6	0.1	2	8-Mar-12
CY-18	HSB-0	5915	Upper	Tsuc/Tss	200M	0.022	0.33	86.4	57.6	0.29	2.5	8-Mar-12
CY-2	HSB-1	5840	Upper	Tss/Tslt	10M	0.023	0.51	52.2	15.7	0.1	2.2	8-Mar-12
CY-19	HSB-1	5840	Upper	Tss/Tslt	200M	0.02	0.51	90	45.1	0.15	2.7	8-Mar-12
CY-3	HSB-2	5915	Lower	Tss	10M	0.012	0.28	66.7	28.6	0.1	2.4	8-Mar-12
CY-20	HSB-2	5915	Lower	Tss	200M	0.011	0.29	90.9	62.1	0.14	2.2	8-Mar-12
CY-4	HSB-3	5820	Lower	Tss/Tslt	10M	0.02	0.88	79.8	54.3	0.23	2.4	8-Mar-12
CY-21	HSB-3	5820	Lower	Tss/Tslt	200M	0.018	0.8	87.4	64.3	0.31	2.3	8-Mar-12
CY-5	HSB-4	5670	Lower	Tslt	10M	0.015	0.36	80	36.1	0.15	3	8-Mar-12
CY-22	HSB-4	5670	Lower	Tslt	200M	0.012	0.37	91.7	51.4	0.14	2.6	8-Mar-12
CY-6	HSB-5	6040	Upper	Tss/Tslc	10M	0.01	0.35	50	28.6	0.1	2.2	8-Mar-12
CY-23	HSB-5	6040	Upper	Tss/Tslc	200M	0.009	0.35	88.9	62.9	0.6	2.4	8-Mar-12
CY-7	HSB-6	5930	Lower	Tslt/Tsw	10M	0.012	0.21	66.7	19	0.1	3.5	8-Mar-12
CY-24	HSB-6	5930	Lower	Tslt/Tsw	200M	0.011	0.21	90.9	47.6	0.29	2.9	8-Mar-12
CY-8	HSB-7	5830	Lower	Tslt	10M	0.023	0.19	73.9	26.3	0.1	3.8	8-Mar-12
CY-25	HSB-7	5830	Lower	Tslt	200M	0.022	0.17	90.9	58.8	0.14	2.9	8-Mar-12
CY-9	HSB-8	5735	Lower	Tslt/Tsw	10M	0.013	0.14	84.6	14.3	0.1	3.1	8-Mar-12
CY-26	HSB-8	5735	Lower	Tslt/Tsw	200M	0.011	0.11	90.9	36.4	0.3	2.7	8-Mar-12
CY-10	HSB-9	5610	Lower	Tslt/Tsw	10M	0.014	0.6	85.7	11.7	0.14	2.9	8-Mar-12
CY-27	HSB-9	5610	Lower	Tslt/Tsw	200M	0.012	0.63	91.7	28.6	0.16	2.8	8-Mar-12
CY-11	HSB-10	5460	Lower	Tsw/Tslt	10M	0.022	0.85	81.8	9.4	0.1	2.6	8-Mar-12
CY-28	HSB-10	5460	Lower	Tsw/Tslt	200M	0.023	0.86	95.7	26.7	0.3	3.2	8-Mar-12
CY-12	HSB-11	5800	Upper/Lower	Tslc/Tslt	10M	0.032	0.6	71.9	10	0.15	2.6	8-Mar-12
CY-29	HSB-11	5800	Upper/Lower	Tslc/Tslt	200M	0.027	0.58	96.3	32.8	0.46	3.4	8-Mar-12
CY-13	HSB-12	5930	Upper	Tslc	10M	0.013	0.25	61.5	20	0.1	2.6	8-Mar-12
CY-30	HSB-12	5930	Upper	Tslc	200M	0.013	0.26	84.6	57.7	0.31	2.2	8-Mar-12
CY-14	HSB-13	5700	Lower	Tslt/Tslc	10M	0.019	0.46	68.4	15.2	0.1	3	8-Mar-12
CY-31	HSB-13	5700	Lower	Tslt/Tslc	200M	0.021	0.49	76.2	38.8	0.1	2.9	8-Mar-12
CY-15	HSB-14	5835	Lower	Tsw/Tslt	10M	0.016	0.21	75	14.3	0.1	2.6	8-Mar-12
CY-32	HSB-14	5835	Lower	Tsw/Tslt	200M	0.012	0.17	91.7	35.3	0.1	3.8	8-Mar-12
CY-16	HSB-15	5950	Upper	Tslc	10M	0.021	0.49	47.6	30.6	0.1	2.3	8-Mar-12
CY-33	HSB-15	5950	Upper	Tslc	200M	0.018	0.48	83.3	72.9	0.1	3.4	8-Mar-12
CY-17	HSB-16	5890	Upper	Tslc/Tslt	10M	0.026	0.7	57.7	20	0.1	2.4	8-Mar-12
CY-34	HSB-16	5890	Upper	Tslc/Tslt	200M	0.027	0.63	92.6	63.5	0.1	3	8-Mar-12

						Head Grade, oz/ton		Extraction, %		Consumption lb/ton		
Test	Description	Avg. Elev (ft)	Seibert Unit	Rock Type	Size	Au	Ag	Au	Ag	NaCN	Lime	Report
CY-35	HSB-17A	5940	Lower	Tslt	10M	0.028	0.67	75	29.9	0.1	2.7	8-Mar-12
CY-38	HSB-17A	5940	Lower	Tslt	200M	0.026	0.64	88.5	60.9	0.27	3.8	8-Mar-12
CY-36	HSB-17B	5865	Lower	Tslt	10M	0.023	0.39	78.3	30.8	0.15	2.5	8-Mar-12
CY-39	HSB-17B	5865	Lower	Tslt	200M	0.027	0.49	92.6	46.9	0.29	4.2	8-Mar-12
CY-37	HSB-18	5580	Lower	Tslt	10M	0.007	0.54	85.7	18.5	0.16	2.8	8-Mar-12
CY-40	HSB-18	5580	Lower	Tslt	200M	0.009	0.58	88.9	39.7	0.15	5	8-Mar-12
CY-1	3465-1	5960	Upper	Tslc	10M	0.035	0.71	62.9	39.4	0.16	2	14-Mar-12
CY-16	3465-1	5960	Upper	Tslc	200M	0.033	0.57	90.9	54.4	0.16	2.7	14-Mar-12
CY-2	3465-2	5885	Lower	Tslt	10M	0.015	0.75	73.3	36	0.14	1.6	14-Mar-12
CY-17	3465-2	5885	Lower	Tslt	200M	0.014	0.77	92.9	54.5	0.14	2.3	14-Mar-12
CY-3	3465-3	5790	Lower	Tslt	10M	0.045	1.2	73.3	29.2	0.3	2	14-Mar-12
CY-18	3465-3	5790	Lower	Tslt	200M	0.043	1.16	90.7	50	0.14	2.6	14-Mar-12
CY-4	3465-4	5715	Lower	Tslt	10M	0.088	1.7	67	21.8	0.14	2.2	14-Mar-12
CY-19	3465-4	5715	Lower	Tslt	200M	0.078	1.67	92.3	44.9	0.16	2.6	14-Mar-12
CY-5	3465-5	5625	Lower	Tslt	10M	0.018	0.84	77.8	6	0.31	2.7	14-Mar-12
CY-20	3465-5	5625	Lower	Tslt	200M	0.017	0.78	94.1	20.5	0.14	3.2	14-Mar-12
CY-6	3465-6	6050	Upper	Tss	10M	0.014	0.31	42.9	25.8	0.14	2.2	14-Mar-12
CY-21	3465-6	6050	Upper	Tss	200M	0.012	0.25	75	68	0.15	2.8	14-Mar-12
CY-7	3465-7	5980	Upper	Tslc	10M	0.022	0.29	50	27.6	0.14	1.8	14-Mar-12
CY-22	3465-7	5980	Upper	Tslc	200M	0.017	0.24	82.4	70.8	0.15	2.9	14-Mar-12
CY-8	3465-8	5915	Upper	Tslc	10M	0.023	0.45	52.2	33.3	0.19	2	14-Mar-12
CY-23	3465-8	5915	Upper	Tslc	200M	0.019	0.34	84.2	79.4	0.14	2.6	14-Mar-12
CY-9	3465-9	5850	Lower	Tslt	10M	0.029	0.49	58.6	26.5	0.14	1.8	14-Mar-12
CY-24	3465-9	5850	Lower	Tslt	200M	0.023	0.4	87	60	0.15	2.4	14-Mar-12
CY-10	3465-10	5790	Lower	Tslt	10M	0.042	1.11	73.8	26.1	0.15	1.8	14-Mar-12
CY-25	3465-10	5790	Lower	Tslt	200M	0.038	0.91	86.8	54.9	0.14	2.1	14-Mar-12
CY-11	3465-11	5857	Lower	Tslt	10M	0.022	0.65	63.6	18.5	0.14	2.3	14-Mar-12
CY-26	3465-11	5857	Lower	Tslt	200M	0.019	0.59	94.7	49.2	0.14	2.7	14-Mar-12
CY-12	3465-12	5925	Upper	Tslc	10M	0.016	0.62	50	24.2	0.14	2.2	14-Mar-12
CY-27	3465-12	5925	Upper	Tslc	200M	0.013	0.61	76.9	59	0.15	2.6	14-Mar-12
CY-13	3465-13	5845	Upper	Tslc/Tslt	10M	0.023	0.41	52.2	14.6	0.14	1.8	14-Mar-12
CY-28	3465-13	5845	Upper	Tslc/Tslt	200M	0.031	0.43	96.8	39.5	0.14	2.1	14-Mar-12
CY-14	3465-14	5760	Lower	Tslt	10M	0.050	0.56	60	17.9	0.14	2.1	14-Mar-12
CY-29	3465-14	5760	Lower	Tslt	200M	0.045	0.55	95.6	47.3	0.14	2.2	14-Mar-12
CY-15	3465-15	5670	Lower	Tslt	10M	0.025	0.46	68	10.9	0.14	1.8	14-Mar-12

						Head Grade, oz/ton		Extraction, %		Consumption lb/ton		
Test	**Description**	**Avg. Elev (ft)**	**Seibert Unit**	**Rock Type**	**Size**	**Au**	**Ag**	**Au**	**Ag**	**NaCN**	**Lime**	**Report**
CY-30	3465-15	5670	Lower	Tslt	200M	0.021	0.44	95.2	31.8	0.16	2.3	14-Mar-12
73109A	HSB11-014:275-335	5795	Upper/Lower	Tslc	10M	0.020	0.53	51	18	0.32	1	Jan-15
73111A	HSB11-014:275-335	5795	Upper/Lower	Tslc	200M	0.017	0.58	90	49	0.5	1.5	Jan-15
73109B	HSB11-043:494-532	5520	Lower	Tsw	10M	0.020	0.28	87	7	0.3	1.5	Jan-15
73111B	HSB11-043:494-532	5520	Lower	Tsw	200M	0.021	0.29	97	28	1.25	1.5	Jan-15
73109C	HSB11C-079:572-627	5500	Lower	Tsw	10M	0.018	0.45	84	5	0.46	1.5	Jan-15
73111C	HSB11C-079:572-627	5500	Lower	Tsw	200M	0.019	0.47	96	24	0.77	2	Jan-15
73109D	HSB11C-091:532-541:550.5-577	5565	Lower	Tslt	10M	0.022	0.16	83	11	0.32	1.5	Jan-15
73111D	HSB11C-091:532-541:550.5-577	5565	Lower	Tslt	200M	0.020	0.16	95	43	0.86	2	Jan-15
73110A	HSB11C-099:345-386	5900	Lower	Tslt	10M	0.013	0.28	68	21	0.34	1.5	Jan-15
73112A	HSB11C-099:345-386	5900	Lower	Tslt	200M	0.011	0.28	90	57	0.51	1.5	Jan-15

Note: Tslc = lower conglomerate in upper Siebert; Tsw = tuffaceous siltstone; Tslt = latitic tuff in lower Siebert; Tsuc = upper conglomerate in upper Siebert; Tss = sandstone in upper Siebert.

Table 13.18 Hasbrouck Deposit Column Tests, Grades and Reagents
(Data from McPartland, 2012, and Wright, 2012)

						Head Grade oz/ton		Consumption, lb/ton	
Test	**Description**	**Avg. Elev (ft)**	**Siebert**	**Rock Type**	**Crush Size**	**Au**	**Ag**	**NaCN**	**Lime**
P-1	HSB-0	5915	Upper	Tsuc/Tss	3/4	0.014	0.30	3.12	2.0
P-2	HSB-0	5915	Upper	Tsuc/Tss	3/8	0.019	0.30	3.04	2.0
P-3	HSB-1	5840	Upper	Tss/Tslt	3/4	0.021	0.50	3.19	2.2
P-4	HSB-1	5840	Upper	Tss/Tslt	3/8	0.021	0.50	3.64	2.2
P-5	HSB-2	5915	Lower	Tss	3/4	0.013	0.25	3.38	2.4
P-6	HSB-2	5915	Lower	Tss	3/8	0.012	0.24	3.19	2.4
P-7	HSB-3	5820	Lower	Tss/Tslt	3/4	0.017	0.27	3.32	2.8
P-8	HSB-3	5820	Lower	Tss/Tslt	3/8	0.018	0.27	3.16	2.8
P-9	HSB-4	5670	Lower	Tslt	3/4	0.014	0.23	3.00	3.0
P-10	HSB-4	5670	Lower	Tslt	3/8	0.014	0.16	3.19	3.0
P-11	HSB-5	6040	Upper	Tss/Tslc	3/4	0.011	0.26	2.78	2.2
P-12	HSB-5	6040	Upper	Tss/Tslc	3/8	0.011	0.32	2.83	2.2
P-13	HSB-6	5930	Lower	Tslt/Tsw	3/4	0.016	0.21	2.25	3.6
P-14	HSB-6	5930	Lower	Tslt/Tsw	3/8	0.013	0.15	2.29	3.6
P-15	HSB-7	5830	Lower	Tslt	3/4	0.028	0.14	2.49	3.8
P-16	HSB-7	5830	Lower	Tslt	3/8	0.027	0.16	2.51	3.8
P-19	HSB-8	5735	Lower	Tslt/Tsw	3/4	0.013	0.07	2.61	3.2
P-18	HSB-8	5735	Lower	Tslt/Tsw	3/8	0.015	0.09	2.88	3.2
P-17	HSB-9	5610	Lower	Tlst/Tsw	3/4	0.013	0.57	2.64	3.0
P-20	HSB-9	5610	Lower	Tlst/Tsw	3/8	0.015	0.61	2.32	3.0
P-21	HSB-10	5460	Lower	Tsw/Tslt	3/4	0.024	0.78	0.89	2.6
P-22	HSB-10	5460	Lower	Tsw/Tslt	3/8	0.024	0.78	2.60	2.6
P-23	HSB-11	5800	Upper/Lower	Tslc/Tslt	3/4	0.034	0.60	2.59	2.6
P-24	HSB-11	5800	Upper/Lower	Tslc/Tslt	3/8	0.033	0.61	2.87	2.6
P-25	HSB-12	5930	Upper	Tslc	3/4	0.014	0.22	2.88	2.6
P-26	HSB-12	5930	Upper	Tslc	3/8	0.014	0.24	3.08	2.6
P-27	HSB-13	5700	Lower	Tslt/Tslc	3/4	0.017	0.44	3.21	3.0
P-28	HSB-13	5700	Lower	Tslt/Tslc	3/8	0.016	0.46	3.34	3.0
P-29	HSB-14	5835	Lower	Tsw/Tslt	3/4	0.014	0.19	2.86	2.6
P-30	HSB-14	5835	Lower	Tsw/Tslt	3/8	0.016	0.19	2.91	2.6
P-31	HSB-15	5950	Upper	Tslc	3/4	0.015	0.49	2.81	2.4
P-32	HSB-15	5950	Upper	Tslc	3/8	0.030	0.52	2.97	2.4
P-33	HSB-16	5890	Upper	Tslc/Tslt	3/4	0.024	0.66	2.90	2.4
P-34	HSB-16	5890	Upper	Tslc/Tslt	3/8	0.027	0.63	3.28	2.4
P-35	HSB-17A	5940	Lower	Tslt	3/4	0.031	0.60	5.33	2.6
P-36	HSB-17A	5940	Lower	Tslt	3/8	0.034	0.63	5.85	2.6
P-37	HSB-17B	5865	Lower	Tslt	3/4	0.029	0.50	4.12	2.6
P-38	HSB-17B	5865	Lower	Tslt	3/8	0.029	0.38	4.54	2.6

						Head Grade oz/ton		Consumption, lb/ton	
Test	**Description**	**Avg. Elev (ft)**	**Siebert**	**Rock Type**	**Crush Size**	**Au**	**Ag**	**NaCN**	**Lime**
P-39	HSB-18	5580	Lower	Tslt	3/4	0.007	0.48	3.93	2.6
P-40	HSB-18	5580	Lower	Tslt	3/8	0.010	0.51	4.50	2.6
P-1	3465-1	5960	Upper	Tslc	3/4	0.036	0.70	3.98	2.0
P-2	3465-1	5960	Upper	Tslc	3/8	0.042	0.76	4.91	2.0
P-3	3465-2	5885	Lower	Tslt	3/4	0.016	0.72	2.68	2.0
P-4	3465-2	5885	Lower	Tslt	3/8	0.018	0.71	3.07	2.0
P-5	3465-3	5790	Lower	Tslt	3/4	0.050	1.16	3.72	2.0
P-6	3465-3	5790	Lower	Tslt	3/8	0.045	1.26	4.20	2.0
P-7	3465-4	5715	Lower	Tslt	3/4	0.074	1.45	4.72	2.0
P-8	3465-4	5715	Lower	Tslt	3/8	0.075	1.65	4.34	2.0
P-9	3465-5	5625	Lower	Tslt	3/4	0.020	0.78	3.48	2.5
P-10	3465-5	5625	Lower	Tslt	3/8	0.018	0.85	3.75	2.5
P-11	3465-6	6050	Upper	Tss	3/4	0.013	0.29	2.55	2.0
P-12	3465-6	6050	Upper	Tss	3/8	0.014	0.33	2.58	2.0
P-13	3465-7	5980	Upper	Tslc	3/4	0.019	0.26	2.66	2.0
P-14	3465-7	5980	Upper	Tslc	3/8	0.022	0.27	2.81	2.0
P-15	3465-8	5915	Upper	Tslc	3/4	0.022	0.47	2.87	2.0
P-16	3465-8	5915	Upper	Tslc	3/8	0.020	0.47	3.09	2.0
P-17	3465-9	5850	Lower	Tslt	3/4	0.026	0.49	3.33	2.0
P-18	3465-9	5850	Lower	Tslt	3/8	0.028	0.46	3.23	2.0
P-19	3465-10	5790	Lower	Tslt	3/4	0.037	0.99	3.14	2.0
P-20	3465-10	5790	Lower	Tslt	3/8	0.037	1.00	3.38	2.0
P-21	3465-11	5857	Lower	Tslt	3/4	0.020	0.69	2.99	2.0
P-22	3465-11	5857	Lower	Tslt	3/8	0.019	0.66	2.97	2.0
P-23	3465-12	5925	Upper	Tslc	3/4	0.015	0.64	2.11	2.0
P-24	3465-12	5925	Upper	Tslc	3/8	0.015	0.63	2.11	2.0
P-25	3465-13	5845	Upper	Tslc/Tslt	3/4	0.017	0.39	2.24	2.0
P-26	3465-13	5845	Upper	Tslc/Tslt	3/8	0.019	0.41	2.63	2.0
P-27	3465-14	5760	Lower	Tslt	3/4	0.059	0.59	4.01	2.0
P-28	3465-14	5760	Lower	Tslt	3/8	0.053	0.57	3.97	2.0
P-29	3465-15	5670	Lower	Tslt	3/4	0.018	0.42	2.79	2.0
P-30	3465-15	5670	Lower	Tslt	3/8	0.020	0.40	2.77	2.0

Note: Tslc = lower conglomerate in upper Siebert; Tsw = tuffaceous siltstone; Tslt = latitic tuff in lower Siebert; Tss = sandstone in upper Siebert.

Table 13.19 Hasbrouck Deposit Column Tests, Extractions and Tails

(Data from McPartland, 2012, and Wright, 2012)

				Extracted, %		Tails Grade, oz/ton	
Test	Description	Siebert Unit	Crush Size (inches)	Au	Ag	Au	Ag
P-1	HSB-0	Upper	P80 3/4	42.9	13.3	0.008	0.26
P-2	HSB-0	Upper	P80 3/8	36.8	16.7	0.012	0.25
P-3	HSB-1	Upper	P80 3/4	38.1	8.0	0.013	0.46
P-4	HSB-1	Upper	P80 3/8	52.4	12.0	0.010	0.44
P-5	HSB-2	Lower	P80 3/4	61.5	12.0	0.005	0.22
P-6	HSB-2	Lower	P80 3/8	66.7	16.7	0.004	0.20
P-7	HSB-3	Lower	P80 3/4	64.7	3.7	0.006	0.26
P-8	HSB-3	Lower	P80 3/8	72.2	7.4	0.005	0.25
P-9	HSB-4	Lower	P80 3/4	71.4	4.3	0.004	0.22
P-10	HSB-4	Lower	P80 3/8	78.6	9.1	0.003	0.20
P-11	HSB-5	Upper	P80 3/4	36.4	19.2	0.007	0.21
P-12	HSB-5	Upper	P80 3/8	45.5	18.8	0.006	0.26
P-13	HSB-6	Lower	P80 3/4	56.3	4.8	0.007	0.20
P-14	HSB-6	Lower	P80 3/8	69.2	6.7	0.004	0.14
P-15	HSB-7	Lower	P80 3/4	67.9	7.1	0.009	0.13
P-16	HSB-7	Lower	P80 3/8	66.7	12.5	0.009	0.14
P-19	HSB-8	Lower	P80 3/4	69.2	14.3	0.004	0.06
P-18	HSB-8	Lower	P80 3/8	66.7	11.1	0.005	0.08
P-17	HSB-9	Lower	P80 3/4	84.6	10.5	0.002	0.51
P-20	HSB-9	Lower	P80 3/8	80.0	8.2	0.003	0.56
P-21	HSB-10	Lower	P80 3/4	75.0	5.1	0.006	0.74
P-22	HSB-10	Lower	P80 3/8	79.2	6.4	0.005	0.73
P-23	HSB-11	Upper/Lower	P80 3/4	55.9	5.0	0.015	0.57
P-24	HSB-11	Upper/Lower	P80 3/8	66.7	6.6	0.011	0.57
P-25	HSB-12	Upper	P80 3/4	50.0	13.6	0.007	0.19
P-26	HSB-12	Upper	P80 3/8	50.0	16.7	0.007	0.20
P-27	HSB-13	Lower	P80 3/4	64.7	6.8	0.006	0.41
P-28	HSB-13	Lower	P80 3/8	75.0	10.9	0.004	0.41
P-29	HSB-14	Lower	P80 3/4	64.3	5.3	0.005	0.18
P-30	HSB-14	Lower	P80 3/8	62.5	10.5	0.006	0.17
P-31	HSB-15	Upper	P80 3/4	40.0	16.3	0.009	0.41
P-32	HSB-15	Upper	P80 3/8	26.7	23.1	0.022	0.40
P-33	HSB-16	Upper	P80 3/4	41.7	9.1	0.014	0.60
P-34	HSB-16	Upper	P80 3/8	44.4	14.3	0.015	0.54
P-35	HSB-17A	Lower	P80 3/4	58.1	20.0	0.013	0.48
P-36	HSB-17A	Lower	P80 3/8	67.6	23.8	0.011	0.48
P-37	HSB-17B	Lower	P80 3/4	58.6	14.0	0.012	0.43
P-38	HSB-17B	Lower	P80 3/8	72.4	28.9	0.008	0.27

				Extracted, %		Tails Grade, oz/ton	
Test	**Description**	**Siebert Unit**	**Crush Size (inches)**	**Au**	**Ag**	**Au**	**Ag**
P-39	HSB-18	Lower	P80 3/4	85.7	8.3	0.001	0.44
P-40	HSB-18	Lower	P80 3/8	90.0	15.7	0.001	0.43
P-1	3465-1	Upper	P80 3/4	33.3	18.6	0.024	0.57
P-2	3465-1	Upper	P80 3/8	38.1	22.4	0.026	0.59
P-3	3465-2	Lower	P80 3/4	50.0	13.9	0.008	0.62
P-4	3465-2	Lower	P80 3/8	61.1	23.9	0.007	0.54
P-5	3465-3	Lower	P80 3/4	60.0	12.9	0.020	1.01
P-6	3465-3	Lower	P80 3/8	66.7	18.3	0.015	1.03
P-7	3465-4	Lower	P80 3/4	73.0	8.3	0.020	1.33
P-8	3465-4	Lower	P80 3/8	65.3	12.7	0.026	1.44
P-9	3465-5	Lower	P80 3/4	75.0	2.6	0.005	0.76
P-10	3465-5	Lower	P80 3/8	83.3	3.5	0.003	0.82
P-11	3465-6	Upper	P80 3/4	23.1	6.9	0.010	0.27
P-12	3465-6	Upper	P80 3/8	28.6	12.1	0.010	0.29
P-13	3465-7	Upper	P80 3/4	31.6	7.7	0.013	0.24
P-14	3465-7	Upper	P80 3/8	36.4	14.8	0.014	0.23
P-15	3465-8	Upper	P80 3/4	36.4	14.9	0.014	0.40
P-16	3465-8	Upper	P80 3/8	45.0	23.4	0.011	0.36
P-17	3465-9	Lower	P80 3/4	50.0	10.2	0.013	0.44
P-18	3465-9	Lower	P80 3/8	50.0	15.2	0.014	0.39
P-19	3465-10	Lower	P80 3/4	73.0	16.2	0.010	0.83
P-20	3465-10	Lower	P80 3/8	70.3	20.0	0.011	0.80
P-21	3465-11	Lower	P80 3/4	45.0	4.3	0.011	0.66
P-22	3465-11	Lower	P80 3/8	52.6	7.6	0.009	0.61
P-23	3465-12	Upper	P80 3/4	40.0	7.8	0.009	0.59
P-24	3465-12	Upper	P80 3/8	46.7	12.7	0.008	0.55
P-25	3465-13	Upper	P80 3/4	41.2	2.6	0.010	0.38
P-26	3465-13	Upper	P80 3/8	47.4	4.9	0.010	0.39
P-27	3465-14	Lower	P80 3/4	30.5	5.1	0.041	0.56
P-28	3465-14	Lower	P80 3/8	47.2	8.8	0.028	0.52
P-29	3465-15	Lower	P80 3/4	61.1	4.8	0.007	0.40
P-30	3465-15	Lower	P80 3/8	65.0	7.5	0.007	0.37

13.7 Summary of Test Results and Conclusions

Metallurgical testing of material from the Three Hills and Hasbrouck deposits was performed by the previous owners and by WKM. Testing included:

- Bottle roll tests that evaluated amenability of Three Hills and Hasbrouck ores to cyanidation;
- Column leach tests that evaluated the amenability of the crushed and ROM ore from both deposits to conventional heap leaching;
- Abrasion testing of ore from the Hasbrouck deposit;
- Comminution testing of ore from the Hasbrouck deposit; and
- HPGR testing of Hasbrouck deposit ore.

Review of the studies above, summarized in Table 13.1, support the following conclusions:

- Three Hills Deposit
    - Metallurgical performance is consistent throughout the deposit.
    - Gold recovery increases weakly with decreasing particle size.
    - There is no significant correlation between grade and recovery.
    - Field recovery for gold from a two-stage leach cycle is predicted to be 79% at 171 days.
    - Drain-down recovery for gold is predicted to be 2.5% over 12 months.
    - Consumption of NaCN is predicted to be 0.45 lb/ton.
    - Consumption of lime (“CaO”) is predicted to be 4 lb/ton.
    - Percolation of solution through ROM material is predicted to be acceptable.
- Hasbrouck Deposit
    - Gold and silver recoveries increase strongly with decreasing particle size.
    - Recoveries for upper Siebert ore crushed in an HPGR and tested in both columns and bottle rolls are predicted to be 55.6% for gold and 11.0% for silver.
    - Recoveries for lower Siebert ore crushed in an HPGR and tested in both columns and bottle rolls are predicted to be 76.6% for gold and 11.0% for silver at 115 days.
    - Mine scale recovery using a weighted average of the upper and lower Siebert units are predicted to be 72.2% for gold and 11.0% for silver.

- Drain-down gold recovery for both upper and lower Siebert units is predicted to be 1.5% over 24 months. No recovery of silver during drain-down is predicted.
- Within each lithological unit, gold recovery slowly increases with decreasing elevation; for economic modelling of the project, a single average recovery value has been used due to the weakness of this effect.
- There is no significant correlation between either gold or silver grade and recovery.
- NaCN consumption is predicted to be 0.75 lb/ton.
- Cement consumption is predicted to be 5lb /ton.

13.8 Hasbrouck Project Metallurgical Parameter Summary

Predicted Hasbrouck project metallurgical parameters, based on all available data, are presented in Table 13.20 and Table 13.21, and are recommended for use in the economic analysis of this project at the pre-feasibility level of studies.

Table 13.20 Hasbrouck Project Recovery Factors
(from WKM, 2016)

THREE HILLS MINE

Three Hills Mine - Gold Recovery	Recovery	Source Documents
Column Recovery	81.1%	1996-11-11 - MLI - 3HM - Bottle Rolls & Columns - Report 2335 2015-03-19 - KCA - 3HM - 48in Column Test - Report 0140082-THB03-02
Operational Adjustment Factor	-2.1%	2016-08-23 - H.C. Osborne - Technical Memo - Hasbrouck Project Metallurgy
Operational Recovery	**79.0%**	2015-03-19 - KCA - 3HM - 48in Column Test - Report 0140082-THB03-02
Drain-Down Recovery	**2.5%**	2016-08-23 - H.C. Osborne - Technical Memo - Hasbrouck Project Metallurgy
Leach Time to Operational Recovery	171 days	
Leach Recovery Schedule:-		2016-08-23 - H.C. Osborne - Technical Memo - Hasbrouck Project Metallurgy
Month Placed	0%	
1st Month	0%	
2nd Month	43%	
3rd Month	18%	
4th Month	9%	
5th Month	5%	
6th Month	3%	
7th Month	1%	
Drain-Down Recovery Schedule:-		2016-08-23 - H.C. Osborne - Technical Memo - Hasbrouck Project Metallurgy
1st Month	0.10%	
2nd Month	0.20%	
3rd Month	0.25%	
4th Month	0.38%	
5th Month	0.38%	
6th Month	0.38%	
7th Month	0.25%	
8th Month	0.20%	
9th Month	0.15%	
10th Month	0.10%	
11th Month	0.08%	
12th Month	0.05%	

Three Hills Mine Reagent Consumption	Amount	Source Documents
3HM NaCN Consumption	0.45 lb/ton	2015-03-19 - KCA - 3HM - 48in Column Test - Report 0140082-THB03-02 2016-08-23 - H.C. Osborne - Technical Memo - Hasbrouck Project Metallurgy
3HM Cement Consumption	nil	N/A
3HM Lime Consumption	4 lb/ton	2015-03-19 - KCA - 3HM - 48in Column Test - Report 0140082-THB03-02

HASBROUCK MINE

Hasbrouck Mine - Upper Siebert Gold Recovery	Recovery	Source Documents
ANV 3/8" Recovery (Columns)	47.6%	2012-03-14 - MLI - HBM - Heap Leach and Milling - Report 3465 2012-03-08 - MLI - HBM - Heap Leach and Milling - Report 3536 2016-08-16c - HC Osborne - HBP - 2016 PFS Metallurgical Factors.xlxs
HPGR Adjustment Factor (Columns)	10.0%	2015-03-05 - KCA - HBM - HPGR Test #1 - Bulk Sample - Report KCA0140117 HSB07 01 2016-08-23 - H.C. Osborne - Technical Memo - Hasbrouck Project Metallurgy
Operational Adjustment Factor	-2.0%	2016-08-23 - H.C. Osborne - Technical Memo - Hasbrouck Project Metallurgy
Operational Recovery	**55.6%**	
Drain-Down Recovery	**1.50%**	2016-08-23 - H.C. Osborne - Technical Memo - Hasbrouck Project Metallurgy
Leach Time to Operational Recovery	115 days	2012-03-14 - MLI - HBM - Heap Leach and Milling - Report 3465 2012-03-08 - MLI - HBM - Heap Leach and Milling - Report 3536
Leach Recovery Schedule:-		2016-08-23 - H.C. Osborne - Technical Memo - Hasbrouck Project Metallurgy
Month Placed	0%	
1st Month	0%	
2nd Month	39.6%	
3rd Month	9.0%	
4th Month	4%	
5th Month	2%	
6th Month	1%	
7th Month	0%	
Drain-Down Recovery Schedule		(See Hasbrouck Weighted Average Gold Recovery below)

Hasbrouck Mine - Lower Siebert Gold Recovery	Recovery	Source Documents
ANV 3/8" Recovery (Columns)	70.2%	2012-03-14 - MLI - HBM - Heap Leach and Milling - Report 3465 2012-03-08 - MLI - HBM - Heap Leach and Milling - Report 3536 2016-08-22a- HC Osborne - HBP - 2016 PFS Metallurgical Factors.xlxs
HPGR Adjustment Factor (BRs)	6.4%	2015-04-01 - KCA - HBM - HPGR Test #2 - Core Sample - Report KCA0140171-HSB12-01 2016-08-23 - H.C. Osborne - Technical Memo - Hasbrouck Project Metallurgy
Columns vs. BR Adjustment Factor	2.0%	2016-08-23 - H.C. Osborne - Technical Memo - Hasbrouck Project Metallurgy
Operational Adjustment Factor	-2.0%	2016-08-23 - H.C. Osborne - Technical Memo - Hasbrouck Project Metallurgy
Operational Recovery	**76.6%**	2016-08-16c - HC Osborne - HBP - 2016 PFS Metallurgical Factors.xlxs 2016-08-23 - H.C. Osborne - Technical Memo - Hasbrouck Project Metallurgy
Drain-Down Recovery	**1.5%**	2016-08-23 - H.C. Osborne - Technical Memo - Hasbrouck Project Metallurgy
Leach Time to Operational Recovery	115 days	2012-03-14 - MLI - HBM - Heap Leach and Milling - Report 3465 2012-03-08 - MLI - HBM - Heap Leach and Milling - Report 3536
Leach Recovery Schedule:-		2016-08-23 - H.C. Osborne - Technical Memo - Hasbrouck Project Metallurgy
Month Placed	0.0%	
1st Month	0.0%	
2nd Month	57.0%	
3rd Month	11.0%	
4th Month	4.0%	
5th Month	3.0%	
6th Month	1.0%	
7th Month	0.6%	
Drain-Down Recovery Schedule		(See Hasbrouck Weighted Average Gold Recovery below)

Hasbrouck Mine Weighted Average Gold Recovery	Weighted Recovery	Source Documents
Upper Siebert % of Reserve	19.3%	2016-08-11-MDA-HBP-Sched_v7_Econ_v3
Upper Siebert Recovery of Reserve	10.7%	
Lower Siebert % of Reserve	80.7%	2016-08-11-MDA-HBP-Sched_v7_Econ_v3
Lower Siebert Recovery of Reserve	61.8%	
Weighted Average Recovery	**72.6%**	
Drain-Down Recovery	**1.5%**	2016-08-23 - H.C. Osborne - Technical Memo - Hasbrouck Project Metallurgy
Leach Time to Operational Recovery	115 days	2012-03-14 - MLI - HBM - Heap Leach and Milling - Report 3465 2012-03-08 - MLI - HBM - Heap Leach and Milling - Report 3536
Drain-Down Recovery Schedule:-		2016-08-23 - H.C. Osborne - Technical Memo - Hasbrouck Project Metallurgy
1st Month	0.015%	
2nd Month	0.015%	
3rd Month	0.030%	
4th Month	0.045%	
5th Month	0.060%	
6th Month	0.075%	
7th Month	0.090%	
8th Month	0.090%	
9th Month	0.090%	
10th Month	0.090%	
11th Month	0.075%	
12th Month	0.075%	
13th Month	0.075%	
14th Month	0.075%	
15th Month	0.075%	
16th Month	0.075%	
17th Month	0.075%	
18th Month	0.075%	
19th Month	0.075%	
20th Month	0.075%	
21st Month	0.060%	
22nd Month	0.045%	
23rd Month	0.030%	
24th Month	0.015%	

Hasbrouck Mine Silver Recovery	Recovery	Source Documents
ANV 3/8" crush work	13%	2012-03-14 - MLI - HBM - Heap Leach and Milling - Report 3465 2012-03-08 - MLI - HBM - Heap Leach and Milling - Report 3536
Operational Adjustment Factor	-2%	2016-08-23 - H.C. Osborne - Technical Memo - Hasbrouck Project Metallurgy
Operational Recovery	**11%**	
Drain-Down Recovery	**0%**	
Leach time to Operational Recovery	115 days	2012-03-14 - MLI - HBM - Heap Leach and Milling - Report 3465 2012-03-08 - MLI - HBM - Heap Leach and Milling - Report 3536
Leach Recovery Schedule:-		2016-08-23 - H.C. Osborne - Technical Memo - Hasbrouck Project Metallurgy
Month Placed	0%	
1st Month	0%	
2nd Month	7%	
3rd Month	2%	
4th Month	1%	
5th Month	1%	
6th Month	0%	
7th Month	0%	

Note: 3HM = Three Hills Mine; HBM = Hasbrouck Mine; Source Documents are internal WKM electronic files.

Table 13.21 Hasbrouck and Three Hills Predicted Reagent Consumptions

Hasbrouck Mine Reagent Consumption	Amount	Source Documents
HBM NaCN Consumption	0.75 lb/ton	2015-04-01 - KCA - HBM - HPGR Recovery Test - Core Sample - Report KCA0140171-HSB12-01
HBM Cement Consumption	5 lb/ton	2015-01-15 - MLI - HBM - Agglomeration of 0.375in Core - Report 3948 2015-03-09 - KCA - HBM - HPGR Comp Perm Test - Bulk Sample - Report KCA0140171 HSB11 01
HBM Lime Consumption	nil	N/A

14.0 MINERAL RESOURCES

14.1 Introduction

This section is taken from Tietz et al. (2015). Mineral Resource estimation described in this section for the Three Hills and Hasbrouck deposits follows the guidelines of Canadian Instrument 43-101 ("NI 43-101"). The modeling and estimation of gold and silver resources were done under the supervision of Paul G. Tietz, a qualified person under NI 43-101 with respect to mineral resource estimation. Mr. Tietz is independent of WKM by the definitions and criteria set forth in NI 43-101; there is no affiliation between Mr. Tietz and WKM except that of an independent consultant/client relationship.

MDA classifies resources in order of increasing geological and quantitative confidence into Inferred, Indicated, and Measured categories to be in compliance with the "CIM Definition Standards - For Mineral Resources and Mineral Reserves" (2014), where:

Mineral Resource

Mineral Resources are sub-divided, in order of increasing geological confidence, into Inferred, Indicated and Measured categories. An Inferred Mineral Resource has a lower level of confidence than that applied to an Indicated Mineral Resource. An Indicated Mineral Resource has a higher level of confidence than an Inferred Mineral Resource but has a lower level of confidence than a Measured Mineral Resource.

A Mineral Resource is a concentration or occurrence of solid material of economic interest in or on the Earth's crust in such form, grade or quality and quantity that there are reasonable prospects for eventual economic extraction.

The location, quantity, grade or quality, continuity and other geological characteristics of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge, including sampling.

Material of economic interest refers to diamonds, natural solid inorganic material, or natural solid fossilized organic material including base and precious metals, coal, and industrial minerals.

The term Mineral Resource covers mineralization and natural material of intrinsic economic interest which has been identified and estimated through exploration and sampling and within which Mineral Reserves may subsequently be defined by the consideration and application of Modifying Factors. The phrase 'reasonable prospects for eventual economic extraction' implies a judgment by the Qualified Person in respect of the technical and economic factors likely to influence the prospect of economic extraction. The Qualified Person should consider and clearly state the basis for determining that the material has reasonable prospects for eventual economic extraction. Assumptions should include estimates of cutoff grade and geological continuity at the selected cut-off, metallurgical recovery, smelter payments, commodity price or product value, mining and processing *method and mining, processing and general and administrative costs. The Qualified Person should state if the assessment is based on any direct evidence and testing.*

Interpretation of the word 'eventual' in this context may vary depending on the commodity or mineral involved. For example, for some coal, iron, potash deposits and other bulk minerals or commodities, it may be reasonable to envisage 'eventual economic extraction' as covering time periods in excess of 50 years. However, for many gold deposits, application of the concept would normally be restricted to perhaps 10 to 15 years, and frequently to much shorter periods of time.

Inferred Mineral Resource

An Inferred Mineral Resource is that part of a Mineral Resource for which quantity and grade or quality are estimated on the basis of limited geological evidence and sampling. Geological evidence is sufficient to imply but not verify geological and grade or quality continuity.

An Inferred Mineral Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and must not be converted to a Mineral Reserve. It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.

An Inferred Mineral Resource is based on limited information and sampling gathered through appropriate sampling techniques from locations such as outcrops, trenches, pits, workings and drill holes. Inferred Mineral Resources must not be included in the economic analysis, production schedules, or estimated mine life in publicly disclosed Pre-Feasibility or Feasibility Studies, or in the Life of Mine plans and cash flow models of developed mines. Inferred Mineral Resources can only be used in economic studies as provided under NI 43-101.

There may be circumstances, where appropriate sampling, testing, and other measurements are sufficient to demonstrate data integrity, geological and grade/quality continuity of a Measured or Indicated Mineral Resource, however, quality assurance and quality control, or other information may not meet all industry norms for the disclosure of an Indicated or Measured Mineral Resource. Under these circumstances, it may be reasonable for the Qualified Person to report an Inferred Mineral Resource if the Qualified Person has taken steps to verify the information meets the requirements of an Inferred Mineral Resource.

Indicated Mineral Resource

An Indicated Mineral Resource is that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics are estimated with sufficient confidence to allow the application of Modifying Factors in sufficient detail to support mine planning and evaluation of the economic viability of the deposit.

Geological evidence is derived from adequately detailed and reliable exploration, sampling and testing and is sufficient to assume geological and grade or quality continuity between points of observation.

An Indicated Mineral Resource has a lower level of confidence than that applying to a Measured Mineral Resource and may only be converted to a Probable Mineral Reserve.

Mineralization may be classified as an Indicated Mineral Resource by the Qualified Person when the nature, quality, quantity and distribution of data are such as to allow confident interpretation of the geological framework and to reasonably assume the continuity of mineralization. The Qualified Person must recognize the importance of the Indicated Mineral Resource category to the advancement of the feasibility of the project. An Indicated Mineral Resource estimate is of sufficient quality to support a Pre-Feasibility Study which can serve as the basis for major development decisions.

Measured Mineral Resource

A Measured Mineral Resource is that part of a Mineral Resource for which quantity, grade or quality, densities, shape, and physical characteristics are estimated with confidence sufficient to allow the application of Modifying Factors to support detailed mine planning and final evaluation of the economic viability of the deposit.

Geological evidence is derived from detailed and reliable exploration, sampling and testing and is sufficient to confirm geological and grade or quality continuity between points of observation.

A Measured Mineral Resource has a higher level of confidence than that applying to either an Indicated Mineral Resource or an Inferred Mineral Resource. It may be converted to a Proven Mineral Reserve or to a Probable Mineral Reserve.

Mineralization or other natural material of economic interest may be classified as a Measured Mineral Resource by the Qualified Person when the nature, quality, quantity and distribution of data are such that the tonnage and grade or quality of the mineralization can be estimated to within close limits and that variation from the estimate would not significantly affect potential economic viability of the deposit. This category requires a high level of confidence in, and understanding of, the geology and controls of the mineral deposit.

Modifying Factors

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

MDA reports resources at cutoffs that are reasonable for deposits of this nature given anticipated mining methods and plant processing costs, while also considering economic conditions, because of the regulatory requirements that a resource exists "in such form and quantity and of such a grade or quality that it has reasonable prospects for economic extraction."

Although MDA is not an expert with respect to any of the following factors, MDA is not aware of any unusual environmental, permitting, legal, title, taxation, socio-economic, marketing, or political factors that may materially affect the Hasbrouck mineral resources as of the date of this report.

14.2 Three Hills Deposit

The Three Hills deposit was modeled and estimated by evaluating the drill data statistically, interpreting mineral domains on cross sections and then orthogonal "long" sections, analyzing the modeled mineralization statistically to establish estimation parameters, and estimating gold grades into a three-dimensional block model. All modeling of the Three Hills resources was performed using Geovia Surpac™ software (version 6.6).

The effective date of the Three Hills mineral resource estimate is August 4, 2014.

14.2.1 Three Hills Data

A geologic model for estimating the gold resources at Three Hills was created from drilling data generated by historic operators, over a period from 1974 through 2013. The Three Hills deposit mineral resource reported in this technical report is based on project drill database consisting of 291 drill holes totaling 88,199ft. The large majority of the drilling (273 total holes for 82,787ft) has been by some form of rotary percussion drilling (reverse circulation, rotary, air track). Eighteen diamond core holes for 5,412ft have been drilled on the project.

The Three Hills drill-hole assay database contains 14,884 gold assays, and 6,934 silver assays. Due to the generally low silver values, and subsequent minor impact on projected economics, only gold was estimated in the current resource. All less-than-detection values were converted to "0" for use in the resource estimate.

The geology database includes drill-hole lithology and alteration data. Project digital topography was provided by WKM. These data were incorporated into a digital database using State Plane coordinates, Nevada West zone, NAD83 datum, expressed in US Survey feet.

WKM drilled three core holes for geotechnical purposes, ten RC exploration holes, and one water well which was logged and sampled for assay, in 2014. These drill data were received by MDA after completion of the current resource estimate. MDA reviewed the data and determined that the 2014 drilling would have no material impact on the resource model or estimate.

14.2.2 Deposit Geology Pertinent to Resource Modeling

Three Hills mineralization is contained primarily within the outcropping Siebert Formation with limited mineralization in the underlying Fraction Tuff. The Siebert Formation consists of interlayered siltstones, sandstones, conglomerates, and tuffs and the coarser, more permeable sandstones and conglomerates are generally pervasively silicified and are the preferred hosts for gold mineralization at Three Hills. The higher gold grades are associated with discontinuous, irregular 0.05- to 0.5inch-wide veinlets, vein stockworks, and erratic breccia veins of chalcedony and quartz.

The sub-horizontal to east-dipping contact between the Siebert and Fraction Tuff contains consistently higher grades of gold and is more commonly argillized than silicified. This contact zone controls mineralization lateral to the core of the deposit.

The drill-defined extent of Three Hills gold mineralization is approximately 1,000ft east–west by 2,700ft north–south with a maximum depth of 500ft along the down-dip eastern edge of the deposit. Mineralization remains open at depth to the east and southeast along the Siebert-Fraction contact.

The Three Hills deposit is pervasively oxidized to the base of the drill-defined mineralization.

The water table was not encountered in drilling and the resource is considered to be above the water table for future mine development.

14.2.3 Three Hills Geologic Model

A cross-sectional geologic model of the Three Hills deposit was created by MDA that consisted of a total of 29 vertical, north-looking cross sections spaced at 100ft intervals across the deposit.

Using the interpreted drill data, along with the surface geology, the geologic model included the wallrock lithologies, with all apparent structural offsets, and the zones of moderate to strong silicification. The modeled lithologies included the Siebert Formation (Ts), the Fraction Tuff (Tf), the Brougher Rhyolite (Tbrt), and the Oddie Rhyolite (To). The resulting cross-sectional model was used as a template to guide the mineral-domain modeling (discussed below).

The lithology cross-sectional polygons were converted into 3-dimensional solids which were used to code the block model on a block-in, block-out basis. The silicification polygons were three-dimensionally rectified to the drill data and vertical slices of the polygons were created at 20ft intervals orthogonal to the cross sections. The silicification zones were then modeled on 20ft-spaced long sections used to code the block model also on a block-in, block-out basis. The lithology solids and long-section silicification polygons were used to assign density values to the block model (see Section 14.2.6 for details on the block model density).

14.2.4 Mineral-Domain Grade Model

The gold mineral domains were modeled on the same 29 east-west cross-sections as the geologic model. In order to define the mineral domains, the natural populations were first identified on quantile graphs that plot the gold-grade distributions of the drill-hole assays. This analysis led to the identification of low- (~0.004 to ~0.015 oz Au/ton), medium- (~0.015 to 0.04oz Au/ton), and high-grade (>~0.04 oz Au/ton) gold populations, assigned to domains 100, 200, and 300, respectively.

The drill-hole traces, topographic profile, and the lithology/alteration geologic interpretations were plotted on the sections with gold assays (colored by the grade-domain population ranges) plotted along the drill-hole traces, and these data were used as the base for MDA's interpretations of the mineral domains. Mineral-domain envelopes were interpreted on the sections to more-or-less capture assays corresponding approximately to each of the defined grade populations.

Due to inconsistencies in the geologic logs of the historic RC holes, as well as the fact that essentially all subsurface geologic information is derived from RC chips, it was difficult to correlate the three mineral domains to specific geologic characteristics. In a general sense, medium-grade zones of mineralization (domain 200) typically are associated with moderate to strong pervasively silicified Siebert Formation, often containing thin silica veinlets. While high-grade assays occur both within narrow mineralized structural breccias that extend up into the Siebert and within the base of the Siebert just above the contact with the Fraction Tuff. The low-grade (domain 100) zones envelope the domain 200 mineralization, but they extend progressively further laterally away from the within the breccia,

Representative cross sections showing gold mineral-domain interpretations are in Figure 14.1 and Figure 14.2.

The cross-sectional mineral-domain polygons were digitized and then three-dimensionally rectified to the drill data. Vertical slices of the polygons were created at 20-foot intervals orthogonal to the cross sections, and the mineral domains were then modeled on 20-foot-spaced long sections. The final product of the long-section work is a set of 20-foot-spaced mineral-domain envelopes that three-dimensionally honor the drill data at the resolution of the block model.

Figure 14.1 Three Hills Section 13821570 Showing Geology and Gold Mineral Domains, Looking North
(location of Section shown in Figure 7.8)

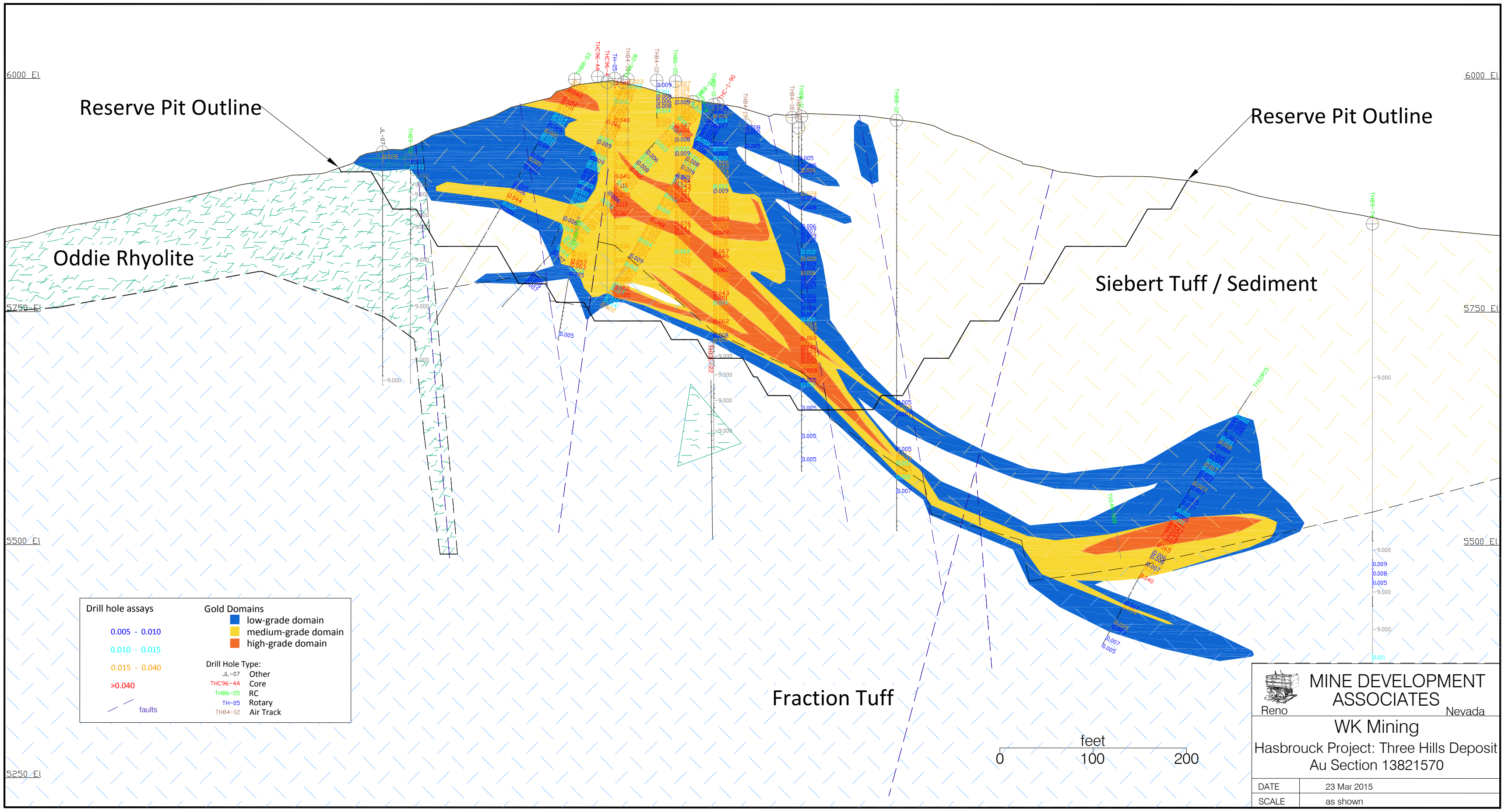
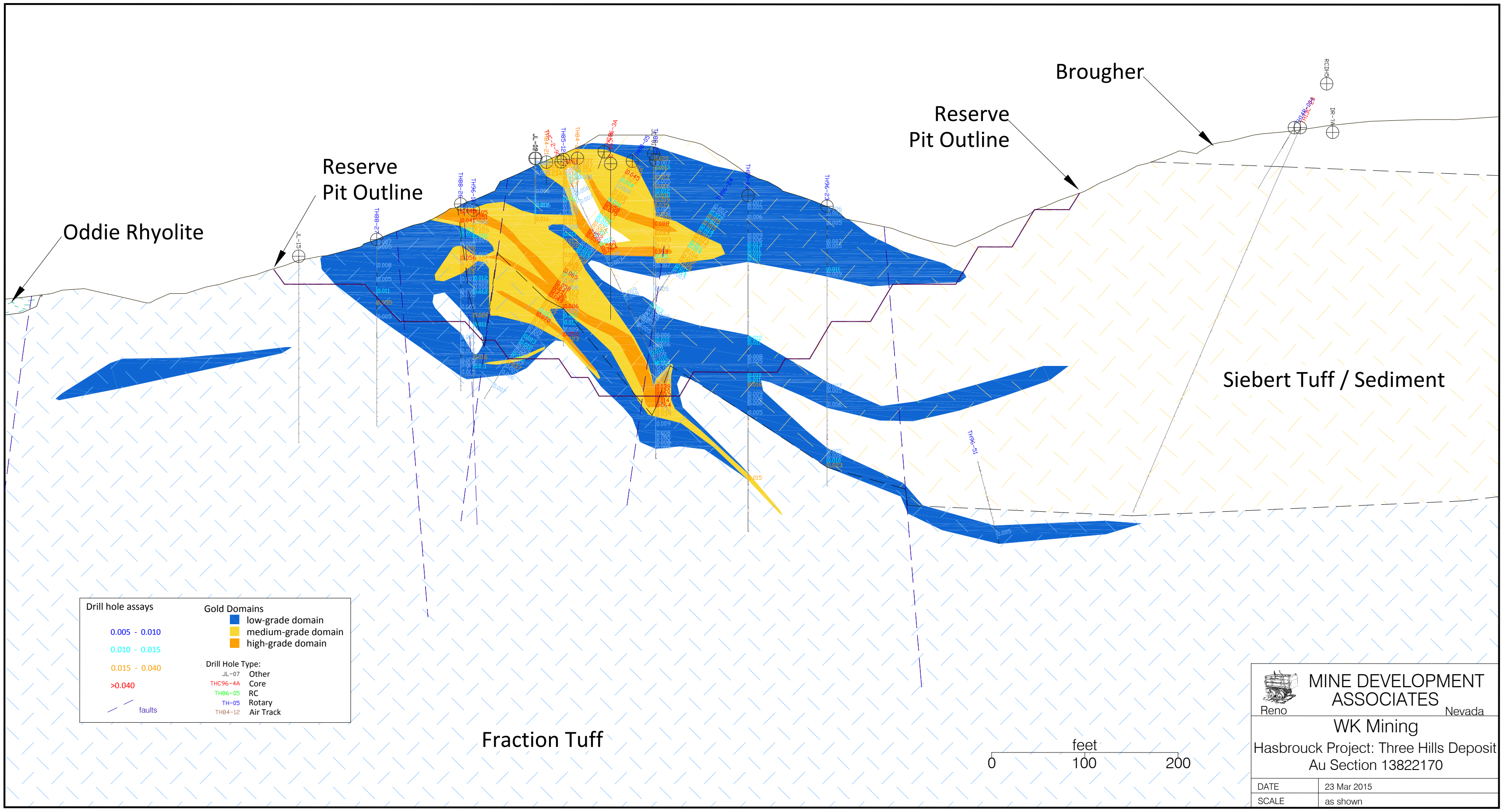


Figure 14.2 Three Hills Section 13822170 Showing Geology and Gold Mineral Domains, Looking North
(location of Section shown in Figure 7.8)



14.2.5 Three Hills Sample Coding and Compositing

Drill-hole assays were coded by the sectional mineral-domain polygons. MDA analyzed the assay data and capped a total of 11 individual metal analyses which were statistically and spatially deemed beyond a given domain's natural population of samples. This number of samples capped represents approximately 0.25% of the total domain-coded assay values within the database. The capped analyses occur within all grade ranges and all estimation areas. Descriptive statistics of the uncapped and capped sample grades by domain are presented in Table 14.1.

Compositing was made at 20ft down-hole lengths, honoring all mineral domain boundaries. Length-weighted composites were used in the block-model grade estimation and the volume inside each mineral domain was estimated using only composites from inside that domain. Composite descriptive statistics for the metal domains are presented in Table 14.2.

Table 14.1 Three Hills Mineral Domain Assay Statistics

Domain	Assays	Count	Mean (oz Au/ton)	Median (oz Au/ton)	Std. Dev.	CV	Min. (oz Au/ton)	Max. (oz Au/ton)	# Capped
100	Au	2517	0.008	0.006	0.006	0.780	0.000	0.122	4
	Au Cap	2517	0.008	0.006	0.005	0.680	0.000	0.050	
200	Au	1566	0.022	0.020	0.013	0.560	0.000	0.259	3
	Au Cap	1566	0.022	0.020	0.011	0.480	0.000	0.090	
300	Au	413	0.093	0.060	0.137	1.470	0.012	1.607	4
	Au Cap	413	0.088	0.060	0.097	1.090	0.012	0.700	
All	*Au*	*4496*	*0.021*	*0.011*	*0.048*	*2.350*	*0.000*	*1.607*	*11*
	Au Cap	*4496*	*0.020*	*0.011*	*0.037*	*1.870*	*0.000*	*0.700*	

Table 14.2 Three Hills Mineral Domain Composite Statistics

Domain	Count	Mean (oz Au/ton)	Median (oz Au/ton)	Std. Dev.	CV	Min. (oz Au/ton)	Max. (oz Au/ton)
100	848	0.008	0.007	0.004	0.47	0.000	0.035
200	572	0.022	0.021	0.007	0.33	0.000	0.053
300	187	0.088	0.064	0.072	0.82	0.017	0.700
All	*1607*	*0.020*	*0.012*	*0.032*	*1.59*	*0.000*	*0.700*

14.2.6 Density

The density database consists of 112 density measurements on core samples collected during the 1996 and 2013 core drilling programs. The samples were from all significant rock types and gold grade ranges, and the procedures used the water immersion method.

MDA analyzed the data and the general statistics by modeled rock type and gold mineral domain. After reviewing the data, two samples were removed due to spurious results. The tonnage factor statistics (in cuft/ton units) for the remaining 110 samples are shown in Table 14.3. Due to the often highly fractured nature of the deposit, and the fact that voids resulting from many of the open fractures cannot be accurately reflected in density determinations, the measured density values were factored up by 1% to 2% to account for the unavoidable sample-selection bias. The factored data, shown in the "Model TF" column in Table 14.3, reflect the actual tonnage factor values assigned to the Three Hills block model.

Table 14.3 Descriptive Statistics of Three Hills Tonnage Factor (ft^3/ton) Values by Rock Type

Rock Type	Count	Mean	Median	Min.	Max.	Std.Dev.	Model TF
Tbrt	1	14.43	14.43	14.43	14.43		14.60
To	23	14.48	14.53	13.60	15.25	0.45	14.65
Tf	21	15.56	15.34	14.12	17.12	0.90	15.60
Ts (non-silic)	27	15.98	15.66	14.34	18.09	1.02	16.00
Ts (silic)	27	14.30	14.12	12.62	16.27	0.95	14.50
100200300 (non-silic)	11	15.33	15.10	13.93	17.47	0.98	15.50

14.2.7 Three Hills Block Model Coding

The 20ft-spaced long-sectional mineral-domain polygons were used to code a north-south three-dimensional block model that is comprised of 20ft (width) x 20ft (length) x 20ft (height) blocks. In order for the block model to better reflect the irregularly shaped limits of the various gold domains, as well as to explicitly model dilution, the percentage volume of each mineral domain within each block is stored (the "partial percentages").

Lithology and silicification are coded into the block model on a block-in/block-out basis. The percentage of each block that lies below the topographic surface is also stored. Each block is assigned a tonnage factor listed on Table 14.3 based on its coded lithology, silicification, and mineral domain.

14.2.8 Resource Model and Estimation

The resource estimate reflects the general northerly trend and variably east-dipping nature of the Three Hills gold mineralization. To replicate the change in orientation observed within the deposit, two search-ellipse orientations were used to control the resource estimate. The first orientation (designated Area 10) represents the generally horizontal nature of the near-surface, low- and mid-grade mineralization within the Siebert Formation. The second orientation area (Area 20) is coded into the block model using a solid and represents the deeper mineralization that occurs along the east-dipping Siebert/Fraction Tuff contact. See Table 14.4 for the search ellipse parameters.

Table 14.4 Three Hills Search Ellipse Orientations

Est. Area	Azimuth	Plunge	Tilt
10	0	0	0
20	0	0	-35

Grade interpolation utilized Inverse Distance Cubed (ID3), with nearest neighbor and ordinary kriging estimates also being made for checking estimation results and sensitivities. Variography and geostatistical evaluations were made to determine distances for search and classification criteria. The estimation parameters applied at Three Hills are summarized in Table 14.5. The estimation used two search passes with successive passes not overwriting previous estimation passes. The first-pass search distances take into consideration the results of both the variography and drill-hole spacing. The second pass was designed to estimate grade into all blocks coded to the mineral domains that were not estimated in the first pass.

The estimation passes were performed independently for each of the mineral domains, so that only composites coded to a particular domain were used to estimate grade into blocks coded by that domain. The estimated grades were coupled with the partial percentages of the mineral domains to enable the calculation of a single weight-averaged block-diluted grade for each block.

Table 14.5 Summary of Three Hills Estimation Parameters

Estimation Parameters: Gold Domains 100+200+300

Estimation Pass	Search Ranges (ft)			Comp Constraints		
	Major	Semi-Major	Minor	Min	Max	Max/hole
1 (area 10)	200	150	100	2	15	3
1 (area 20)	200	133	67	2	15	3
2	500	500	500	1	18	3

14.2.9 Three Hills Mineral Resources

MDA classified the Three Hills resources by a combination of distance to the nearest sample and the number of samples, while at the same time taking into account reliability of underlying data and understanding and use of the geology (Table 14.6). There are no Measured Resources due to the general lack of QA/QC data that could be used for verification purposes and to some uncertainties related to historic drill hole locations. Indicated Resources are limited to the near-surface, north-south core of the deposit. The mineralization at depth along the east side of the deposit and the scattered mineralization to the northwest are considered Inferred only.

Table 14.6 Three Hills Classification Parameters

Class	Estimation Pass	Min. Number of Drill holes	Min. Number of Composite	Avg. Dist. to Nearest 2 Composites
Indicated*	1	2	2	100
Inferred	all other modeled mineralization			
*only within north-south oriented center of deposit				

The Three Hills mineral resources are inclusive of reserves and listed in Table 14.7 using a cutoff grade of 0.005 oz Au/ton. The cutoff was chosen to capture mineralization potentially available to open-pit extraction and heap-leach processing. The block-diluted resources are also tabulated at additional cutoffs in order to provide grade-distribution information, as well as to provide for economic conditions other than those envisioned by the 0.005 oz Au/ton cutoff (Table 14.8). Three Hills resources have an effective date of August 4, 2014.

Figure 14.3 and Figure 14.4 show cross sections of the block model that correspond to the mineral-domain cross sections in Figure 14.1 and Figure 14.2, respectively.

Table 14.7 Three Hills Reported Mineral Resources (0.005oz Au/ton Cutoff)

Class	Tons	oz Au/ton	oz Au
Indicated	10,897,000	0.017	189,000
Inferred	2,568,000	0.013	32,000

Note: rounding may cause apparent inconsistencies

Table 14.8 Three Hills Mineral Resources

Cutoff	Indicated Resource		
(oz Au/ton)	Tons	oz Au/ton	oz Au
0.004	11,593,000	0.017	192,000
0.005	***10,897,000***	***0.017***	***189,000***
0.006	10,034,000	0.018	185,000
0.007	9,098,000	0.020	179,000
0.008	8,157,000	0.021	173,000
0.009	7,355,000	0.023	166,000
0.010	6,689,000	0.024	160,000
0.012	5,771,000	0.026	151,000
0.015	4,838,000	0.029	138,000
0.020	3,385,000	0.034	114,000

Cutoff	Inferred Resource		
(oz Au/ton)	Tons	oz Au/ton	oz Au
0.004	3,113,000	0.011	34,000
0.005	***2,568,000***	***0.013***	***32,000***
0.006	2,087,000	0.014	30,000
0.007	1,683,000	0.016	27,000
0.008	1,318,000	0.019	25,000
0.009	1,046,000	0.022	23,000
0.010	858,000	0.024	21,000
0.012	615,000	0.030	18,000
0.015	402,000	0.039	16,000
0.020	200,000	0.062	12,000

Figure 14.3 Three Hills Section 13821570 Showing Block Model Gold Grades Looking North

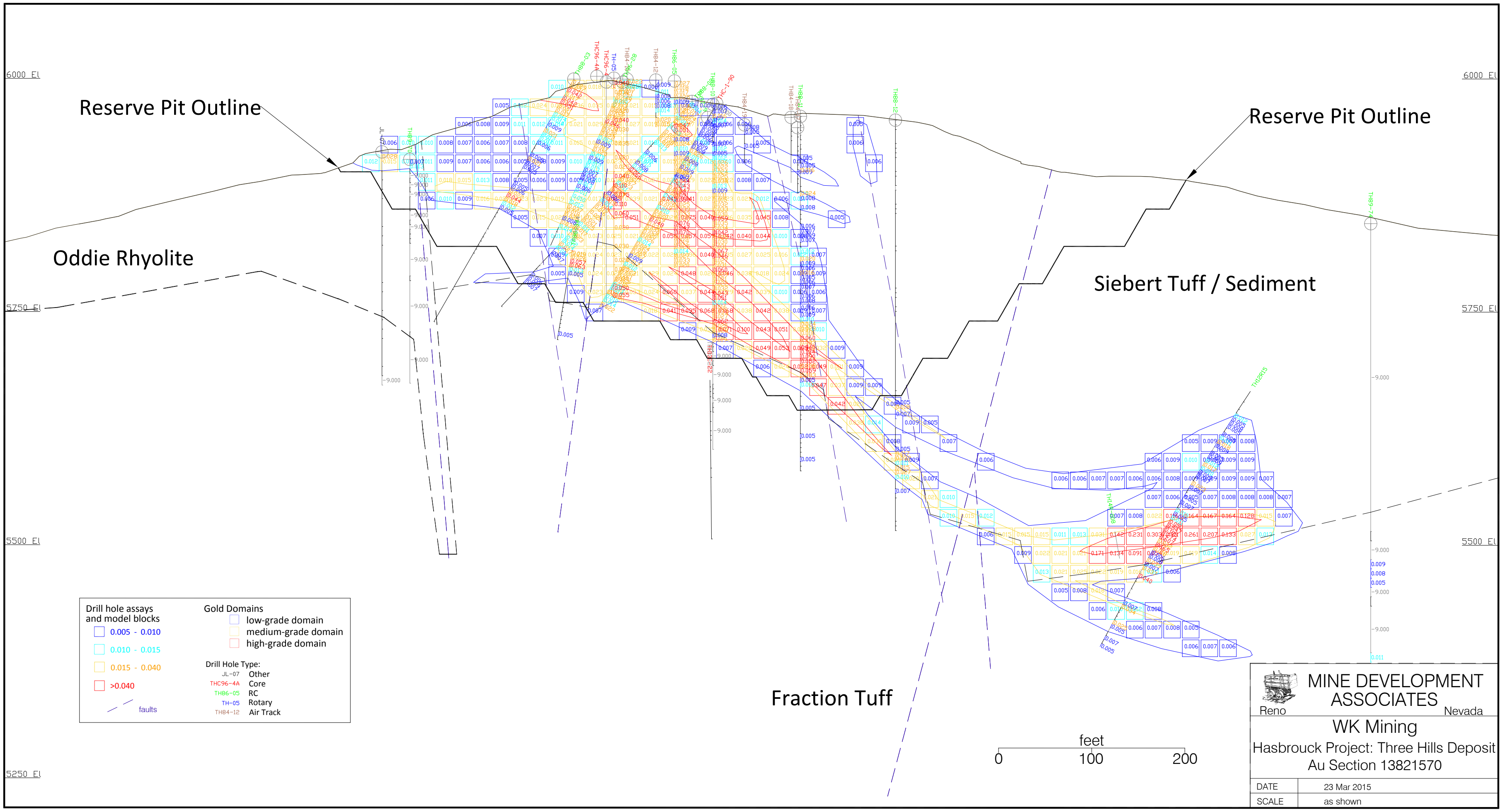
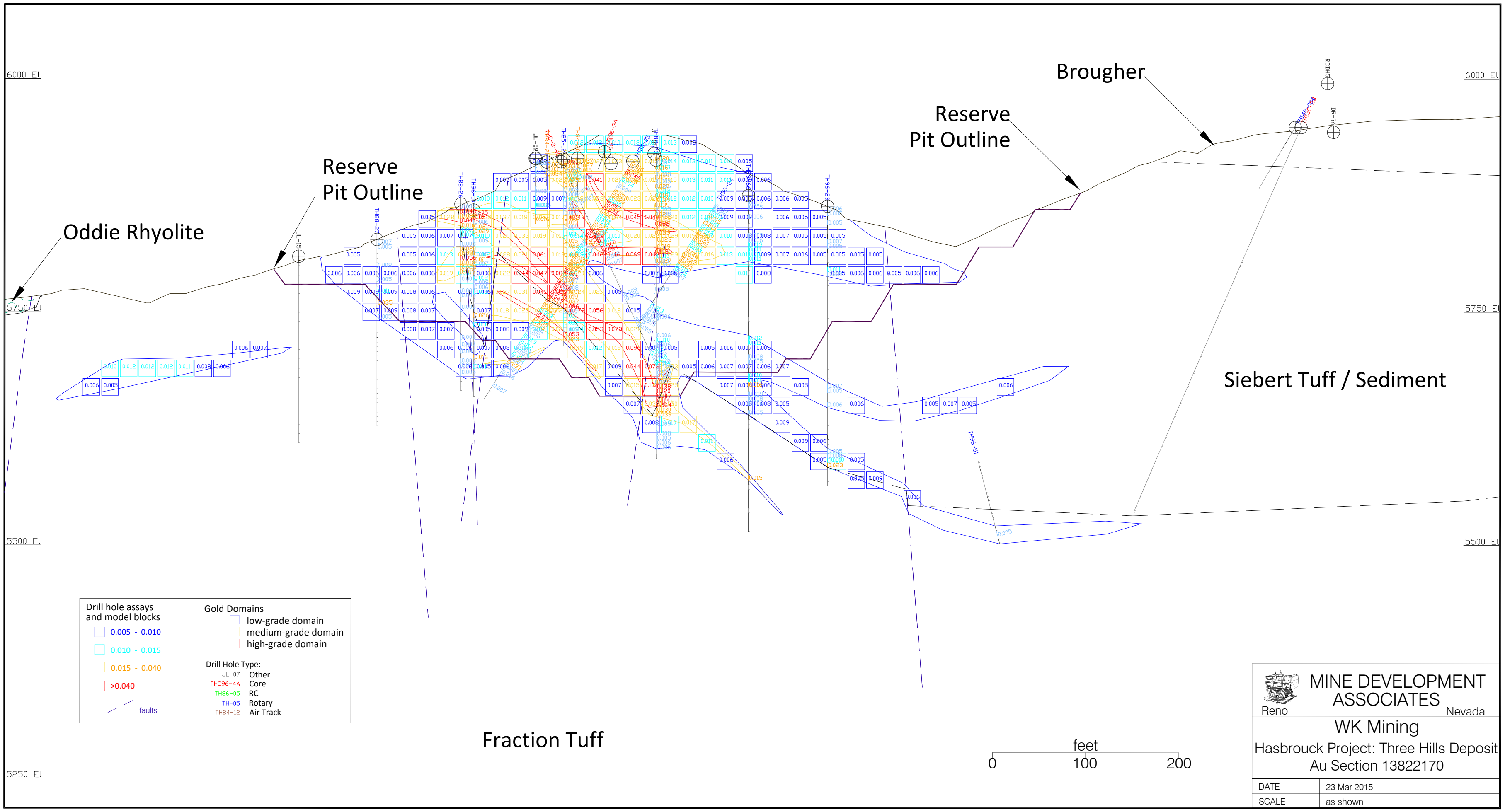


Figure 14.4 Three Hills Section 13822170 Showing Block Model Gold Grades Looking North



14.2.10 Model Checks

Volumes indicated by the sectional mineral-domain modeling were compared to the long-section volumes and those coded to the block model to assure close agreement, and all block-model coding was checked visually on the computer. Nearest-neighbor and ordinary-krige estimates of the Three Hills resources were undertaken as a check on the inverse-distance-cubed resource model. Grade-distribution plots of assays and composites versus the nearest-neighbor, krige, and inverse-distance block grades were also evaluated as a check on the estimation. Finally, the inverse-distance grades were visually compared to the drill-hole assay data to assure that reasonable results were obtained.

14.2.11 Comments on the Three Hills Resource Modeling

The Three Hills gold resource is based on drill-sample analyses, density measurements, logged silicification content, and lithologic and structural geologic contacts. At a 0.005oz Au/ton cutoff, Three Hills mineralization consists of a single, irregularly shaped deposit that extends for more than 2,700ft north-south and 1,000ft east-west. Mineralization remains open at depth to the east and southeast along the Siebert-Fraction contact.

Mineralization at Three Hills is similar in style to that at Hasbrouck, though the degree and spatial extent of silicification and brecciation/veining is smaller and generally not as well developed.

There are no Measured resources at Three Hills due to a general lack of QA/QC data that could be used for verification purposes and to some uncertainties related to historic drill hole locations. Indicated resources are limited to the near-surface, north-south core of the deposit.

The core of the deposit is relatively well-defined and infill drilling is not expected to materially change the current resource model and estimate. Additional drilling on the periphery of the deposit, including following up on the 2014 drill program completed by WKM on the southeast edge of the deposit, has the potential to upgrade the classification of the existing Inferred resource and to expand the resource to the east and southeast.

14.3 Hasbrouck Deposit

The Hasbrouck deposit was modeled and estimated by evaluating the drill data statistically, interpreting mineral domains on cross sections and then level plans, analyzing the modeled mineralization statistically to establish estimation parameters, and estimating gold and silver grades into a three-dimensional block model. All modeling of the Hasbrouck resources was performed using Geovia Surpac™ software, version 6.6.

The effective date of the Hasbrouck deposit mineral resource estimate is November 3, 2014.

14.3.1 Data

A geologic model for estimating the gold and silver resources at Hasbrouck was created from drilling data generated by historic operators, over a period from 1974 through 2012. The Hasbrouck deposit mineral resource reported in this technical report is based on project drill database consisting of 317 drill holes totaling 216,761ft. The large majority of the drilling (252 total holes for 179,174ft) has been by reverse circulation (RC) while 43 diamond core holes for 28,607ft and 22 air-track holes for 8,980ft have also been drilled on the project.

The Hasbrouck drill-hole assay database contains 42,150 gold assays, and 42,143 silver assays. Both gold and silver were estimated in the current resource. Also included in the database are 14,201 gold and 13,782 silver cyanide leach analyses though a unique cyanide leach model was not complete at Hasbrouck. All less-than-detection values were converted to "0" for use in the resource estimate.

The database includes the 191 underground samples collected by Cordex in 1980 from the Main, Ore Car, South, and Northeast adit underground workings. These data have been used to guide the development of the geology and gold mineral model, but the gold and silver assay data has not been used in the estimation of mineral resources presented in this Technical Report because of lack of knowledge of collection technique and the inability to verify assay values.

The geology database includes drill-hole lithology and alteration data. Project digital topography was provided by WKM. These data were incorporated into a digital database using State Plane coordinates, Nevada West zone, NAD83 datum, expressed in US Survey feet.

WKM drilled 14 RC exploration holes located south, southeast, and north of the current resource model in 2014. These drill data were received by MDA after completion of the current resource estimate. MDA reviewed the data and determined that the 2014 drilling would have no material impact on the resource model or estimate.

14.3.2 Deposit Geology Pertinent to Resource Modeling

The precious metals mineralization at Hasbrouck is concentrated within the Siebert Formation, stratigraphically below the chalcedonic sinter horizons that outcrop near the peak of Hasbrouck Mountain.

The upper portion of the Siebert Formation is dominated by volcaniclastic sedimentary rocks, mostly sandstones and conglomerates. Beneath Hasbrouck Mountain, the upper Siebert has a maximum thickness of about 300ft and the base of the upper Siebert is generally marked at the bottom of the lower-most conglomerate. The lower portion of the Siebert Formation consists predominantly of various lithic, crystal and lapilli ash-flow units with interbedded volcaniclastic sedimentary units, primarily sandstone and siltstone. The lower Siebert lithologies outcrop along drill roads along the north, east, and south flanks of Hasbrouck Mountain. The upper/lower Siebert contact is not a smooth plane but is disrupted by numerous north-south and northwest-directed faults that have 50 to 100ft of apparent vertical offset.

The mineralization at Hasbrouck is accompanied by strong pervasive silicification, with associated adularia and pyrite, within both the volcaniclastic rocks and tuffaceous units of the Siebert Formation. Pervasive silicification and hydrothermal brecciation/veining is common within the upper Siebert and the top of the lower Siebert. Silicification and veining decreases and becomes more structurally-controlled at depth within the lower Siebert tuffaceous and fine-grained sedimentary rocks. Argillic alteration, characterized by the presence of illite and montmorillonite, forms an envelope around the silicified and mineralized zones and is most common in the lower Siebert tuffaceous rocks.

The Kernick structure, which was the focus of the historic underground production at Hasbrouck, strikes roughly east-west across Hasbrouck Mountain and dips to the north. Although the Kernick structural zone itself is mineralized, the bulk of the mineralization in the deposit occurs in the hanging wall of the structure and consists principally of millimeter- to centimeter-scale, discontinuous silica-pyrite veinlets, sheeted veinlets and stockworks, all closely associated with multiple, larger and coalesced, but erratic bodies of hydrothermal breccias. The sheeted vein and enclosing hydrothermal breccias are interpreted to be dominantly near-vertical, west-northwest trending zones. Stratigraphic control, whereby the porous volcaniclastic units are preferentially mineralized, is prevalent throughout the deposit but is especially evident in many of the moderate-grade zones along the peripheries of the deposit. A minor amount of mineralization lies in the footwall of the Kernick structure, along what are interpreted to be smaller, subsidiary structural zones.

At a 0.006oz Au/ton cutoff, Hasbrouck mineralization consists of a single, irregularly shaped deposit that extends for more than 2,500ft in an east-west and about 2,400ft in a north-south direction. The silver mineralization outline at a 0.25oz Ag/ton cutoff is similar to the gold outline, although it is somewhat less extensive. Mineralization remains open at depth along the intersection of the cross-cutting structural fabrics. However, deeper drilling into the Fraction Tuff has yet to intersect significant mineralization.

Oxidation: The Hasbrouck mineralization is predominantly oxidized though isolated zones of minor (<1 percent sulfide) remnant sulfides can occur throughout the deposit. The partially oxidized sulfidic mineralization is generally associated with areas of strong pervasive silicification or within thin silica veins. Due to the irregular and varying nature of oxidation, and also the irregular distribution of the cyanide leach data, a unique oxidation model was not completed.

As discussed in Section 13.0, metallurgical tests indicate that the upper and lower Siebert have different gold extraction characteristics possibly related to the degree of silicification within these two stratigraphic horizons.

Groundwater: The water table was not encountered in drilling. The resource is considered to be above the water table and ground water is not expected to be a factor in future mine development.

14.3.3 Lithology/Alteration Model

A cross-sectional lithologic/structural model of the Hasbrouck deposit was created by MDA based on north-looking cross sections spaced at 100-foot intervals.

Using the interpreted drill data, along with the surface geology, the lithology model included the wallrock lithologies, with all apparent structural offsets. The modeled lithologies included the upper and lower portions of the Siebert Formation (Tsus and Tslt, respectively), the Fraction Tuff (Tf), and the young Tertiary volcanics/sinter/Quaternary colluvium unit which overlie the Siebert Formation in the west-center portion of Hasbrouck hill. These post-Siebert lithologies are a small, fault-bounded erosional remnant that appears to be post-mineral. The lower portion of the Siebert Formation was not explicitly modeled but is considered the "default" lithology within the model.

The volcaniclastic-dominant upper Siebert Formation and Fraction Tuff lithology cross-sectional polygons were converted into 3-dimensional solids which were used to code the block model.

Using the lithology solids as a guide, zones of moderate to strong silicification were modeled on 28 west-looking cross-sections spaced at 100-foot intervals with the spacing decreasing to 50-foot within the west-center of the deposit. The resulting cross-sectional model was used as a template to guide the mineral-domain modeling (discussed below).

The Tertiary volcanic/Quaternary alluvium and silicification polygons were three-dimensionally rectified to the drill data and vertical slices of the polygons were created orthogonal to the cross sections. The volcanic and silicification zones were then modeled on 10-foot- and 20-foot-spaced level plans, respectively, used to code the block model. The lithology solids and level plans were used to assign density values to the block model (see Section 14.3.6 for details on the block model density).

14.3.4 Mineral-Domain Grade Model

A mineral domain is a natural grade population of a metal that occurs within a specific geologic setting. In order to define the mineral domains, the natural populations were first identified on quantile graphs that plot the metal-grade distributions of the drill-hole assays. This analysis led to the identification of low- (~0.004 to ~0.015 oz Au/ton), medium- (~0.015 to 0.07oz Au/ton), and high-grade (>~0.07 oz Au/ton) gold populations, assigned to domains 100, 200, and 300, respectively. Two silver populations were identified, low (~0.25 to ~1.0oz Ag/ton) and medium (>~1.0oz Ag/ton), assigned to domains 100 and 200, respectively. Ideally, each of these populations can be correlated with specific geologic characteristics that are captured in the project database to aid in the definition of the mineral domains.

The gold and silver mineral domains were modeled on the same west-looking cross-sections as the silicification model. The drill-hole traces, topographic profile, and the lithology/alteration geologic interpretations were plotted on the sections with gold and silver assays (colored by the grade-domain population ranges) plotted along the drill-hole traces, and these data were used as the base for MDA's interpretations of the mineral domains. Mineral-domain envelopes for each metal were interpreted on the sections to more-or-less capture assays corresponding approximately to each of the defined grade populations.

In a general sense, medium-grade zones of mineralization (gold domain 200) typically are associated with moderate to strong pervasively silicified Siebert Formation, often containing thin silica veinlets. The silicified Siebert occurs wallrock to the high-grade mineralization (gold domain 300) which occurs primarily within narrow, near-vertical mineralized structural breccias or zones of that extend up through the Siebert. The low-grade (domain 100) zones envelope the domain 200 mineralization, but they extend progressively further laterally away from the within the breccia. In general, the low-grade silver domain is spatially associated with the mid-grade gold domain while mid-grade silver domain 200 is associated with the high-grade gold domain.

Erratic low-grade gold and silver mineralization occurs within the post-mineral lithologies (Tertiary volcanic/Quaternary alluvium) that occur as erosional remnants on the west side of Hasbrouck Mountain. The mineralization within these units occurs primarily as mineralized cobbles and boulders that have eroded off the exposed mineralized Siebert formation. A unique mineral domain (domain 10 for gold and silver) was created so that grade estimation is constrained within this mineral type.

Representative cross sections showing gold mineral-domain interpretations are presented in Figure 14.5 and Figure 14.6.

The cross-sectional mineral-domain polygons were digitized and then three-dimensionally rectified to the drill data. The rectified polygons were sliced at 10-foot vertical intervals and the mineral domains were then modeled on 10-foot-spaced level plans. The final product of the level plan work is a set of 10-foot-spaced mineral-domain envelopes that three-dimensionally honor the drill data at twice the resolution of the 20-foot block model. The 10-foot level plan intervals were chosen to ensure that the occasional thin, sub-horizontal mineral zones are coded into the block model.

Figure 14.5 Hasbrouck Deposit Section 1563300 Showing Geology and Gold Mineral Domain Looking West

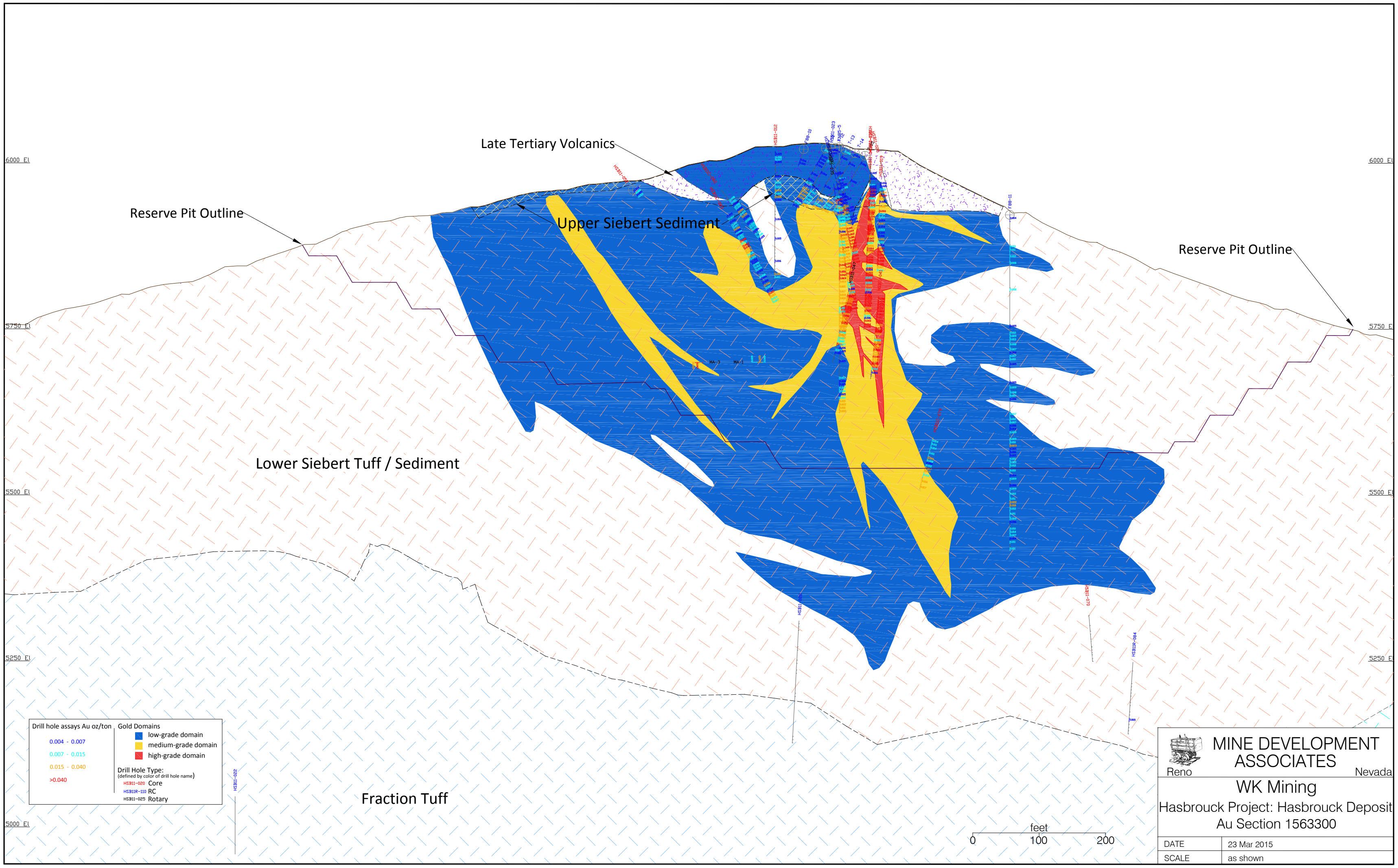
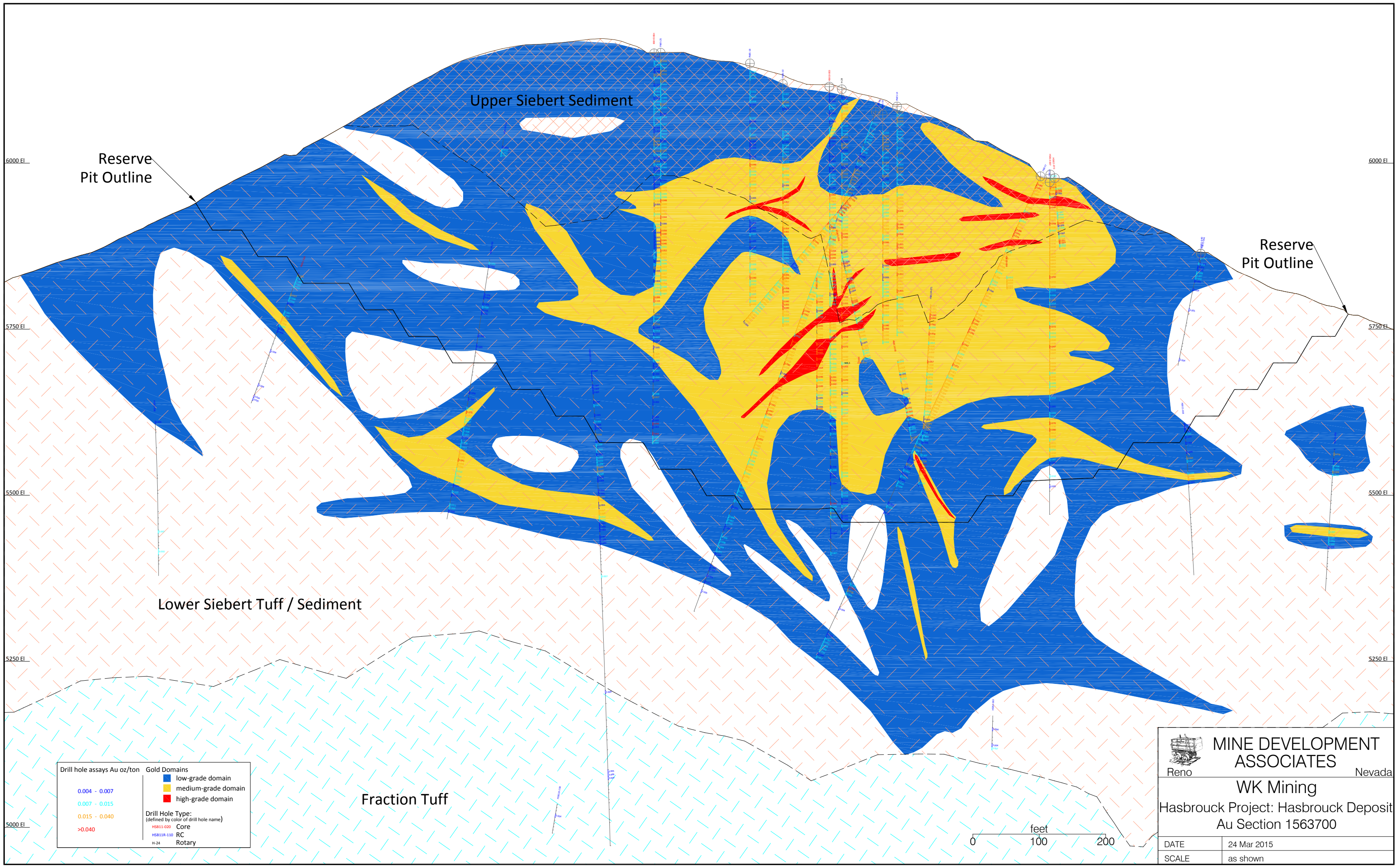


Figure 14.6 Hasbrouck Deposit Section 1563700 Showing Geology and Gold Mineral Domain Looking West



14.3.5 Sample Coding and Compositing

Drill-hole assays were coded by the sectional mineral-domain polygons. MDA analyzed the assay data and capped a total of 24 individual metal analyses which were statistically and spatially deemed beyond a given domain's natural population of samples. This number of samples capped represents less than 0.1% of the total domain-coded assay values within the database. The capped analyses occur within all grade ranges and all estimation areas. Descriptive statistics of the uncapped and capped sample grades by domain are presented in Table 14.9.

Compositing was made at 20ft down-hole lengths, honoring all mineral domain boundaries. Length-weighted composites were used in the block-model grade estimation and the volume inside each mineral domain was estimated using only composites from inside that domain. Composite descriptive statistics for the metal domains are presented in Table 14.10.

Table 14.9 Hasbrouck Mineral Domain Assay Statistics

Domain	Assays	Count	Mean (oz Au/ton)	Median (oz Au/ton)	Std. Dev.	CV	Min. (oz Au/ton)	Max. (oz Au/ton)	# Capped
10	Au	331	0.005	0.003	0.005	1.090	0.000	0.039	
	Au Cap	331	0.005	0.003	0.005	1.090	0.000	0.039	
100	Au	9880	0.007	0.006	0.006	0.880	0.000	0.116	7
	Au Cap	9880	0.007	0.006	0.006	0.860	0.000	0.070	
200	Au	5072	0.025	0.020	0.024	0.970	0.000	0.849	8
	Au Cap	5072	0.024	0.020	0.018	0.760	0.000	0.200	
300	Au	434	0.168	0.097	0.285	1.690	0.000	3.165	7
	Au Cap	434	0.153	0.097	0.173	1.130	0.000	1.000	
All	*Au*	*15717*	*0.017*	*0.009*	*0.054*	*3.220*	*0.000*	*3.165*	22
	Au Cap	*15717*	*0.016*	*0.009*	*0.038*	*2.330*	*0.000*	*1.000*	

Domain	Assays	Count	Mean (oz Ag/ton)	Median (oz Ag/ton)	Std. Dev.	CV	Min. (oz Ag/ton)	Max. (oz Ag/ton)	# Capped
10	Ag	329	0.110	0.080	0.140	1.320	0.000	1.140	
	Ag Cap	329	0.110	0.080	0.140	1.320	0.000	1.140	
100	Ag	8894	0.370	0.320	0.230	0.630	0.000	2.410	
	Ag Cap	8894	0.370	0.320	0.230	0.630	0.000	2.410	
200	Ag	980	1.990	1.340	2.300	1.160	0.000	66.210	2
	Ag Cap	980	1.980	1.340	2.170	1.100	0.000	20.000	
All	*Ag*	*10203*	*0.510*	*0.350*	*0.860*	*1.690*	*0.000*	*66.210*	*2*
	Ag Cap	*10203*	*0.510*	*0.350*	*0.830*	*1.630*	*0.000*	*20.000*	

Table 14.10 Hasbrouck Mineral Domain Composite Statistics

Au Domain	Count	Mean (oz Au/ton)	Median (oz Au/ton)	Std. Dev.	CV	Min. (oz Au/ton)	Max. (oz Au/ton)
10	105	0.004	0.004	0.004	0.790	0.000	0.019
100	2842	0.007	0.007	0.004	0.590	0.000	0.070
200	1481	0.024	0.022	0.012	0.500	0.001	0.165
300	157	0.153	0.105	0.120	0.790	0.027	0.697
All	*4585*	*0.016*	*0.009*	*0.031*	*1.920*	*0.000*	*0.697*

Ag Domain	Count	Mean (oz Ag/ton)	Median (oz Ag/ton)	Std. Dev.	CV	Min. (oz Ag/ton)	Max. (oz Ag/ton)
10	106	0.110	0.080	0.110	1.06	0.000	0.740
100	2547	0.370	0.340	0.180	0.49	0.000	1.310
200	326	1.980	1.440	1.720	0.87	0.300	18.460
All	*2979*	*0.510*	*0.350*	*0.720*	*1.41*	*0.000*	*18.460*

14.3.6 Density

The density database consists of 344 density measurements on core samples collected by Allied Nevada during the 2010 and 2011 core drilling programs. The samples were from all significant rock types and gold grade ranges, and the procedures used the water immersion method.

MDA analyzed the data and the general statistics by modeled rock type and gold mineral domain. After reviewing the data, four samples were removed due to spurious results or potential sampling bias. The tonnage factor statistics (in cuft/ton units) for the remaining 340 samples are shown in Table 14.11. Due to the often highly fractured nature of the deposit, and the fact that voids resulting from many of the open fractures cannot be accurately reflected in density determinations, the measured density values were factored up by 1% to 2% to account for the unavoidable sample-selection bias. The factored data, shown in the "Model TF" column in Table 14.11, reflect the actual tonnage factor values assigned to the Hasbrouck block model.

Table 14.11 Descriptive Statistics of Hasbrouck Tonnage Factor (cuft/ton) by Rock Type

Rock Type	Count	Mean	Median	Min.	Max.	Std.Dev.	Model TF
Tvf/Qal	14	17.15	17.32	12.76	21.08	3.08	17.58
Non-silicified	65	15.94	16.18	12.81	20.15	1.57	16.23
Au_100200300 (non-silic)	60	14.38	13.99	12.61	18.31	1.37	14.35
Silicified	201	13.23	13.08	12.32	17.60	0.77	13.33

14.3.7 Underground Workings

MDA was provided the plan maps of the historic underground workings associated with the Kernick structure (Main adit) along with the more limited workings developed on the SE adit, NE adit and the Ore Car Adit. Modeled solids of the Kernick and Ore Car workings were also provided. MDA used the location of the underground workings to guide the mineral domain modeling and also incorporated the workings into the block model to account for the volume loss. The latter volume loss, although minor at <1% of total deposit volume, is coded into the block model as the percentage of each block containing underground workings or stopes.

14.3.8 Block Model Coding

The 10-foot-spaced level plan mineral-domain polygons were used to code a three-dimensional block model that is comprised of 20 foot (width) x 20 foot (length) x 20 foot (height) blocks. Each 20-foot high block is coded using the average volume of the two 10-foot-spaced levels. In order for the block model to better reflect the irregularly shaped limits of the various gold and silver domains, as well as to explicitly model dilution, the percentage volume of each mineral domain within each block is stored (the "partial percentages").

Lithology and silicification are coded into the block model on a block-in/block-out basis. The block model also contains a "rock_pct" attribute that is the percentage of each block that lies below the topographic surface minus the percentage of each block containing underground workings or stopes.

Each block is assigned a tonnage factor listed on Table 14.11 based on its coded lithology, silicification, and mineral domain.

14.3.9 Resource Model and Estimation

The resource estimate reflects the general west-northwest trend and variably-dipping nature of the Hasbrouck gold mineralization. To replicate the change in orientation observed within the deposit, three search-ellipse orientations were used to control the resource estimate. The first orientation (designated Area 10 and considered the model default code) represents the generally horizontal nature of the bedding-related low- to mid-grade mineralization within the Siebert Formation peripheral to the higher-grade, near-vertical. The second and third orientation areas (Area 20 and 30) are coded into the block model using solids and represent the more structurally-controlled mineralization that occurs along the east-dipping Siebert/Fraction Tuff contact. See Table 14.12 for the search ellipse parameters.

Table 14.12 Hasbrouck Search Ellipse Orientations

Area	Major Bearing	Mj Plunge	Tilt
1	0	0	0
2	100	0	60
3	100	0	90

Grade interpolation utilized Inverse Distance Squared (ID2), with nearest neighbor and ordinary kriging estimates also being made for checking estimation results and sensitivities. Variography and geostatistical evaluations were made to determine distances for search and classification criteria.

The estimation parameters applied at Hasbrouck are summarized in Table 14.13. The estimation used two search passes for the low-grade domains (coded domains 10 and 100), and three search passes for the mid-and high-grade mineral domains (domains coded as 200 and 300), with successive passes not overwriting previous estimation passes. The first-pass search distances take into consideration the results of both the variography and drill-hole spacing. The second- and third-pass was designed to estimate grade into all blocks coded to the mineral domains that were not estimated in the first pass. Due to the generally similar mineral orientations and statistical correlations between the gold and silver mineralization, and the relatively low value that the silver contributes to the project economics, the silver estimate uses the same estimation parameters as developed for the gold mineralization.

Table 14.13 Summary of Hasbrouck Estimation Parameters

Estimation Pass	Search Ranges (ft)			Comp Constraints		
	Major	Semi-Major	Minor	Min	Max	Max/hole
Domain 10 and 100						
1	300	300	200	2	15	3
2	500	500	500	1	18	3
Domain 200 and 300						
1 (area 1)	150	150	100	2	12	3
1 (area 2 and 3)	150	150	50	2	12	3
2	300	300	200	2	18	3
3	500	500	500	1	18	3

The estimation passes were performed independently for each of the mineral domains, so that only composites coded to a particular domain were used to estimate grade into blocks coded by that domain. The estimated grades were coupled with the partial percentages of the mineral domains to enable the calculation of a single weight-averaged block-diluted grade for each block.

14.3.10 Hasbrouck Mineral Resources

MDA classified the Hasbrouck resources to Measured, Indicated, and Inferred categories using a combination of distance to the nearest sample and the number of samples, while at the same time taking into account reliability of underlying data and understanding and use of the geology (Table 14.14). The pre-Allied drilling is limited to Indicated and Inferred resources only due to the general lack of QA/QC data that could be used for verification purposes and to some uncertainties related to drill-hole locations.

Table 14.14 Hasbrouck Classification Parameters

Class	Estimation Pass	Min. Number of Drill holes	Min. Number of Composites	Avg. Dist. to Nearest 2 Composites
Measured	1	2*	3	50
Indicated	1	2	2	145
Inferred	all other modeled mineralization			

* minimum one Allied hole

The Hasbrouck stated resource is fully diluted to 20ft x 20ft x 20ft blocks and tabulated on gold-equivalent ("AuEq") grade cutoff that was chosen to capture mineralization potentially available to open-pit extraction and heap-leach processing. The block dimensions were chosen as practical sizes for open-pit mining of a deposit of this kind.

The Hasbrouck mineral resources are inclusive of reserves and listed in Table 14.15 using a cutoff grade of 0.006oz AuEq/ton. The formula used to calculate the AuEq grade is:

$$\text{oz AuEq/ton} = \text{oz Au/ton} + (\text{oz Ag/ton} \times 0.000417)$$

The AuEq grade is calculated using the individual gold and silver grades of each block, along with a gold price of $1,300.00 per ounce gold and a silver price of $22 per ounce silver. The AuEq grade calculation includes the difference in gold versus silver recovery in the proposed heap-leach processing scenario.

The block-diluted resources are also tabulated at additional cutoffs in Table 14.16 in order to provide grade-distribution information, as well as to provide for economic conditions other than those envisioned by the 0.006oz AuEq/ton cutoff. Hasbrouck resources have an effective date of November 3, 2014.

Figure 14.7 and Figure 14.8 show cross sections of the block model that correspond to the mineral-domain cross sections in Figure 14.5 and Figure 14.6, respectively.

Table 14.15 Hasbrouck Reported Mineral Resources (0.006oz AuEq/ton cutoff grade)

Class	Tons	oz Au/ton	oz Au	oz Ag/ton	oz Ag
Measured	8,261,000	0.017	143,000	0.357	2,949,000
Indicated	45,924,000	0.013	595,000	0.243	11,147,000
M+I	54,185,000	0.014	738,000	0.260	14,096,000
Inferred	11,772,000	0.009	104,000	0.191	2,249,000

Note: rounding may cause apparent inconsistencies

Table 14.16 Hasbrouck Mineral Resources

Cutoff	Measured Resource				
(oz AuEq/ton)	Tons	oz Au/ton	oz Au	oz Ag/ton	oz Ag
0.005	9,142,000	0.016	147,000	0.327	2,992,000
0.006	***8,261,000***	***0.017***	***143,000***	***0.357***	***2,949,000***
0.007	7,501,000	0.019	139,000	0.386	2,896,000
0.008	6,700,000	0.020	134,000	0.420	2,814,000
0.009	5,925,000	0.022	128,000	0.457	2,706,000
0.010	5,243,000	0.023	122,000	0.493	2,584,000
0.012	4,349,000	0.026	114,000	0.544	2,364,000
0.015	3,575,000	0.029	105,000	0.595	2,128,000
0.020	2,708,000	0.034	91,000	0.668	1,808,000

Cutoff	Indicated Resource				
(oz AuEq/ton)	Tons	oz Au/ton	oz Au	oz Ag/ton	oz Ag
0.005	50,281,000	0.012	616,000	0.225	11,312,000
0.006	***45,924,000***	***0.013***	***595,000***	***0.243***	***11,147,000***
0.007	40,310,000	0.014	562,000	0.268	10,819,000
0.008	34,082,000	0.015	521,000	0.299	10,204,000
0.009	28,350,000	0.017	478,000	0.332	9,399,000
0.010	23,731,000	0.019	440,000	0.359	8,528,000
0.012	17,457,000	0.022	381,000	0.406	7,085,000
0.015	13,293,000	0.025	333,000	0.440	5,853,000
0.020	9,495,000	0.029	274,000	0.482	4,579,000

Cutoff	Measured and Indicated Resource				
(oz AuEq/ton)	Tons	oz Au/ton	oz Au	oz Ag/ton	oz Ag
0.005	59,423,000	0.013	763,000	0.241	14,304,000
0.006	***54,185,000***	***0.014***	***738,000***	***0.260***	***14,096,000***
0.007	47,811,000	0.015	701,000	0.287	13,715,000
0.008	40,782,000	0.016	655,000	0.319	13,018,000
0.009	34,275,000	0.018	606,000	0.353	12,105,000
0.010	28,974,000	0.019	562,000	0.384	11,112,000
0.012	21,806,000	0.023	495,000	0.433	9,449,000
0.015	16,868,000	0.026	438,000	0.473	7,981,000
0.020	12,203,000	0.030	365,000	0.523	6,387,000

Cutoff	Inferred Resource				
(oz AuEq/ton)	Tons	oz Au/ton	oz Au	oz Ag/ton	oz Ag
0.005	13,629,000	0.008	113,000	0.172	2,343,000
0.006	***11,772,000***	***0.009***	***104,000***	***0.191***	***2,249,000***
0.007	9,525,000	0.010	91,000	0.219	2,087,000
0.008	7,085,000	0.011	75,000	0.247	1,751,000
0.009	4,897,000	0.012	59,000	0.278	1,363,000
0.010	3,487,000	0.014	48,000	0.305	1,063,000
0.012	2,086,000	0.017	35,000	0.333	695,000
0.015	1,289,000	0.020	25,000	0.377	485,000
0.020	696,000	0.023	16,000	0.423	294,000

Figure 14.7 Hasbrouck Deposit Section 1563300 Showing Block Model Gold Grades Looking West

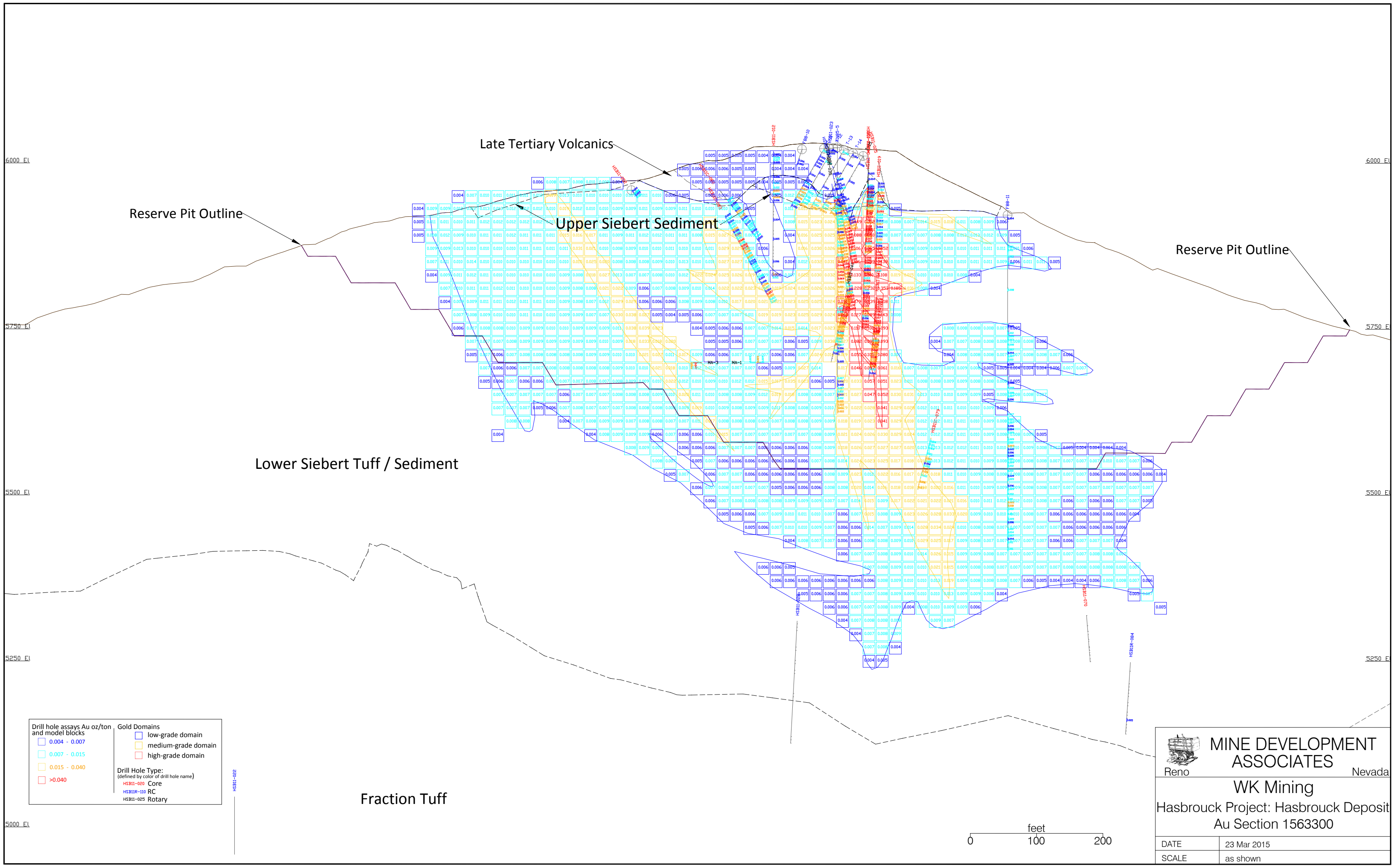
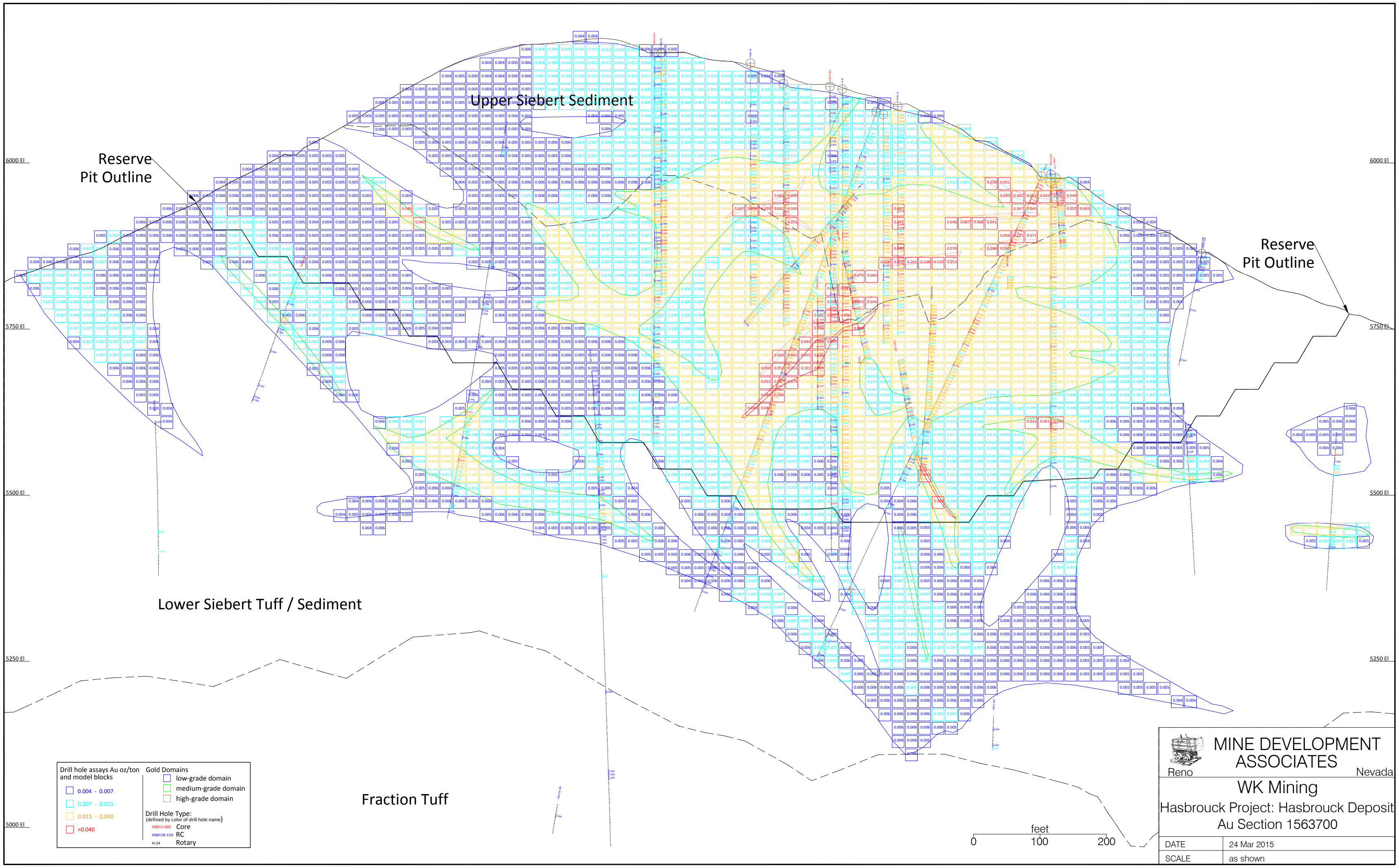


Figure 14.8 Hasbrouck Deposit Section 1563700 Showing Block Model Gold Grades, Looking West



14.3.11 Model Checks

Volumes indicated by the sectional mineral-domain modeling were compared to the level-plan volumes and those coded to the block model to assure close agreement, and all block-model coding was checked visually on the computer. Nearest-neighbor and ordinary-krige estimates of the Hasbrouck resources were undertaken as a check on the inverse-distance-squared resource model. Grade-distribution plots of assays and composites versus the nearest-neighbor, krige, and inverse-distance block grades were also evaluated as a check on the estimation. Finally, the inverse-distance grades were visually compared to the drill-hole assay data to assure that reasonable results were obtained.

14.3.12 Comments on the Hasbrouck Resource Modeling

The Hasbrouck gold and silver resource is based on drill-sample analyses, density measurements, logged silicification content, and lithologic and structural geologic contacts. At a 0.006oz AuEq/ton cutoff, Hasbrouck mineralization consists of a single, irregularly shaped deposit that extends for more than 2,500ft in an east-west direction over the top of Hasbrouck Mountain. The mineralization at Hasbrouck is accompanied by strong pervasive silicification within the upper Siebert and the top of the lower Siebert. Within the large, continuous lower-grade mineralized shell, higher-grade gold and silver mineralization is related to dominantly near-vertical, west-northwest trending zones of sheeted silica veinlets and stockworks, all closely associated with multiple, larger and coalesced, but erratic bodies of hydrothermal breccias. Stratigraphic control, whereby the porous volcaniclastic units are preferentially mineralized, is prevalent throughout the deposit, but is especially evident in many of the moderate-grade zones along the peripheries of the deposit. Structural control is present along various northwest trending sub parallel structures. Crosscutting N-S structures locally off-sets mineralization.

The core of the deposit is relatively well-defined and infill drilling is not expected to materially change the current resource model and estimate. Additional drilling along the periphery of the deposit, including following up on the limited 2014 drill program completed by WKM on the northeast edge of the deposit, has the potential to extend the resource to the east and west along the dominant mineral trend observed within the deposit.

15.0 MINERAL RESERVE ESTIMATES

15.1 Introduction

MDA classifies reserves in order of increasing confidence into Probable and Proven categories to be in accordance with the "CIM Definition Standards - For Mineral Resources and Mineral Reserves" (2014), and therefore Canadian National Instrument 43-101. Mineral reserves for the Hasbrouck project were developed by applying relevant economic criteria in order to define the economically extractable portions of the resource. CIM standards require that modifying factors be used to convert Mineral Resources to Reserves. The standards define modifying factors and Proven and Probable Reserves with CIM's explanatory material shown in italics as follows:

Mineral Reserve

Mineral Reserves are sub-divided in order of increasing confidence into Probable Mineral Reserves and Proven Mineral Reserves. A Probable Mineral Reserve has a lower level of confidence than a Proven Mineral Reserve.

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

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

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

Mineral Reserves are those parts of Mineral Resources which, after the application of all mining factors, result in an estimated tonnage and grade which, in the opinion of the Qualified Person(s) making the estimates, is the basis of an economically viable project after taking account of all relevant Modifying Factors. Mineral Reserves are inclusive of diluting material that will be mined in conjunction with the Mineral Reserves and delivered to the treatment plant or equivalent facility. The term 'Mineral Reserve' need not necessarily signify that extraction facilities are in place or operative or that all governmental approvals have been received. It does signify that there are reasonable expectations of such approvals.

'Reference point' refers to the mining or process point at which the Qualified Person prepares a Mineral Reserve. For example, most metal deposits disclose mineral reserves with a "mill feed" reference point. In these cases, reserves are

reported as mined ore delivered to the plant and do not include reductions attributed to anticipated plant losses. In contrast, coal reserves have traditionally been reported as tonnes of "clean coal". In this coal example, reserves are reported as a "saleable product" reference point and include reductions for plant yield (recovery). The Qualified Person must clearly state the 'reference point' used in the Mineral Reserve estimate.

Probable Mineral Reserve

A Probable Mineral Reserve is the economically mineable part of an Indicated, and in some circumstances, a Measured Mineral Resource. The confidence in the Modifying Factors applying to a Probable Mineral Reserve is lower than that applying to a Proven Mineral Reserve.

The Qualified Person(s) may elect, to convert Measured Mineral Resources to Probable Mineral Reserves if the confidence in the Modifying Factors is lower than that applied to a Proven Mineral Reserve. Probable Mineral Reserve estimates must be demonstrated to be economic, at the time of reporting, by at least a Pre-Feasibility Study.

Proven Mineral Reserve

A Proven Mineral Reserve is the economically mineable part of a Measured Mineral Resource. A Proven Mineral Reserve implies a high degree of confidence in the Modifying Factors.

Application of the Proven Mineral Reserve category implies that the Qualified Person has the highest degree of confidence in the estimate with the consequent expectation in the minds of the readers of the report. The term should be restricted to that part of the deposit where production planning is taking place and for which any variation in the estimate would not significantly affect the potential economic viability of the deposit. Proven Mineral Reserve estimates must be demonstrated to be economic, at the time of reporting, by at least a Pre-Feasibility Study. Within the CIM Definition standards the term Proved Mineral Reserve is an equivalent term to a Proven Mineral Reserve.

Modifying Factors

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

MDA has used Measured and Indicated resources as the basis to define reserves for both the Three Hills and Hasbrouck mines, which together compose the Hasbrouck project. Reserve definition was done by first identifying ultimate pit limits using economic parameters and pit optimization techniques. The resulting optimized pit shells were then used for guidance in pit design to allow access for equipment and personnel. MDA then considered mining, processing, metallurgical, infrastructure, economic, marketing, legal, environmental, social and governmental factors for defining the estimated reserves.

Three Hills has been designed using five pit phases in order to detail construction needs. The ultimate Three Hills pit design was expanded outside of the optimized pit shell to include additional Brougher Rhyolite which will be used for construction (see Section 16.5).

Hasbrouck has been designed using four pit phases. MDA used the phased pit designs to define the production schedule, which was then used for cash-flow analysis for the pre-feasibility study. The final cash-flow model was produced by MDA and demonstrates that the deposits make a positive cash flow and are reasonable with respect to statement of reserves for the Hasbrouck project.

15.2 Pit Optimization

Pit optimization was done for the 2015 PFS using Geovia's Whittle (version 4.5.2) software and has not been updated for this study. The optimization used economic and geometrical parameters to define the ultimate pit for both deposits. The economic and geometrical parameters from 2015 remain relevant for this study. Pit optimization used only Measured and Indicated resources for processing. All Inferred material was considered to be waste.

15.2.1 Economic Parameters

Economic parameters used for the pit optimization are provided in Table 15.1. These are initial parameters used for the pre-feasibility to determine the pit design, and may differ from the final values used in the cash-flow model. Pit optimizations were re-run using the final cash-flow values as a test to ensure that pit designs remained valid.

Table 15.1 Pre-Feasibility Economic Parameters

	Three Hills	Hasbrouck	
Mining	$ 2.00	$ 2.00	$/ton Mined
Crushing & Stacking	NA	$ 3.20	$/ton Processed
Leaching	$ 2.33	$ 1.30	$/ton Processed
G&A Cost per Ton	$ 0.42	$ 0.42	$/ton Processed
Refining - Au	$ 5.00	$ 5.00	$/oz Au Produced
Refining - Ag	NA	$ 0.25	$/oz Ag Produced
Royalty	4%	4%	NSR

Mining costs are based on budgetary quotations from mining contractors and include owners costs for engineering, geology, and contract management. Processing costs were provided by KCA and are broken into crushing and stacking, followed by leaching. Crushing and stacking costs do not apply to Three Hills because Three Hills ore will be processed using ROM leaching.

Yearly general and administrative costs ("G&A") have been estimated by MDA with input from WKM and are discussed later. The yearly G&A costs have been divided by the average annual tonnage to determine the cost per ton.

The royalty has been applied as a gross smelter return ("GSR"), which means that the royalty percentage has been multiplied by the recovered metal and metal prices. This is conservative as the royalty will have deductions for metal transportation, insurance, and refining costs.

Gold and silver recovery estimates were provided by Herb Osborne of H.C. Osborne and Associates, the Qualified Person responsible for Section 13.0. Table 15.2 shows the recoveries used for each deposit.

Table 15.2 Metallurgical Recoveries

	Gold	Silver
Three Hills	79.0%	NA
Hasbrouck Upper Seibert	61.0%	11.0%
Hasbrouck Lower Seibert	75.8%	11.0%

Pit optimizations were completed using varying gold and silver prices to better understand the sensitivity of each deposit to metal price. The gold price was incremented from $300 to $2,000 per ounce in $20.00 steps for both Three Hills and Hasbrouck. As Three Hills does not have any stated silver resources, silver was not used to generate value in Three Hills. However, for Hasbrouck the value from silver was calculated with constant silver to gold ratio based on $1,250/oz Au to $18/oz Ag prices. Lower metal price pit shells were analyzed while determining pit phasing.

The ultimate pit limits were determined using prices of $1,250 and $18.00 per ounce of gold and silver respectively. The ultimate pit was selected on Whittle discounted evaluations of the various pit shells using a 5% discount rate and a processing limit of 5,400,000 tons per year.

Of note, the final gold price used for the Hasbrouck project cash flow was $1,225 per ounce Au and $17.50 per ounce Ag. This change in prices had a minimal impact on the results (less than 2 % on tonnage) and MDA believes that the pit designs resulting from the initial analysis are well within reason.

15.2.2 Geometrical Parameters

The only geometrical parameters applied to the Three Hills and Hasbrouck pit optimizations are slope parameters. Slopes have been based on a geotechnical study from Golder Associates Inc. (Golder, 2015). The study was completed as part of the pre-feasibility and includes recommendations for both Three Hills and Hasbrouck mines. These recommendations are documented in the Golder Associates report: "*Hasbrouck Project, Esmeralda County, Nevada Pre-Feasibility Level Pit Slope Evaluation*" (January, 2015). The geotechnical report was further reviewed by SRK Consulting and documented in a memorandum "*Hasbrouck Project Geotech PFS Review*" (Wellman, 2015). In summary, SRK Consulting concluded that "*The methodology* *and approach presented in the report by Golder Associates is valid and in accordance with industry accepted best practices. It is SRK's opinion that the slope angle recommendations provided by Golder are appropriate at a pre-feasibility study (PFS) level*".

15.2.2.1 Three Hills Mine Slope Parameters

Slope parameters were based on studies provided by Golder Associates. Three Hills slope recommendations were provided based on rock type and maximum slope heights. MDA flagged a zone type into the block model based on the rock types. The Three Hills recommended inter-ramp slopes are shown by zone in Table 15.3, as provided by Golder Associates. MDA flattened the slopes used for the pit optimization to represent the overall angle that reflects the inclusion of ramps in the final pit designs as shown in Table 15.3.

Table 15.3 Three Hills Slope Parameters

	Zone Number	Inter-Ramp Angle (degrees)	Maximum Slope Height	Overall Angle Used
North Siebert	1	35°	120ft	25° to 35°
South Siebert	2	40°	200ft	38°
Fraction Tuff	3	45°	200ft	45°
Brougher Dacite Flow	4	45°	200ft	45°
Oddie Ryholite	5	45°	200ft	45°

15.2.2.2 Hasbrouck Mine Slope Parameters

The mining at Hasbrouck will be predominately in the Siebert Formation. For the Siebert Formation, Golder provided slope recommendations based on the overall slope height. In addition, it was recommended that a 65ft geotechnical bench (or the addition of a ramp) be added to the design every 120ft in wall height. Table 15.4 shows the recommended slopes by wall height.

Table 15.4 Hasbrouck Slope Recommendations

Overall Slope Heights (ft)	Inter-Ramp Angle (degrees)	Maximum Height w/out Geotech Bench (ft)
<= 360	40°	120
360 to 480	35°	120
480 to 600	32°	120
600 to 720	30°	120
720 to 840	28°	120

Because the deposit is located under the top of Hasbrouck Mountain, the wall heights in different directions will be variable for both the ultimate pit and any pit phases that are designed. For pit optimizations, the modeling area was divided into 9 different zones around the potential pit so that slopes could be provided in a variable manner. The optimization required some trial and error to apply the slopes appropriately based on how far down the edge of the hill each pit would be mined. The final pit optimizations included some flattening to account for ramps and required geotechnical benches.

15.2.3 Cutoff Grades

Internal and external cutoff grades were calculated for both the Three Hills and Hasbrouck mines based on the economic parameters. Internal cutoff grades assume that an economical pit design has been developed, and because all of the material inside of the pit will be mined, regardless of waste/ore classification, the mining cost inside the pit is a sunk cost. Thus, the internal cutoff grade does not include mining cost. In contrast, the external cutoff grade includes the mining cost and is a break-even cutoff grade.

The calculated cutoff grades for both Three Hills and Hasbrouck are shown in Table 15.5. These are shown by gold price to illustrate how the gold price can impact the cutoff grade choice. However, the resulting cutoff grades are very low in relation to the minimum detection limits when assaying for gold. As such, a minimum cutoff grade has been applied for each deposit. For pit optimization work, a minimum cutoff grade of 0.005 and 0.007 ounces gold per ton has been applied to the Three Hills and Hasbrouck mines, respectively. When running pit optimizations, Whittle is allowed to select the most economic destination for material (process it or place it in the waste dump), so where the economic cutoff grade is higher than the minimum cutoff grade, the economic cutoff grade prevails.

Table 15.5 Calculated Cutoff Grades (oz Au/ton)

			Hasbrouck			
Au Price	Three Hills		Upper Seibert		Lower Siebert	
($/oz Au)	Internal	External	Internal	External	Internal	External
$1,000	0.004	0.006	0.010	0.014	0.008	0.011
$1,050	0.003	0.006	0.010	0.013	0.008	0.011
$1,100	0.003	0.006	0.009	0.013	0.008	0.010
$1,150	0.003	0.005	0.009	0.012	0.007	0.010
$1,200	0.003	0.005	0.009	0.012	0.007	0.009
$1,250	0.003	0.005	0.008	0.011	0.007	0.009
$1,300	0.003	0.005	0.008	0.011	0.006	0.009
$1,350	0.003	0.005	0.008	0.010	0.006	0.008
$1,400	0.003	0.004	0.007	0.010	0.006	0.008
$1,450	0.003	0.004	0.007	0.010	0.006	0.008
$1,500	0.002	0.004	0.007	0.009	0.006	0.007

15.2.4 Pit-Optimization Method and Results

The choice of ultimate pits and pit phases were done as a two-step process. The first step was to optimize a set of pit shells based on varying a revenue factor. Whittle did this using a Lerchs-Grossman ("LG") algorithm. The revenue factor was multiplied by the recovered ounces and the metal prices, essentially creating a nested set of pit shells based on different metal prices. For both Three Hills and Hasbrouck, the revenue factors were varied from 0.30 to 2.0 in increments of 0.020. A base price of $1,000 per ounce of gold, and $18.00 per ounce of silver was used, so the resulting pit shells represent gold prices from $300 to $2,000 per ounce in increments of $20.00. This has the potential of generating up to 86 different pit shells that can be used for analysis, though in some cases pit shells with increments are coincidental to other pits and reported as a single pit.

The second step of the process was to use the Pit by Pit ("PbP") analysis tool in Whittle to generate a discounted operating cash flow (note that capital is not included). This used a rough scheduling by pit phase for each pit shell to generate the discounted value for the pit. The program develops three different discounted values: best, worst, and specified. The best case value uses each of the pit shells as pit phases or pushbacks. For example, when evaluating pit 20, there would be 19 pushbacks mined prior to pit 20, and the resulting schedule takes advantage of mining more valuable material up front to improve the discounted value. Evaluating pit 21 would have 20 pushbacks; pit 22 would have 21 pushbacks and so on. Note that this is not a realistic case as the incremental pushbacks would not have enough mining width between them to be able to mine appropriately, but this does help to define the maximum potential discounted operating cash flow.

The worst case does not use any pushbacks in determining the discounted value for each of the pit shells. Thus, each pit shell is evaluated as if mining a single pit from top to bottom. This does not get the advantage of mining more valuable material up front, so it generally provides a lower discounted value than that of the best case.

The specified case allows the user to specify pit shells to be used as pushbacks and then schedules the pushbacks and calculates the discounted cash flow. This is more realistic than the base case as it allows for more mining width, though the final pit design will have to ensure that appropriate mining width is available. The specified case has been used for each mine to determine the ultimate pit limits to design to, as well as to specify guidelines for designing pit phases.

15.2.4.1 Three Hills Pit Optimization Results

The Three Hills mine pit optimizations were completed using Whittle software with the parameters previously discussed. The basic LG results are shown in Table 15.6 by gold price in $100 per ounce increments. The PbP analysis results are listed in Table 15.7 and shown graphically in Figure 15.1.

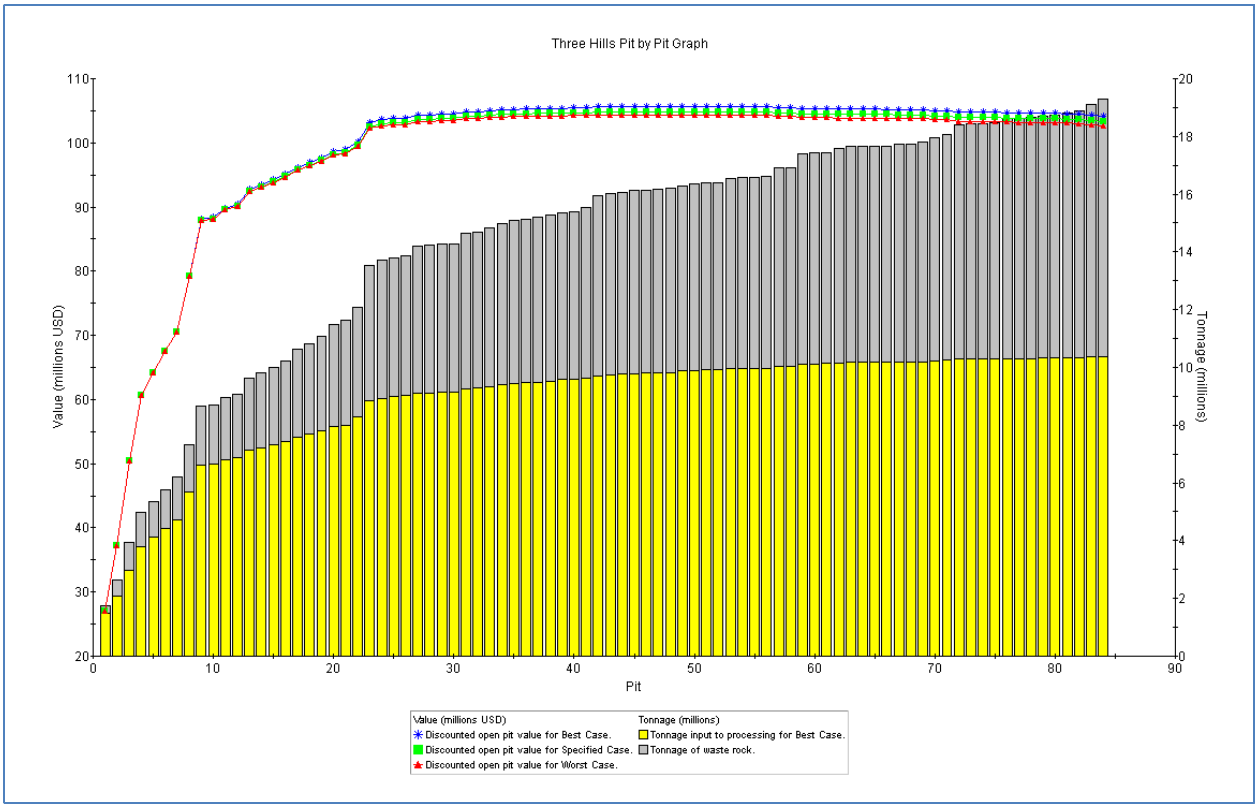
Table 15.6 Three Hills Pit Optimization Results

		Material Processed			Waste	Total	Strip
Pit	Pit Au Price	K Tons	oz Au/ton	K ozs Au	K Tons	K Tons	Ratio
1	$ 300	1,105	0.030	33	627	1,732	0.57
6	$ 400	3,378	0.027	90	2,370	5,748	0.70
11	$ 500	5,741	0.022	129	3,203	8,944	0.56
16	$ 600	6,674	0.021	142	3,563	10,237	0.53
21	$ 700	7,606	0.020	153	4,033	11,639	0.53
26	$ 800	9,014	0.019	168	4,838	13,852	0.54
31	$ 900	9,265	0.019	171	5,375	14,640	0.58
36	$ 1,000	9,459	0.018	174	5,677	15,136	0.60
41	$ 1,100	9,638	0.018	175	5,905	15,544	0.61
46	$ 1,200	9,793	0.018	177	6,352	16,145	0.65
51	$ 1,300	9,910	0.018	178	6,477	16,387	0.65
56	$ 1,400	9,963	0.018	179	6,652	16,615	0.67
61	$ 1,500	10,130	0.018	181	7,304	17,434	0.72
66	$ 1,600	10,174	0.018	181	7,495	17,669	0.74
71	$ 1,700	10,243	0.018	182	7,825	18,068	0.76
75	$ 1,800	10,290	0.018	183	8,197	18,487	0.80
79	$ 1,900	10,313	0.018	183	8,369	18,683	0.81
84	$ 2,000	10,385	0.018	184	8,891	19,276	0.86

Table 15.7 Three Hills Pit by Pit Analysis Results

Pit	Au Price ($/oz) to Create Pit	Material Processed K Tons	oz Au/ton	K ozs Au	Waste K Tons	Total K Tons	Strip Ratio	Discounted Op Cost (M US) Best	Spec	Worst
1	$ 300	1,480	0.024	36	252	1,732	0.17	$ 27.03	$ 27.03	$ 27.03
2	$ 320	2,097	0.024	51	544	2,641	0.26	$ 37.22	$ 37.22	$ 37.22
3	$ 340	2,984	0.024	70	946	3,930	0.32	$ 50.53	$ 50.53	$ 50.53
4	$ 360	3,776	0.023	86	1,204	4,980	0.32	$ 60.57	$ 60.57	$ 60.57
5	$ 380	4,112	0.022	92	1,257	5,369	0.31	$ 64.19	$ 64.19	$ 64.19
6	$ 400	4,441	0.022	97	1,309	5,750	0.29	$ 67.52	$ 67.52	$ 67.52
7	$ 420	4,708	0.022	102	1,489	6,196	0.32	$ 70.53	$ 70.53	$ 70.53
8	$ 440	5,671	0.021	117	1,639	7,310	0.29	$ 79.15	$ 79.14	$ 79.14
9	$ 460	6,622	0.020	132	2,029	8,651	0.31	$ 88.15	$ 87.96	$ 87.96
10	$ 480	6,642	0.020	133	2,042	8,685	0.31	$ 88.35	$ 88.15	$ 88.15
11	$ 500	6,819	0.020	136	2,127	8,946	0.31	$ 89.82	$ 89.58	$ 89.58
12	$ 520	6,890	0.020	137	2,175	9,065	0.32	$ 90.42	$ 90.16	$ 90.16
13	$ 540	7,147	0.020	141	2,472	9,619	0.35	$ 92.75	$ 92.44	$ 92.41
14	$ 560	7,224	0.020	143	2,592	9,815	0.36	$ 93.49	$ 93.17	$ 93.13
15	$ 580	7,333	0.020	144	2,666	9,999	0.36	$ 94.24	$ 93.90	$ 93.84
16	$ 600	7,449	0.020	146	2,791	10,240	0.37	$ 95.07	$ 94.70	$ 94.63
17	$ 620	7,567	0.020	148	3,049	10,617	0.40	$ 96.18	$ 95.79	$ 95.71
18	$ 640	7,702	0.019	150	3,115	10,817	0.40	$ 96.89	$ 96.49	$ 96.38
19	$ 660	7,805	0.019	152	3,289	11,093	0.42	$ 97.63	$ 97.21	$ 97.09
20	$ 680	7,957	0.019	154	3,536	11,493	0.44	$ 98.64	$ 98.19	$ 98.04
21	$ 700	7,992	0.019	155	3,650	11,642	0.46	$ 98.94	$ 98.49	$ 98.34
22	$ 720	8,272	0.019	158	3,806	12,078	0.46	$ 100.11	$ 99.61	$ 99.41
23	$ 740	8,835	0.019	166	4,685	13,519	0.53	$ 103.16	$ 102.55	$ 102.24
24	$ 760	8,930	0.019	167	4,797	13,727	0.54	$ 103.57	$ 102.95	$ 102.62
25	$ 780	8,988	0.019	168	4,821	13,809	0.54	$ 103.76	$ 103.13	$ 102.79
26	$ 800	9,017	0.019	168	4,839	13,855	0.54	$ 103.85	$ 103.21	$ 102.87
27	$ 820	9,098	0.019	169	5,120	14,218	0.56	$ 104.33	$ 103.68	$ 103.32
28	$ 840	9,104	0.019	170	5,125	14,229	0.56	$ 104.35	$ 103.70	$ 103.33
29	$ 860	9,142	0.019	170	5,134	14,275	0.56	$ 104.43	$ 103.77	$ 103.40
30	$ 880	9,153	0.019	170	5,136	14,289	0.56	$ 104.45	$ 103.79	$ 103.42
31	$ 900	9,268	0.019	171	5,376	14,644	0.58	$ 104.83	$ 104.15	$ 103.76
32	$ 920	9,288	0.018	172	5,399	14,686	0.58	$ 104.87	$ 104.19	$ 103.80
33	$ 940	9,330	0.018	172	5,487	14,818	0.59	$ 105.00	$ 104.31	$ 103.91
34	$ 960	9,398	0.018	173	5,573	14,971	0.59	$ 105.13	$ 104.43	$ 104.03
35	$ 980	9,430	0.018	173	5,665	15,096	0.60	$ 105.23	$ 104.52	$ 104.11
36	$ 1,000	9,462	0.018	174	5,678	15,140	0.60	$ 105.26	$ 104.55	$ 104.13
37	$ 1,020	9,491	0.018	174	5,714	15,204	0.60	$ 105.31	$ 104.59	$ 104.17
38	$ 1,040	9,517	0.018	174	5,748	15,264	0.60	$ 105.34	$ 104.62	$ 104.20
39	$ 1,060	9,582	0.018	175	5,762	15,344	0.60	$ 105.39	$ 104.66	$ 104.22
40	$ 1,080	9,595	0.018	175	5,787	15,383	0.60	$ 105.41	$ 104.68	$ 104.24
41	$ 1,100	9,641	0.018	175	5,906	15,547	0.61	$ 105.47	$ 104.73	$ 104.28
42	$ 1,120	9,713	0.018	176	6,226	15,939	0.64	$ 105.59	$ 104.84	$ 104.37
43	$ 1,140	9,743	0.018	177	6,291	16,035	0.65	$ 105.62	$ 104.86	$ 104.39
44	$ 1,160	9,765	0.018	177	6,309	16,073	0.65	$ 105.63	$ 104.87	$ 104.39
45	$ 1,180	9,794	0.018	177	6,351	16,145	0.65	$ 105.64	$ 104.87	$ 104.39
46	$ 1,200	9,796	0.018	177	6,353	16,148	0.65	$ 105.64	$ 104.87	$ 104.39
47	$ 1,220	9,815	0.018	177	6,365	16,180	0.65	$ 105.64	$ 104.87	$ 104.39
48	$ 1,240	9,824	0.018	177	6,380	16,204	0.65	$ 105.64	$ 104.87	$ 104.39
49	$ 1,260	9,880	0.018	178	6,412	16,293	0.65	$ 105.63	$ 104.85	$ 104.36
50	$ 1,280	9,905	0.018	178	6,453	16,358	0.65	$ 105.63	$ 104.84	$ 104.35
51	$ 1,300	9,913	0.018	178	6,478	16,391	0.65	$ 105.62	$ 104.83	$ 104.34

Figure 15.1 Three Hills PbP Graph



15.2.4.2 Three Hills Pit Shell Selected for Design Guidance

The PbP results shown in Table 15.7 provide the basis for determining the ultimate pit limits. The best discounted value for the specified case was obtained with pit shell 45, and this was used for guidance in pit design. Due to the limited size for the pit shell, no pit phases were designed.

15.2.4.3 Hasbrouck Pit Optimization Results

Hasbrouck mine pit optimizations were completed using Whittle software with the parameters previously discussed. The basic LG results are shown in Table 15.8 by gold price in $100 per ounce increments. The PbP analysis results are shown in Table 15.9 and graphically in Figure 15.2

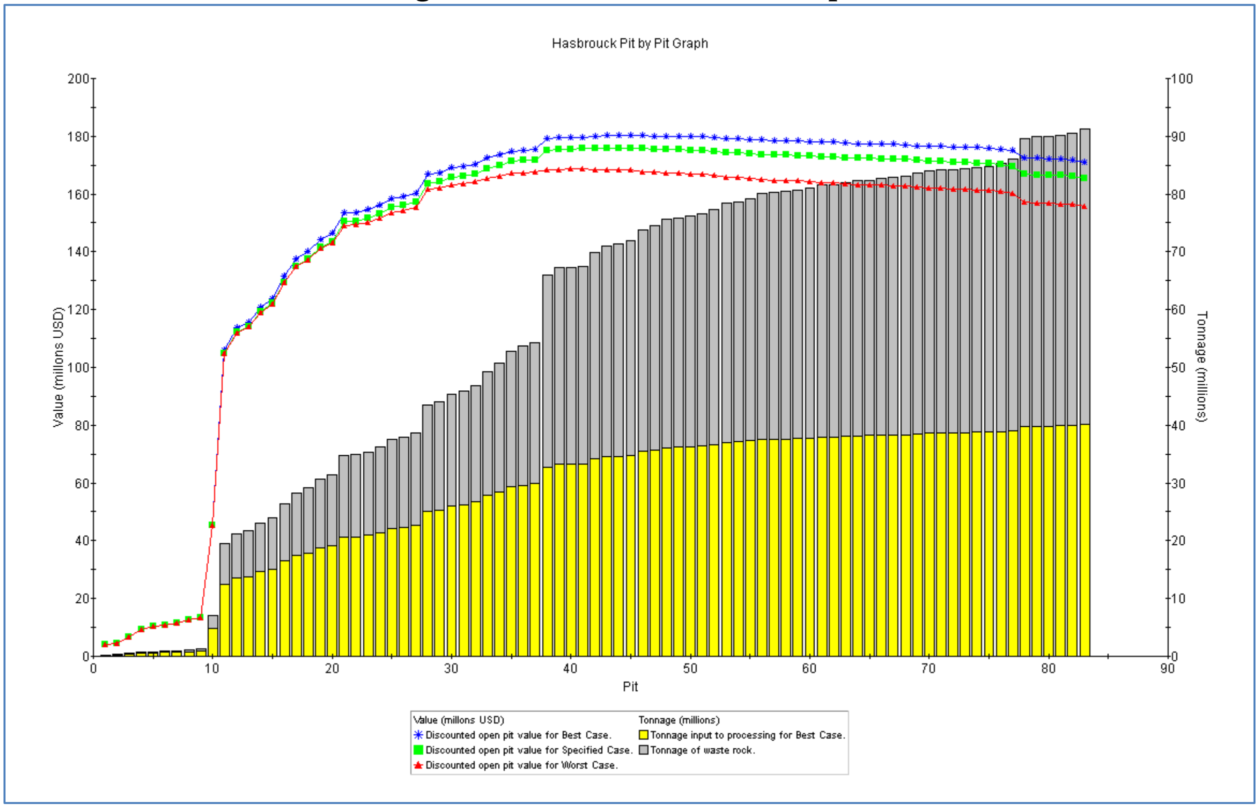
Table 15.8 Hasbrouck Pit Optimization Results

		Material Processed					Waste	Total	Strip
Pit	Au Price	K Tons	Oz Au/ton	K Ozs Au	Oz Ag/ton	K Ozs Ag	K Tons	K Tons	Ratio
3	$ 400	354	0.029	10	0.479	170	146	500	0.41
8	$ 500	729	0.027	20	0.483	352	374	1,103	0.51
13	$ 600	8,255	0.027	226	0.485	4,000	13,485	21,740	1.63
18	$ 700	12,393	0.024	299	0.435	5,388	16,741	29,134	1.35
23	$ 800	16,450	0.022	358	0.397	6,531	18,838	35,288	1.15
28	$ 900	21,867	0.019	426	0.363	7,947	21,726	43,593	0.99
33	$ 1,000	26,631	0.018	476	0.331	8,817	22,629	49,260	0.85
38	$ 1,100	32,158	0.017	552	0.308	9,889	33,830	65,988	1.05
43	$ 1,200	34,208	0.017	576	0.303	10,356	36,864	71,072	1.08
48	$ 1,300	36,106	0.017	596	0.296	10,690	39,559	75,665	1.10
53	$ 1,400	37,052	0.016	606	0.294	10,902	41,404	78,456	1.12
58	$ 1,500	37,635	0.016	612	0.292	10,995	42,783	80,418	1.14
63	$ 1,600	38,111	0.016	617	0.291	11,090	43,930	82,041	1.15
68	$ 1,700	38,373	0.016	620	0.290	11,140	44,658	83,031	1.16
73	$ 1,800	38,744	0.016	623	0.289	11,203	45,747	84,491	1.18
78	$ 1,900	39,782	0.016	634	0.289	11,490	49,907	89,689	1.25
83	$ 2,000	40,144	0.016	638	0.288	11,574	51,216	91,360	1.28

Table 15.9 Hasbrouck Pit by Pit Analysis Results

	Au Price ($/oz)	Total Material Processed					Waste	Total	Strip	LoM	Disc. Op Cash Flow (M USD)		
Pit	to Create Pit	K Tons	Oz Au/ton	K Ozs Au	Oz Ag/ton	K Ozs Ag	K Tons	K Tons	Ratio	Years	Best	Specified	Worst
1	360	230	0.027	6	0.430	99	33	262	0.14	0.04	$ 3.93	$ 3.93	$ 3.93
2	380	256	0.028	7	0.441	113	46	302	0.18	0.05	$ 4.42	$ 4.42	$ 4.42
3	400	412	0.027	11	0.434	179	88	500	0.21	0.08	$ 6.86	$ 6.86	$ 6.86
4	420	585	0.026	15	0.447	262	147	733	0.25	0.11	$ 9.48	$ 9.48	$ 9.48
5	440	639	0.026	17	0.445	284	175	814	0.27	0.12	$ 10.24	$ 10.24	$ 10.24
6	460	694	0.026	18	0.439	305	187	880	0.27	0.13	$ 10.90	$ 10.90	$ 10.90
7	480	735	0.026	19	0.440	324	218	953	0.30	0.14	$ 11.45	$ 11.45	$ 11.45
8	500	823	0.025	21	0.438	361	280	1,103	0.34	0.15	$ 12.53	$ 12.53	$ 12.53
9	520	881	0.025	22	0.442	390	329	1,211	0.37	0.16	$ 13.20	$ 13.20	$ 13.20
10	540	4,912	0.020	98	0.300	1,471	2,104	7,016	0.43	0.91	$ 45.18	$ 45.18	$ 45.18
11	560	12,474	0.020	253	0.355	4,425	7,102	19,576	0.57	2.31	$ 105.98	$ 104.81	$ 104.66
12	580	13,502	0.020	271	0.352	4,750	7,752	21,254	0.57	2.50	$ 113.62	$ 112.21	$ 112.05
13	600	13,798	0.020	276	0.350	4,825	7,936	21,734	0.58	2.56	$ 115.64	$ 114.16	$ 114.00
14	620	14,607	0.020	291	0.348	5,086	8,505	23,111	0.58	2.70	$ 120.91	$ 119.20	$ 119.02
15	640	15,132	0.020	299	0.347	5,255	8,826	23,958	0.58	2.80	$ 123.98	$ 122.13	$ 121.95
16	660	16,455	0.020	322	0.345	5,676	9,983	26,438	0.61	3.05	$ 131.73	$ 129.51	$ 129.30
17	680	17,468	0.019	338	0.344	6,012	10,785	28,253	0.62	3.23	$ 137.56	$ 135.10	$ 134.89
18	700	17,897	0.019	346	0.343	6,137	11,229	29,126	0.63	3.31	$ 140.05	$ 137.42	$ 137.20
19	720	18,716	0.019	359	0.342	6,399	11,994	30,710	0.64	3.47	$ 144.32	$ 141.61	$ 141.12
20	740	19,169	0.019	365	0.341	6,544	12,269	31,438	0.64	3.55	$ 146.33	$ 143.58	$ 142.99
21	760	20,625	0.019	390	0.336	6,932	14,172	34,797	0.69	3.82	$ 153.38	$ 150.50	$ 149.23
22	780	20,666	0.019	390	0.336	6,944	14,212	34,878	0.69	3.83	$ 153.55	$ 150.67	$ 149.40
23	800	20,934	0.019	394	0.336	7,039	14,344	35,278	0.69	3.88	$ 154.47	$ 151.56	$ 150.22
24	820	21,431	0.019	401	0.335	7,188	14,877	36,308	0.69	3.97	$ 156.29	$ 153.33	$ 151.79
25	840	22,061	0.019	410	0.334	7,374	15,460	37,521	0.70	4.09	$ 158.38	$ 155.40	$ 153.64
26	860	22,269	0.019	413	0.334	7,428	15,666	37,934	0.70	4.12	$ 159.05	$ 156.06	$ 154.25
27	880	22,687	0.018	418	0.333	7,555	16,064	38,752	0.71	4.20	$ 160.30	$ 157.30	$ 155.36
28	900	25,062	0.018	450	0.329	8,241	18,519	43,581	0.74	4.64	$ 166.90	$ 163.69	$ 161.57
29	920	25,314	0.018	453	0.329	8,327	18,670	43,984	0.74	4.69	$ 167.46	$ 164.22	$ 162.06
30	940	26,009	0.018	462	0.326	8,484	19,425	45,434	0.75	4.82	$ 169.01	$ 165.63	$ 163.18
31	960	26,290	0.018	465	0.326	8,571	19,691	45,980	0.75	4.87	$ 169.57	$ 166.16	$ 163.61
32	980	26,697	0.018	470	0.325	8,671	20,143	46,840	0.75	4.94	$ 170.34	$ 166.89	$ 164.14
33	1000	27,789	0.017	484	0.321	8,920	21,458	49,247	0.77	5.15	$ 172.34	$ 168.85	$ 165.50
34	1020	28,448	0.017	492	0.318	9,057	22,322	50,770	0.78	5.27	$ 173.45	$ 169.94	$ 166.31
35	1040	29,335	0.017	503	0.316	9,258	23,480	52,814	0.80	5.43	$ 174.76	$ 171.21	$ 167.23
36	1060	29,645	0.017	507	0.315	9,352	23,984	53,628	0.81	5.49	$ 175.17	$ 171.62	$ 167.41
37	1080	29,871	0.017	510	0.314	9,392	24,339	54,210	0.81	5.53	$ 175.44	$ 171.86	$ 167.56
38	1100	32,790	0.017	557	0.303	9,937	33,180	65,970	1.01	6.07	$ 179.25	$ 175.24	$ 168.37
39	1120	33,251	0.017	563	0.302	10,053	33,961	67,212	1.02	6.16	$ 179.64	$ 175.60	$ 168.57
40	1140	33,311	0.017	563	0.302	10,069	34,054	67,365	1.02	6.17	$ 179.68	$ 175.64	$ 168.59
41	1160	33,339	0.017	564	0.302	10,080	34,074	67,413	1.02	6.17	$ 179.69	$ 175.65	$ 168.60
42	1180	34,188	0.017	574	0.300	10,265	35,764	69,952	1.05	6.33	$ 180.04	$ 175.90	$ 168.56
43	1200	34,534	0.017	578	0.300	10,357	36,518	71,052	1.06	6.40	$ 180.13	$ 175.93	$ 168.46
44	1220	34,654	0.017	580	0.300	10,385	36,751	71,405	1.06	6.42	$ 180.15	$ 175.93	$ 168.43
45	1240	34,847	0.017	582	0.299	10,426	37,049	71,896	1.06	6.45	$ 180.16	$ 175.90	$ 168.37
46	1260	35,473	0.017	589	0.297	10,548	38,330	73,803	1.08	6.57	$ 180.11	$ 175.73	$ 167.69
47	1280	35,772	0.017	592	0.297	10,628	38,836	74,608	1.09	6.62	$ 180.05	$ 175.60	$ 167.52
48	1300	36,094	0.017	596	0.296	10,690	39,551	75,645	1.10	6.68	$ 179.92	$ 175.40	$ 167.21
49	1320	36,208	0.016	597	0.296	10,713	39,720	75,928	1.10	6.71	$ 179.88	$ 175.33	$ 167.10
50	1340	36,319	0.016	598	0.295	10,729	39,890	76,210	1.10	6.73	$ 179.81	$ 175.24	$ 166.97
51	1360	36,420	0.016	600	0.295	10,752	40,106	76,526	1.10	6.74	$ 179.75	$ 175.15	$ 166.86
52	1380	36,677	0.016	602	0.295	10,809	40,575	77,252	1.11	6.79	$ 179.55	$ 174.89	$ 166.49
53	1400	37,039	0.016	606	0.294	10,902	41,395	78,434	1.12	6.86	$ 179.20	$ 174.44	$ 165.89

Figure 15.2 Hasbrouck PbP Graph



15.2.4.4 Hasbrouck Pit Shells Selected for Design Guidance

The PbP results shown in Table 15.9 provide the basis for determining the ultimate pit limits for the Hasbrouck mine. The best discounted value for the specified case was obtained with pit shell 44, and this was used for guidance in pit design. In order to maximize the specified case discounted cash flow, other pit shells were used as pit phases or pushbacks in the analysis. These included pit shells 9, 18, and 30. These pit shells were also used for guidance for the design of phase 1, phase 2, and phase 3 respectively.

15.3 Pit Designs

Detailed pit designs were completed for both the Three Hills and Hasbrouck mines. Three hills was completed as a single ultimate pit and the Hasbrouck pit design was completed in 4 pit phases. All of the pit designs were completed in Surpac 6.4.1 software using similar design parameters.

15.3.1 Bench Height

Pit designs were created to use 20ft bench heights. This corresponds to the resource model block heights, and MDA believes this to be reasonable with respect to dilution and equipment anticipated to be used in mining.

15.3.2 Pit Design Slopes

Slope parameters were based on geotechnical studies provided by Golder Associates as previously discussed in sections 15.2.2.1 and 15.2.2.2.

15.3.2.1 Three Hills Pit Slope Design Parameters

Three Hills pit design has been completed to contain toes, crests, and ramp strings. The ultimate pit design was completed using 20ft bench heights. Slope parameters used are based on the recommendations of Golder (2015). Table 15.10 shows the parameters used for the Three Hills ultimate pit design.

Table 15.10 Three Hills Slope Design Parameters

	Catch Bench Separation (ft)	Bench Face Angle (degrees)	Catch Bench Width (ft)	Inter-Ramp Angle (degrees)	Max Height w/out Ramp or 65 ft. Geotech Bench (ft)
North Siebert	40	60°	35	35°	120
South Siebert	40	60°	25	40°	200
Fraction Tuff	40	70°	25	45°	200
Brougher Dacite Flow	40	70°	25	45°	200
Oddie Ryholite	40	70°	25	45°	200

15.3.2.2 Hasbrouck Pit Slope Design Parameters

Hasbrouck mine pit designs have been completed with toes, crest, and ramp access. The design was completed using 4 different pit phases in order to promote mining of higher value material as early as possible in the schedule. The slope recommendations were provided by Golder (2015). Table 15.11 shows the parameters used for the Hasbrouck pit designs based on wall height. The parameters were applied to all pit phases individually.

Table 15.11 Hasbrouck Pit Design Parameters

Overall Slope Hieght (ft)	No. of Geotech Catch Benches	Catch Bench Separation (ft)	Bench Face Angle (degrees)	Catch Bench Width (ft)	Inter-Ramp Angle (degrees)	Max Height w/out Ramp or 65 ft. Geotech Bench (ft)
<= 360	2	40	60°°	25	40°	120
360 to 480	3	40	60°	34	35°	120
480 to 600	4	40	60°	41	32°°	120
600 to 720	5	40	60°	46	30°	120
720 to 840	6	40	60°	52	28°	120

15.3.3 Haul Roads

Haul roads and ramps were designed for both mines to have a maximum centerline gradient of 10%. In areas where the ramps may curve along the outside of the pit, the inside gradient may be up to 11% or 12% for short distances. A portion of mining will occur in areas where mining benches are above the lowest crest point in the design. In some of these areas, haul roads have been designed inside of the ultimate pit footprint and ramps are not incorporated into the high-wall design. These haul roads provide access to upper benches and then are consumed by mining the pit.

In the interior pit phases for the Hasbrouck mine, a ramp is left in the high wall. These ramps are mined out by subsequent pit phases. Access to the upper benches of the ultimate pit is gained on the previous (phase 3) pit ramp left in the high wall, which is mined out in the final phase leaving a high wall without a ramp. After the pit is advanced below the lowest pit crest, ramp access is carried in the pit design.

The design anticipates the use of 100-ton type trucks. The ramp widths are based on the Caterpillar 777 style trucks with an operating width of 20ft. Haul roads are generally designed to be 90ft wide, which allows for 3.35 times the width of the truck for running width, plus another 23ft for a single berm at least half the tire height.

In the lower portion of the Three Hills ultimate pit, a slot cut is driven 80ft wide. This is used as a ramp, and the width is considered to be the minimum mining width. As the slot cut will not require berms, the width is sufficient for 2 way traffic.

Haulage outside of the pit is required to deliver material to the waste dumps and heap leach pad at Three Hills, and to the crusher or coarse stockpile at the Hasbrouck mine. In cases where these roads require a berm on each side, the road design width is 115ft. This allows for 69ft of running width.

15.3.4 Ultimate Pit Designs

Ultimate pit designs were developed for both the Three Hills and Hasbrouck mines. The ultimate pit for Three Hills is shown in Figure 15.3. The pit extends from the bottom elevation of 5,620ft to the upper crest at 5,990ft. The pit extents are approximately 1,400ft east to west and 2,125ft north to south.

The ultimate pit for Hasbrouck is shown in Figure 15.4. The top of Hasbrouck Mountain is about 6,270ft in elevation and the most upper crest of the ultimate pit is at approximately 5,960ft. The lowest bench of the ultimate pit is at 5,400ft elevation. The pit extents are approximately 2,500ft east to west and 1,900ft north to south.

Figure 15.3 Three Hills Ultimate Pit Design

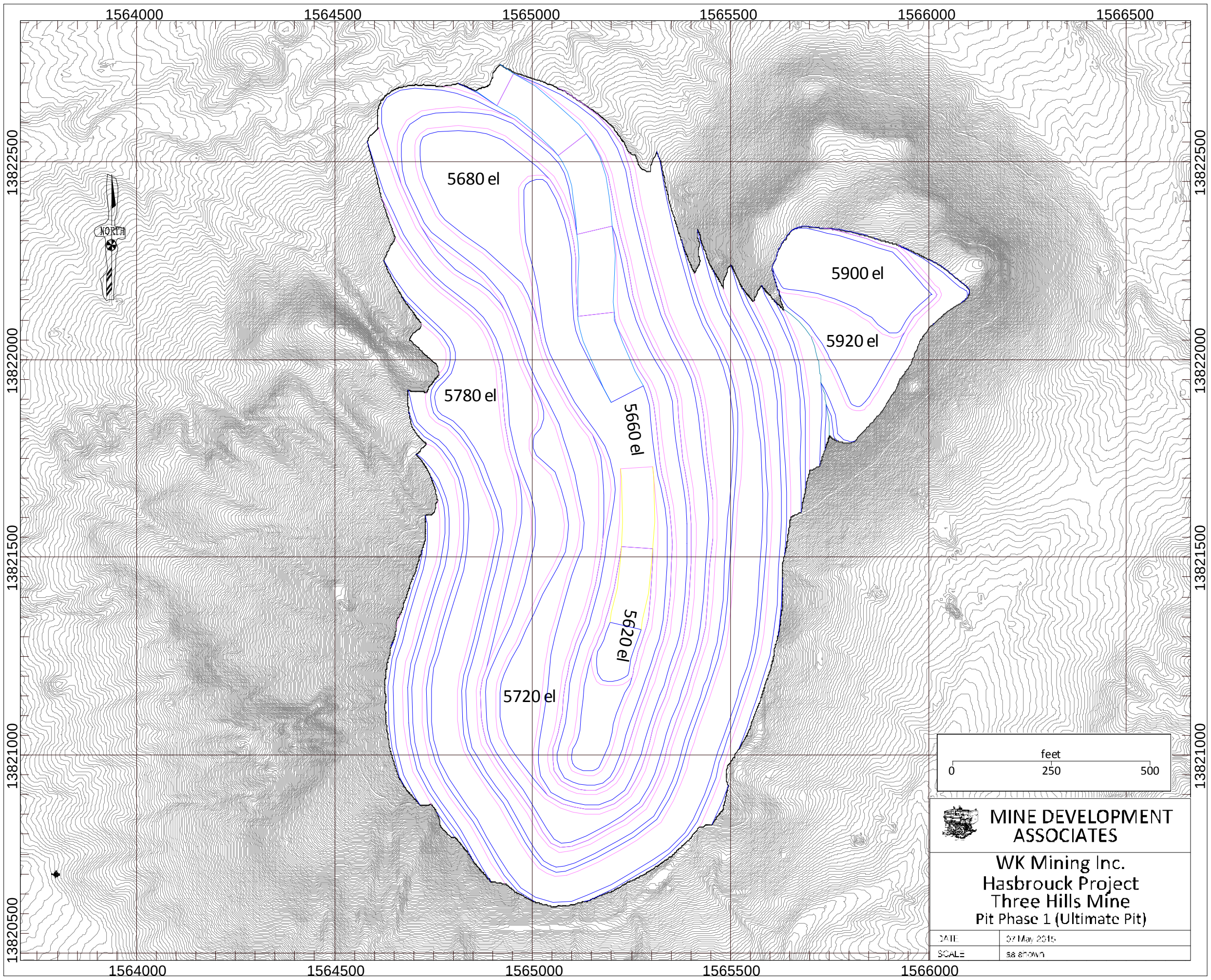
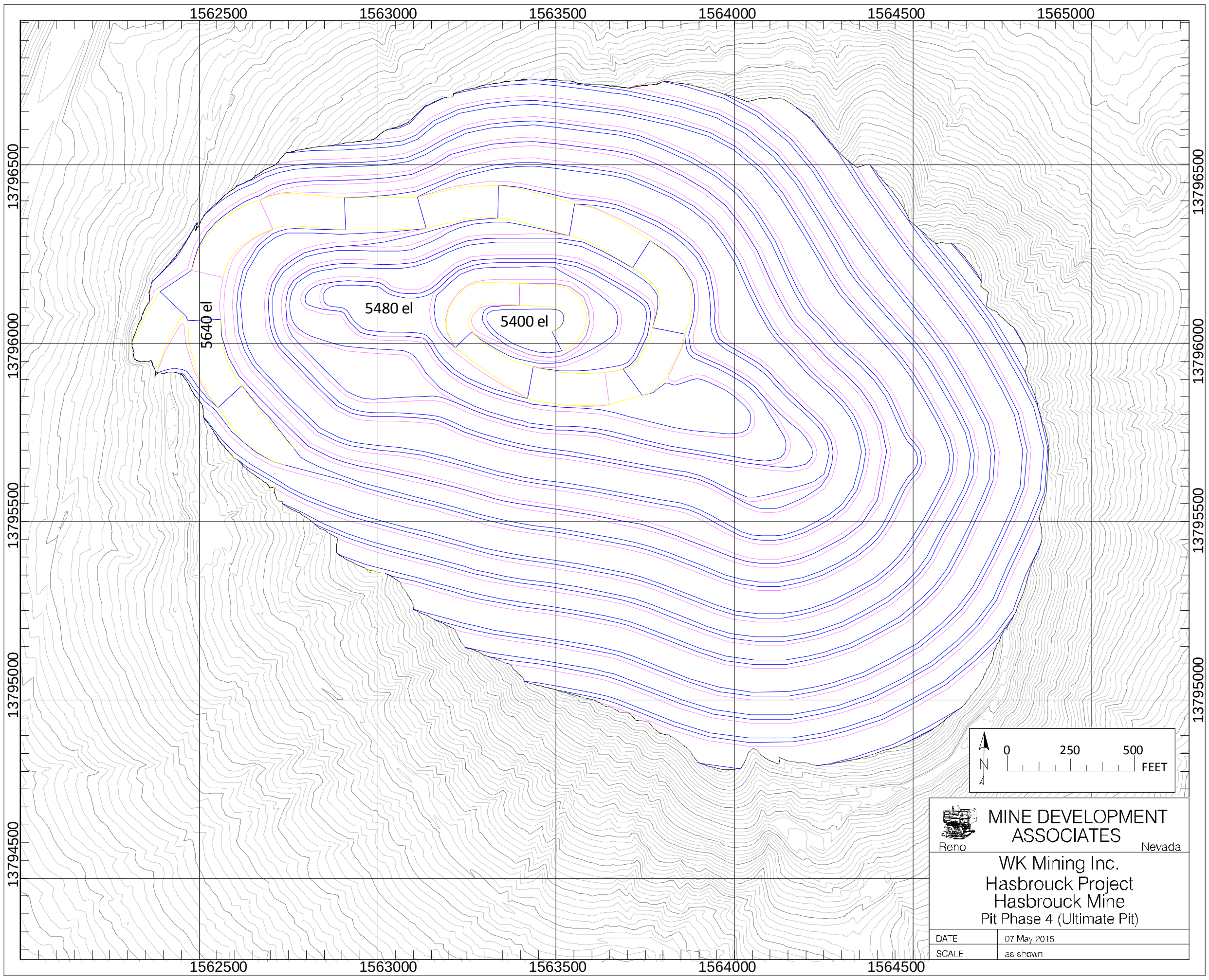


Figure 15.4 Hasbrouck Ultimate Pit Design (Phase 4)



15.3.5 Pit Phasing

The Three Hills pit was divided into 5 phases in order to sequence the mining of construction materials followed by ore. The pit phases are shown in Figure 15.5 and are described as follows:

- Phase 1: Consists primarily of Brougher Rhyolite to be used for leach-pad over-liner material and some access road material. Phase 1 does not contain any ore as defined and is mined solely to provide construction material.
- Phase 2: This contains a mixture of Brougher Rhyolite and Siebert waste material to be used for access roads and fill around the leach pad, ponds, and roads. Phase 2 does not contain any ore, and is also used only to provide construction material.
- Phase 3: Mines ore and waste from the top of the southern hill down to the 5,880ft elevation.

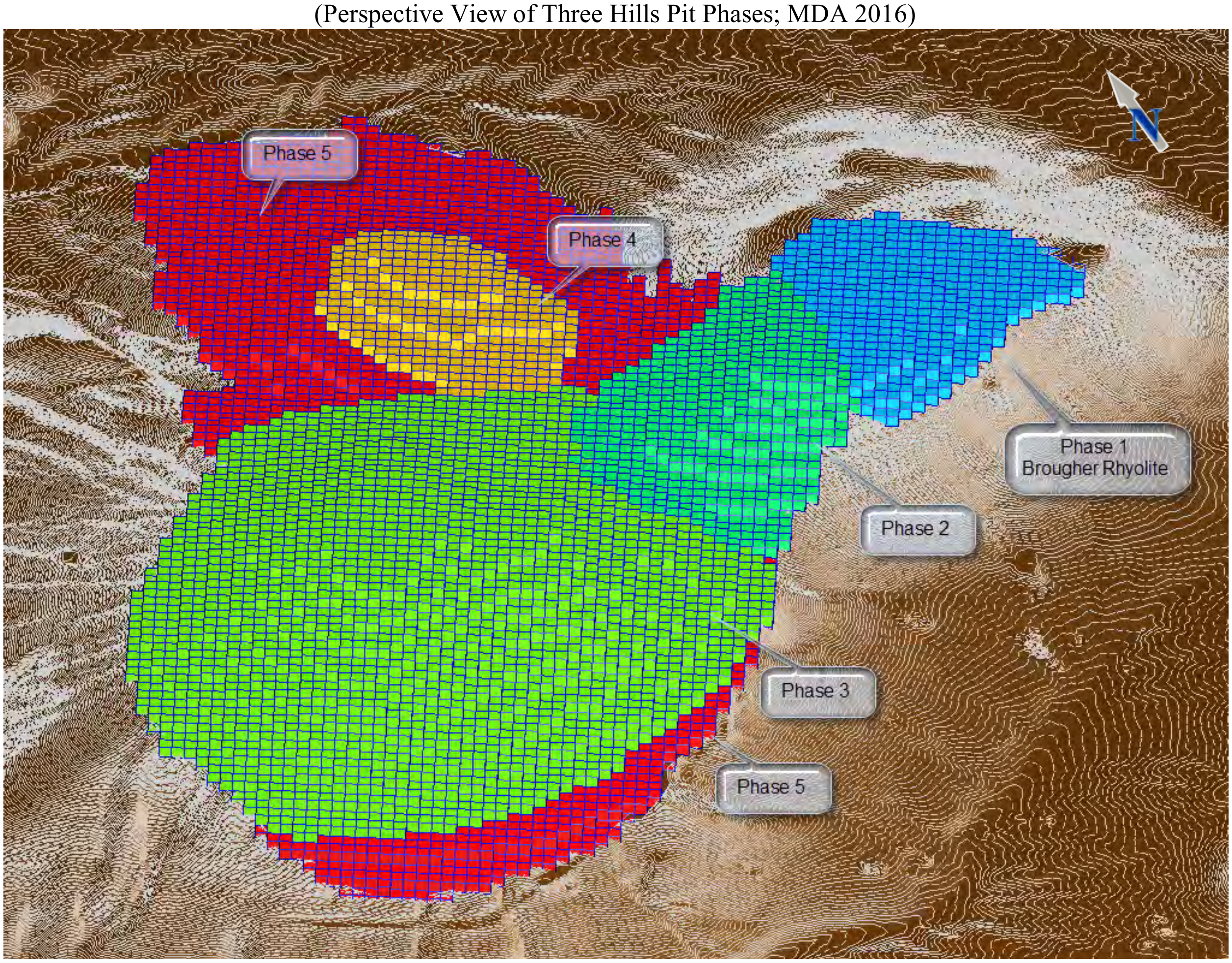
- Phase 4: Mines ore and waste from the top of the northern hill down to the 5,880ft elevation.

- Phase 5: Mines the remaining ore and waste to complete the ultimate pit.

Note that phase 1 was designed to include only Brougher Rhyolite material and to be mined approximately 300 feet to the east of the existing fiber optic cable that runs through the proposed ultimate pit. This allows for mining of this material prior to moving the fiber optic cable. This was done to facilitate the construction mining schedule.

It should also be noted that the phase 1 pit design was created outside of the optimized pit shell in order to provide the Brougher Rhyolite material. In all, a total of 347,000 tons of additional waste is mined due to this requirement. Additional testing is yet to be completed on the Oddie Rhyolite formation to determine if it would be suitable for construction materials. Should this be successful, then some of the additional waste may be reduced.

Figure 15.5 Perspective View of Three Hills Mine Pit Phases
(Perspective View of Three Hills Pit Phases; MDA 2016)



Note: Not to scale

Hasbrouck was designed to achieve the ultimate pit using 4 pit phases. These start at the top of the mountain and mine downward. The pits primarily work from west to east. The 4 pit phases are described as follows:

- Phase 1: Start mining on the top of the mountain at 6,270ft elevation. The bottom bench of phase 1 is at 5,700ft elevation. Access will be developed on the surface inside the pit boundary, and then mined out as phase 1 is mined down. The uppermost crest that is left behind is at the 6,170ft elevation. A ramp is left in the southeast high-wall of the pit for easy access to phase 2. The phase 1 pit design is shown in Figure 15.6.
- Phase 2: Mining starts at the crest of phase 1 (the 6,170ft elevation) and mines down to the bottom of phase 2 at the 5,600ft bench. The upper most crest of phase 2 is at approximately 6,110ft in elevation. Phase 2 pit design is shown in Figure 15.7.
- Phase 3: Mining starts at the crest of phase 2 (the 6,100ft bench) and continues to phase 3's ultimate depth at the 5,440ft elevation. Access is gained using the phase 2 ramp that was left behind. Again, a ramp is left in the high-wall of phase 3 to provide access for phase 4. Phase 3 pit design is shown in Figure 15.8.
- Phase 4: Mining starts at the phase 3 crest on the 6,060ft bench. Phase 4 achieves the ultimate pit with the bottom bench located at the 5,400ft elevation. This is the final pit phase and no ramps are left in the final high-wall. However, the wall is accessible every 120ft in height from the crest via the 65ft wide geotechnical benches. The ultimate pit shown in Figure 15.4 represents the phase 4 design.

Figure 15.6 Hasbrouck Phase 1 Pit Design

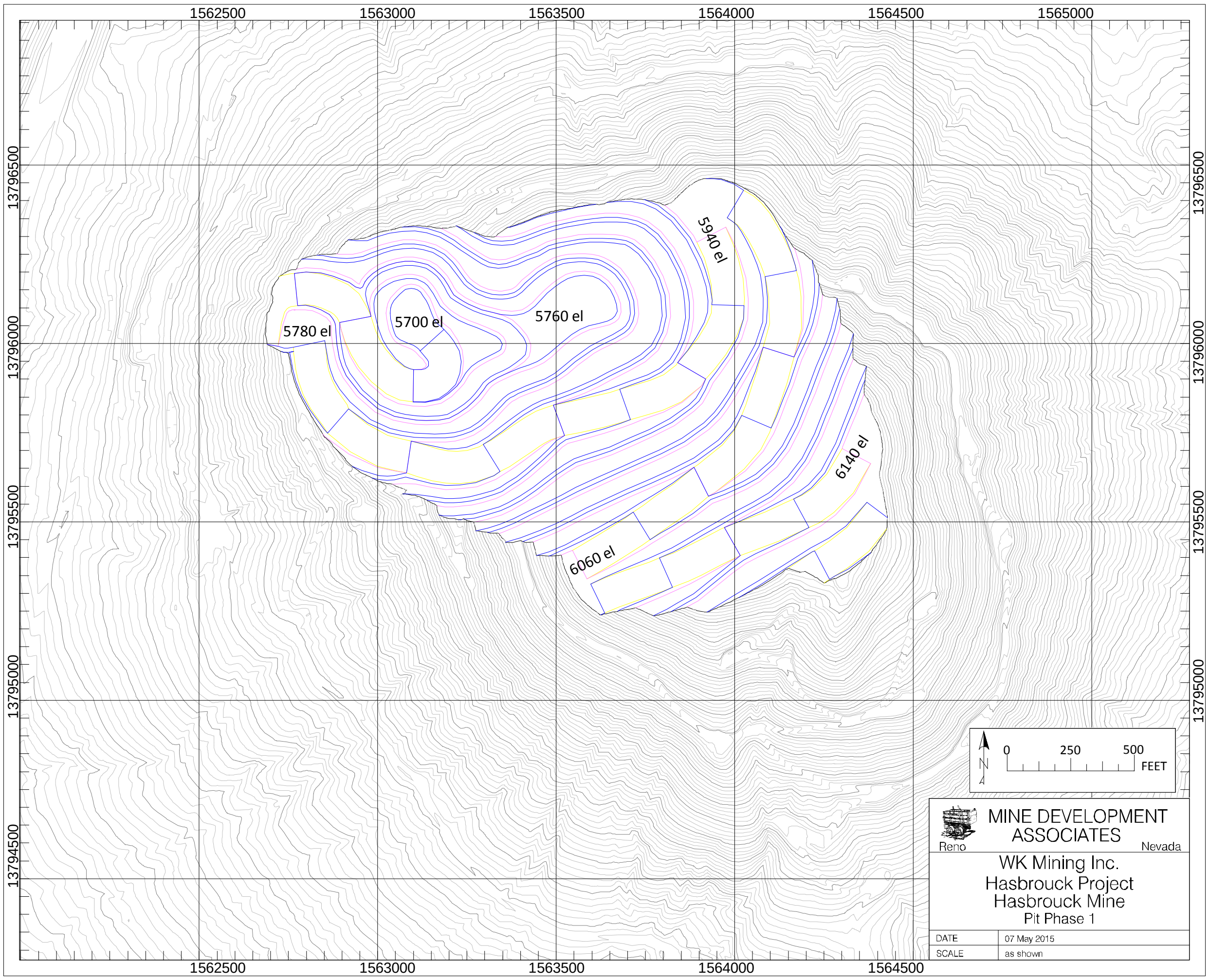


Figure 15.7 Hasbrouck Phase 2 Pit Design

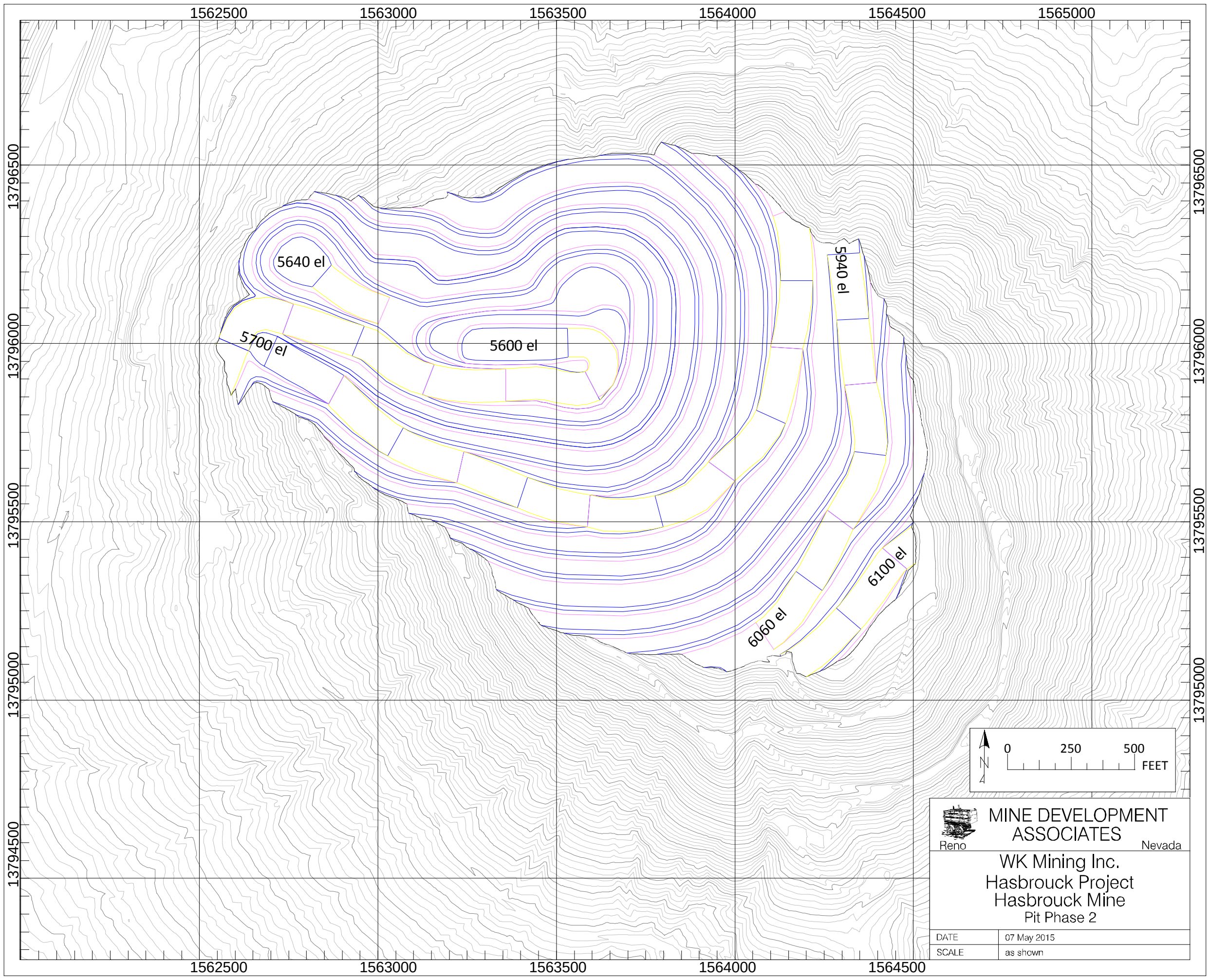
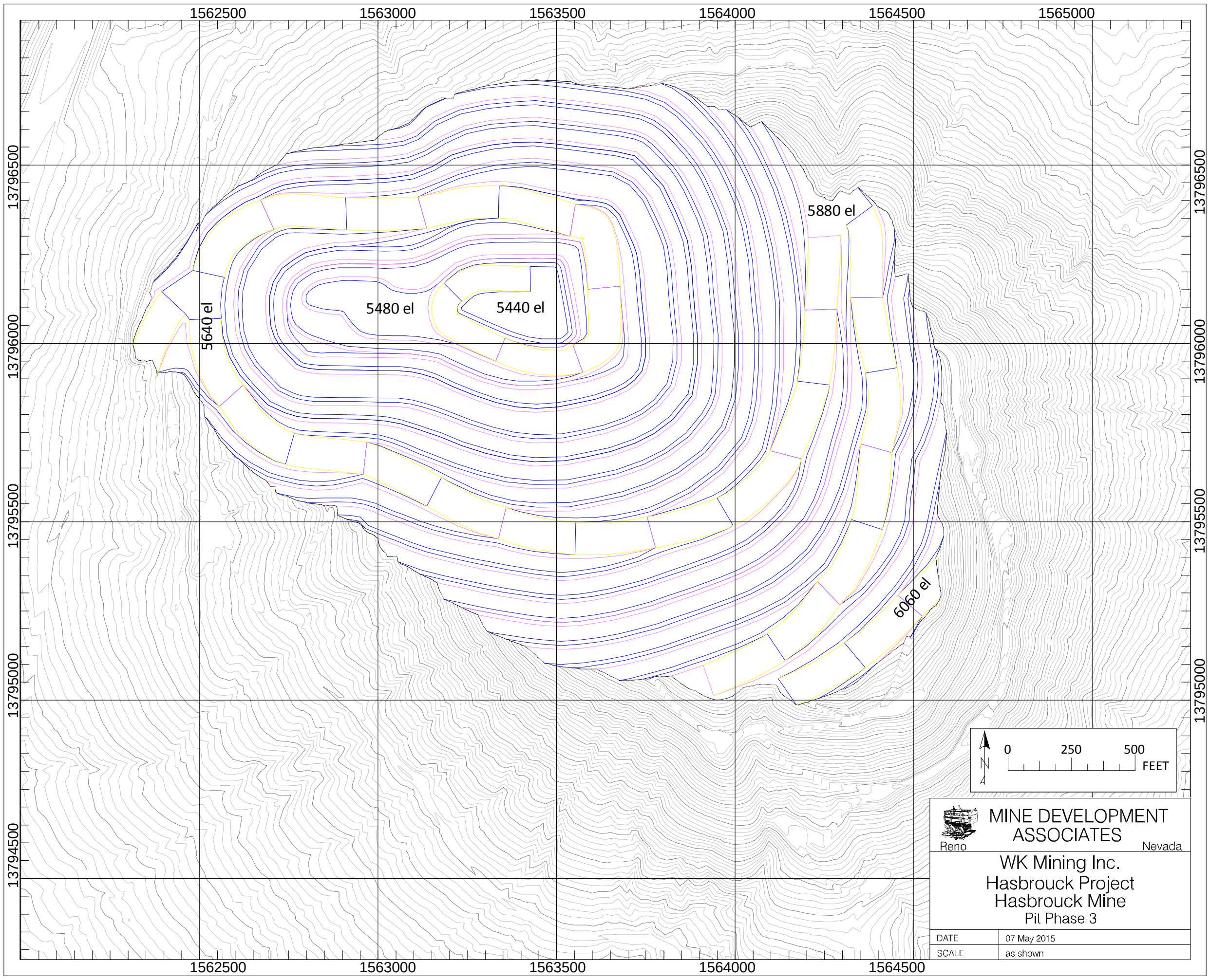


Figure 15.8 Hasbrouck Phase 3 Pit Design



15.4 Dilution

The resource models for the Three Hills and Hasbrouck deposits were created using 3-dimensional mineralized domains to confine the estimations by reporting grade and portion of each block within the various domains. The domains were then diluted back to the block size based on the contribution of each domain to the block. The resource models have block dimensions of 20ft long by 20ft wide by 20ft high for both Three Hills and Hasbrouck.

Because the resource models have been diluted to the block grades, MDA considers the block size to be reasonable and believes that this represents an appropriate amount of dilution for statement of reserves.

15.5 Three Hills and Hasbrouck Mine Proven and Probable Reserves

Table 15.12 through Table 15.15 report the Proven and Probable reserves for the Three Hills and Hasbrouck mines, based on the pit designs discussed in previous sections. These reserves are shown to be economically viable based on the Hasbrouck project cash flows created for the PFS and MDA believes that they are reasonable for the statement of Proven and Probable reserves. The reference point for the estimated reserves is at the exit from the respective open pits at the Three Hills and Hasbrouck mines. Summation discrepancies may be noticeable due to minor rounding issues.

Table 15.12 Three Hills Probable Reserves
(0.005oz Au/ton cutoff)

	K Tons	oz Au/ton	K Ozs Au
Probable	9,653	0.018	175

Cutoff grade for Three Hills reserves: 0.005 oz Au/ton

Table 15.13 Hasbrouck Proven and Probable Reserves

Upper Siebert	K Tons	oz Au/ton	K Ozs Au	oz Ag/ton	K Ozs Ag
Proven	1,301	0.020	26	0.387	504
Probable	5,576	0.016	89	0.260	1,452
Proven & Probable	6,877	0.017	114	0.284	1,955
Lower Siebert					
Proven	4,942	0.021	101	0.417	2,058
Probable	23,798	0.016	372	0.275	6,555
Proven & Probable	28,740	0.016	473	0.300	8,614
Total Hasbrouck					
Proven	6,242	0.020	127	0.410	2,562
Probable	29,374	0.016	461	0.273	8,007
Proven & Probable	35,617	0.017	588	0.297	10,569

Cutoff grade for Hasbrouck reserves: upper Siebert 0.008 oz Au/ton, and Hasbrouck lower Siebert 0.007 oz Au/ton

Table 15.14 Combined Three Hills and Hasbrouck Proven and Probable Reserves

	K Tons	oz Au/ton	K Ozs Au	oz Ag/ton	K Ozs Ag
Proven	6,242	0.020	127	0.410	2,562
Probable	39,028	0.016	635	0.205	8,007
Proven & Probable	45,270	0.017	762	0.233	10,569

Cutoff grade for Three Hills reserves: 0.005 oz Au/ton
Cutoff grade for Hasbrouck reserves: upper Siebert 0.008 oz Au/ton, and Hasbrouck lower Siebert 0.007 oz Au/ton

Table 15.15 Proven and Probable Reserves and Stripping by Pit Phase

		Proven Reserves					Probable Reserves					Proven & Probable Reserves					Waste	Total	Strip
	Pit	K Tons	oz Au/ton	K Ozs Au	oz Ag/ton	K Ozs Ag	K Tons	oz Au/ton	K Ozs Au	oz Ag/ton	K Ozs Ag	K Tons	oz Au/ton	K Ozs Au	oz Ag/ton	K Ozs Ag	K Tons	K Tons	Ratio
Three Hills	Ultimate Pit	-	-	-	-	-	9,653	0.018	175	-	-	9,653	0.018	175	-	-	8,331	17,984	0.86
Hasbrouck	Phase 1	2,467	0.025	63	0.493	1,217	7,915	0.018	142	0.282	2,232	10,383	0.020	205	0.332	3,449	5,091	15,474	0.49
	Phase 2	1,683	0.020	34	0.470	791	7,217	0.018	126	0.316	2,282	8,901	0.018	160	0.345	3,073	8,988	17,888	1.01
	Phase 3	1,253	0.013	16	0.300	376	8,627	0.014	117	0.281	2,420	9,880	0.013	133	0.283	2,796	10,595	20,475	1.07
	Phase 4	839	0.017	14	0.212	178	5,615	0.013	75	0.191	1,074	6,453	0.014	89	0.194	1,252	14,929	21,382	2.31
	Total	6,242	0.020	127	0.410	2,562	29,374	0.016	461	0.273	8,007	35,617	0.017	588	0.297	10,569	39,602	75,219	1.11
All Deposits	Total	6,242	0.020	127	0.410	2,562	39,028	0.016	635	0.205	8,007	45,270	0.017	762	0.233	10,569	47,933	93,203	1.06

15.5.1 Three Hills and Hasbrouck Mines In-pit Inferred Resources

Inferred resources at both Three Hills and Hasbrouck were considered as waste and not used in the economic analysis. The CIM definition of Inferred Resources is given below, with CIM's explanatory material shown in italics:

> An Inferred Mineral Resource is that part of a Mineral Resource for which quantity and grade or quality are estimated on the basis of limited geological evidence and sampling. Geological evidence is sufficient to imply but not verify geological and grade or quality continuity.
>
> An Inferred Mineral Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and must not be converted to a Mineral Reserve. It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.
>
> *An Inferred Mineral Resource is based on limited information and sampling gathered through appropriate sampling techniques from locations such as outcrops, trenches, pits, workings and drill holes. Inferred Mineral Resources must not be included in the economic analysis, production schedules, or estimated mine life in publicly disclosed Pre-Feasibility or Feasibility Studies, or in the Life of Mine plans and cash flow models of developed mines. Inferred Mineral Resources can only be used in economic studies as provided under NI 43-101.*
>
> *There may be circumstances, where appropriate sampling, testing, and other measurements are sufficient to demonstrate data integrity, geological and grade/quality continuity of a Measured or Indicated Mineral Resource, however, quality assurance and quality control, or other information may not meet all industry norms for the disclosure of an Indicated or Measured Mineral Resource. Under these circumstances, it may be reasonable for the Qualified Person to report an Inferred Mineral Resource if the Qualified Person has taken steps to verify the information meets the requirements of an Inferred Mineral Resource.*

In-pit Inferred resources are shown in Table 15.16. In-pit resources are presented using a 0.005 oz Au/ton cutoff grade for Three Hills, 0.008 oz Au/ton for Hasbrouck upper Siebert, and 0.007 oz Au/ton lower Siebert. The cutoff grades are reflective of the cutoffs used to report reserves. Note that resources use a cutoff of 0.005 oz Au/ton for all deposits.

Table 15.16 Total In-Pit Inferred Resources, Hasbrouck Project

	K Tons	oz Au/ton	K Ozs Au	oz Ag/ton	K Ozs Ag
Three Hills	342	0.007	2	-	-
Hasbrouck					
Upper Siebert	560	0.010	6	0.099	56
Lower Siebert	2,105	0.012	25	0.184	386
Total	2,665	0.011	31	0.166	442
Total In Pit Inferred Material	3,007	0.011	33	0.147	442

Cutoff grade for Three Hills: 0.005 oz Au/ton
Cutoff grade for Hasbrouck: upper Siebert 0.008 oz Au/ton, and Hasbrouck lower Siebert 0.007 oz Au/ton

16.0 MINING METHODS

The pre-feasibility for the Hasbrouck project includes mining at both the Three Hills Mine and the Hasbrouck Mine. These are planned as open-pit, truck and loader operations. The truck and loader method provides reasonable costs and selectivity for these deposits. Only open pit mining methods are considered for mining at the Hasbrouck project.

16.1 Definition of Mine Material Types

For production scheduling, material types were classified into ore or waste categories. Ore consists of only Proven and Probable reserves. For the Hasbrouck Mine, these are further divided into upper and lower Siebert ore, which have been tracked separately in order to recognize their different metallurgical recoveries. All ore is oxide.

Waste material was defined as all material inside of the pit designs that did not meet Proven and Probable reserve classifications. For Three Hills, waste was further divided into Brougher Rhyolite and other waste. All Inferred material was considered waste. A total of 8,331,000 tons of waste have been defined at Three Hills and 39,602,000 tons have been defined at Hasbrouck. Table 15.15 in Section 15.5 shows the tons of ore and waste to be mined by pit.

16.2 Mine Roads and Equipment Access

In-pit ramp dimensions were discussed previously in the Reserves section of this report. Haulage routes constructed outside of the pit were designed to all allow for two-way traffic. Sufficient running surface is to be maintained to allow for about 3.5 times the width of the haul trucks, and a sufficient berm at least half of the tallest tire of any vehicle using the road will have to be maintained. Roads outside of the pit that have a hill or dump next to them will require about 90 feet minimum width (including the berm), and roads where two berms are to be maintained will require 115 feet of width or more (also including berm widths).

The main haul roads from the pit exit to the crusher pad have been designed using gradients between 5% and 8%.

16.3 Waste Rock Storage Areas

16.3.1 Geotechnical Aspects of Waste Rock Storage Areas

The waste rock storage areas ("WRSA") at the Three Hills site were investigated during the September, 2014 geotechnical field investigation. Five test pits were excavated within the footprint of the proposed facility. The WRSA is currently sited along the west slopes of the topographic feature that is identified as the Three Hills. The upper portions of the WRSA will be founded on bedrock and the lower portions are founded on granular soils located along the base of Three Hills. Bedrock within the footprint of the WRSA is composed of rhyolite and tuff. The tuff is the same rock unit that underlies the HLF and is described as weak to extremely weak, slightly to moderately weathered, and relatively unfractured. When highly weathered or pulverized, the bedrock exhibited low plasticity. The rhyolite is described as slightly to moderately weathered, welded, and medium strong with localized strong silicified zones. The tuff is considered rippable with an appropriately sized dozer, while the rhyolite is considered marginally rippable with localized non-rippable zones.

Soils encountered along the base of the Three Hills slopes are described as silty and clayey sands, likely reworked from the volcanic tuff. Bedrock was encountered within 2ft of the ground surface for the majority of the test pits, with one test pit that encountered bedrock 8ft below ground surface. Roots were present to approximately 2ft below ground surface. Groundwater is not anticipated to influence the design, construction or operation of the waste rock storage areas.

The WRSAs at the Hasbrouck Mine will be sited along the south and east slopes of Hasbrouck Peak. It is anticipated the upper portions of the WRSAs will be founded directly on bedrock, and on granular soils in the lower portions of the WRSAs. Shallow bedrock is anticipated in areas of surficial soil cover. The areas along the base of Hasbrouck Peak are mapped as alluvial deposits and form the northern perimeter of the broad alluvial drainages that transmit water during periods of heavy precipitation. Bedrock along the slopes of Hasbrouck Peak is mapped as volcanic tuff, and is anticipated to be of similar properties to the tuff observed at the Three Hills site. Groundwater is not anticipated to influence the design, construction or operation of the WRSAs at the Hasbrouck Mine, as it is at considerable depth.

16.3.2 Waste Rock Storage Area Designs

Mined waste will initially be used as fill for construction in areas as required, such as for roads, leach pads, and for fill around the crusher. For the Hasbrouck Mine, some waste may be used for berm construction to contain rock that may roll off of the mountain during initial mining.

Mine waste storage has been designed as a single facility for Three Hills and two waste facilities for Hasbrouck (East and South waste rock storage areas). The Three Hills waste storage area includes a haul road leading from the base of the dump in the north to the upper dump lifts. This road has been designed with a 90 foot wide ramp at less than 10% gradient to provide two-way haul truck access. In addition, the lower portion of the dump contains a built in haul road that leads around the base of the dump to the ROM heap leach pad.

The Three Hills waste dump was designed to be constructed from the base up, starting with dumping of waste material to define the haul road to the leach pad. The dump would then be constructed in 20ft to 40ft lifts depending on the efficiencies and operations preference. The dump design assumes a 34° dump face and leaves catch benches 40ft wide for every 40ft in dumping height. This gives an inter-ramp slope of about 2.5H:1V. The overall slope of the dump is approximately 3.0H:1V and minimizes the effort required for reclamation at that overall slope. The Three Hills waste storage area is shown in Section 18.1 (Figure 18.1) and in the yearly pit position maps in Appendix B.

The Hasbrouck east waste rock storage area will be used primarily for waste mined from the upper benches in each phase, and thereafter the south waste storage area will be used as the main waste storage area. The east waste dump will be accessed from roads developed directly off of the upper mining benches over to the upper portion of the waste dump. It is currently envisioned that the dump will be built by starting from the upper benches, so no ramps are built into the lower portions of it. Dumping will begin at the crest of the designed dump and continue until a dumping face between 50ft and 100ft tall is developed. MDA believes that lifts up to 100ft tall can be safely dumped in this manner; however, it will be important to monitor these dump faces for stability during operation to ensure safety.

Once the upper lift has been dumped to a height of 100ft, a road will be established to the base of the dump, or slightly higher, where a second lift will be established and built out in a similar fashion. Once the lower lift has been dumped in, dumping can be continued on the upper lift. A dump toe is to be established by leaving a berm on the lower lift so that waste dumped from the upper lift is contained leaving room for a 76ft wide catch bench. This will allow for the return of truck traffic to the lower lift if additional dumping is to be done, and also allows for grading of the dump to a 3H:1V slope during final reclamation.

The east waste storage area has been designed to have a height of up to 330ft from the final crest to the lowest dump toe. The east waste storage area is shown in Section 18.1 (Figure 18.2) and in the yearly pit position maps in Appendix C.

The Hasbrouck south waste storage area is designed to be just south of the main haul road that comes out of the pit exits as shown in Section 18.1 (Figure 18.2) and in the yearly pit position maps in Appendix C. The road is intended to be the upper boundary of the dump and to provide access for equipment onto the various lifts. The dump will be constructed in the same manner as described for the east dump, dumping from the top until a 100ft lift height is established. Then a second lift will be started at, or just above, the dump toe and extended to the south until it has a desired lift height.

The Hasbrouck south waste storage area has been designed to have a height of up to 360ft from the final crest to the lowest dump toe.

Lift heights will need to be monitored to maintain a safe dump face. When dumping, the lift gradient should rise toward the dump face between 2% and 4% to allow for settling and solidification of the dump floor. The dump face should be tended to by a dozer to maintain a proper berm to keep trucks from backing over the edge. The dozer operator should be trained to watch for issues such as cracking or sloughing at the dump face. It is important that a wide dump face is worked to allow time for settling and inspection.

16.4 Stockpiles

Long term stockpiling strategies were not used for either the Three Hills or Hasbrouck mines. All ore from Three Hills will be placed directly on the ROM leach pad by haul trucks. At the Hasbrouck Mine, the ore will be hauled and directly dumped into the crusher as much as possible. A short term stockpiled has been planned near the crusher for when the crusher temporarily cannot keep up with ore haulage (such as unexpected down time at the primary crusher). This stockpile will be re-handled by the contract miner as required. The estimated mining costs include a provision that up to 3.5% of the ore would be re-handled.

16.5 Mine-Production Schedule

The pre-feasibility study has been based on contract mining of Three Hills and Hasbrouck mines. The mine production schedule has been assuming the use of loaders and 100-ton class trucks.

Production scheduling was completed using Geovia's MineSched™ (version 9.01) software. Proven and Probable reserves were used to schedule mine production, and Inferred resources inside of the pit were considered as waste. Additional detail was given to the mining of waste material required for fill and leach-pad over-liner material to be used for construction at Three Hills.

16.5.1 Three Hills Production Schedule

Three Hills production schedules have been completed based on a 15,000tpd production requirement for the ROM heap leach pad. As the ore is generally low grade, it may not be profitable to incur re-handling costs, so a major assumption was that stockpiles would not be used for Three Hills ore. In addition, a limit of 1 bench per month of mining was imposed, with the exception of the upper few benches which were not confined by a pit crest and will be small in total tonnage. The 1 bench limit was used as a rule of thumb to ensure that the mining schedule allows for the development and mining of benches in a realistic fashion and not overly aggressive.

Detailed monthly schedules were created for the construction period based on construction requirements for heap-leach over-liner and fill material requirements defined by NewFields. Waste scheduled to be mined for construction includes:

- 235,000 cubic yards (334,000 tons) of Brougher Rhyolite for over-liner material sent to a stockpile for crushing;
- 24,000 cubic yards (34,000tons) of Brougher Rhyolite sent to a stockpile for crushing prior to use for coarse road surfacing material;
- 134,000 cubic yards (185,000 tons) of fill material for fill around pond and plant facilities;
- 42,000 cubic yards (59,000 tons) of fill material for the heap-leach facility; and
- 69,000 cubic yards (90,000 tons) of fill material for roads.

In total, 504,000 cubic yards (702,000 tons) of waste material is now scheduled for construction purposes. The density of the material is assumed from the bulk density from the block model. A net swell factor of 1.3 was assumed based on about 1.4 through mining, followed by subsequent compaction when placed.

Construction material is mined from Three Hills phases 1 and 2, which corresponds to months -9 through -4. Production mining starts in month -2.

The production schedule was produced using monthly periods. Ore placed on the pad had a lag time applied so that gold production was not assumed at time of placement. The lag time was developed by MDA in coordination with Herb Osborne of H.C. Osborne and Associates and Carl Defilippi of KCA, who are QP's for the metallurgy and processing sections of this report, respectively. The schedule assumed that the full extraction of recoverable gold placed on the pad would take up to 7 months. Additional recovery of gold was applied during the drain-down period based on direction from H.C. Osbourne. For Three Hills, additional drain-down recovery of 2.5% was spread out over a 12 month period after operational recoveries were achieved. The operational recovery used was 79%, leading to an ultimate, total recovery of 81.5% after drain down. The percentage of that recovery assumed for each month is derived from Table 13.20 (see Section 13.8). The additional drain-down recoveries are also shown in Table 13.20.

16.5.2 Hasbrouck Production Schedule

Hasbrouck production schedules were completed based on a 17,500tpd production requirement. As mentioned previously, no long term stockpiles were assumed for Hasbrouck, and all ore is to be delivered to the crusher. A short term stockpile is planned near the crusher so that when the crusher is not available, trucks can dump without delay.

Subsequent to the 2015 PFS, additional studies were made to reduce the capital required to start the Hasbrouck Mine. It was determined that a 4-month delay would allow the Three Hills Mine to generate the returns required to fully fund the Hasbrouck Mine capital investment. Thus, mining at Hasbrouck was assumed to start 4 months after completion of Three Hills mining. This places the startup of Hasbrouck Mine in month 25 (25^{th} month after the start of production at Three Hills). Little pre-stripping is required as ore is located near the surface, though waste is mined early to assist in obtaining construction fill material. During the initial startup at Hasbrouck, some ore may be stockpiled in the short term stockpile until the crusher is available. The construction schedule for Hasbrouck Mine has not yet been detailed.

The production schedule for Hasbrouck was produced using monthly periods, and like Three Hills, a lag time for gold recovery was applied to ore sent through the crusher. The schedule assumed that the full extraction of recoverable gold placed on the pad would take 8 months. Upper Siebert ore was assigned a 55.6% recovery and lower Siebert was assigned a 76.6% recovery. Both ore types were assigned 11% recovery for silver. The recoverable ounces were calculated, and the lag times were applied as shown in Table 13.20. This table also shows the drain-down recovery used at the end of the operational recovery. A total of 1.5% additional recovery was used, and the drain-down recovery was completed over a 24-month period.

All waste material will be hauled to waste dumps as previously described for both Three Hills and Hasbrouck mines, except that material need for construction.

16.5.3 Combined Annual Production Schedule

Mine and process annual production schedules are shown in Table 16.1 and Table 16.2 respectively. Yearly pit and dump positions are shown in Appendix B and Appendix C.

Table 16.1 Annual Mine Production Schedule

		Units	Pre-Prod	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Total
Three Hills	Ore Mined	K Tons	540	5,450	3,664	-	-	-	-	-	-	-	9,653
		oz Au/ton	0.014	0.015	0.023	-	-	-	-	-	-	-	0.018
		K Ozs Au	8	84	83	-	-	-	-	-	-	-	175
	Pit to Dump	K Tons	966	4,735	2,630	-	-	-	-	-	-	-	8,331
	Total Tons	K Tons	1,506	10,185	6,293	-	-	-	-	-	-	-	17,984
	Strip Ratio	W:O	1.79	0.87	0.72								0.86
Hasbrouck Phase 1	Ore Mined	K Tons	-	-	905	4,675	3,048	1,755	-	-	-	-	10,383
		oz Au/ton	-	-	0.011	0.017	0.022	0.027	-	-	-	-	
		K Ozs Au	-	-	10	80	66	48	-	-	-	-	205
		oz Ag/ton	-	-	0.099	0.309	0.371	0.447	-	-	-	-	
		K Ozs Ag	-	-	89	1,444	1,130	785	-	-	-	-	3,449
	Pit to Dump	K Tons	-	-	2,065	2,264	505	256	-	-	-	-	5,091
	Total Tons	K Tons	-	-	2,970	6,940	3,553	2,011	-	-	-	-	15,474
	Strip Ratio	W:O			2.28	0.48	0.17	0.15					0.49
Hasbrouck Phase 2	Ore Mined	K Tons	-	-	-	1,273	2,521	2,954	2,152	-	-	-	8,901
		oz Au/ton	-	-	-	0.013	0.017	0.019	0.020	-	-	-	
		K Ozs Au	-	-	-	16	44	56	44	-	-	-	160
		oz Ag/ton	-	-	-	0.254	0.273	0.364	0.458	-	-	-	
		K Ozs Ag	-	-	-	323	689	1,074	987	-	-	-	3,073
	Pit to Dump	K Tons	-	-	675	5,667	1,032	1,251	362	-	-	-	8,988
	Total Tons	K Tons	-	-	675	6,940	3,553	4,206	2,515	-	-	-	17,888
	Strip Ratio	W:O			NA	4.45	0.41	0.42	0.17				1.01
Hasbrouck Phase 3	Ore Mined	K Tons	-	-	-	97	819	1,678	3,819	3,467	-	-	9,880
		oz Au/ton	-	-	-	0.010	0.012	0.013	0.013	0.015	-	-	
		K Ozs Au	-	-	-	1	10	22	51	50	-	-	133
		oz Ag/ton	-	-	-	0.032	0.153	0.177	0.283	0.373	-	-	
		K Ozs Ag	-	-	-	3	125	297	1,079	1,292	-	-	2,796
	Pit to Dump	K Tons	-	-	-	2,122	2,150	2,291	3,355	678	-	-	10,595
	Total Tons	K Tons	-	-	-	2,219	2,969	3,969	7,173	4,146	-	-	20,475
	Strip Ratio	W:O				21.90	2.62	1.37	0.88	0.20			1.07
Hasbrouck Phase 4	Ore Mined	K Tons	-	-	-	-	-	-	416	2,913	1,746	-	5,076
		oz Au/ton	-	-	-	-	-	-	0.010	0.012	0.017	-	
		K Ozs Au	-	-	-	-	-	-	4	36	29	-	69
		oz Ag/ton	-	-	-	-	-	-	0.014	0.106	0.238	-	
		K Ozs Ag	-	-	-	-	-	-	6	309	415	-	729
	Pit to Dump	K Tons	-	-	-	-	-	-	4,242	8,638	1,228	-	14,109
	Total Tons	K Tons	-	-	-	-	-	-	4,659	11,551	2,975	-	19,184
	Strip Ratio	W:O							10.19	2.97	0.70		2.78
Hasbrouck Phase 5	Ore Mined	K Tons	-	-	-	-	-	-	-	25	1,353	-	1,378
		oz Au/ton	-	-	-	-	-	-	-	0.013	0.015	-	
		K Ozs Au	-	-	-	-	-	-	-	0	20	-	20
		oz Ag/ton	-	-	-	-	-	-	-	0.411	0.378	-	
		K Ozs Ag	-	-	-	-	-	-	-	10	512	-	522
	Pit to Dump	K Tons	-	-	-	-	-	-	-	87	733	-	820
	Total Tons	K Tons	-	-	-	-	-	-	-	112	2,086	-	2,198
	Strip Ratio	W:O								3.50	0.54		0.60
Total	Ore Mined	K Tons	540	5,450	4,568	6,045	6,388	6,388	6,388	6,405	3,099	-	45,270
		oz Au/ton	0.014	0.015	0.020	0.016	0.019	0.020	0.015	0.014	0.016	-	0.017
		K Ozs Au	8	84	93	98	120	126	98	87	49	-	762
		oz Ag/ton	-	-	0.020	0.293	0.304	0.338	0.324	0.252	0.299	-	0.233
		K Ozs Ag	-	-	89	1,770	1,944	2,156	2,071	1,611	927	-	10,569
	Pit to Dump	K Tons	966	4,735	5,370	10,053	3,687	3,798	7,959	9,403	1,962	-	47,933
	Total Tons	K Tons	1,506	10,185	9,938	16,099	10,075	10,185	14,347	15,808	5,061	-	93,203
	Strip Ratio	W:O	1.79	0.87	1.18	1.66	0.58	0.59	1.25	1.47	0.63		1.06
	Rehandle	K Tons	-	-	-	377	641	639	639	639	624	5	3,562

Table 16.2 Annual Process Production Schedule

Three Hills Leach	Units	Pre-Prod	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10	Total
Material	K Tons	540	5,450	3,664	-	-	-	-	-	-	-	-	9,653
Placed on	oz Au/ton	0.014	0.015	0.023	-	-	-	-	-	-	-	-	0.018
Pad	K Ozs Au	8	84	83	-	-	-	-	-	-	-	-	175
Recoverable	K Ozs Au	6	67	65	-	-	-	-	-	-	-	-	138
Recovered	K Ozs Au	-	54	83	5	-	-	-	-	-	-	-	142
Cumulative Recovery	%		59.0%	78.6%	81.5%								
Hasbrouck Leach													
Upper Seibert Material	K Tons	-	-	905	4,208	1,561	201	3	-	-	-	-	6,877
Placed on	oz Au/ton	-	-	0.011	0.016	0.022	0.024	0.008	-	-	-	-	0.017
Pad	K Ozs Au	-	-	10	66	34	5	0	-	-	-	-	114
	oz Ag/ton	-	-	0.099	0.281	0.367	0.553	0.000	-	-	-	-	0.284
	K Ozs Ag	-	-	89	1,182	573	111	0	-	-	-	-	1,955
Recoverable Au	K Ozs Au	-	-	5	37	19	3	0	-	-	-	-	64
Recovered Au	K Ozs Au	-	-	0	35	23	5	0	0	-	1	1	65
Cumulative Au Recovery	%			3.0%	46.4%	53.1%	55.6%	55.6%	55.6%		56.2%	57.1%	
Recoverable Ag	K Ozs Ag	-	-	10	130	63	12	0	-	-	-	-	215
Recovered Ag	K Ozs Ag	-	-	0	115	79	22	0	0	-	-	-	215
Cumulative Ag Recovery	%			0.1%	9.0%	10.5%	11.0%	11.0%	11.0%				
Non-Upper Seibert Material	K Tons	-	-	-	1,838	4,827	6,187	6,384	6,405	3,099	-	-	28,740
Placed on	oz Au/ton	-	-	-	0.017	0.018	0.020	0.015	0.014	0.016	-	-	0.016
Pad	K Ozs Au	-	-	-	32	86	121	98	87	49	-	-	473
	oz Ag/ton	-	-	-	0.320	0.284	0.331	0.324	0.252	0.299	-	-	0.300
	K Ozs Ag	-	-	-	588	1,371	2,045	2,071	1,611	927	-	-	8,614
Recoverable Au	K Ozs Au	-	-	-	24	66	93	75	66	38	-	-	363
Recovered Au	K Ozs Au	-	-	-	15	58	93	81	65	51	3	4	370
Cumulative Au Recovery	%				47.8%	62.0%	69.4%	73.1%	73.4%	76.6%	77.2%	78.1%	
Recoverable Ag	K Ozs Ag	-	-	-	65	151	225	228	177	102	-	-	948
Recovered Ag	K Ozs Ag	-	-	-	40	136	212	243	191	125	-	-	948
Cumulative Ag Recovery	%				6.9%	9.0%	9.7%	10.4%	10.7%	11.0%			
All HBM Material (Upper & Lower Seibert) Material	K Tons	-	-	905	6,045	6,388	6,388	6,388	6,405	3,099	-	-	35,617
Placed on	oz Au/ton	-	-	0.011	0.016	0.019	0.020	0.015	0.014	0.016	-	-	0.017
Pad	K Ozs Au	-	-	10	98	120	126	98	87	49	-	-	588
	oz Ag/ton	-	-	0.099	0.293	0.304	0.338	0.324	0.252	0.299	-	-	0.297
	K Ozs Ag	-	-	89	1,770	1,944	2,156	2,071	1,611	927	-	-	10,569
Recoverable Au	K Ozs Au	-	-	5	61	85	96	75	66	38	-	-	426
Recovered Au	K Ozs Au	-	-	0	50	81	98	81	65	51	4	5	435
Cumulative Au Recovery	%			3.0%	46.8%	57.7%	64.9%	68.6%	69.6%	72.5%	73.1%	74.0%	
Recoverable Ag	K Ozs Ag	-	-	10	195	214	237	228	177	102	-	-	1,163
Recovered Ag	K Ozs Ag	-	-	0	155	215	234	243	191	125	-	-	1,163
Cumulative Ag Recovery	%			0.1%	8.3%	9.7%	10.1%	10.5%	10.8%	11.0%			
Total Au Production	K Ozs Au	-	54	83	55	81	98	81	65	51	4	5	577
Total Ag Production	K Ozs Ag	-	-	0	155	215	234	243	191	125	-	-	1,163
Total - All Leach													
Material	K Tons	540	5,450	4,568	6,045	6,388	6,388	6,388	6,405	3,099	-	-	45,270
Placed on	oz Au/ton	0.014	0.015	0.020	0.016	0.019	0.020	0.015	0.014	0.016	-	-	0.017
Pad	K Ozs Au	8	84	93	98	120	126	98	87	49	-	-	762
	oz Ag/ton	-	-	0.020	0.293	0.304	0.338	0.324	0.252	0.299	-	-	0.233
	K Ozs Ag	-	-	89	1,770	1,944	2,156	2,071	1,611	927	-	-	10,569
Total Au Production	K Ozs Au	-	54	83	55	81	98	81	65	51	4	5	577
Total Ag Production	K Ozs Ag	-	-	0	155	215	234	243	191	125	-	-	1,163
Cumulative Recovery - Au	%	0.0%	59.0%	74.6%	68.3%	68.1%	70.4%	72.2%	72.5%	74.6%	75.0%	75.7%	
Cumulative Recovery - Ag	%			0.1%	8.3%	9.7%	10.1%	10.5%	10.8%	11.0%			

16.6 Consumables

Major mining consumables include ANFO used in blasting operations and fuel used for equipment and blasting. Table 16.3 shows estimated ANFO and fuel consumptions.

Table 16.3 Major Mining Consumables

Blasting Consumables	Units	Pre-Prod	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Total
Bulk ANFO	Tons	140	955	928	1,512	941	952	1,340	1,477	473	-	8,718
Fuel Requirements												
Drilling	K Gal	32	222	214	351	219	222	313	344	110	-	2,027
Blasting	K Gal	13	28	27	34	27	27	32	34	15	-	237
Loading	K Gal	39	263	260	435	281	284	391	429	141	-	2,523
Haulage	K Gal	85	625	645	1,002	571	563	901	977	344	-	5,714
Support	K Gal	144	209	214	210	209	209	209	210	123	-	1,740
Maintenance	K Gal	26	39	39	39	39	39	39	39	23	-	323
Total	K Gal	339	1,386	1,400	2,072	1,347	1,345	1,886	2,033	756	-	12,564

16.7 Equipment Selection and Productivities

The production schedules were established to mine required waste while fulfilling ore requirements to the leach pad or crusher. Mine production was scheduled assuming contractors would mine using Cat 992 style loaders and 100-ton capacity haul trucks. Three Hills mining productivity rates will vary between about 500,000 tons per month at startup, to around 900,000 tons of month during peak mining. Ramp up of production is done over about 4 months. Mining starts in month -9 to mine waste material required for over-liner material and construction fill. Production mining starts in Month -2 where both waste and ore is mined. The ore will be placed directly on the leach pad assuming that permission to load the pad is given by permitting agencies. The average mining rate is about 860,000 tons per month after ramp up of production. Maximum tons per day of 1,500 tons per day to the pad is assumed.

Mining rates at Hasbrouck were developed in order to supply a maximum of 1,750 tons per day to processing facilities. The average peak mining rate of about 1.4 million tons per month.

Mining productivities assumed a mining schedule, equipment productivities, operating efficiencies, and availabilities.

The following subsections describe the mine operating scheduled and productivity assumptions.

16.7.1 Mine Operating Schedule

The mine operating schedule assumes 2 shifts, 12-hours per shift, 365 days per year. The operating schedule assumes 6 days of holidays and 4 weather delay days per year. However, holidays will likely use skeleton crews to achieve production. Table 16.4 shows the yearly mine operating schedule. This includes estimates for standby and delay times. Overall, the shift operating efficiency, a measure of available work time in the shift compared to 12 hours per shift, is 87.5%. Yearly operating efficiency taking into consideration holidays and weather delays, is 85.1%.

Table 16.4 Mine Operating Schedule

	Units	Pre-Prod	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Total
	K Tons Mined	1,506	10,185	9,938	16,099	10,075	10,185	14,347	15,808	5,061	-	93,203
	K Tons Rehandel	-	-	90	605	639	639	639	641	310	-	3,562
	Total K Tons Moved	1,506	10,185	10,029	16,703	10,714	10,824	14,985	16,449	5,371	-	96,765
Standby Time	Days per Period	243	365	365	366	365	365	365	366	215	-	3,015
	Holidays per Period	4	6	6	6	6	6	6	6	5	-	51
	Weather Delays	3	4	4	4	4	4	4	4	2	-	33
	Days per Week	7	7	7	7	7	7	7	7	7	-	
	Shifts per Day	2	2	2	2	2	2	2	2	2	-	
	Hrs per Shift	12	12	12	12	12	12	12	12	12	-	
	Scheduled Hrs / Period	5,664	8,520	8,520	8,544	8,520	8,520	8,520	8,544	4,992	-	70,344
Delays / Efficiency	Lunch Breaks	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	-	
	Shift Startup / Shutdown	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	-	
	Breaks	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	-	
	Safety / Training Hrs/Shift	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	-	
	Misc - Blast & Move	-	-	-	-	-	-	-	-	-	-	
	Operator Hours after Misc	4,956	7,455	7,455	7,476	7,455	7,455	7,455	7,476	4,368	-	61,551
	Shift Operator Efficiency	87.5%	87.5%	87.5%	87.5%	87.5%	87.5%	87.5%	87.5%	87.5%	0.0%	87.5%
	Schedule Operator Efficiency	85.0%	85.1%	85.1%	85.1%	85.1%	85.1%	85.1%	85.1%	84.7%	0.0%	85.1%

16.7.2 Equipment Requirements

Equipment requirements were determined using the mine operating schedule, applying operating efficiency, equipment availability, and productivity estimates. Estimated equipment requirements are shown in Table 16.5.

Table 16.5 Equipment Requirements

Drill Requirements	Units	Pre-Prod	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Total
Number of Production Drills	#	1	2	2	3	3	2	4	5	3	-	5
Operating Efficiency	%	85%	85%	85%	85%	85%	85%	85%	85%	85%	0%	85%
Drill Availability	%	90%	89%	59%	88%	87%	86%	85%	85%	85%	0%	84%
Operating Hours	Op Hrs	1,365	11,013	10,126	17,410	10,892	11,011	15,510	17,090	5,471	-	99,889
Available Equipment Hours	Avail Hrs	3,326	13,333	9,249	19,681	13,482	12,785	17,886	20,652	7,997	-	118,392
Use of Available Equipment Hours	%	41%	83%	109%	88%	81%	86%	87%	83%	68%	0%	84%
Loader Requirements												
Number of Loaders	#	1	2	3	3	2	2	3	3	2	-	3
Operating Efficiency	%	85%	85%	85%	85%	85%	85%	85%	85%	85%	0%	85%
Loader Availability	%	90%	90%	88%	84%	80%	80%	81%	81%	79%	0%	83%
Operating Hours	Op Hrs	1,403	9,487	9,363	15,700	10,128	10,231	14,107	15,471	5,075	-	90,965
Equipment Hours	Eq Hrs	1,603	10,842	10,700	17,942	11,575	11,693	16,123	17,681	5,800	-	103,960
Available Equipment Hours	Op Hrs	4,460	13,363	14,348	19,818	19,538	19,377	19,147	19,126	11,138	-	140,316
Use of Available Equipment Hours	%	36%	81%	75%	91%	59%	60%	84%	92%	52%	0%	74%
Haulage Requirements												
Number of Trucks	#	4	5	8	8	8	8	10	10	7	-	10
Operating Efficiency	%	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	1.00	-	0.86
Truck Availability	%	0.90	0.89	0.88	0.88	0.87	0.86	0.86	0.86	1.00	-	0.88
Operating Hours	Op Hrs	4,312	31,568	32,579	50,626	28,846	28,444	45,522	49,340	17,355	-	288,592
Equipment Hours	Eq Hrs	4,929	36,078	37,233	57,858	32,967	32,507	52,025	56,388	19,835	-	329,819
Available Equipment Hours	Op Hrs	13,435	38,022	42,110	60,279	59,428	58,747	64,734	71,764	24,104	-	432,623
Use of Available Equipment Hours	%	37%	95%	88%	96%	55%	55%	80%	79%	82%	0%	76%
Support Equipment												
Water Truck - 20,000 Gallon	#	1	1	1	1	1	1	1	1	1	-	1
430 Kw Dozer (D10)	#	-	-	-	-	-	-	-	-	-	-	-
300 Kw Dozer (D9)	#	1	1	1	1	1	1	1	1	1	-	1
230 Kw Dozer (D8)	#	1	1	1	1	1	1	1	1	1	-	1
14' Motor Grader (14M)	#	1	1	1	1	1	1	1	1	1	-	1
50 ton Crane	#	1	1	1	1	1	1	1	1	1	-	1
Pit Pumps (5299 lpm)	#	-	-	-	-	-	-	-	-	-	-	-
Light Plants	#	1	3	3	3	3	3	3	3	3	-	3

16.7.3 Drill & Blast Productivity

Drilling productivities were based on the operating schedule, drill penetration rates, blast pattern dimensions, bit sizes, and non-drill time. Blast patterns were defined for production, trim row, and pioneer drilling. The bulk of the drilling for blasting operations is done with production drilling using 45,000 pound pull-down type rotary blast hole drills with 8.75-inch diameter drills. Trim-row blasting is a technique used for controlled blasting around the perimeter of the ultimate pit. This drilling is done using the production drills, but with a 6.75-inch drill bit. Pioneer drilling is only done at the start of mining using smaller drills that are more mobile. These drills are only used during the first two months of mining at each deposit and use a 4.75-inch drill bit.

Drilling parameters for production, trim-row, and pioneer drilling is shown in Table 16.6.

Penetration rates were estimated using the Bauer and Calder equation adjusted to achieve reasonable penetration rates based on MDA experience. Penetration rates of 78, 105, and 106 feet per hour were used for production, trim row, and pioneer drilling respectively.

Non-drill times account for the steel handling and setup and move times. A total of 1.70, 1.70, and 2.20 minutes were used for production, trim-row, and pioneer drilling.

Table 16.6 Blast-Hole Drilling Parameters

		Production	Trim Rows	Pioneering
	Units	Imperial	Imperial	Imperial
Bench Height	Feet	20.0	20.0	20.0
Hole Diameter	Inches	8.75	6.75	4.75
Spacing	Feet	15.00	13.00	9.00
Burden	Feet	15.00	13.00	9.00
Area of Influence	$Feet^2$	225.00	169.05	80.99
Sub Drill	Feet	5.00	4.30	3.00
Stemming	Feet	10.00	8.67	6.00
Powder Colum	Feet	15.01	15.65	17.01
Loading Density	Lbs/Ft	4.96	2.95	1.46
Powder/hole	Lbs	74.52	46.22	24.90
ANFO SG	SG	0.85	0.85	0.85
Rock SG	SG	2.70	2.70	2.70
Tons per Hole	Tons	379.5	285.1	136.6
Powder Factor	Lb/Ton	0.196	0.162	0.182
Powder Factor	Lbs/ft^3	0.017	0.014	0.015

16.7.4 Loading Productivity

Loading productivities assume the use of CAT 100-ton trucks with CAT 992 style loaders. Bucket size of 15.2 cubic yards is assumed along with a fill factor of 95%. A cycle time of 50 seconds per bucket is assumed, and the loading assumes that trucks are loaded to full 100 wet-ton capacity. The loading productivity parameters and calculations are shown in Table 16.7. Theoretical productivity is estimated to be 1,263 tons per hour and with operating efficiency of 85% is estimated to be 1,050 tons per hour.

Loader availabilities were assumed to start at 90% and then reduced 1% per year until a minimum of 85% is reached.

Table 16.7 Loading Productivity Calculations

Loading Parameters		992K 777G
Shovel Mech. Avail.	%	85%
Operating Efficiency	%	83%
Bucket Capacity	cy	16
Bucket Fill Factor	%	95%
Avg. Cycle Time	sec	50
Truck Parameters		
Truck Mech. Avail.	%	85%
Operating Efficiency	%	83%
Volume Capacity	cym	78.6
Tonnage Capacity	lt (Wet)	100
Truck Spot Time	sec	24
Truck Operating Width	m	5.98

Shovel Productivity		992K 777G
Effective Bucket Capacity	cyd	15.20
Tonnes per Pass - Wet	lst (Wet)	20.2
Tonnes per Pass - Dry	lst (Dry)	19.4
Theoretical Passes - Vol	passes	5.17
Theoretical Passes - Wt	passes	4.95
Actual Passes Used	passes	5.0
Truck Tonnage - Wet	wmt/load	100
Truck Tonnage - Dry	dmt/load	96
Truck Capacity Utilized - Vol	%	96%
Truck Capacity Utilized - Wt	%	100%
Load Time	min	4.57
Theoretical Productivity	dst/hr	1,263
Tonnes per Operating Hour	dst/hr	1,050
Tonnes per Day	dst/day	18,700
Potential - 355 day year	ton/year	6,638,500

16.7.5 Haul Truck Productivity

Mine loading and haulage requirements were determined based on the amount of tonnage needed to be moved to achieve the desired process production rate. MineSched software was used to determine the truck hours and the number of trucks required to achieve the production. Road centerlines were developed and input into MineSched to represent the haulage routes. Speeds were flagged into the centerlines based on CAT 777 performance curves. Maximum speed limits were set to:

- Level travel – 30 mph (downhill gradient less than 4%);
- Downhill loaded – 25 mph; and
- Downhill empty – 30 mph.

Travel uphill on ramps is governed by the truck performance curve. Bench travel was assumed to be 12 mph.

Haul truck efficiencies were assumed to be 85%, of available working time. Availabilities assumed a starting point of 90% for new fleets declining at 1% per year down to a low of 85%. Haulage truck hours calculated in MineSched ("MS Hrs") are shown in Table 16.8 for ore and waste by deposit. Haul cycle times include 4.70 minutes spot and load time and 1.00 minute turn and dump time per 90 ton load. Productivity calculations assumed 100-ton trucks would carry 90-dry tons per load to coordinate the tonnage with dry tonnage in the resource model. Haul cycles for stockpile re-handle of 8.70 minutes per load were assumed which includes load, spot, and dump times.

Note that the MS Hrs were considered to be theoretical or productive hours without any operational interruptions. Operating hours were calculated from the productive hours by dividing them by the operational efficiency of 85%. Further, the equipment hours assumed that the trucks would be running through standby time determined from the mine operating schedule. Thus, the equipment hours used to determine haulage equipment cost were calculated by dividing the operating hours by 87.5% shift operator efficiency.

Table 16.8 Haulage Hours and Cycle Times

	Material	Units	Pre-Prod	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Total
Three Hills	Waste	MS Hrs	1,937	10,568	6,445	-	-	-	-	-	-	-	18,950
	Ore	MS Hrs	1,728	16,265	10,637	-	-	-	-	-	-	-	28,630
	Waste	K Tons	966	4,735	2,630	-	-	-	-	-	-	-	8,331
	Ore	K Tons	540	5,450	3,664	-	-	-	-	-	-	-	9,653
	Waste	CT Min	5.16	6.36	7.53	-	-	-	-	-	-	-	6.64
	Ore	CT Min	11.58	10.43	9.98	-	-	-	-	-	-	-	10.33
Hasbrouck	Waste	MS Hrs	-	-	8,062	27,373	9,058	9,265	22,472	23,747	5,399	-	105,377
	Ore	MS Hrs	-	-	2,403	14,685	14,432	13,883	15,192	17,160	8,854	-	86,608
	Waste	K Tons	-	-	2,740	10,053	3,687	3,798	7,959	9,403	1,962	-	39,602
	Ore	K Tons	-	-	905	6,045	6,388	6,388	6,388	6,405	3,099	-	35,617
	Waste	CT Min	-	-	10.19	9.11	7.57	7.52	10.45	7.94	1.06	-	8.53
	Ore	CT Min	-	-	8.64	7.43	6.51	6.06	7.21	8.77	1.04	-	6.66
Rehandle	Ore	MS Hrs	-	-	154	1,028	1,086	1,086	1,086	1,089	527	-	6,057
(Hasbrouck Only)		K Tons	-	-	90	605	639	639	639	641	310	-	3,562
		CT Min	-	-	8.70	8.70	8.70	8.70	8.70	8.70	8.70	-	8.70
Total - All Mining	Waste	MS Hrs	1,937	10,568	14,507	27,373	9,058	9,265	22,472	23,747	5,399	-	124,327
	Ore	MS Hrs	1,728	16,265	13,039	14,685	14,432	13,883	15,192	17,160	8,854	-	115,238
	Waste	K Tons	966	4,735	5,370	10,053	3,687	3,798	7,959	9,403	1,962	-	47,933
	Ore	K Tons	540	5,450	4,568	6,045	6,388	6,388	6,388	6,405	3,099	-	45,270
	Waste	CT Min	5.16	6.36	9.01	9.11	7.57	7.52	10.45	7.94	1.06	-	8.24
	Ore	CT Min	11.58	10.43	9.73	7.43	6.51	6.06	7.21	8.77	1.04	-	7.57

16.7.6 Support and Maintenance Equipment

Support and maintenance equipment assumed 85% availability, 85% operating efficiency, and a utilization factor based on MDA experience. The utilization factors were intended to reflect the amount of use required based on the equipment type. The following utilization was used for support and maintenance equipment:

- Water truck – 50% utilization;
- D9 Dozer – 50% utilization;
- D8 Dozer – 50% utilization;
- 14G Grader – 70% utilization;
- 50-ton Crane – 16% utilization (includes 40% utilization during construction periods followed by 10% utilization during operations);
- Light Plants – 85% utilization;
- Lube Truck – 70% utilization;
- Service / Mechanic Truck – 70% utilization;
- Tire Truck – 50% utilization; and
- Flat Bed Truck – 15% utilization.

16.8 Mining Personnel and Staffing

It is anticipated that the mining contractor will have between 60 and 80 operators and staff involved with the operation. It has been assumed that the contractor will work between 12 hour shifts, 2 shifts per day, 7 days per week. The contractor will supply personnel and equipment as required to ensure ore flow is available 24 hours per day and 7 days per week to process facilities.

Other mine personnel will be employed by the owner for general activities, including mine supervision, engineering, surveying, geology, and ore control. Table 16.9 list the personnel requirements by department. Process personnel requirements were estimated by KCA.

Table 16.9 Owners General Mine Personnel

Yearly Personnel Requirements	Units	Pre-Prod	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10	Yr 11	Maximum
Administration	#	10	8	8	8	8	8	8	8	8	7	3	3	10
Mine General Personnel	#	10	10	10	10	10	10	10	10	10	-	-	-	10
Hourly Mine Operations Personnel	#	45	69	88	92	89	84	109	114	84	-	-	-	114
Process Personnel	#	35	35	63	63	63	63	63	63	63	63	-	-	63
Total Personnel	#	100	122	169	173	170	165	190	195	165	70	3	3	195

16.9 Mine Pit Dewatering

All mining is anticipated to be above the water table, so no dewatering wells will be required. Storm water that enters the pit will be handled using in-pit sumps as needed. Any excess water that doesn't naturally infiltrate into the ground will be placed in water trucks using a portable pump and then used for dust control on haul roads.

17.0 RECOVERY METHODS

The Hasbrouck heap-leach project includes two separate facilities to be located 5 miles apart. The Three Hills Mine will be constructed first, followed by the Hasbrouck Mine. The Three Hills Mine will be a ROM heap-leach operation with carbon-column adsorption and support infrastructure facilities. Loaded carbon produced at the Three Hills Mine will be processed offsite by "toll stripping". If necessary, loaded carbon will be processed by "ashing". The Hasbrouck Mine will be a crushed ore, heap-leach operation with mining, a full recovery plant and associated infrastructure.

17.1 Three Hills Proposed Mine Recovery Methods

17.1.1 Three Hills Process Description Summary

The Three Hills Mine will be a 15,000 ton per day ROM heap-leach operation. Processing at Three Hills will be by conventional heap-leaching of ROM ore stacked on a single use pad. Gold will be leached from the mineralized material with dilute cyanide solution and recovered from the solution in a carbon adsorption circuit. Loaded carbon will be processed offsite by "toll stripping" where the carbon is stripped of metal in a desorption-recovery plant and returned for re-use along with the doré product. In the event that there is insufficient capacity or other circumstances that prevent the processing of loaded carbon by toll stripping, carbon will be processed by "ashing" (carbon is smelted directly) to produce doré bars.

17.1.2 Three Hills Process Design Criteria

The criteria used for the design of the Three Hills heap-leach and ADR operation are summarized below in Table 17.1. Administrative and maintenance support will be provided on site. Laboratory support will be at a facility rented in the town of Tonopah. All process equipment has been sized for 5.475 million tons per year. Doré bars will be exported from the Three Hills property to a third party for refining and sale.

Table 17.1 Three Hills Process Design Criteria Summary

ITEM	DESIGN CRITERIA
Annual Ore Processing Rate	5.475 million tons– Design
Stacking Operation	12 hours/shift, 1 shift/day, 7 days/week, 365 days/ year
Leaching Operation	12 hours/shift, 2 shifts/day, 7 days/week, 365 days/yr
Average Production Rate	15,000 ton/day
Life of Mine	2 Years
Crushing	None - ROM
Average Gold Grade	0.018 oz Au/ton
Gold Recovery	79.0%
Primary Heap-leaching Cycle	114 days
Secondary Heap-leaching Cycle	57 days

17.1.3 Three Hills Lime Storage and Addition

Pebble lime will be required for pH control in the heap-leach and will have a nominal consumption of 4.0 lb/ton of ore. Lime will be stored in a 150 ton silo (5 days capacity) equipped with a variable speed feeder, which meters the lime directly into the loaded haul trucks for delivery to the heap-leach pad. Lime will be added in proportion to the tonnage of ore being hauled.

17.1.4 Three Hills Stacking

The ore at Three Hills will be processed in a truck-stacked ROM heap-leach. Ore from the mine will be loaded into haul trucks, mixed with lime for pH control as described above, and delivered to the heap-leaching facility ("HLF") where it will be placed in 30ft lifts by the haul trucks. A dozer will be used to periodically assist the trucks in heap construction and rip the heap surface prior to the start of leaching.

17.1.5 Three Hills Solution Application and Leaching

The ore will be leached using a dilute solution of sodium cyanide applied by a system of drip emitters. Leach solutions will be applied to the crushed ore heap at a nominal application rate of 0.0025 gpm/ft^2. Drip emitters will be used as they generate less evaporation than sprays and will minimize the make-up water requirement.

The dilute cyanide leach solution will percolate through the stacked ore, dissolve gold and drain by gravity to a pregnant solution tank, which will store the solution prior to further processing.

Vertical turbine pumps in the pregnant solution tank will pump solution to the head tank of the carbon columns. The solution will flow by gravity, through the carbon in columns, to a barren solution tank.

High-strength cyanide solution and antiscalant will be added to the barren tank by metering pumps. The barren solution will be pumped to the heap-leach pad using a vertical turbine pump. In-line strainers will be installed on the barren solution header to minimize the plugging of sprays by fine particulates. If desired, or if the grade of the pregnant solution collected from the heap is not at the desired level, the pregnant solution coming from the heap can be transferred to the barren solution tank instead of to the pregnant solution tank via valves and piping. Pregnant solution transferred this way will bypass the adsorption plant and be returned to the heap where it will increase in grade and so reduce the volume of pregnant solution treated in the adsorption plant.

17.1.6 Three Hills Leach-Pad Design and Solution Collection

17.1.6.1 Three Hills Basic Design

The HLF will be a multiple-lift, single-use type leach pad designed to accommodate 10 million tons of ROM ore. The HLF has been designed with a lining system in accordance with International Cyanide Code requirements. These requirements meet or exceed North American standards and practices for lining systems, piping systems, and process ponds, which are intended to lessen the environmental risk of the facilities impacting local soils, surface water, and ground water, in and around the site.

The HLF has been sized using an average stacked material density of 97 lb/ft3 and a maximum heap height of 150ft. ROM material will be truck-stacked at an average rate of 13,223 tons per day, 365 days per year. Material will be stacked in lifts varying in height from 20 to 30ft. Benches provided between lifts will create an average overall slope of 3:1 (horizontal to vertical), which provides operational and post-closure stability of the heap, and minimizes grading during reclamation.

The HLF will be lined with a composite lining system consisting of a prepared subgrade, a layer of 12in thick compacted low-permeability soil layer or geosynthetic clay liner (“GCL”), and an 80mil high-density polyethylene (“HDPE”) geomembrane liner.

The HLF will be constructed in a single phase providing a total lined leach-pad surface area of 3 million square feet. The construction of the leach pad will include the perimeter access road, pad geomembrane lining system, solution collection system, and permanent and temporary storm water diversion facilities. Solutions collected from the HLF will drain by gravity to either the barren or pregnant tanks located within the geomembrane-lined event pond.

17.1.6.2 Three Hills Mine Heap Leach Facilities Geotechnical

A geotechnical investigation was completed at the Three Hills Mine site in September, 2014 in support of the design activities. During this investigation, three boreholes and three test pits were excavated within the footprint of the proposed heap-leach facility (“HLF”). Logs of the subsurface conditions were created, and samples of subsurface materials were collected and tested in the laboratory.

Surface topography at the Three Hills HLF site slopes gently to the northwest with a low relief valley that runs through the center of the proposed leach pad. The valley was dry at the time of the investigation, and appears to host water only at times of high precipitation. Sage brush and native grasses were present throughout the surface of the site.

The Three Hills HLF site is characterized with a shallow bedrock surface that is overlain by granular soils typically less than 8 feet thick and described as silty and clayey sand. The soils appear to be a reworked form of the volcanic tuff encountered elsewhere at the site, possibly transported and deposited by alluvial means. Roots were present from the surface to a depth of about 2 feet.

Bedrock was a rhyolitic volcanic tuff described as weak to extremely weak rock, slightly to moderately weathered, and relatively un-fractured. Often a residual bedrock veneer, up to 2 feet thick, was present at the top of bedrock surface. When highly weathered or pulverized, the bedrock exhibited low plasticity. The tuff was relatively homogeneous through the depth of the borings with localized highly weathered and extremely weak zones. Bedrock adjacent to the slope of Three Hills was welded, locally silicified and marginally rippable, while rock encountered within the footprint of the leach pad was not silicified and considered rippable with a D-9 to D-8 sized dozer.

Slope stability analysis for the Three Hills HLF was performed for both static and seismic conditions. A representative cross section was analyzed for the slope stability analysis. The section represented an ultimate heap height of 150ft with ROM ore placed in 30ft lifts at the angle of repose (approximately 1.4H:1V), and subsequent lifts setback to maintain an overall slope of 3H:1V. The critical section selected for analysis is located on the northern end of the HLF, adjacent to the event pond. At this location the base grade slopes toward the facility toe and the HLF is at its maximum height. The modeled liner system consisted of a GCL under a HDPE geomembrane.

The analysis for static conditions indicate factors of safety for both circular and block failure modes of 1.9 and 1.3, respectively. The results for the pseudo-static conditions during operations indicate factors of safety for both circular and block failure modes of 1.6 and 1.0, respectively. The results for the pseudo-static conditions during closure indicate factors of safety for both circular and block failure modes as 1.3 and 0.8, respectively. The results indicate that the slopes will remain stable throughout the lifetime of the facility for static conditions and the operating basis earthquake (475 year return event). In the event of an extreme seismic event (2,475 year return event), slope movement up to 24in may occur, which may result in minor sloughing but would not compromise the integrity of the slope.
Groundwater was not encountered during the field investigation and it is not anticipated to influence the design, construction or operation of the Three Hills HLF.

17.1.7 Three Hills Solution Storage

17.1.7.1 Three Hills Event Pond

The event pond will have a total storage capacity of approximately 7.5 million gallons. The capacity is based on the runoff from the estimated 100-year, 24-hour storm event and anticipated drain-down resulting from a 12-hour power outage, plus 110% of the capacity of the largest tank within the containment area of the pond. Excess solution would consist of a mixture of process solutions and storm water collected by the leach pad.

The event pond lining system will consist of two layers of HDPE geomembrane liner sandwiching a geonet layer to provide dual containment with leak detection. This lining system will be installed over a soil bedding layer. The pond bottom will slope towards a sump where solutions collected in the event pond will be pumped back to the process.

17.1.7.2 Three Hills Pregnant and Barren Solution Tanks

Leach solution draining from the heap to the pregnant and barren solution tanks will be monitored during operation with higher grade solution being routed to the pregnant solution tank and the remaining solution being routed to the barren tank. The pregnant solution tank is sized with sufficient capacity to operate for 30 minutes at the nominal primary leach rate of 3,000 gpm, which equates to 90,000 gallons of capacity.

The barren solution tank is sized to store fluids for 30 minutes of operation at the nominal secondary leach rate of 1,500 gpm plus the 3,000 gpm barren solution flow from the open-top carbon columns. This equates to a tank size of 135,000 gallons. Solution in the barren solution tank will be pumped to the active leach areas of the heap.

In the event of power outage or equipment malfunction, or if flows from the HLF exceed the storage capacity of the solution tanks and associated pumps, solution will flow into the event pond to maintain containment.

17.1.8 Three Hills Solution Management

The Three Hills process system is designed as a zero discharge facility. Based on weather data and the HLF water balance, the project will operate in a monthly water deficit under all weather conditions; cyanide neutralization will not be required.

Several methods of solution management will be employed at the HLF to maintain adequate solution storage within the process tanks and event pond, and to reduce the need for make-up water and water treatment. The following elements have been incorporated into the design:

- Large event pond for solution storage during storm events and upset conditions;
- Drip irrigation emitters on the heap;
- Barren solution tank; and
- Pregnant solution tank.

The event pond will remain substantially empty and will not have seasonal accumulation under normal operating conditions. Solution collected in the event pond during storm events will be returned to the leach system as makeup solution as soon as practical. Solution in the pregnant and barren tanks will be maintained at the mid- to lower-range of their working capacities. Solution overflowing from either tank will be directed to the event pond.

17.1.9 Three Hills Process Water Balance

Ecological Resource Consultants, Inc. ("ERC") completed a water balance for the heap-leach facility at the Three Hills Mine. The evaluation included development of a stochastic water balance that accounts for inflows such as rain and make-up water, outflows such as evaporation, and consumptive loss due to ore wetting.

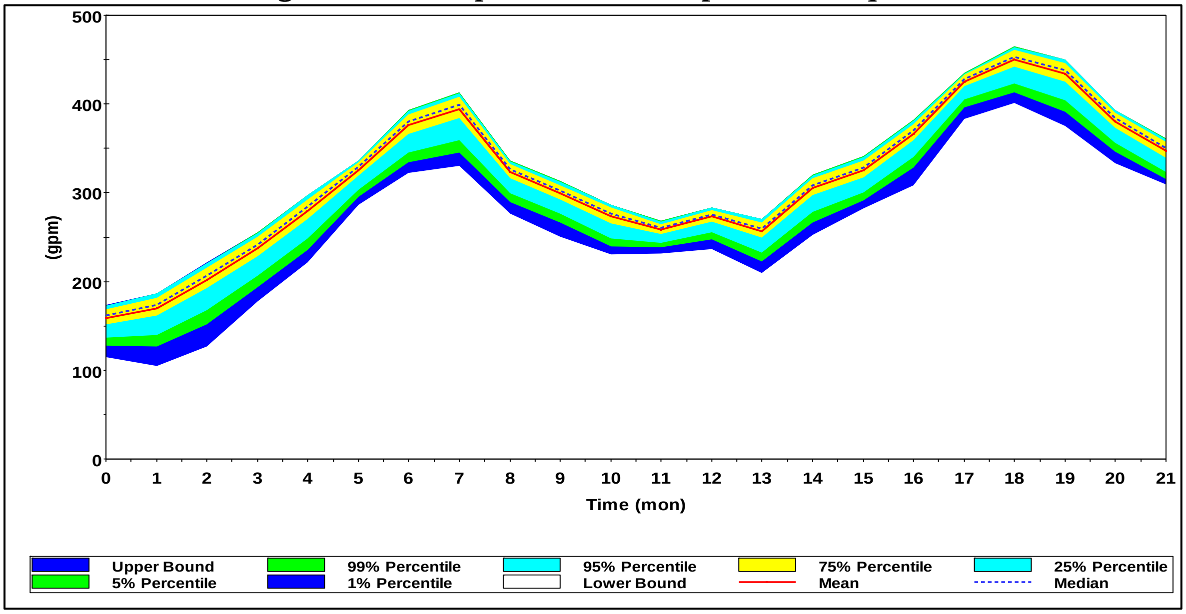
To estimate inflow and outflow water requirements, the following criteria were considered:

- Total lined leach-pad area.
- Solution application flow rate and area.
- Heap-leach facility capacity.
- Climactic conditions and the 100-year, 24-hour storm event for the site, based upon data derived from local weather stations.
- Runoff coefficients for actively leached area, non-active leached area, side slopes and exposed liner.
- Make-up water volume will be available, if required.
- Average as-mined moisture content and specific moisture retention of the ore.
- Nominal solution application rate of 0.0025 gpm/ft^2.
- Maximum solution application rate of 0.0040 gpm/ft^2.
- Nominal side slope solution application rate of 0.00125 gpm/ft^2.
- Nominal solution flow rate is 4,500 gpm.
- Nominal 1,800,000 square feet of the top of the heap under leach.
- Minimum 1,125,000 square feet of the top of the heap under leach.

17.1.9.1 Three Hills Process Solution and Makeup Water

Losses are expected to exceed meteorological inputs. Make-up water is expected to be required during all months in all reviewed conditions. The make-up water requirement calculated by the ERC water balance does not include water needed for dust suppression or construction. The heap-leach facility make-up water rates are anticipated to range from approximately 170 gpm at the beginning of operations to nearly 450 gpm during the second summer when evaporation losses are greatest, assuming average precipitation conditions. The anticipated make-up water requirements are presented in Figure 17.1.

Figure 17.1 Heap-Leach Make-up Water Requirement



17.1.9.2 Three Hills Precipitation Data

Estimates of monthly precipitation at Three Hills were developed based on a review of regional data published by the Western Regional Climate Center. Monthly and annual precipitation statistics used in the water balance model, including standard deviations and correlation coefficients are summarized in Table 17.2.

Table 17.2 Mean Modeled Monthly Precipitation

Month	Mean Precipitation (in)	Standard Deviation (in)	Correlation Coefficient
January	0.37	0.36	0.129
February	0.44	0.5	0.013
March	0.49	0.55	0.073
April	0.45	0.48	0.418
May	0.47	0.55	-0.027
June	0.26	0.4	0.145
July	0.47	0.53	-0.086
August	0.5	0.63	0.001
September	0.39	0.51	-0.093
October	0.43	0.48	-0.036
November	0.37	0.52	0.145
December	0.31	0.3	0.113
Annual	**4.92**	**1.96**	

17.1.9.3 Three Hills Water Balances

ERC completed a comprehensive water balance using the software GoldSim (version 9.60) which is a stochastic modeling tool that can be used to model a range of potential outcomes. A Monte Carlo Simulation model was developed using a monthly timestep for a period of 22 months, which is considered the operational period for the facility.

The water balance, in essence, tracks the inputs (process water and precipitation) and outputs (evaporation and ore uptake) through the system over time. Initially, process water added to fresh ore is absorbed (uptake) to increase the gravimetric moisture content ("MC") from the natural MC of 3 percent to the under-leach MC of 13 percent. Process water will be added to the heap at an average rate of 0.0025 gpm/ft^2. At the end of a leach cycle, interstitial free water will drain from the heap until a MC of 9.7 percent is achieved.

A heap loading rate of 15,000 tons per day was used in the water balance. This information was used to calculate drain-down timing related to various heap heights and storm runoff from the different surface areas (heap top, heap slopes and exposed geomembrane).

The water balance was conducted using both deterministic (average precipitation) and stochastic methods. Both methods use a set of fixed variables, but the deterministic method uses average precipitation data, whereas the stochastic method uses statistics to vary the precipitation to capture maximum and minimum precipitation cycles.

17.1.10 Three Hills Adsorption & Recovery

17.1.10.1 Three Hills Adsorption

The adsorption facility at Three Hills will consist of a single train of 6 up-flow, open-top carbon columns ("CIC"s). The columns are capable of holding six tons of carbon each, thus providing a CIC process inventory of 36 tons of carbon.

Pregnant solution will be pumped to the carbon adsorption feed tank of the CICs at a nominal flow rate of 3,000 gpm. A magnetic flow meter and a wire sampler will be installed on the feed to the CICs to allow the calculation of total gold ounces fed to the carbon columns.

Pregnant solution will flow by gravity through the set of 5 columns in series, exiting the lowest adsorption column as barren solution. Barren solution from the fifth, lowest, carbon column will be continuously sampled by a wire sampler for metallurgical accounting, then discharged to the carbon safety screen to recover any floating carbon particles.

Underflow from the safety screen will flow by gravity to the barren solution tank. Any carbon recovered on the safety screen will be collected into a carbon super-sack for reuse.

The adsorption columns will operate in this fashion until the carbon contained in the first, upper, column achieves the desired precious-metal loading or the barren solution grade increases to an unacceptably high level. Loaded carbon from the first carbon adsorption column will then be pumped to the acid wash vessel. Carbon in each of the lower adsorption columns will be sequentially moved up the adsorption train, counter-current to the solution flow. This will continue from the fifth carbon column to the second carbon column. Once carbon has been advanced through the carbon columns, the barren, regenerated carbon will be pumped into the fifth column.

17.1.10.2 Three Hills Carbon Handling

Carbon that is loaded with gold will be transferred, by truck, to either a "toll-stripper" or "carbon ashing" facility for further processing, as described in Section 17.1.10.3 and Section 17.1.10.4. Based on carbon loading of 150 oz/ton, the Three Hills Mine is expected to produce approximately 40 tons of loaded carbon per month.

17.1.10.3 Toll-Stripping of Carbon

"Toll Stripping" is a process wherein carbon is sent to an off-site desorption and recovery plant where the gold-loaded carbon is stripped for a fee, a doré is produced and barren carbon is returned for re-use at the mine. It is assumed that returned carbon from the toll stripper can be used three additional times before carbon activity levels will no longer be suitable for carbon adsorption and must be replaced.

17.1.10.4 Three Hills Carbon Ashing

"Carbon ashing" is a process wherein gold-loaded carbon is sent to a refinery and smelted directly to produce doré. The carbon is completely consumed during this process.

17.1.11 Three Hills Process Reagents Delivery, Storage and Consumption Estimates

Process reagents will be stored in a fenced area under a steel roof structure.

Average estimated annual consumption of reagents based on design rates and reagent storage capacities are shown in Table 17.3.

Table 17.3 Three Hills Projected Annual Reagent Consumption and Storage

Reagent	Form	Storage Capacity	Annual Consumption
Pebble Lime	Bulk	150 tons	10,950 tons
Sodium Cyanide (30%)	Liquid Bulk Delivery Truck	12.3 tons	1,232 tons
Activated Carbon	1,100 lb. super sacks	22 tons + Columns	132 tons
Antiscalant	240 gal liquid Tote Bins	8 totes (1,920 gal)	23,400 gal

17.1.11.1 Three Hills Pebble Lime

Pebble lime will be used to treat the ore prior to leaching. Lime maintains an alkaline pH during leaching. Lime will be delivered in tanker trucks which will be off-loaded pneumatically into a silo. A variable speed feeder on the bottom of the silo will dispense pebble lime onto the ore being carried by haul trucks to the heap leach, and is added in proportion to the tonnage of ore in each truck.

17.1.11.2 Three Hills Sodium Cyanide (NaCN)

NaCN will be used in the leaching and, potentially, the adsorption process. Dissolved cyanide forms stable complexes with gold and silver, allowing these metals to remain in solution for eventual recovery.

NaCN will be delivered in tanker trucks as a liquid at 30% concentration for storage in an 8,529 gallon steel tank. Storage capacity will be approximately equal to 3.6 days of NaCN usage.

17.1.11.3 Three Hills Carbon

Activated carbon will be used to adsorb precious metals from the leach solution in the adsorption columns. Make-up carbon is 6 x 12 mesh. Carbon will be delivered in 1,100 lb super sacks. New carbon will be added to the circuit to replace carbon fines and carbon with reduced activity from the stripping process. The new carbon requirement to replace fine carbon losses is projected at 54 lb/ton of carbon stripped plus carbon consumed by the toll stripping and carbon ashing processes (approximately 10 tons per month).

17.1.11.4 Three Hills Antiscalant

Antiscalant agents are used to prevent the build-up of scale in the process solution and heap irrigation lines. Antiscalant agent is normally added to the process pump intakes, or directly into pipelines. Consumption will vary depending on the concentration of scale-forming species in the process stream. Delivery is in liquid form in 240 gallon tote bins.

Antiscalant is added directly from the supplier tote bins into the pregnant and barren pumping systems using variable speed, chemical-metering pumps. Antiscalant consumption is expected to be 64 gallons per day. The recommended minimum inventory is 2 tote bins.

17.2 Hasbrouck Mine Recovery Methods

17.2.1 Summary of Hasbrouck Mine Process Description

The Hasbrouck Mine will include a 17,500 ton per day heap-leach operation. Processing at Hasbrouck will be by conventional heap leaching of crushed ore stacked on a single use pad. Gold and silver will be leached with a dilute cyanide solution and recovered from the solution using a carbon adsorption-desorption-recovery process to produce doré bars.

17.2.2 Hasbrouck Process Design Criteria

The criteria used for the design of the Hasbrouck heap-leach operation are summarized below in Table 17.4.

Table 17.4 Hasbrouck Mine Process Design Criteria Summary

ITEM	DESIGN CRITERIA
Annual Ore Processing Rate	6.3 million tons
Crushing and Stacking Operation	12 hours/shift, 2 shift/day, 7 days/week
Crushing Equipment Availability	75%
Nominal Stacking Rate	17,500 ton/day
Leaching Operation	12 hours/shift, 2 shift/day, 7 days/week
Average Daily Production Rate	17,500 ton/day
Life of Mine	5.53 years
Average Gold grade	0.017 oz Au/ton
Average Silver Grade	0.301 oz Ag/ton
Upper Seibert Gold Recovery	59.0%
Lower Seibert Gold Recovery	75.6%
Average Gold Recovery	73.0%
Silver Recovery	11.0%
Heap-leaching Cycle	115 days

17.2.3 Hasbrouck Mine Ore Stockpiles

The Hasbrouck Mine will include two stockpiles: the ROM stockpile and the crushed ore stockpile. The ROM stockpile is sized to accommodate 70,000 tons of ore. The ROM ore will be re-handled from the ROM stockpile by a front-end loader to supplement the direct dump feed to the ROM feed bin for the primary crushing circuit.

The crushed ore stockpile is planned to have a live capacity of approximately 2,300 tons. The crushed ore will be pulled from the stockpile by 2 belt feeders to the fine ore reclaim conveyor in a tunnel below the stockpile. Each belt feeder will be able to feed crushed ore to the fine ore reclaim conveyor at an average rate of 730 dry tph. The reclaim conveyor will discharge to an overland conveyor system that will transport the crushed ore to the agglomeration area.

17.2.4 Hasbrouck Mine Crushing

ROM ore will be delivered, and direct dumped to the greatest extent possible, by haul trucks from the mine to a primary crusher’s dump hopper. Haul trucks will deliver ore to an ROM stockpile either for blending or when the dump hopper is full or inaccessible due to other traffic. A front-end loader will deliver ore from the ROM stockpile to the dump hopper either for blending or to supplement haul truck availability.

A stationary, 20in grizzly will be positioned above the dump hopper to prevent oversized ore from entering or obstructing the feeder. A rock breaker will be installed to break up oversized ore retained on the stationary grizzly. ROM ore will be delivered at an average rate of 730 dry tons per hour to a vibrating grizzly with a spacing of 6in. Oversized ore from the vibrating grizzly will be crushed in a primary jaw crusher.

The primary jaw crusher will crush oversize from the vibrating grizzly to 100% passing 12in. The discharge from the jaw crusher will combine with the vibrating grizzly undersize onto a primary crusher discharge conveyor, which will feed the secondary screen-feed splitter.

The secondary screen-feed splitter will use 2 secondary screen belt feeders to feed jaw crusher product to 2 parallel secondary screens. The secondary screens will scalp ore that is greater than 2in. This +2in, oversized ore will be recombined and sent to a cone crusher feed splitter box where 2 belt feeders will choke feed the secondary cone crushers. Output from the secondary cone crushers and the screen undersize will combine on a conveyor belt feeding the HPGR feed bin.

The HPGR feed bin will have a storage capacity of 950 tons. A belt feeder will meter the cone crusher product onto the HPGR feed conveyor. The HPGR feed conveyor will have a variable frequency drive to ensure the HPGR is choke fed. The HPGR product will discharge onto the HPGR discharge conveyor. An adjustable edge splitter at the transfer point from the HPGR discharge conveyor will cut approximately 7.5% of the HPGR discharge ore from each side of the belt to recycle it back to the HPGR, for a total recycle of 15% of the HPGR product. The center ore from the edge splitter chute will go to the fine ore stacker and onto a fine ore stockpile. Due to the high quantity of fines produced by the HPGR, a foaming dust suppression system and an extendible chute at the discharge of the fine ore stacker will be installed.

17.2.5 Hasbrouck Mine Agglomeration

The crushed ore will be agglomerated with cement prior to cyanide leaching. The crushed ore will be conveyed from the crushed ore stockpile to the agglomeration area by an overland conveyor, which will discharge onto the pug mill feed conveyor. Cement will be added to the pug mill feed conveyor from a 100 ton silo with a screw feeder at a nominal rate of 5 lb per ton of crushed ore. The crushed ore and cement will then be fed to the pug mill for blending. Barren solution will be added in the pug mill to adjust the crushed ore's moisture content to between 7 and 13%. The pug mill will discharge onto the pug mill discharge conveyor, which in turn will discharge onto an overland conveyor, which feeds the stacking system. This overland conveyor will be adjusted as necessary to accommodate stacking.

The pug mill and all downstream conveyors will be located on lined areas for containment purposes. The liner will prevent the release of cyanide solution to the environment.

17.2.6 Hasbrouck Mine Stacking

The heap will be constructed using a conveyor stacking system. The conveyor stacking system will include the following components:

- An overland conveyor which will feed the mobile stacking system.

- Four "ramp" portable transfer conveyors, each 120ft long for conveying crushed ore up the heap for additional lifts.
- Nine "grasshopper" portable transfer conveyors, each 120ft long for conveying crushed ore across relatively flat areas.
- An 80ft long, horizontal, “Index Feed Conveyor” for transferring crushed ore from the grasshopper conveyors to a “Horizontal Feed Conveyor”.
- A moveable, 125ft long, “Horizontal Index Conveyor” that will transfer crushed ore to a radial stacker.
- A 136ft long, telescoping, “Radial Stacking Conveyor” which will stack ore on the heap.

The grasshopper and ramp conveyors will transport the crushed ore from the overland conveyor on the heap to the stacking conveyors. The stacking conveyors will allow the radial stacker to place crushed ore in 30ft lifts with minimal downtime. The radial stacker and horizontal feed conveyor together will be capable of moving while slewing and stacking ore in an arc. The radial stacker will be able to retreat approximately the length of a grasshopper conveyor.

The system will be periodically stopped to add or remove grasshopper conveyors. The pad will be stacked from the down-slope toe in an up-slope direction for stability.

17.2.7 Hasbrouck Mine Solution Application and Leaching

The ore will be leached using a dilute solution of sodium cyanide applied by a system of drip emitters, which will reduce evaporation and minimize make-up water requirements. Leach solution will be applied to the crushed ore heap at a nominal application rate of 0.0025 gpm/ft^2.

The dilute sodium cyanide leach solution will percolate through the ore on the heap, dissolving gold and silver, and drain by gravity to a pregnant solution tank, which will store the solution prior to further processing. Submersible pumps in the pregnant tank will pump solution to the head tank of the carbon columns. The solution will flow by gravity through the carbon in columns, and returning to a barren tank.

High-strength cyanide solution and antiscalant will be added to the barren tank by metering pumps. The barren solution will be pumped to the heap-leach pad by a vertical turbine pump. Strainers will be installed on the barren solution header tank to minimize the plugging of sprays by fine particles.

17.2.8 Hasbrouck Mine Leach-Pad Design

17.2.8.1 Hasbrouck Mine Leach-Pad Basic Design

The Hasbrouck Mine HLF will be a multiple-lift, single-use type leach pad designed to accommodate 36 million tons of crushed ore, and will be constructed in two phases. The HLF has been designed with a lining system in accordance with International Cyanide Code requirements and meets or exceeds North American standards and practices for lining systems, piping systems, and process ponds. These standards and practices are intended to lessen the environmental risk of the facilities to impact the local soils, surface water, and ground water in and around the site.

The HLF has been sized using an average stacked ore density of 93.6lb/ft^3 and a maximum heap height of 150ft. Ore will be conveyor-stacked at a nominal rate of 17,500 tons per day. Ore will be stacked in 30ft lifts, and benches will be installed between lifts to create an average slope of 3:1 (horizontal to vertical), which provides operational and post-closure stability of the heap and minimizes grading at the time of reclamation.

The HLF will be continuously lined with a composite lining system consisting of a prepared subgrade, a 12in layer of compacted, low-permeability soil layer or GCL, and an 80mil HDPE geomembrane liner.

The HLF will be constructed in two phases providing a total lined leach-pad surface area of 8.5 million square feet. Phase 1 will consist of the northern portion of the leach-pad, perimeter access road, pad geomembrane lining system, solution collection system, permanent and temporary storm water diversion facilities, and the geomembrane-lined event pond. In Phase 2 the overland conveyor feeding the stacking system will be moved and the southern portion of the leach pad, pad geomembrane liner system, and solution collection system will be constructed.

17.2.9 Hasbrouck Mine Heap Leach Facilities Geotechnical

Geotechnical field investigations at the Hasbrouck HLF have not been performed at this stage of design; these are planned to be completed during the next phase of design activities. Surface and subsurface conditions within the footprint of the Hasbrouck Mine HLF were characterized by surface mapping conducted by Vista Gold Corporation during their ownership of the Hasbrouck property. Site topography includes a north-south trending mountain range on the eastern flank of the Hasbrouck site and a large, relatively flat valley approximately 6 miles wide lies to the west of the Hasbrouck site. Several broad alluvial drainages trend east to west from the north and south flanks of Hasbrouck Peak. Drainages are typically dry and host water only during times of high precipitation.

The proposed location of the HLF is 1 mile south of Hasbrouck Peak. Surficial alluvial deposits were mapped within the HLF footprint, with tuffaceous bedrock similar to the rock encountered at Three Hills mapped on low relief topographical highs in close proximity to the leach pad. Bedrock depth is anticipated to be shallow; however depth will be confirmed during future design activities.

Slope stability analysis for the Hasbrouck HLF was performed for both static and seismic conditions. A representative cross section was analyzed for the slope stability analysis. The section considered an ultimate heap height of 150ft with agglomerated ore placed in 30ft lifts at the angle of repose (approximately 1.4H:1V), and subsequent lifts setback to maintain an overall slope of 3H:1V. Base grades were modeled at a continuous 4.2% and sloped toward the facility toe. This is considered the most critical slope configuration, and is representative of the southwest portion of the HLF. The liner system will consist of a low-permeability under-liner soil placed beneath an HDPE geomembrane.

The analysis for static conditions indicated factors of safety for both circular and block failure modes of 1.9 and 1.6, respectively. The analysis of pseudo-static conditions during operations indicated factors of safety for both circular and block failure modes of 1.5 and 1.3, respectively. The analysis of pseudo-static conditions during closure indicated factors of safety for both circular and block failure modes of 1.2 and 1.1, respectively. The results indicated that slopes will remain stable throughout the lifetime of the facility for the operating basis earthquake (475 year return event), long term basis earthquake (2,475 year return event), and static conditions.

Groundwater is not anticipated to be present and was not considered an influence on the design, construction or operation of the Hasbrouck HLF.

17.2.10 Hasbrouck Mine Solution Storage

17.2.10.1 Hasbrouck Mine Event Pond

The Hasbrouck Mine process system will be a zero-discharge facility. The event pond will have a total storage capacity of 17.7 million gallons. This capacity is based on the runoff from the estimated 100-year, 24-hour storm event and anticipated drain-down resulting from a 12-hour power outage, and 110% of the capacity of the largest tank within the containment area draining into the event pond. Excess solution will consist of a mixture of process solutions and storm water collected by the leach-pad.

The event pond lining system will consist of two layers of HDPE geomembrane liner separated by a geonet layer to provide dual containment with leak detection. This lining system will be installed over a soil bedding layer. The pond bottom will slope towards a sump where solutions collected in the event pond will be pumped back to the process.

17.2.10.2 Hasbrouck Mine Pregnant and Barren Solution Tanks

Leach solution draining from the heap will be monitored during operations, with higher grade solution being routed to the pregnant solution tank and the remaining solution being routed to the barren tank. The pregnant solution tank will be sized with sufficient capacity for 30 minutes operation at the nominal, primary leach rate of 3,800 gpm, which equates to 114,000 gallons.

The barren solution tank will be sized to store 30 minutes of operation at the nominal leach rate of 3,800 gpm. This equates to a tank size of 114,000 gallons. Solution in the barren solution tank will be pumped to the active leach areas of the heap.

In the event of a power outage or equipment malfunction, or if excess flows from the HLF exceed the storage capacity of the solution tanks, solution will flow into the event pond to maintain containment.

17.2.11 Hasbrouck Mine Solution Management

Several methods of solution management will be employed for the HLF to maintain adequate solution storage within the process tanks and event pond to reduce the need for make-up water and water treatment. The following elements have been incorporated into the design:

- Large event pond for solution storage after storm events and upset conditions.
- Drip irrigation emitters on the heap.
- Barren solution tank.
- Pregnant solution tank.

The event pond will remain substantially empty and will not have any seasonal accumulation under normal operating conditions. Solution collected in the event pond during storm events will be returned to the leach system as makeup solution as soon as practical. Solution in the pregnant and barren tanks should be maintained at the middle to lower range of their working capacities. Solution overflowing from either tank will drain by gravity to the event pond.

The Hasbrouck Mine is designed as a zero discharge facility. Based on weather data and the site water balance the project will operate in a water deficit under all weather conditions; cyanide neutralization will not be required.

17.2.12 Hasbrouck Mine Process Water Balance

KCA completed a water balance for the heap-leach facility at the Hasbrouck Mine. The evaluation included development of a water balance that accounts for inflows such as rain and make-up water, outflows such as evaporation, and consumptive loss due to wetting of ore.

To estimate inflow and outflow water requirements, the following criteria were considered:

- Total lined leach-pad area.
- Solution application flow rate and area.
- Heap-leach facility capacity.
- Climactic conditions for an average year, wet year and dry year.
- Make-up water volume: Solution will be applied by drip irrigation emitters.
- Average as-mined moisture content and specific moisture retention of the ore.
- Nominal solution application rate of 0.0025 gpm/ft^2.
- Nominal solution flow rate is 3,800 gpm.

17.2.12.1 Hasbrouck Mine Process Solution and Makeup Water

Process makeup water will be required for all months and for all precipitation conditions analyzed. Makeup water requirements are greatest between the months of May and August and are lowest during December and January. The HLF will require an average of 256 gal/h of makeup water for the process.

17.2.12.2 Hasbrouck Mine Precipitation Data

Estimates of monthly precipitation at the Hasbrouck Mine site were developed based on a review of regional data published by the Western Regional Climate Center.

17.2.12.3 Hasbrouck Mine Water Balances

Based on the rainfall data, active water balances have been calculated for an average year, extreme wet year, and extreme dry year. The calculation tables are shown in Table 17.5, Table 17.6 and Table 17.7.

Based on the water balance there is no seasonal accumulation of solutions in the event pond and the project will always operate in a water deficit condition.

Table 17.5 Average Year Water Balance, Hasbrouck Mine

Active Leach Area	1,520,000
Lined Pad/Ditch Collection Area (sq. ft)	8,100,000
Lined Pond Collection Area (sq. ft)	120,000
Total Leach Flow to Heap (gpm)	3,800
Evaporation System Flow (gpm)	0
Allowable Wet Season Accum. in Process Ponds (ft^3)	2,250,000
Wet Season Ore Absorption (%)	6.7
Dry Season Ore Absorption (%)	6.7
Average Annual Emitter Evap (%)	2.0
Average Annual Sprinkler Evap (%)	0.0
Ore Throughput per Year (ton)	6,387,500

Assumptions

Pond evap. equals 60% of pan evap. over 50% pond area
Idle heap evapotranspiration equals 75% of pan evap.
Maximum evapotranspiration = rainfall over idle area

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	**Annual**
Days in Month	31	31	30	31	30	31	31	28	31	30	31	30	365
Precipitation (in)	0.47	0.50	0.39	0.43	0.37	0.31	0.37	0.44	0.49	0.45	0.47	0.26	4.95
Pan Evaporation (in)	17.71	15.66	11.17	6.79	2.94	0.00	0.00	3.84	7.26	10.09	13.64	16.09	105
Emitter Evap. (%)	4.0	3.6	2.5	1.5	0.7	0.0	0.0	0.9	1.7	2.3	3.1	3.7	2.0
Sprinkler Evap. (%)													
Idle Heap Evapotrans. Area (sq. ft)	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000
Idle Heap Evapotrans. (in)	13.3	11.7	8.4	5.1	2.2	0.0	0.0	2.9	5.4	7.6	10.2	12.1	79
Ore Placed on Pad (tons)	542,500	542,500	525,000	542,500	525,000	542,500	542,500	490,000	542,500	525,000	542,500	525,000	6,387,500
Precip. Collected (cu.ft)	321,950	342,500	267,150	294,550	253,450	212,350	253,450	301,400	335,650	308,250	321,950	178,100	3,390,750
Ore Absorption (cu. ft)	1,164,462	1,164,462	1,126,899	1,164,462	1,126,899	1,164,462	1,164,462	1,051,772	1,164,462	1,126,899	1,164,462	1,126,899	13,710,603
Emitter Evap. (cu. ft)	916,287	810,223	559,275	351,304	147,204	0	0	179,449	375,621	505,200	705,711	805,617	5,355,890
Sprinkler Evap. (cu. ft)	0	0	0	0	0	0	0	0	0	0	0	0	0
Evapotrans. (cu. ft)	257,717	274,167	213,850	235,783	202,883	0	0	241,267	268,683	246,750	257,717	142,567	2,341,383
Pond Evaporation (cu. ft)	0	0	0	0	0	0	0	0	0	0	0	0	0
Evaporation System (cu. ft)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Net Precip. Gain(+)/Loss(-) (cu. ft)	(2,016,516)	(1,906,352)	(1,632,874)	(1,456,999)	(1,223,536)	(952,112)	(911,012)	(1,171,088)	(1,473,116)	(1,570,599)	(1,805,940)	(1,896,982)	(18,017,127)
Excess Solution Pond													
Allowable Accum. in Excess 0	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	
Accum. into Excess	0	0	0	0	0	0	0	0	0	0	0	0	0
Recycled from Excess	0	0	0	0	0	0	0	0	0	0	0	0	0
Quantity in Excess	0	0	0	0	0	0	0	0	0	0	0	0	
Makeup Solution Required (cu. ft)	2,016,516	1,906,352	1,632,874	1,456,999	1,223,536	952,112	911,012	1,171,088	1,473,116	1,570,599	1,805,940	1,896,982	18,017,127
Solution to Treat/Discharge	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 17.6 Extreme Wet Year Water Balance, Hasbrouck Mine

Active Leach Area	1,520,000
Lined Pad/Ditch Collection Area (sq. ft)	8,100,000
Lined Pond Collection Area (sq. ft)	120,000
Total Leach Flow to Heap (gpm)	3,800
Evaporation System Flow (gpm)	0
Allowable Wet Season Accum. in Process Ponds (ft^3)	2,250,000
Wet Season Ore Absorption (%)	6.7
Dry Season Ore Absorption (%)	6.7
Average Annual Emitter Evap (%)	2.0
Average Annual Sprinkler Evap (%)	0.0
Ore Throughput per Year (ton)	6,387,500

Assumptions

Pond evap. equals 60% of pan evap. over 50% pond area
Idle heap evapotranspiration equals 75% of pan evap.
Maximum evapotranspiration = rainfall over idle area

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	**Annual**
Days in Month	31	31	30	31	30	31	31	28	31	30	31	30	365
Precipitation (in)	0.45	0.43	1.05	0.95	1.70	0.65	0.45	1.00	2.13	1.50	0.26	0.00	10.57
Pan Evaporation (in)	17.71	15.66	11.17	6.79	2.94	0.00	0.00	3.84	7.26	10.09	13.64	16.09	105
Emitter Evap. (%)	4.0	3.6	2.5	1.5	0.7	0.0	0.0	0.9	1.7	2.3	3.1	3.7	2.0
Sprinkler Evap. (%)													
Idle Heap Evapotrans. Area (sq. ft)	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000
Idle Heap Evapotrans. (in)	13.3	11.7	8.4	5.1	2.2	0.0	0.0	2.9	5.4	7.6	10.2	12.1	79
Ore Placed on Pad (tons)	542,500	542,500	525,000	542,500	525,000	542,500	542,500	490,000	542,500	525,000	542,500	525,000	6,387,500
Precip. Collected (cu.ft)	308,250	294,550	719,250	650,750	1,164,500	445,250	308,250	685,000	1,455,625	1,027,500	178,100	0	7,237,025
Ore Absorption (cu. ft)	1,164,462	1,164,462	1,126,899	1,164,462	1,126,899	1,164,462	1,164,462	1,051,772	1,164,462	1,126,899	1,164,462	1,126,899	13,710,603
Emitter Evap. (cu. ft)	916,287	810,223	559,275	351,304	147,204	0	0	179,449	375,621	505,200	705,711	805,617	5,355,890
Sprinkler Evap. (cu. ft)	0	0	0	0	0	0	0	0	0	0	0	0	0
Evapotrans. (cu. ft)	246,750	235,783	575,750	520,917	932,167	0	0	548,333	1,165,208	822,500	142,567	0	5,189,975
Pond Evaporation (cu. ft)	0	0	0	0	0	0	0	0	0	0	0	0	0
Evaporation System (cu. ft)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Net Precip. Gain(+)/Loss(-)	(2,019,249)	(1,915,919)	(1,542,674)	(1,385,932)	(1,041,770)	(719,212)	(856,212)	(1,094,554)	(1,249,666)	(1,427,099)	(1,834,640)	(1,932,516)	(17,019,443)
Excess Solution Pond													
Allowable Accum. in Excess 0	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	
Accum. into Excess	0	0	0	0	0	0	0	0	0	0	0	0	0
Recycled from Excess	0	0	0	0	0	0	0	0	0	0	0	0	0
Quantity in Excess	0	0	0	0	0	0	0	0	0	0	0	0	
Makeup Solution Required	2,019,249	1,915,919	1,542,674	1,385,932	1,041,770	719,212	856,212	1,094,554	1,249,666	1,427,099	1,834,640	1,932,516	17,019,443
Solution to Treat/Discharge	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 17.7 Extreme Dry Year Water Balance, Hasbrouck Mine

Active Leach Area	1,520,000
Lined Pad/Ditch Collection Area (sq. ft)	8,100,000
Lined Pond Collection Area (sq. ft)	120,000
Total Leach Flow to Heap (gpm)	3,800
Evaporation System Flow (gpm)	0
Allowable Wet Season Accum. in Process Ponds (ft^3)	2,250,000
Wet Season Ore Absorption (%)	6.7
Dry Season Ore Absorption (%)	6.7
Average Annual Emitter Evap (%)	2.0
Average Annual Sprinkler Evap (%)	0.0
Ore Throughput per Year (ton)	6,387,500

Assumptions

Pond evap. equals 60% of pan evap. over 50% pond area
Idle heap evapotranspiration equals 75% of pan evap.
Maximum evapotranspiration = rainfall over idle area

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	**Annual**
Days in Month	31	31	30	31	30	31	31	28	31	30	31	30	365
Precipitation (in)	0.20	0.00	0.10	0.45	0.16	0.10	0.20	0.10	0.22	0.15	0.09	0.05	1.81
Pan Evaporation (in)	17.71	15.66	11.17	6.79	2.94	0.00	0.00	3.84	7.26	10.09	13.64	16.09	105
Emitter Evap. (%)	4.0	3.6	2.5	1.5	0.7	0.0	0.0	0.9	1.7	2.3	3.1	3.7	2.0
Sprinkler Evap. (%)													
Idle Heap Evapotrans. Area (sq. ft)	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000	6,580,000
Idle Heap Evapotrans. (in)	13.3	11.7	8.4	5.1	2.2	0.0	0.0	2.9	5.4	7.6	10.2	12.1	79
Ore Placed on Pad (tons)	542,500	542,500	525,000	542,500	525,000	542,500	542,500	490,000	542,500	525,000	542,500	525,000	6,387,500
Precip. Collected (cu.ft)	137,000	0	68,500	308,250	106,175	68,500	137,000	68,500	150,700	102,750	58,225	34,250	1,239,850
Ore Absorption (cu. ft)	1,164,462	1,164,462	1,126,899	1,164,462	1,126,899	1,164,462	1,164,462	1,051,772	1,164,462	1,126,899	1,164,462	1,126,899	13,710,603
Emitter Evap. (cu. ft)	916,287	810,223	559,275	351,304	147,204	0	0	179,449	375,621	505,200	705,711	805,617	5,355,890
Sprinkler Evap. (cu. ft)	0	0	0	0	0	0	0	0	0	0	0	0	0
Evapotrans. (cu. ft)	109,667	0	54,833	246,750	84,992	0	0	54,833	120,633	82,250	46,608	27,417	827,983
Pond Evaporation (cu. ft)	0	0	0	0	0	0	0	0	0	0	0	0	0
Evaporation System (cu. ft)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Net Precip. Gain(+)/Loss(-)	(2,053,416)	(1,974,685)	(1,672,507)	(1,454,266)	(1,252,920)	(1,095,962)	(1,027,462)	(1,217,554)	(1,510,016)	(1,611,599)	(1,858,557)	(1,925,682)	(18,654,627)
Excess Solution Pond													
Allowable Accum. in Excess 0	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	
Accum. into Excess	0	0	0	0	0	0	0	0	0	0	0	0	0
Recycled from Excess	0	0	0	0	0	0	0	0	0	0	0	0	0
Quantity in Excess	0	0	0	0	0	0	0	0	0	0	0	0	
Makeup Solution Required	2,053,416	1,974,685	1,672,507	1,454,266	1,252,920	1,095,962	1,027,462	1,217,554	1,510,016	1,611,599	1,858,557	1,925,682	18,654,627
Solution to Treat/Discharge	0	0	0	0	0	0	0	0	0	0	0	0	0

17.2.13 Hasbrouck Mine Adsorption

The adsorption facility at the Hasbrouck Mine will consist of a single train of 5 up-flow, open-top CICs. The columns will be capable of holding 7 tons of carbon each, providing a CIC process inventory of 35 tons of carbon.

Pregnant solution will be pumped to the carbon adsorption feed tank of the CICs at a nominal flow rate of 3,800 gpm. A magnetic flow meter and a wire sampler will be installed on the feed to the CICs to allow the calculation of total gold ounces fed to the carbon columns.

Pregnant solution will flow by gravity through the set of 5 columns, exiting the last, lowest, adsorption column as barren solution. Barren solution from the last carbon column will be continuously sampled by a wire sampler for metallurgical accounting, and then discharged to the carbon safety screen to recover any floating carbon particles.

Underflow from the safety screen will flow by gravity to the barren solution tank. Carbon recovered on the safety screen will be collected in a carbon super sack for reuse.

The adsorption columns will operate in this fashion until the carbon contained in the first, upper, column achieves the desired precious metal loading, or the barren solution grade increases to an unacceptably high level. Loaded carbon from the first carbon adsorption column will then be pumped to the acid wash circuit. Carbon in each of the lower adsorption columns will be sequentially moved up the adsorption train, counter-current to the solution flow. This will continue from carbon column 5 to carbon column 2. Once carbon has been advanced through the carbon columns, new or regenerated carbon will be pumped into column 5.

17.2.14 Hasbrouck Mine Acid Washing

Loaded carbon from the adsorption circuit will be advanced to an acid wash vessel. In this vessel, hydrochloric acid will be circulated through the carbon to remove calcium carbonate scale before being moved to the desorption cycle. The acid wash vessel is a fiberglass reinforced plastic lined, carbon steel vessel designed to contain 3.0 tons of carbon.

A dilute hydrochloric acid solution will be prepared in the acid mix tank and circulated through the acid wash vessel using a circulation pump. The dilute acid solution overflows the acid wash vessel and returns by gravity to the acid mix tank. Circulation will continue for several hours while process operators monitor and add concentrated acid as needed to maintain the solution's pH at or near 2. After the carbonate scale is removed, and acid is no longer consumed, the circulating acidic solution will be neutralized with caustic and pumped to the adsorption carbon safety screen for disposal as barren solution make-up water.

17.2.15 Hasbrouck Mine Desorption

The carbon will be advanced to the elution vessel after acid washing. The elution vessel is designed to process up to three tons of carbon in a modified Zadra-type desorption cycle, typically requiring 12 to 16 hours per cycle. During this process, gold will be removed from the carbon with a hot caustic strip solution at a temperature of 275°F and a pressure of 70psig. The solution will be heated indirectly using a diesel-fired boiler and heat exchangers. The strip solution exiting the elution column will be cooled through a heat exchanger and from there flow to the recovery circuit where gold will be recovered from the pregnant eluent by electrowinning. Barren eluent leaving the recovery circuit will return to the barren eluent storage tank to be heated and circulated back through the elution vessel. The elution cycle continues until the gold grade of the pregnant and barren eluents are approximately the same, or the allowed strip time has elapsed.

Carbon will then be discharged from the elution vessel onto a dewatering screen within the carbon handling area. Pressure from the barren solution is used to push the carbon from the elution vessel on to the screen for dewatering and further carbon handling.

17.2.15.1 Hasbrouck Mine Electrowinning

Pregnant eluent will flow to two electrowinning cells that will be operated in parallel. Stripped gold from the desorption cycle will be removed from the pregnant eluent by electro-plating onto stainless steel cathodes. Periodically, the stainless steel cathodes will be removed from the electrowinning cell and washed with a high pressure spray to remove the gold sludge. The resulting sludge will be filtered in a plate and frame type filter press. The filter cake will then be processed in an electric mercury retort to remove mercury from the sludge. The mercury will be recovered in a water trap collector and periodically drained from the trap into air-tight vessels and shipped off-site for disposal.

17.2.15.2 Hasbrouck Mine Carbon Thermal Regeneration

Carbon will be transferred as needed from the carbon storage tank to the kiln feed hopper to maintain constant feed to the carbon regeneration kiln. The kiln will be a diesel-fired device that reactivates carbon by heating it at1,400˚F. Reactivation will remove organic compounds that foul activated carbon and which reduces the carbon's activity or capacity to adsorb gold. The kiln will be capable or treating 154 lb of carbon per hour.

17.2.15.3 Hasbrouck Mine Refining and Smelting

After removal of the majority of mercury by retorting, the gold sludge will be treated in an electric induction smelting furnace. The gold sludge will be mixed with fluxes, typically a combination of borax, niter, soda ash and silica sand, and smelted. The soda ash and niter oxidize impurities and allow them to collect into the slag phase while the bullion settles to the bottom of the crucible. Fluorspar may also be used to modify the slag viscosity. The slag and impurities will be poured off into a slag mold and the molten bullion will then be poured into a series of cascading molds. Gas emissions from the furnace will be extracted with a blower and filtered in a baghouse (furnace dust collector) to remove particulates prior to discharge to the atmosphere.

The bullion, or doré, will be quenched and cooled in a water bath. Doré bars will be cleaned of slag and loose metal particles, labeled and weighed. Doré will then be shipped to an off-site refiner for further processing and sale as fine gold.

Slag will be crushed and inspected to remove visible beads of bullion that can be immediately re-melted or recycled to the pour. The remaining slag will be re-smelted to settle and recover any unrecovered bullion. The resulting barren slag will be shipped offsite for disposal.

17.2.16 Hasbrouck Mine Process Reagents

The Hasbrouck Mine site will include storage for NaCN, antiscalant, cement, carbon, sodium hydroxide ("NaOH"), hydrochloric acid ("HCl"), diesel fuel and fluxes (silica, borax, niter and soda ash). Estimated annual reagents consumption and storage capacities for Hasbrouck are shown in Table 17.8.

Table 17.8 Hasbrouck Mine Projected Annual Reagent Consumption

Reagent	Form	Storage Capacity	Annual Consumption
Cement	Bulk	100 tons	15,750 tons
Sodium Cyanide (30%)	Liquid Bulk Delivery Truck	12 tons	2,400 tons
Activated Carbon	1,100 lb Super sacks	22 tons	30 tons
Diesel (process only)	Liquid Bulk Delivery Truck	1,791 gal	134,000 gal
Antiscalant	240 gal Liquid Tote Bins	8 totes (1,920 gal)	23,400 gal
Hydrochloric Acid (32%)	240 gal Liquid Tote Bins	6 totes (1,440 gal)	44,000 gal
Sodium Hydroxide (50%)	Liquid Bulk Delivery Truck	4,887 gal	93 tons
Silica	Dry Solid Sacks	1 ton	4.1 tons
Borax	Dry Solid Sacks	2 tons	6.6 tons
Soda Ash	Dry Solid Sacks	1 ton	2.5 tons
Niter	Dry Solid Sacks	1 ton	3.3 tons

17.2.16.1 Hasbrouck Mine Cement

Dry Portland cement will be purchased in bulk truck loads and stored in a silo on site. A variable-speed screw feeder will meter dry cement onto the pug mill feed conveyor in proportion to the tonnage of ore to be agglomerated.

17.2.16.2 Hasbrouck Mine Sodium Cyanide

NaCN will be used in the leaching, elution and potentially in the adsorption processes. NaCN will be delivered in tanker trucks as a liquid at 30% concentration. NaCN will be stored in an

8,339 gallon, steel tank. Storage capacity will be equivalent to approximately 1.8 days of NaCN usage.

17.2.16.3 Hasbrouck Mine Carbon

Activated carbon will be used to adsorb gold and silver from the leach solution in the adsorption columns. Make-up carbon is 6 x 12 mesh. Carbon will be delivered in 1,100lb super sacks. New carbon will be added to the circuit after being attritioned in the carbon attritioning tank. New carbon required to replace fine carbon losses is projected at 54 lb per ton of carbon stripped.

17.2.16.4 Hasbrouck Mine Antiscalant

Antiscalant agents will be used to prevent the accumulation of scale in the process solution and heap irrigation lines. Antiscalant agents are normally added to the process pump intakes, or directly into pipelines, and consumption will vary depending on the concentration of scale-forming species in the process stream. Delivery will be in liquid form in 240 gallon tote bins.

The antiscalant will be fed from the supplier tote bins into the pregnant and barren pumping systems using variable-speed, chemical-metering pumps. On average, antiscalant consumption is expected to be about 65 gallons per day. The recommended minimum inventory is 2 tote bins.

17.2.16.5 Hasbrouck Mine Sodium Hydroxide

Sodium hydroxide (NaOH or caustic solution) from the reagent area caustic mix/storage tank will be used for acid neutralization in the acid wash circuit as well as in the strip solution. Caustic solution will be delivered in tanker trucks as a liquid at 50% concentration. Caustic solution will be stored in a 4,887 gallon, steel tank and will be fed directly from the storage tank using a small metering pump.

17.2.16.6 Hasbrouck Mine Hydrochloric Acid

HCl will be used in the acid wash section of the elution circuit. The acid washing process consists of circulating dilute acid solution through the bed of carbon to dissolve and remove scale from the carbon. Acid washing is performed every elution cycle. Hydrochloric acid (28-32% by weight) will be delivered in totes, each containing 240 gallons.

17.2.16.7 Hasbrouck Mine Processing Fluxes

Various fluxes are used in the smelting process to remove impurities from bullion. The normal flux components are a mix of silica sand, borax, and sodium carbonate (soda ash). The flux mix composition can be variable and will be adjusted to meet the project smelting needs. Fluorspar and/or potassium nitrate (niter) are sometimes added to the mix. These fluxes will be delivered dry, in 50 lb or 100 lb bags. Average consumption of fluxes is estimated to be 1 lb flux per pound of electrowinning precipitate smelted.

18.0 PROJECT INFRASTRUCTURE

Project infrastructure for the proposed Three Hills and Hasbrouck mines is shown conceptually on the general arrangement maps in Figure 18.1, Figure 18.2, and Figure 18.3.

18.1 Site Facilities

18.1.1 Access and Site Roads

The Three Hills Mine will have two access routes: the Knapp Avenue - Paymaster Canyon route and the South Access Route. The Knapp Avenue route runs west from the town of Tonopah, initially on Knapp Avenue (existing blacktop), and then transitions onto Paymaster Canyon Road ("PMC") (existing gravel) at the county line. A site access road will be installed from the PMC road running parallel to the southwest edge of the HLF to the mine parking lot and security gate area. Knapp Avenue is in Nye County and is administered by Nye county. Paymaster Canyon Road is in Esmeralda County and is administered by Esmeralda county.

The second access route to Three Hills Mine, called the South Access Route, uses existing Esmeralda county gravel roads. The route involves turning west off Highway 95, some 3 miles south of Tonopah, onto an un-named county road (existing gravel), and then turning northeast onto the PMC, and then accessing the mine site via the site access road which will be installed parallel to, and south of, the HLF.

The Hasbrouck Mine will be accessed via a proposed access road from U.S. Highway 95. The access road will route traffic to the parking lot and security gate area.

Turnouts from Highway 95 to the South Access Route and the Hasbrouck Mine access will be installed in consultation with and according to the requirements of the Nevada Department of Transportation.

Nye County and Esmeralda County commissions and the Town of Tonopah Board have been briefed on the project's plan for access, and have concurred subject to entering an agreement for reimbursement for costs of maintenance and repair consequent to mine traffic.

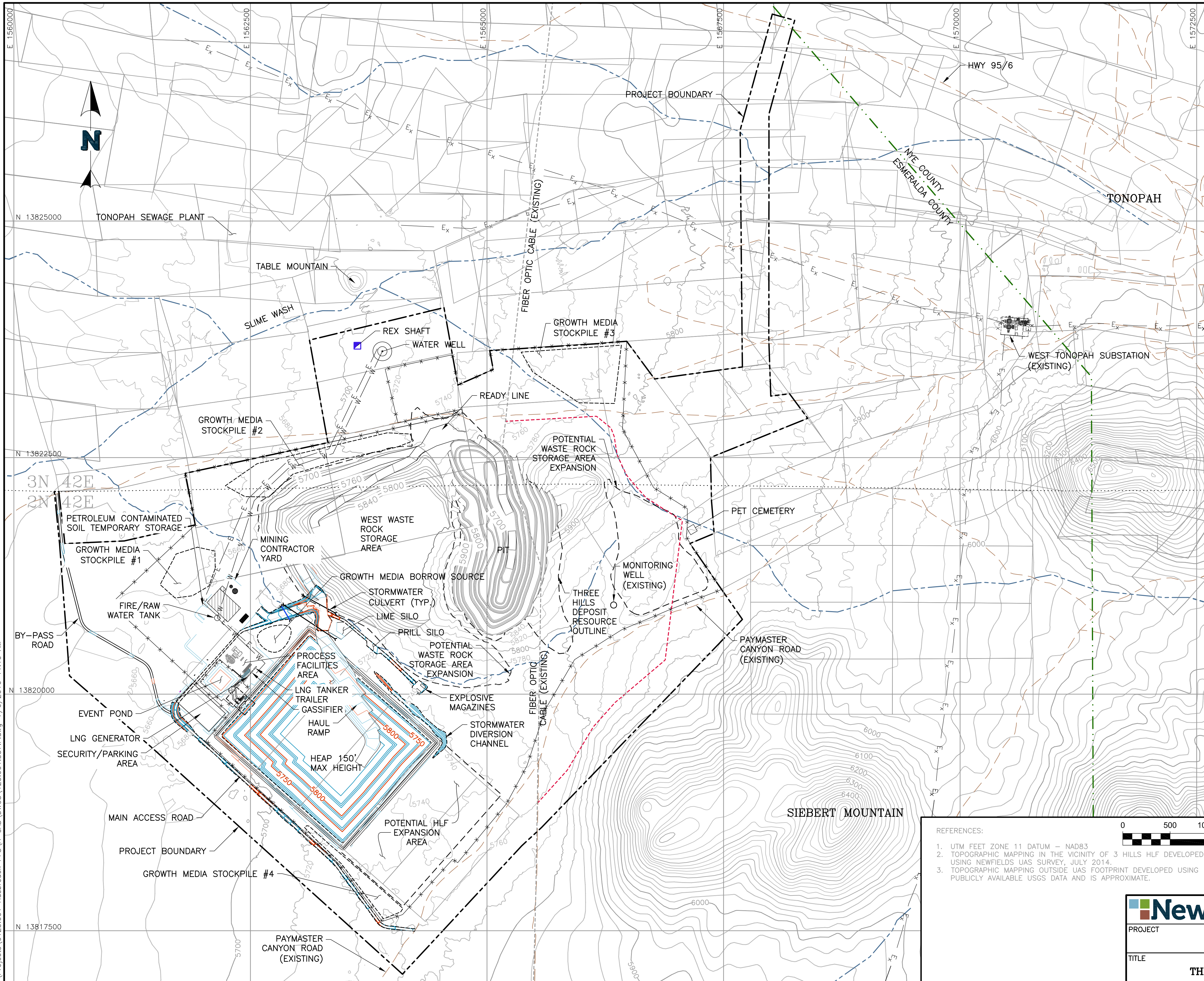
Within each site, light vehicle roads will provide access from the security gate to other areas throughout the site, including the HLF, event pond, processing facilities, administrative areas and mining contractor yard. Material deliveries for lime, prill and explosives will primarily use the light vehicle access road but will cross haul roads at the Three Hills Mine. Haul roads provide travel routes between the mine pit, waste rock storage area, mining contractor yard, and the Three Hills Mine HLF, or the Hasbrouck Mine crushing facility.

18.1.2 Security and Fencing

Both the Three Hills and Hasbrouck mines will have a main security gate allowing controlled entry and exit from each property. These gates will be unmanned, but with call boxes and video surveillance monitored by staff in the warehouse or administration buildings. Visitors' and delivery vehicle entrance will be controlled by the warehouse or administration staff. Card readers will allow company and approved contractor and visitors entrance to the sites.

Fences will be constructed around the perimeter of both sites using 3 to 4 strands of barbed wire. The pits, waste rock storage areas, heap-leach facilities, haul roads, contractor yards and all other ancillary facilities will be secured areas with access controlled at the main security gates.

Internal to the sites, wildlife fencing will be installed around the event pond and pregnant and barren solution tanks. Basic chain link fencing will be used around the warehouse yard and high security fencing will be used to isolate the ADR refinery area.



LEGEND:

- EXISTING GROUND CONTOURS
- PROPOSED GROUND CONTOURS
- EXISTING ROADS/TRAILS
- EXISTING POWER LINE
- EXISTING DRAINAGES
- PROJECT BOUNDARY
- FIBER OPTIC ROW REALIGNMENT
- PROPOSED SECURITY FENCE
- PROPOSED WATER PIPELINE
- MINE HAZARDOUS MATERIAL STORAGE
- FUEL/OIL STORAGE
- TRUCK SHOP/WASH-DOWN AREA WITH DIRT AND OIL TRAPS
- TOWNSHIP/RANGE LINES
- 2N 42E TOWNSHIP NUMBER
- COUNTY LINE

NOTES:

1. CONSTRUCTION MATERIAL PROCESSING TO BE PERFORMED NEAR CONTRACTOR YARD.

REFERENCES:

1. UTM FEET ZONE 11 DATUM – NAD83
2. TOPOGRAPHIC MAPPING IN THE VICINITY OF 3 HILLS HLF DEVELOPED USING NEWFIELDS UAS SURVEY, JULY 2014.
3. TOPOGRAPHIC MAPPING OUTSIDE UAS FOOTPRINT DEVELOPED USING PUBLICLY AVAILABLE USGS DATA AND IS APPROXIMATE.

0 500 1000 FEET

NewFields

CLIENT	WK MINING (USA) LTD.
PROJECT	HASBROUCK PROJECT
TITLE	THREE HILLS MINE SITE PLAN
FILENAME	125.001.537.F
FIGURE NO.	18.1
REVISION	C

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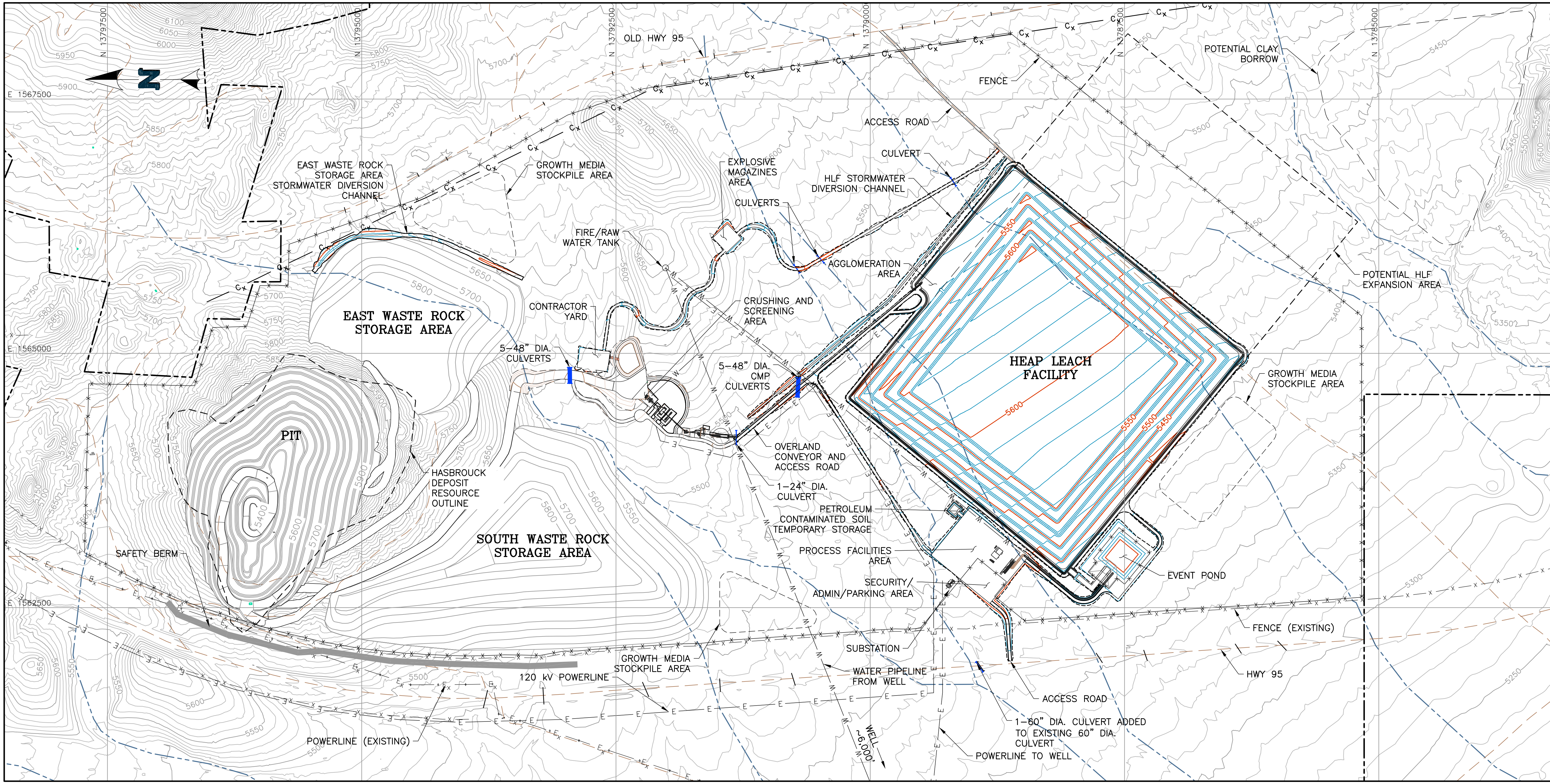

LEGEND:

- EXISTING GROUND CONTOURS
- PROPOSED GROUND CONTOURS
- EXISTING ROADS/TRAILS
- EXISTING DRAINAGES
- PROPERTY BOUNDARY
- EXISTING FENCE
- PROPOSED FENCE
- EXISTING POWER
- PROPOSED POWERLINE
- EXISTING FIBER OPTIC CABLE
- EXISTING CULVERT
- PROPOSED CULVERT
- PROPOSED WATER PIPELINE

NOTES:

1. THE FOLLOWING FEATURES WERE PROVIDED BY MINE DEVELOPMENT ASSOCIATES:
   - –MAIN WASTE ROCK STORAGE AREA
   - –EAST WASTE ROCK STORAGE AREA
   - –PIT
   - –LONG TERM STOCKPILE
   - –CONTRACTOR YARD
2. THE FOLLOWING FEATURES WERE PROVIDED BY KAPPES, CASSIDAY, & ASSOCIATES
   - –CRUSHING AND SCREENING AREA
3. CONSTRUCTION MATERIAL PROCESSING TO BE PERFORMED NEAR CONTRACTOR YARD.

0 500 1000 FEET

REFERENCES:

1. UTM FEET ZONE 11 DATUM – NAD83
2. TOPOGRAPHIC MAPPING IN THE VICINITY OF 3 HILLS HLF DEVELOPED USING NEWFIELDS UAS SURVEY, JULY 2014.
3. TOPOGRAPHIC MAPPING OUTSIDE UAS FOOTPRINT DEVELOPED USING PUBLICLY AVAILABLE USGS DATA AND IS APPROXIMATE.

NewFields	CLIENT: WK MINING (USA) LTD.
PROJECT	HASBROUCK PROJECT
TITLE: HASBROUCK MINE SITE PLAN	FILENAME: 125.001.538.F; FIGURE NO. 18.2; REVISION C

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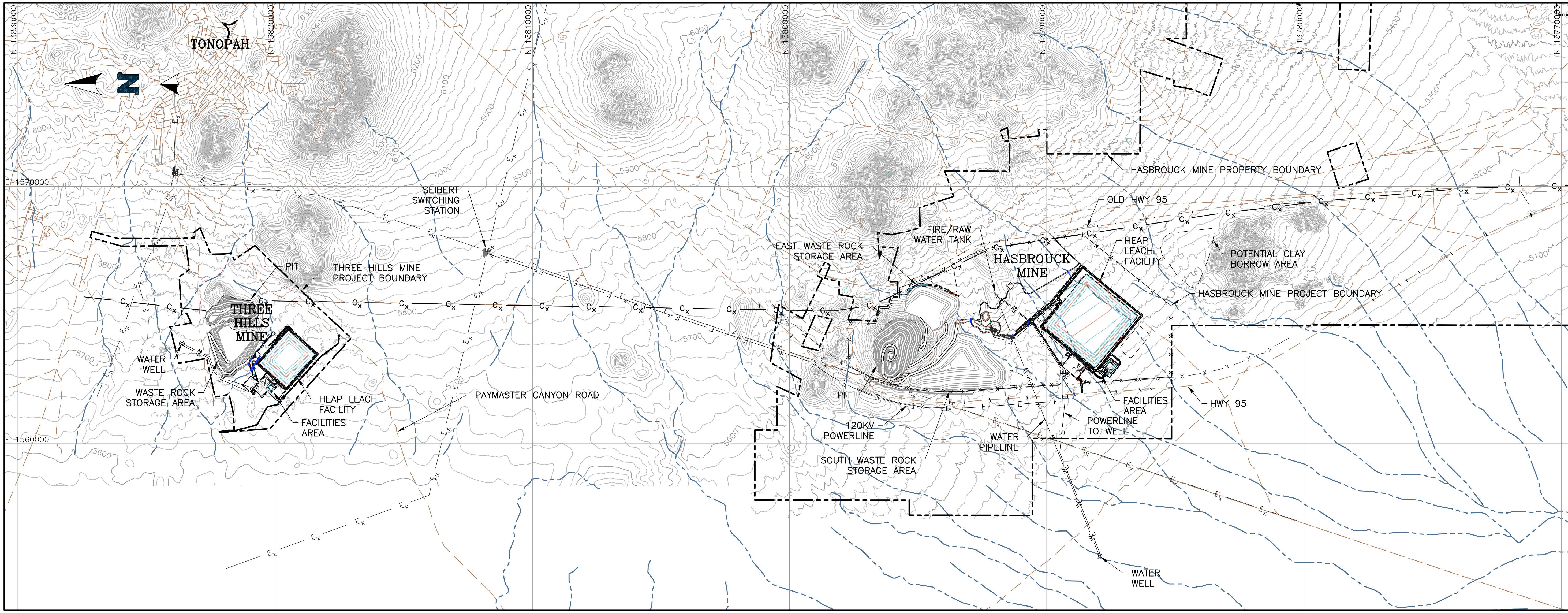

0 2000 4000 FEET

LEGEND:

- EXISTING GROUND CONTOURS
- PROPOSED GROUND CONTOURS
- EXISTING ROADS/TRAILS
- EXISTING DRAINAGES
- PROJECT / PROPERTY BOUNDARIES
- EXISTING FENCE
- PROPOSED FENCE
- EXISTING POWER
- PROPOSED POWERLINE
- EXISTING FIBER OPTIC CABLE
- PROPOSED FIBER OPTIC CABLE RIGHT-OF-WAY
- PROPOSED WATER PIPELINE

REFERENCES:

1. UTM FEET ZONE 11 DATUM – NAD83
2. TOPOGRAPHIC MAPPING IN THE VICINITY OF 3 HILLS HLF DEVELOPED USING NEWFIELDS UAS SURVEY, JULY 2014.
3. TOPOGRAPHIC MAPPING OUTSIDE UAS FOOTPRINT DEVELOPED USING PUBLICLY AVAILABLE USGS DATA AND IS APPROXIMATE.

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NewFields	CLIENT WK MINING (USA) LTD.
PROJECT	HASBROUCK PROJECT
TITLE	WATERLINE ALIGNMENT PLAN
FILENAME	125.001.539.F
FIGURE NO.	18.3
REVISION	D

18.1.3 Water Supply

No potable water supply will be installed at Three Hills Mine, potable water being obtained from the Tonopah water system. A potable water system will be installed at Hasbrouck Mine. This requires obtaining a water right to appropriate groundwater. Water rights have been applied for in 2014 and are currently under review by the state engineer.

Raw water is defined in this report as all water required by the project. It includes water for construction purposes, make-up water for mineral processing, water for dust control on mine roads and ore processing, and other sundry non-potable uses. Raw water is not required to meet potable water standards. The average rate of raw water that will be required at each mine is 500 gpm.

Water for the project is planned to be obtained from groundwater wells near each mine. For the Three Hills Mine, the water supply well will be located approximately 3,700ft north of the process facilities. For the Hasbrouck Mine, the water supply well will be located approximately 7,500ft west of the process facilities. Submersible pumps will be installed at a depth of 1,000ft in each well. Preliminary analysis of the existing water rights and groundwater conditions indicate that these wells can meet the project's raw water requirements. Water rights for the Three Hills well have been applied for in 2014 and are currently under review by the state engineer.

18.1.4 Water Distribution

At both mines HDPE pipelines will be used to convey the required water from the supply wells to 500,000 gallon water storage tanks. At the Three Hills Mine, the water storage tank will be located adjacent to the process facilities. Due to the limited elevation difference between the tank and the facilities, pumps are required to boost pressure and provide adequate flow. At the Hasbrouck Mine, the water storage tank will be located east of the crusher facility. The location of the Hasbrouck tank will provide adequate pressure for the system and booster pumps will not be required.

The chosen route for the water pipeline from the water supply well to the Three Hills Mine will require the consent of a landowner whose land it will cross. Should the landowner in question decline permission, a slightly longer route exclusively on WKM-owned property will be used.

The water pipeline route between the water supply well and the Hasbrouck Mine will be on public land and approval for the well and pipeline installation will be obtained as part of the approval to construct the Hasbrouck Mine required under the National Environmental Protection Act.

18.1.5 Fire Water

The source of fire-fighting water for both the Three Hills and Hasbrouck mines will be the ground water wells for each site. The water transmission systems supplying both mines will be designed to meet the pressure and volume requirements to meet fire codes based on the equipment and building types constructed at each mine. Based on the current building sizing and construction, the required fire-fighting water requirement is estimated at 1,500 gpm for 2 hours with a minimum pressure of 20 psi. At the Three Hills mine, to ensure the flow, volume, and pressure requirements of the fire-fighting source are met, diesel booster pumps will be installed on the fire water transmission pipeline. No pumps will be required at the Hasbrouck Mine.

A fire suppression water system will be installed at each mine to provide service to the buildings. Fire protection water will feed from the fresh water storage tank. Fire hydrants will be placed at regular intervals around the buildings. An agreement will be entered into with the nearby Town of Tonopah Fire Department for fire- fighting services. Light vehicles will carry a small water supply or a fire extinguisher in order to control fires generated by exhaust or catalytic converters.

A fire alarm system will be installed in the administrative building, laboratory, warehouse, plant maintenance shop, truck shop, and ADR building. This system will be used to initiate evacuations and alert personnel of an emergency situation.

Fire extinguishers will be placed in buildings, in equipment storage yards, in vehicles, and in heavy equipment as required by MSHA. Fire extinguishers will be of the type required to address the reasonably anticipated class of fire at a given location. Fire extinguishers will be serviced regularly to ensure their proper functioning. Employees will be trained in the use of hand-held fire extinguishers and alarm systems. Locations and proper use of fire extinguishers will be reviewed with personnel on an annual basis, at a minimum, and upon assignment for new personnel.

18.1.6 Fuel Handling Facility

A fuel storage depot will be located at the contractor yard. It will include separate diesel aboveground tanks for fueling of light/intermediate and heavy vehicles. Gasoline will be obtained either from filling stations in the Town of Tonopah, or from a tank in the fuel storage depot at the contractor yard. Spill containment will be designed for 110 percent of the largest tank or tanker within the containment. Fuel will be delivered via highway-legal trucks directly to the depot. Drivers off-loading fuel will be certified and trained. Cam-lock fittings or other appropriate fittings will be located within the containment to collect spilled fuels. A sump will be located a one end of the containment so that spilled fuels can be pumped from the containment, using a portable pump, for appropriate disposal.

18.1.7 First Aid and Emergency Preparedness

First aid kits will be maintained in the administration building, truck shop, laboratory, process building, warehouse, and safety/security building, in addition to vehicles and heavy equipment as required by MSHA. Personnel will be trained and certified in CPR and basic first aid on an annual basis.

In the event of an emergency on site, responding mine personnel will first contact external emergency services via two-way radios installed in vehicles and heavy equipment or by cell phone. Once the emergency has been stabilized, the Sheriff’s Department and additional regulatory agencies will be contacted as required. Fire and medical emergencies will be responded to by emergency services located in Tonopah.

Fire response is within the jurisdictional boundaries of the BLM, Esmeralda County, and the Town of Tonopah; therefore, these three agencies will likely be the first external responders to an emergency. The closest major medical center to both mines is the Nye Regional Medical Centre in Tonopah, approximately 5 road miles from the Hasbrouck Mine and 2 road miles from the Three Hills Mine. This has an emergency room and emergency medical personnel. lf immediate care is necessary that cannot be provided at the Nye Regional Medical Center, the Med Air Ambulance program out of Las Vegas, Nevada is equipped to provide rapid air transportation of critically injured/ill persons.

Emergency contact information for site personnel, first responders, medical care, and local and federal agencies will be provided at each mine site.

18.1.8 Communications

Both mine sites have good cellular telephone coverage. Voice and data communication at the Three Hills Mine will be either via a cable or satellite, and at the Hasbrouck Mine via satellite.

On-site communications will be by cellular telephone and two-way radio. A separate radio frequency will be established for emergency use, and emergency response and communication protocols will be established.

18.1.9 Transportation

Transportation of materials, equipment, and personnel to and from the mines will be by road-going vehicles. On-site transportation will be trucks of various types.

18.1.10 Buildings

Buildings required for the Hasbrouck project include administration, safety, mine operations, warehouse and laydown area, assay lab, process buildings, and ADR maintenance shop.

The administration building will be a double- or triple-wide office trailer with sufficient room for up to 8 offices and one conference room, as well as a first aid clinic. A second trailer of approximately the same size will be used for mine operations to house the mining supervision, engineering, and geology departments. A third trailer, about half of the size, will be used for safety and training facilities. Each of the buildings will be placed in service with electrical, water, and leach field sewage.

All three of these office trailers will be located at the Three Hills Mine at the beginning of operations. It is envisioned that some or all of these buildings will be relocated to the Hasbrouck Mine once operations have transitioned away from Three Hills.

18.1.10.1 Three Hills Process Area Buildings

The warehouse and laydown area and assay laboratory were evaluated by KCA.

Assay Lab: A full service laboratory facility will be present for use by both the Three Hills and Hasbrouck mines. The laboratory building will be rented in Tonopah and will be fully equipped with all required laboratory and ventilation equipment. The laboratory will be divided into four areas for sample preparation, fire assay, metallurgical testing and a wet laboratory area. The laboratory will also include office space and a restroom. The laboratory is to be sized to process 100 solid samples per day and 150 solution samples per day.

Process warehouse and workshop: The process shop and warehouse at Three Hills will be a 2,900 ft^2, pre-engineered, steel building and located near the CIC circuit. The process shop will have a main work area for repairs and maintenance, and also includes warehouse space for spare parts and necessary equipment. A bridge crane will span half the building to ease maintenance. There will be a fenced laydown area to store larger spare parts.

18.1.10.2 Hasbrouck Process Area Buildings

The warehouse and laydown area and process buildings were evaluated by KCA.

Reagents Storage Building: The reagents storage building (pre-fabricated steel roof with fencing) will be 1500 ft^2. The facility will be divided into three sections with storage for carbon, hydrochloric acid, antiscalant, and other dry reagents such as fluxes.

ADR Plant and Refinery: The ADR plant will be housed in a multi-sectional, pre-engineered, steel building with the main, ADR section approximately 145ft L x 42ft W x 44ft in eave height. An additional pre-engineered section approximately 14ft L x 25ft W x 20ft H for the caustic area will be attached to the ADR section. The refinery will be approximately 79.5ft L x 44.5ft W x 22.75ft H and will share a wall with the ADR building. The refinery will be constructed of concrete masonry unit (“CMU”) walls with a lightweight concrete roof. The main section of the ADR facility will contain the regeneration kiln and carbon handling system, the acid wash and stripping vessel, the strip heating system, and an insulated holding tank. The secure refinery area will contain the electrowinning cells, mercury retort, flux mixing, slag granulation and the fuel-oil fired smelting furnace.

The refinery area will contain a safe which will be secured. The safe will be secured to the concrete structure of the refinery. A concrete slab measuring approximately 29ft L x 15.5ft W with a 10ft cyclone fence and lockable gates will be constructed adjacent to the refinery main door. This area will allow ores to move in and out of the refinery area without compromising security. Security cameras will be installed at strategic locations, connected to remote monitors and recorders.

A dual level office/facilities complex measuring approximately 29ft L x 29ft W x 22.5ft H will be adjacent to the refinery and ADR building. The building will contain a restroom and changing room facilities, a lunch/conference room, offices and a security area.

Process and Maintenance Warehouse: The process shop and warehouse at Hasbrouck will be a 3,430 ft^2, pre-engineered, steel building located near the ADR plant. The Hasbrouck process shop will have a main work area for repairs and maintenance, such as for equipment for the crushing plant and ADR plant, and also includes an office area, tool room and warehouse space for spare parts and necessary equipment. There will be a fenced laydown area to store larger spare parts.

18.1.11 Explosive Storage and Handling

Explosives and blasting agents will be purchased, transported, handled, stored, and used in accordance with the Bureau of Alcohol, Tobacco, Firearms, and Explosives ("BATFE"), Department of Homeland Security ("DHS") provisions, and MSHA regulations. Blasting will be done using ANFO as the primary blasting agent. Boosters and blasting caps will be used to initiate the ANFO in each hole. Ammonium nitrate prill will be stored in a silo in a secure area and mixed with diesel to produce ANFO in specialized explosive trucks. These trucks will deliver the product to the active mining bench as required for blasting.

Conceptual locations are shown in Figure 18.1 and Figure 18.2.

18.2 Electrical Power Supply and Distribution

Electrical power for Three Hills will be provided by a liquefied natural gas ("LNG") generator located on site. Electrical power for the Hasbrouck Mine will be grid power supplied by NV Energy, the local electrical distributor, which has provided preliminary designs and costs for offsite electrical distribution infrastructure. KCA has provided preliminary designs and costs for onsite electrical distribution at both mines.

18.2.1 Offsite Electrical Power

Offsite electrical supply is defined as the infrastructure necessary to bring power to the fence of the mine substation at the Hasbrouck Mine.

Electrical power for Three Hills will be provided by a rented, reciprocating piston engine generator powered by Liquefied Natural Gas ("LNG") as summarized in Section 18.2.2.

A preliminary design and costs for supplying electricity to the Hasbrouck Mine site have been provided by NV Energy and indicate the following:

- A 120 kV switching station ("Siebert switching station");
- Communications equipment;
- Relaying upgrades and communications additions as required at Millers and Sandia; and
- Metering at the mine site substation.

18.2.2 Three Hills Mine Onsite Electrical Power

A budget quote for renting this equipment from Aggreko, a world-leading generating equipment rental company, has been used in this study, and is based on a unit that Aggreko is currently renting to an analogous operation in Nevada. Aggreko's equipment consists of heavy-duty, spark-arrested, turbo-charged, after-cooled engines which have a purpose-built alternator and are suitable for continuous operation in harsh environments (Figure 18.4). This engine design and the use of LNG result in low emissions and little smoke in exhaust gases. Ancillary equipment consist of a trailer-mounted gasifier and a trailer-mounted LNG tank.

Figure 18.4 Example of LNG Powered Reciprocating Piston Engine Generator

At the Three Hills mine site the estimated attached load for the water supply system, process plant including the reagents area and ancillary equipment will be 0.9MW, with an average draw of 0.6MW (Table 18.1).

Table 18.1 Three Hills Heap Leach and Process Facilities Power

Area	Attached Power kW	Peak Power kW	Average Power kW	kWh/year	kWh/ton Ore
Water Distribution	337	252	161	1,411,729	0.258
Heap-leach & Solution Handling	526	436	428	3,246,107	0.618
Adsorption	5	4	4	3,995	0.001
Reagents	4	3	3	8,069	0.002
Ancillaries	16.0	12	9	40,149	0.001
Total At Three Hills	***888***	***707***	***604***	***4,843,948***	***0.885***
Laboratory (located in Tonopah)	234	175	100	859,385	0.157
Total	**1121**	**882**	**713**	**5,703,333**	**1.042**

18.2.2.1 Three Hills Backup Power

A 750kW, 480V diesel or LNG powered backup generator will be installed in the process area for emergency power for those parts of the processing system that need to run continuously, which include the process solution pumps to maintain solution circulation, certain items of small equipment within the plant, and plant lighting. A diesel or LNG fuel tank will provide a minimum of 24 hours of fuel necessary to fulfill the attached equipment power requirements.

18.2.2.2 Three Hills Onsite Electrical Distribution

Within the site, power will be routed to points of use at 4,160V via overhead power lines or at 480V. Where 4,160V is used, transformers will reduce the voltage to 480V to feed the MCC and distribution panels. The ancillary loads, i.e. lighting, instruments, etc. will be fed through small, dry-type transformers with a step down from 480V to a range of 220-127V.

The detailed engineering phase will finalize the design criteria required to construct the branch feeders onsite with respect to costs, safety, reliability, underground or overhead requirements, etc., in conformance with all applicable codes and standards.

18.2.3 Hasbrouck Mine Onsite Electrical Power

The estimated attached load for the water supply system, crushing system, conveying and stacking system, ADR plant including the reagents area, and ancillary equipment at the Hasbrouck mine site is 6.5 MW, with an average draw of 4.1 MW. The estimated process-area electrical power consumption by project area is depicted in Table 18.2.

Table 18.2 Hasbrouck Power For Heap-Leach and Process Facilities

Area	Attached Power kW	Peak Power kW	Average Power kW	kWh/year	kWh/ton Ore
Water Supply & Distribution	491	369	270	1,742,817	0.322
Primary Crushing	409	284	218	1,623,149	0.301
Secondary & Tertiary Crushing	3,268	2,721	2,041	17,630,667	3.265
Conveying, Agglomeration & Stacking	1,246	1,126	845	7,298,804	1.352
Heap-leach & Solution Handling	533	404	396	1,971,363	0.365
Adsorption	5	4	4	9,390	0.002
Reagents	3	1	1	336	0.000
Ancillaries	30	26	17	71,280	0.013
Acid Wash & Elution	31	25	24	85,354	0.016
Carbon Handling & Regeneration	67	56	53	187,814	0.035
Electrowinning & Refining	215	164	160	690,429	0.128
Reagents	4	3	2	21,481	0.004
Ancillaries	194	145	73	313,470	0.058
Total at Hasbrouck	**6496**	**5,328**	**4,104**	**31,646,353**	**5.860**
Laboratory (Located in Tonopah)	234	175	113	847,612	0.157
Total	**6,729**	**5,503**	**4,217**	**32,493,965**	**6.017**

18.2.3.1 Hasbrouck Electrical Substation

The mine site substation will have a capacity of 8,000kVA and will consist of a single transformer with a step down from 120kV to 4,160V. It will include all protective devices, switching, instrumentation, communications, relaying, and ancillaries according to the requirements of the mine and in conformance with codes, regulations, and NV Energy standards.

18.2.3.2 Hasbrouck Backup Power

A 750kW, 480V diesel-powered backup generator will be installed in the process area for emergency power for those parts of the processing system that need to run continuously, which include the process solution pumps to maintain solution circulation, certain items of small equipment within the plant, and plant lighting. A diesel fuel tank will provide a minimum of 24 hours of fuel necessary to fulfill the attached equipment power requirements.

18.2.3.3 Hasbrouck Onsite Electrical Distribution

On-site electricity will be routed to equipment at 4,160V via overhead power lines. Transformers will reduce the voltage from 4,160V to 480V to feed the MCC(s) and distribution panels. Ancillary loads, i.e. lighting, instruments, etc. will be fed through small, dry type transformers which will step down from 480V to a range of 220-127V.

The detailed engineering phase will finalize the design criteria required to construct the branch feeders onsite with respect to costs, safety, reliability, underground or overhead requirements, etc. and always in conformance with all applicable codes and standards.

19.0 MARKET STUDIES AND CONTRACTS

No market studies have been undertaken for this project. However, the commercial products from the Hasbrouck project will be gold-silver doré. Gold-silver doré is readily sold on the global market to commercial smelters and refineries. It is reasonable to assume that doré from the Hasbrouck project will be salable.

To determine appropriate metal prices to be used for economic analysis and cut-off grades, MDA has considered spot prices at the effective date of this report, and reviewed current metal prices used in recent NI 43-101 Technical Reports. The primary selection for metal prices in this report has been done based on consensus prices as described by CIM guidelines, which are given below:

Consensus Prices
The use of consensus prices obtained by collating the prices used by peers or as provided by industry observers, such as analysts for example, may be used in some cases. This methodology has the advantage of providing prices that are acceptable to a wide body of industry professionals (peers). The disadvantage is that sometimes these predictions can be consistently wrong for reasons beyond the QP's control. These prices are generally acceptable for most common commodities, major industrial minerals, and some minor minerals."

MDA reviewed published Technical Reports with respect to metal prices used. Metal prices in these reports ranged from about $1,150 to $1,300 per ounce Au. MDA chose a $1,275 per ounce gold price to be on the upper end of this range as the current trend for gold prices has been increasing. A silver price of $18.21 per ounce was selected to be consistent with a 70:1 gold to silver ratio, which is consistent with the ratio used in the 2015 PFS and the current upward trend in spot silver prices. Accordingly, metal prices of $1,275 per ounce of gold and $18.21 per ounce of silver have been used in this study. Table 19.1 shows the 12-month gold prices with a 12-month average currently at $1,239 per ounce of gold. The 3-year trailing average for gold at the time of publication of this study is $1,386 per oz of gold.

Table 19.1 Kitco Monthly Gold Prices (USD/oz Au – September 2015 to August 2016)

Month / Yr	Average	High	Low	3-Yr Avg	1-Yr Avg
Sep-15	$ 1,125	$ 1,155	$ 1,100	$ 1,330	$ 1,184
Oct-15	$ 1,159	$ 1,184	$ 1,119	$ 1,314	$ 1,179
Nov-15	$ 1,086	$ 1,134	$ 1,057	$ 1,296	$ 1,171
Dec-15	$ 1,068	$ 1,081	$ 1,049	$ 1,279	$ 1,160
Jan-16	$ 1,097	$ 1,116	$ 1,077	$ 1,263	$ 1,147
Feb-16	$ 1,200	$ 1,251	$ 1,127	$ 1,251	$ 1,145
Mar-16	$ 1,246	$ 1,278	$ 1,218	$ 1,242	$ 1,151
Apr-16	$ 1,242	$ 1,286	$ 1,214	$ 1,235	$ 1,154
May-16	$ 1,259	$ 1,294	$ 1,212	$ 1,231	$ 1,159
Jun-16	$ 1,276	$ 1,325	$ 1,212	$ 1,229	$ 1,167
Jul-16	$ 1,337	$ 1,366	$ 1,313	$ 1,230	$ 1,185
Aug-16	$ 1,341	$ 1,364	$ 1,309	$ 1,230	$ 1,203

Twelve-month silver prices are shown in Table 19.2. The 12-month average silver price is $17.85 per ounce.

Table 19.2 Kitco Monthly Silver Prices (USD/oz Ag – September 2015 to August 2016)

Month / Yr	Average	High	Low	3-Yr Avg	1-Yr Avg
Sep-15	$ 14.72	$ 15.26	$ 14.35	$ 21.03	$ 16.13
Oct-15	$ 15.71	$ 16.18	$ 14.43	$ 20.54	$ 16.00
Nov-15	$ 14.51	$ 15.40	$ 13.98	$ 20.03	$ 15.88
Dec-15	$ 14.05	$ 14.49	$ 13.71	$ 19.54	$ 15.70
Jan-16	$ 14.02	$ 14.38	$ 13.58	$ 19.06	$ 15.44
Feb-16	$ 15.04	$ 15.65	$ 14.26	$ 18.64	$ 15.29
Mar-16	$ 15.46	$ 16.13	$ 14.96	$ 18.27	$ 15.23
Apr-16	$ 16.26	$ 17.85	$ 14.96	$ 18.02	$ 15.22
May-16	$ 16.89	$ 17.51	$ 16.06	$ 17.85	$ 15.23
Jun-16	$ 17.18	$ 18.36	$ 15.95	$ 17.74	$ 15.32
Jul-16	$ 19.93	$ 20.47	$ 19.24	$ 17.74	$ 15.72
Aug-16	$ 19.64	$ 20.71	$ 18.50	$ 17.68	$ 16.12

WKM's land obligations and contracts have been summarized in Section 4. There are no other contractual obligations attributed to the project.

20.0 ENVIRONMENTAL STUDIES, PERMITTING, AND SOCIAL OR COMMUNITY IMPACT

Enviroscientists Inc., an environmental permitting and government relations consultant, provided the following section on environmental considerations, permitting, and social and community impacts. It has been taken from Tietz et al. (2015) with modifications for progress in permitting since the 2015 PFS.

The Hasbrouck Project comprises the Three Hills Mine and the Hasbrouck Mine. WKM made the strategic decision shortly after acquiring the properties in April 2014 to permit each mine separately in order in order to accelerate permitting the initial mine, at Three Hills, which due to its small area of disturbance and no significant impacts would be under an Environmental Assessment. This also reduced the amount of money spent on permitting to just that necessary for the project to commence.

WKM has undertaken community engagement through multiple meetings with the Tonopah Town Board, officials of Nye and Esmeralda counties, and local residents through open-house meetings at Goldfield and Tonopah. The meetings have been positive. No agreements are currently in place with the counties or the Tonopah Town Board.

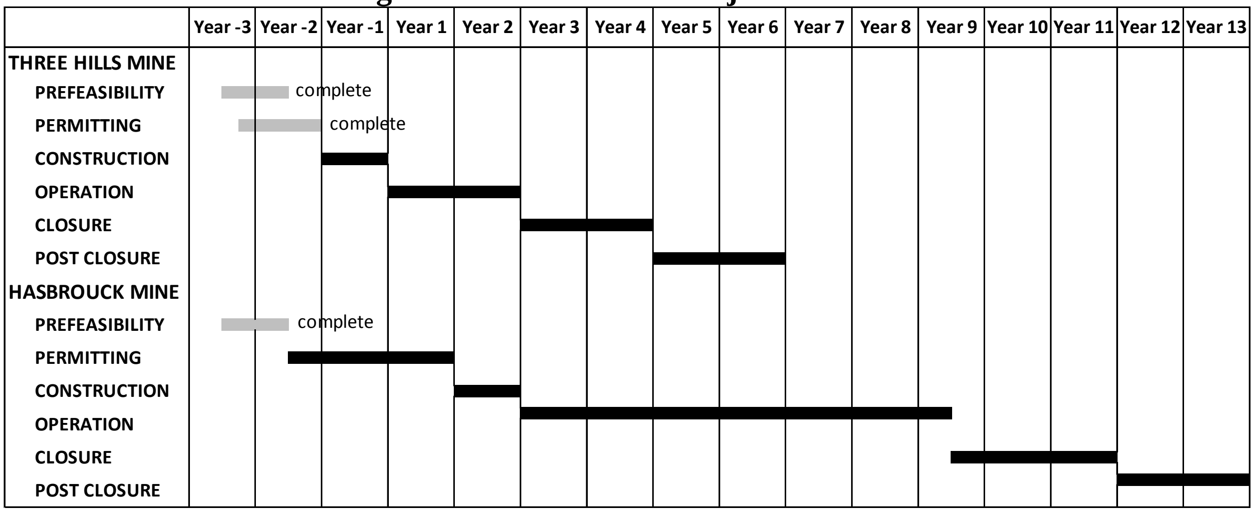
WKM started work on permitting the Three Hills Mine in June, 2014, with the final permit issued in June, 2016, as summarized in

Table 20.1 Three Hills Mine – Key Permit Acquisition Schedule

KEY PERMITS		
PERMIT/APPROVAL	**AGENCY**	**Issued**
Decision Record/Finding of No Significant Impact (DR/FONSI)	US Bureau of Land Management	2015-11-25
New Class I Air Quality Operating Permit to Construct (OPTC)	NV Bureau of Air Pollution Control	2016-06-07
New Class II Air Quality Operating Permit (AQOP)	NV Bureau of Air Pollution Control	2016-06-07
Mercury Operating Permit to Construct (MOPTC)	NV Bureau of Air Pollution Control	2016-06-07
Reclamation Permit (NRP)	NV Bureau of Mining Regulation and Reclamation	2015-12-03
Water Pollution Control Plan (WPCP)	NV Bureau of Mining Regulation and Reclamation	2015-10-31

Permitting the Hasbrouck Mine has commenced and is planned to proceed concurrently with operating Three Hills Mine, allowing permits for the Hasbrouck Mine to be in hand when needed, see Figure 20.1 below. Year -1 represents when a decision is made to commence the project.

Figure 20.1 Hasbrouck Project Schedule



Acquiring key permits for the Hasbrouck Mine is expected to take 33 months and $3 million. The nature of the permitting process does not allow accurate estimates of time and money; the amounts allowed in this study are considered conservative given the straightforward nature of the Hasbrouck Mine and recent experience of permitting similar operations in Nevada. The cost and time might be more than estimated but are more likely to be less.

WKM commenced the process for obtaining permits for the Hasbrouck Mine by commissioning Enviroscientists Inc. to perform base-line botany studies in 2014 and 2015. A class III cultural survey was performed by Western Cultural Resource Management in 2012.

The mine plan for Hasbrouck Mine as presented in this report will require the typical amount of permitting for a mining operation in Nevada, including the completion of an Environmental Impact Statement ("EIS"). There appear to be no biological, cultural, hydrology, or geochemistry issues that would otherwise delay or disrupt the timely process of applications for development. The only exception to this are seasonal restrictions for the completion of biology surveys and cultural surveys (snow).

There are no known environmental issues at either property that would be expected to have a material impact on WKM's ability to extract the estimated mineral resources.

Generally, a number of environmental and other permits are required from the BLM, the Nevada Division of Environmental Protection ("NDEP"), and Esmeralda County. The principal permits are:

- A Mine Plan of Operations ("Plan"), approved by BLM;
- A Nevada Reclamation Permit ("NRP") issued by NDEP's Bureau of Mining Regulation and Reclamation ("BMRR");
- Various Rights-of-Way ("ROW"s) issued by the BLM;

- A Water Pollution Control Permit ("WPCP"), issued by the BMRR;
- A Class I Air Quality Operating Permit to Construct ("AQOPC"), issued by the NDEP's Bureau of Air Pollution Control ("BAPC");
- A Class II Air Quality Operating Permit ("AQOP"), issued by the NDEP's Bureau of Air Pollution Control ("BAPC"); and
- A Mercury Operating Permit to Construct ("MOPC"), issued by the BAPC.

Applications will be submitted to obtain these permits and approvals. In the case of the Plan and the NRP, there is a single application (Plan Application) that will meet the requirements of both the BLM and BMRR.

Make-up water for both mines is planned to be appropriated ground water from a well installed at each mine. A water right will be required for each well, issued by the Nevada Division of Water Resources ("NDWR").

WKM will comply with applicable federal and state environmental statutes, standards, regulations, and guidelines in the permitting of the Hasbrouck project. Environmental baseline studies will be conducted at each of the two properties, and facility and infrastructure locations, to meet federal and state requirements.

The review and approval process for the Plan by the BLM constitutes a federal action under the National Environmental Policy Act ("NEPA") and BLM regulation. BLM is required to comply with NEPA and prepare either an Environmental Assessment ("EA"), or an Environmental Impact Statement ("EIS").

The following sections provide additional detailed information on the principal permits necessary to develop each property and the NEPA process, as well as the status of each permit.

20.1 Mineral Exploration

Mineral exploration at both the Hasbrouck Mine and the Three Hills Mine is and will be authorized by the BLM under multiple Notices. Each Notice authorizes up to five acres of disturbance and is bonded with the BLM. Current disturbances and bond amounts for each existing Notice are shown in Table 20.2.

Table 20.2 WK Mining (USA)'s Notices

Notice #	Disturbance Acreage	Bond Amount
NVN-91216	4.88	$ 65,450.00
NVN-89964	1.84	$ 14,033.00
NVN-89750	4.53	$ 18,758.00

20.2 BLM Plan of Operations / BMRR Nevada Reclamation Permit

Generally, the BLM and the BMRR have implemented a process for Plan Application processing that commences before submitting the Plan Application, and continues through the review and approval process for the Plan Application. WKM submitted a Plan Application for the Three Hills Mine which was approved in November, 2015, and will be submitting a Plan Application for the Hasbrouck Mine when baseline data collection is complete.

20.2.1 BLM Pre-Application Planning

Generally, a pre-application meeting is part of the BLM pre-application planning process. It is scheduled by the proponent and the BLM to discuss the anticipated scope of the mining operation and to review the environmental resource baseline data that will likely be required by the BLM in the Plan Application. Pre-application meetings generally occur one to two years before submitting the Plan, this time varying with the complexity of the mining operations and baseline data needs. A pre-application meeting between WKM and the BLM Tonopah field office took place on October 1, 2014 for the Three Hills Mine. A pre-application meeting has yet to be scheduled for the Hasbrouck Mine permitting process.

The process for collecting baseline data generally includes developing baseline data collection work plans which are submitted to the BLM for review and approval. Once approved, baseline data collection proceeds at the proponent’s discretion. Following such approval, field surveys are carried out to collect relevant baseline data. Desktop studies may be utilized in lieu of field surveys for certain baseline studies. Field survey findings are summarized in a report which is submitted to the BLM for review and approval. In some cases, and depending on the resource being assessed, the baseline data collection process also involves the State of Nevada, e.g. geochemical and hydrological surveys.

At the Three Hills Mine, environmental baseline data that was collected in connection with the permitting effort there included:

- Ore and waste rock geochemical characterization;
- Hydrogeological characterization;
- Analysis of utilizing Tonopah Public Utilities water supply;
- Air quality modeling;
- Botanical and wildlife surveys, including noxious weeds;
- Socioeconomic assessment;
- Visual assessment;
- Cultural resources inventory;
- Traffic study, noise study, and
- Blasting vibration impacts analysis.

The specific baseline data needs for the Hasbrouck Mine have yet to be determined, but are likely to be similar.

20.2.2 Plan of Operations Processing

The process of Plan Application involves submitting a Plan to the BLM and BMRR for surface disturbance in excess of five acres. The single application utilizes the format of the Plan document accepted by the BLM and BMRR. The Application describes the operational procedures for the construction, operation, and closure of the Project. BLM and BMRR required that the Plan Application includes:

- A waste rock management plan;
- Quality assurance plan;
- A storm water spill contingency plan;
- A spill prevention plan;
- Reclamation plan;
- A monitoring plan;
- An interim management plan; and
- A Reclamation Cost Estimate ("RCE") for the closure of the Project.

Generally, a Plan is based on the mine plan design and environmental baseline studies. It includes all mine and processing design information and mining methods. The BLM determines the completeness of the Plan Application and, when the completeness letter is submitted to the proponent, the NEPA process begins. The RCE is reviewed by both agencies and the bond amount is determined prior to the BLM issuing a Decision Record on the Plan Application and BMRR issuing an NRP. A Plan Application for the Three Hills Mine was prepared and submitted to the BLM and the BMRR in May 2015, and a Decision Record was issued in November 2015. An NRP was issued in December 2015.

A Plan Application will be submitted for the Hasbrouck Mine when operational and baseline surveys are complete and operations and design for the Project are at a level where a Plan Application can be developed to the necessary level of detail.

20.3 National Environmental Policy Act

The NEPA process is triggered by a federal action and, as was the case at Three Hills Mine, the issuance of a completeness letter for the Plan is the trigger for the federal action. The NEPA review process is completed by either an EA or an EIS.

20.3.1 Environmental Assessment Process

The EA process is conducted in accordance with NEPA regulations (40 CFR 1500 et. seq.), BLM guidelines for implementing the NEPA in BLM Handbook H-1790-1 (updated January 2008), and BLM Washington Office Bulletin 94-310. The intent of the EA is to assess the direct, indirect, residual, and cumulative effects of a project, and to determine the significance of those effects. Scoping is conducted by the BLM and includes a determination of the environmental resources to be analyzed in the EA, as well as the degree of analysis for each environmental resource. The scope of the cumulative analysis is also addressed during the scoping process.

Following scoping and baseline information collection, the EA is either prepared by the BLM, or prepared by a third party contractor for the BLM. When the BLM determines that the EA is complete, a Preliminary EA is made available to the public for review. Comments received from the public will be incorporated into a Final EA, or included in the Decision Record and Finding of No Significant Impacts.

For the Three Hills Mine the BLM held their internal NEPA kick-off meeting on April 30, 2015, at which time it was determined that because the project area was less than one square mile, there were no significant impacts and no negative socio-economic issues, an EA was the appropriate approach to comply with NEPA.

20.3.2 Environmental Impact Statement Process

The EIS process is conducted in accordance with NEPA regulations (40 CFR 1500 et. seq.), BLM guidelines for implementing the NEPA in BLM Handbook H-1790-1 (updated January 2008), and BLM Washington Office Bulletin 94-310. The intent of the EIS is to assess the direct, indirect, residual, and cumulative effects of the project and to determine the significance of those effects. Scoping is conducted by the BLM and includes a determination of the environmental resources to be analyzed in the EIS, as well as the degree of analysis for each environmental resource. The scope of the cumulative analysis is also addressed during the scoping process. Following scoping and baseline information collection, a Draft EIS is prepared for the BLM by a third party contractor. When the BLM determines the Draft EIS is complete, it is submitted to the public for review. Comments received from the public are incorporated into a Final EIS, which is in turn be reviewed by the BLM and the public prior to a record of decision ("ROD"). Under an EIS there can be significant impacts. The preparation of an EIS is a lengthier and more expensive process than an EA. The project proponent pays for the third party contractor to prepare the EIS, and also pays recovery costs to the BLM for any work on the project by BLM specialists.

Because the Hasbrouck Mine disturbance will exceed one square mile, it is expected that the BLM will require the preparation of an EIS to comply with NEPA for this project.

20.3.3 Water Pollution Control Permit

A WPCP was procured from the BMRR to construct, operate, and close a mining facility in the State of Nevada for the Three Hills Mine, and another WPCP will be required for Hasbrouck Mine. The contents of an application are prescribed in the Nevada Administrative Code Section 445A.394 through 445A.399. A WPCP application will be prepared for the Hasbrouck Mine and will be based on the following:

- Open pit mining, with no anticipated pit lake formation;
- Storage of non-acid generating waste rock;
- Heap leaching with associated process water tanks and event ponds;
- Adsorption-Desorption-Recovery processing;
- Refining;

- Exploration;
- A water supply pipeline, associated water delivery pipelines, and power;
- A power substation and distribution system;
- Access and haul roads; and
- Ancillary facilities that include storm water diversions, sediment control basins, reagent and fuel storage, fresh water storage, monitoring wells, meteorological station, and solid and hazardous waste management facilities.

WPCP applications include:

- Engineering designs for waste rock storage areas and heap leach facilities;
- Waste rock characterization reports;
- Hydrogeological summary reports;
- Engineering designs for process components, including methods for the control of storm water runoff;
- Containment reports detailing specifications for containment of process fluids;
- A process fluid management plan;
- A monitoring plan;
- An emergency response plan;
- A temporary closure plan; and
- A tentative plan for permanent closure of the mine.

20.3.4 Air Quality Operating Permit

The Hasbrouck Mine requires a New Class I AQOPC because the mining plan includes components that have the potential to emit mercury and a New Class II AQOP, issued by the Nevada BAPC. Applications will include a description of each facility, a detailed emission inventory, and air quality modeling. Applications will also include locations, plot plans, and process flow diagrams.

Generally, BAPC issues an initial completeness determination within 30 days of receiving the permit application for an OPTC and 10 days for an AQOP, and any deficiencies in the application are addressed at that point. The BAPC then performs a technical review of the application and when complete, issues a draft permit. This permit is reviewed by the operator and, if deemed acceptable for operations, a final permit is issued. The permit issuance process is between six and nine months.

This process was followed for permitting the Three Hills Mine and will be followed for permitting the Hasbrouck Mine.

20.3.5 Mercury Operating Permit to Construct

Generally, application for the MOPC is made to BAPC and includes a description of each facility, a detailed emission inventory, and a Maximum Achievable Control Technology ("MACT") assessment. The application will also include locations, plot plans, and process flow diagrams.

The BAPC issues an initial completeness determination within 30 days of receiving the permit application, and any deficiencies in the application are addressed at that point. The BAPC then performs a technical review of the application and, when complete, issues a draft permit. This permit is reviewed by the operator and, if deemed acceptable for operations, a final permit is issued. The permit issuance process is between six and nine months.

This process was followed when permitting the Three Hills Mine and will be followed when permitting the Hasbrouck Mine.

20.4 Esmeralda County

An agreement with the Esmeralda County Board of County Commissioners for the maintenance of the county roads travelled by traffic accessing the Three Hills Mine will be needed. At the time of writing, negotiations between WKM and Esmeralda County are progressing amicably and no obstacles are anticipated in entering Esmeralda County's standard form of road maintenance agreement.

20.5 Nye County

An agreement with the Nye County Board of County Commissioners for the maintenance of Knapp Avenue will be needed, this being one of two access routes to the Three Hills Mine. At the time of writing, negotiations between WKM and Nye County are progressing amicably and no obstacles are anticipated in entering Nye County's standard form of road maintenance agreement.

20.6 Other Permits

In addition to the principal environmental permits outlined above, Table 20.3 lists other notifications or ministerial permits that will likely be necessary to operate the Three Hills and Hasbrouck mines.

Table 20.3 Ministerial Permits, Plans, and Notifications

Notification/Permit	Agency	Timeframe	Comments
Mine Registry	Nevada Division of Minerals	30 days after mine operations begin	
Mine Opening Notification	State Inspector of Mines	Before mine operations begin	
Solid Waste Landfill	Nevada Bureau of Waste Management	180 days prior to landfill operations	
Hazardous Waste Management Permit	Nevada Bureau of Waste Management	Prior to the management or recycling of hazardous waste	
General Storm Water Permit	Nevada Bureau of Water Pollution Control	Prior to construction activities	
Hazardous Materials Permit	State Fire Marshall	30 days after the start of operations	
Fire and Life Safety	State Fire Marshall	Prior to construction	
Explosives Permit	Bureau of Alcohol, Tobacco, and Firearms	Prior to purchasing explosives	Mining contractor may be responsible for permit
Mine Identification Number	Mine Safety and Health Administration	Prior to start-up	
Notification of Commencement of Operation	Mine Safety and Health Administration	Prior to start-up	
Radio License	Federal Communications Commission	Prior to radio use	

20.7 Environmental Study Results and Known Issues

For the Three Hills Mine, WKM collected baseline data in early 2014 for environmental studies necessary for the Plan Application and permitting process. Results indicated:

- Limited biological and cultural issues;
- Air quality impacts appear to be within State of Nevada standards;
- Traffic and noise issues are present, but at low levels; and
- Socioeconomic impacts are positive.

Allied Nevada, the former owner of the properties initiated baseline data collection for the proposed Hasbrouck Mine in late 2013 and early 2014. WKM collected biology and botany data at the proposed Hasbrouck Mine in May 2015.

20.8 Waste Disposal, Monitoring, Water Management

The following is based on WKM's Plan Application to the BLM for the Three Hills Mine. Similar measures are being developed for the Hasbrouck Mine.

20.8.1 Waste Handling and Disposal

WKM will institute a waste management plan that will identify the wastes generated at the site and their means of disposal. A training program will be implemented to inform employees of their responsibilities in proper waste disposal procedures. A landfill in the Project Area is not planned, and all solid wastes will be disposed off-site. Used lubricants and solvents will be characterized according to the Resource Conservation and Recovery Act (RCRA) and will be stored and disposed of appropriately. WKM will have a trained response team at the site 24 hours per day to manage potential spills of regulated materials at the site. Response for transportation-related releases of regulated materials bound for the site will be the responsibility of the local and regional agencies. However, where appropriate, WKM may assist with response to off-site incidents, including providing resources based on agency requests.

20.8.1.1 Hazardous Wastes

WKM may obtain a Hazardous Waste Identification Number from NDEP. The Three Hills and Hasbrouck mines are expected to be in the "conditionally exempt small quantity generator" category as defined by the U.S. Environmental Protection Agency ("EPA"). Used solvents are the only hazardous wastes identified as potentially existing at the mines at this time.

20.8.1.2 Non-Hazardous Wastes

Used oil and coolant will be stored in secondary containment at the Three Hills and Hasbrouck mines. These will be either recycled or disposed of in accordance with state and federal regulations. Used containers will be disposed of or recycled according to federal, state, and local regulations.

20.8.1.3 Domestic Waste Disposal

Solid wastes generated by the mine and process departments at both Three Hills and Hasbrouck will be collected in dumpsters near the point of generation. Industrial solid waste will be disposed of in an off-site Class III landfill in accordance with NAC 444.731 through 444.737.

20.8.2 Waste Water (Sewage) Disposal

Sewage disposal will be handled at the Hasbrouck Mine in a septic leach field and in portable toilets. No potable water system or septic field will be installed at the Three Hills Mine; these requirements being met by the Town of Tonopah where the administration offices and assay laboratory will be located.

Sewage drain pipes will be routed from the administrative facilities and buildings containing running water at the Hasbrouck Mine to the septic leach fields. Leach fields will be sized and permitted to accommodate the anticipated number of employees and personnel at each site. Near equipment ready-lines or other areas where running water is not available, but where toilets will be required, portable toilets will be provided and serviced by a local contractor. A septic field with the capacity to treat waste for up to 100 persons will be installed to the west of the administration and warehouse buildings at the Hasbrouck Mine.

A centralized oil-water separator will be installed adjacent to the truck shops at the Three Hills and Hasbrouck mines to treat water from drains located at each maintenance bay and from the wash rack. The floor drains in the maintenance area will be designed to collect rainwater and snow melt from vehicles and equipment. Gray water from the oil/water separator will be collected in a tank within containment or a lined impoundment. Gray water will be recycled back to the wash system; excess water will be used for dust control. Separated oil will be stored either in a double-lined tank or a single-wall tank within a concrete containment, and collected and disposed of by a licensed waste collection contractor.

20.8.3 Waste Rock and Tailings Characterization

Waste rock and tailings at Three Hills Mine has been characterized as inert and environmentally benign. Waste rock and tailings characterization at Hasbrouck Mine is ongoing and initial results indicate that ground water, rock in general, and mineralized material planned to be mined are generally non-reacting and are not acid generating. As a result, waste rock management is expected to be by random placement with quarterly sampling of placed materials.

20.9 Social and Community Issues

There are no known social or community issues that would materially impact on WKM's ability to extract mineral resources at the Three Hills and Hasbrouck mines. Identified socioeconomic issues (employment, payroll, services and supply purchases, and tax) are anticipated to be positive.

Some blasting at the Hasbrouck Mine will require brief closures of the adjacent U.S. Highway 95. Preliminary meetings with the Nevada Department of Transportation ("NDOT") indicate that shutting down a highway while blasting is performed for mining and road construction is routinely permitted.

20.10 Mine Reclamation

The following is based on WKM's Reclamation Plan, which is contained within WKM's Plan Application to the BLM for the Three Hills Mine. Similar measures are being developed for the Hasbrouck Mine.

Reclamation of disturbed areas resulting from activities outlined in the Reclamation Plan will be completed in accordance with BLM and NDEP regulations. The areas for disturbance can be divided into the following:

- Open pit;
- Waste rock storage areas;
- Heap leach facility;
- Borrow areas;
- Growth media stockpiles;
- Haul roads;
- Buildings and yard areas;
- Process plant;
- Administration;
- Laboratory; and
- Ancillary facilities.

WKM anticipates that with the exception of the open pit, surface mine components will be reclaimed and revegetated.

It is not economically feasible to reclaim the slopes of the open pit when mining is complete due to a number of factors including pit wall stability and geology, topography of the final pit configuration, potential adverse effects to the environment associated with the activities required for reclamation, and maintaining access to mineral resources. WKM sought and gained exemption from NDEP BMRR under NAC519A.250 for reclamation of the slopes of the open pit at the Three Hills Mine and will do the same for the Hasbrouck Mine.

The final grading plan at each mine will be designed to minimize the visual impacts of disturbance. Slopes will be re-contoured to blend with surrounding topography, interrupt straight-line features and facilitate revegetation where practicable. Where feasible, large constructed topographic features such as waste rock storage areas, may be arranged to have rounded crests and variable slope angles to resemble natural landforms.

Reclaimed surfaces will be re-vegetated to control runoff, minimize erosion, provide forage for wildlife and livestock, and reduce visual impacts. Seedbed preparation and seeding will take place in the fall after grading and top-soiling of reclaimed areas.

20.10.1 Central Operating Area (Administration, HLF, and Process)

During final mine closure, buildings and structures will likely be dismantled and materials will be salvaged or removed to an authorized landfill. Concrete foundations and slabs will be broken using a track-hoe mounted hydraulic hammer or similar methods and buried in place under approximately 3ft of material in such a manner to prevent ponding and to allow vegetation growth. After demolition and salvage operations are complete, the disturbed areas will be covered with approximately 12in of growth media and revegetated. Alternatively, buildings and structures may be left on private land in support of other industrial or commercial, post-mining land uses.

Reagents and explosives will be removed or appropriately disposed of. Surface pipelines will be removed and salvaged or disposed of. Underground pipeline ends will be capped and left in place. Unneeded utility poles will be cut off at ground level and removed.

20.10.2 Heap Leach Facility

The leach pad will be re-contoured to an average final slope configuration not steeper than 3H:1V to provide for long-term mass stability. The toe of the re-contoured slope will be inside the lined facility, and subsequently placed cover material will direct surface runoff away from the lined area of the pad. Re-contoured sides-slopes will include slope breaks horizontally along contour approximately every 100 vertical feet. Slope breaks will be small flat benches up to 20ft wide and blended into the slopes. The toe and crest of the facility will also be rounded to blend into the adjacent slopes. Minimizing the total continuous slope length with benches, and rounding the toe and crests, will help to limit erosion until vegetation is established.

Growth media will be hauled to the heap leach surfaces from growth media stockpiles and to the borrow areas. The cover for the heap leach pad will generally be designed to accomplish the following;

- Limit infiltration of meteoric water;
- Isolate process materials from storm water runoff;
- Limit erosion; and
- Support successful revegetation.

20.10.3 Mine Pits

Operational and post-closure open pit slope configurations will be controlled by several parameters that include the geometry of the ore body, geologic and geotechnical characteristics of the host rock, equipment constraints, and safe operating practices. The open pit walls will be too steep to allow soil replacement and revegetation due to access logistics and safety concerns.

Open pit ramps will be barricaded to prevent entry by the public. The open pit floor and ramps are expected to be competent rock surfaces that will be stable without reclamation. These areas have little or no potential to support vegetation. There are no plans to re-vegetate the open pit.

During final reclamation, a physical barrier (e.g., berms, fencing, or other appropriate barriers) will be installed along the open pit crest areas to control access by people, livestock, and large wildlife. Post-mining modifications of open pit walls to decrease slope angles are not planned.

20.10.4 Waste Rock Storage Areas

Waste rock storage areas will be reclaimed to minimize slope erosion, create mass stability, round edges, revegetate surfaces, and minimize soil loss, consistent with the surrounding topographic features. The final slopes of the reclaimed waste rock storages facilities will have slopes of 3H:1V or shallower, up to 100ft high benches, and 20ft wide intermediate benches to reduce surface water flow velocities and erosion. Reclamation of the waste rock storage areas will be conducted concurrently with regular mine operations to the extent reasonable. It is anticipated that the waste rock storage areas will be constructed in multiple lifts with setbacks between lifts that will facilitate final grading. To the greatest extent practicable, areas of the waste storage facilities that reach their ultimate configurations and become inactive during the active mining phase will be re-contoured and covered with 12in of stockpiled salvaged growth media and seeded.

20.10.5 Roads

Roads without a defined post-mining use will be reclaimed concurrent with mining operations as they become no longer needed. Where the original topography exceeds 3H:1V, road cuts will be filled with road bed material to blend with existing topography and to ensure no steeper than 3H:1V slopes, except where located generally in bedrock. There are no planned asphalt roads or parking areas. Roads and safety berms will be re-contoured or re-graded to approximate original contour. Where the road is located on fill, the side slopes will be rounded and re-graded to 2.5H:1V. Finished slopes will be generally similar in character to the surrounding topography. Compacted road surfaces will be ripped, covered with growth media from the safety berms or road fill, and revegetated.

Certain access roads will be needed after mine closure to access monitoring points. As monitoring is completed and the facility is considered to be finally closed, such access roads will be reclaimed.

As determined by the BLM, roads on public lands suitable for public access, or which continue to provide public access consistent with pre-mining conditions, will not be reclaimed at mine closure. Narrow access roads may remain on large haul roads after they have been re-contoured and seeded.

20.11 Mine Closure

Reclamation and site closure activities shall be performed in accordance with the NRPs and WPCPs for the Three Hills Mine and Hasbrouck Mine, as summarized in the following sections.

20.11.1 Slope Stabilization

Slope stability analyses on the waste rock storage areas were performed using industry practices and experience from similar projects. Where possible, the outside portions of the final waste rock storage areas will be constructed such that variable topography will be achieved during reclamation re-contouring.

The walls of the open pit will generally have an overall slope of 35º to 45º.

20.11.2 Final Engineering and Monitoring Plans

WKM will adhere to BMP and BMRR standards and specific requirements for post reclamation monitoring. Post reclamation monitoring and maintenance will include the following:

- Following mine closure, berm and sign maintenance, site inspections, and any other necessary monitoring for the period of reclamation responsibility will be conducted. Monitoring of re-vegetation success will be conducted annually until the re-vegetation standards have been met and will include noxious weed monitoring and abatement as necessary.
- WKM will monitor heap-leach pad flow and chemistry. Mitigation will be developed if necessary. Post-mining ground water quality will be monitored for 5 years according to the requirements established by the NDEP upon approval of the WPCP with the goal of demonstrating the site poses no potential to degrade waters of the state through the successful implementation of the detailed Final Plan for Permanent Closure.
- Re-vegetation monitoring will be conducted for a minimum of five years following implementation of re-vegetation activities or until re-vegetation success has been achieved. Re-vegetation monitoring will occur based on seasonal growth patterns, precipitation, and weather conditions.
- Noxious weed monitoring and control will be implemented for a five-year period following closure.

20.11.2.1 Heap Drain-Down and Neutralization

Drain-down of water from within the HLFs will continue for several years after closure. Drain-down flow rate at the start of the closure period will be at the operational flow rate and will steadily decline over a number of years until reaching a steady state condition where inflow of meteoric water through the cover will equal the outflow. When the steady state is reached, outflows will be disposed of in a passive evaporation system made by converting the event pond into evapotranspiration cells (“ET cells”). Initially, outflows will exceed what can be handled by the ET cells; excess outflows will be disposed of by an active evaporation system (mechanical misting devices).

Monitoring wells around the heap leach facility will be maintained until WKM is released from this requirement by the NDEP. These wells will then be plugged and abandoned according to the requirements of the State Engineer.

20.11.2.2 Ponds and Pump Stations

When no longer needed for solution management, the event pond will be converted into evapotranspiration ("ET") cells or reclaimed. Assumptions have been made to convert the event pond into an ET cell because the cell is a double-lined facility with leak collection and recovery system ("LCRS"). As part of the design, the converted ET cell will be covered with six inches of growth media and seeded.

Solids are expected to be present in some quantity in the process tanks and event pond at the time of closure. Representative samples will be obtained to determine the chemical characteristics of the pond solids. Depending on the results of the characterization testing, the solids will be left in the pond and buried in place in the event pond, under the ET cell cover, or removed and placed in an approved landfill.

20.11.2.3 Roads, Diversion Works and Erosion Controls

Runoff from waste rock storage areas and other slopes will occur following precipitation events. However, re-graded slope angles, re-vegetation (including growth media placement) and Best Management Practices ("BMPs") will be used to limit erosion and reduce sediment in runoff. Silt fences, sediment traps, and other BMPs will be used to prevent migration of eroded material until reclaimed slopes and exposed surfaces have demonstrated erosional stability.

20.11.2.4 Fencing

A 20,500ft perimeter fence will be constructed around the Three Hills facilities and a 33,000 ft perimeter fence will be constructed at Hasbrouck to prevent access by livestock, wildlife, and the public. In general, three strand barbed wire fences will be used per BLM Handbook 1741-1. The area within the perimeter fence is approximately 476 acres at Three Hills and 1,288 acres at Hasbrouck mine. Chain-link fences will be erected within the perimeter fence in areas where a higher level of security is needed, such as the event pond, in order to protect livestock and other animals from entry. These will be removed at closure after the ponds are reclaimed. The perimeter fence will be monitored on a regular basis and repairs made as needed. Gates or cattle guards will be installed along roadways, as appropriate.

21.0 CAPITAL AND OPERATING COSTS

MDA has authored Section 21, Capital and Operating Costs, with subsections for Process Capital and Process Operating costs provided by KCA. NewFields has provided inputs for leach-pad Capital and also some input to Infrastructure Capital Costs, which are included in the Other Capital Costs (Section 21.9). H.C. Osborne and Associates, and Mr. Paul Sterling, a consultant to WKM, have reviewed Process Operating Costs.

Capital costs at the start of the project are attributed to the startup of Three Hills Mine at $46,742,000, which includes $4,864,000 of working capital. $83,082,000 in capital is required for the startup of Hasbrouck after the return of Three Hills Mine working capital, and there is an additional $13,170,000 in sustaining capital. Total life-of-project capital is $142,993,000. Direct capital costs include sales tax.

Working capital is estimated based on the additional operating capital for Month 1 required prior to development of sufficient revenues to maintain a positive cash balance. This capital is retained in account until the project is sustainable with a positive cumulative cash flow, which occurs in Month 2.

Marsh Canada advise that a surety bond to cover the full bonding amounts for both Three Hills and Hasbrouck mines should be obtainable once WKM has several years of successful operating history, but prior to a demonstrated operating history a surety bond for only half of the bond amount will be possible. Three Hills Mine initial capital includes $2,279,000 in environmental bonding costs, this being two thirds of the predicted bonding amount, the balance being covered by a surety bond. The cost to maintain the surety bonding was included in operating costs. Once WKM switches to the surety bonding for Hasbrouck, it is assumed that the cash provided as the initial Three Hills bond will be released, which occurs in month 25. This has been included as part of growth capital as it is used toward construction of Hasbrouck mine.

No sustaining capital was attributed to the Three Hills mine, other than some sustaining capital for power generation.

Table 21.1 shows the estimated capital costs for both the Three Hills and Hasbrouck mines. This is returned to the cash flow as a credit in Year 1 when the operation is projected to generate a positive cash balance in excess of the initial working capital amount (some equity financed capital may remain in the project). This is shown in the cash-flow portion of the economic analysis presented in Section 22.2, Table 22.4.

Table 21.1 Hasbrouck Project Capital Cost Summary

Direct Costs	**Units**	**Initial**	**Growth**	**Sustaining**	**Total**
Pre-Production	K USD	$ 5,813	$ 190		$ 6,003
Mining	K USD	$ 184	$ 77	$ 127	$ 388
Plant and Recovery	K USD	$ 8,073	$ 38,313	$ -	$ 46,386
Leach Pads	K USD	$ 7,617	$ 10,048	$ 9,348	$ 27,012
Ponds and Site Infrastructure	K USD	$ 1,948	$ 2,910	$ -	$ 4,858
Water Supply	K USD	$ 1,740	$ 3,030	$ -	$ 4,770
Roads	K USD	$ 1,013	$ 1,039	$ -	$ 2,052
Light Vehicles	K USD	$ 490	$ 113	$ 336	$ 938
Site and Administration	K USD	$ 47	$ 77	$ -	$ 124
Safety & Security	K USD	$ 82	$ 15	$ -	$ 97
Owner's Capital	K USD	$ 6,383	$ 8,227	$ 32	$ 14,642
Total Direct Costs	K USD	$ 33,389	$ 64,039	$ 9,843	$ 107,270
Indirect Costs					
Initial Fills	K USD	$ 146	$ 1,764	$ -	$ 1,910
Indirects	K USD	$ 1,229	$ 2,615	$ 421	$ 4,265
EPCM	K USD	$ 1,466	$ 5,465	$ 514	$ 7,445
Newmont Buyout	K USD	$ -	$ 1,000	$ -	$ 1,000
Total Indirects	K USD	$ 2,841	$ 10,844	$ 935	$ 14,620
Contingencies					
Mining (15%)	K USD	$ 550	$ 30	$ -	$ 579
Plant and Recovery (20%)	K USD	$ 1,760	$ 7,560	$ -	$ 9,320
Leach Pads (15% - 25%)	K USD	$ 1,142	$ 2,512	$ 2,337	$ 5,991
Roads, Ponds, Water, and Infrastructure (25%)	K USD	$ 1,145	$ 1,697	$ -	$ 2,842
Other (15%)	K USD	$ 1,050	$ 1,265	$ 55	$ 2,370
Total Contingency	K USD	$ 5,647	$ 13,063	$ 2,392	$ 21,103
Total Capital Cost	K USD	$ 41,878	$ 87,946	$ 13,170	$ 142,993
Working Capital	K USD	$ 4,864	$ (4,864)	$ -	$ -
Total Capital w/ Working Capital	K USD	$ 46,742	$ 83,082	$ 13,170	$ 142,993

Mining and re-handle operating costs were estimated by MDA based on first principle costs plus the addition of the contractor’s assumed recovery of mining capital and profit margin of 15%. These costs were compared to the 2015 PFS contractor quotations and are comparable to those quotations assuming commodity pricing from the 2015 PFS. Processing operating costs were estimated by KCA and provided to MDA in the form of fixed and variable costs. These costs were then applied to the process schedule by MDA to generate the life of mine (“LOM”) processing costs, which include additional costs during processing at the end of the mine life while pads continue to be leached, but are no longer being loaded with fresh ore. General and administrative costs and Nevada’s net proceeds tax were estimated by MDA. Reclamation costs were estimated by Enviroscientists, Inc., using BLM reclamation cost estimate spreadsheets. These costs were reviewed by Mr. Paul Sterling, a consultant to WKM.

Total estimated costs are $8.33 per ton of ore. Table 21.2 shows a summary of the operating cost estimate. Note the economic summary shown in Section 22.0 (Table 22.1) shows cost per ton of ore, and shows an apparent discrepancy with the mining cost in Table 21.2. This is due to the inclusion of re-handle costs into the mining cost per ton of ore in the economic summary. Additionally, the total costs shown in Table 22.1 are based on the definition of the World Gold Council's Adjusted Operating Cost per ton of ore, for a total of $8.43 per ton of ore, which includes a credit for silver production and does not include reclamation (as per the World Gold Council Adjusted Operating Cost definition). The costs in Table 21.2 do not include silver credits and do include reclamation.

Table 21.2 Operating Cost Summary

		K USD	USD per ton Processed
Three Hills	Mining Cost	$ 30,670	$ 3.18
	Process Cost	$ 24,575	$ 2.55
Hasbrouck	Mining Cost	$130,943	$ 3.68
	Process Cost	$139,963	$ 3.93
	Re-handle	$ 2,340	$ 0.07
Total	Mining Cost	$161,613	$ 3.57
	Process Cost	$164,538	$ 3.63
	Re-handle	$ 2,340	$ 0.05
	G&A Cost	$ 20,621	$ 0.46
	Reclamation - Three Hills	$ 3,419	$ 0.35
	Reclamation - Hasbrouck	$ 5,519	$ 0.15
	Nevada Net Proceeds Tax	$ 19,201	$ 0.42
	Net Operating Cost	$377,251	$ 8.33

21.1 Mining Capital

Projected mining capital is minimized by planning to use a contractor for mining operations. Mining capital costs have been split into contract mining capital and owner mining capital, where the contractor mining capital includes mobilization, demobilization, and pre-production capital. Pre-production contract mining capital includes construction of roads and establishing initial benches prior to production mining. All pre-production contractor costs are included in the cash flow as pre-production capital.

Owner mining capital includes mining software, operations offices, office furnishings and computers, and communications equipment. Mining capital is summarized in Table 21.3 Preproduction capital shown in Table 21.3 is for mining of construction material during year -1. In addition, year -1 owner mining pre-production capital of $1,952,000 was included as pre-production capital for normal mining operations starting in year -1. This, along with $380,000 of initial processing costs in year -1, is the difference between the year -1 total in Table 21.3 and preproduction costs shown in Table 21.1.

Estimated mining capital costs were based on vendor or contractor quotations. Note that light vehicle capital for mining is discussed in Section 21.6, Other Capital Costs.

Table 21.3 Summary of Estimated Project Mining Capital

Three Hills - Contract Mining Capital	Units	Pre-Prod	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Total
Mobilization	K USD	$ 284	$ -	$ 120	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 404
Road Construction / Pioneering	K USD	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
Pre-Production - Mining	K USD	$ 3,147	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 3,147
Three Hills Pre-production Mining Capital	K USD	$ 3,481	$ -	$ 120	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 3,601
Hasbrouck - Contract Mining Capital												
Demobilization	K USD	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 127	$ -	$ 127
Road Construction / Pioneering	K USD	$ -	$ -	$ 70	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 70
Hasbrouck Pre-production Mining Capital	K USD	$ -	$ -	$ 70	$ -	$ -	$ -	$ -	$ -	$ 127	$ -	$ 197

Owner Mining Capital	Units	Pre-Prod	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Total
Software	K USD	$ 155	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 155
Mine Operations Offices	K USD	$ -	$ -	$ 77	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 77
Computers, Printers, and Plotters	K USD	$ 26	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 26
Communications (phones, internet, etc)	K USD	$ 3	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 3
Owner Mining Capital Total	K USD	$ 184	$ -	$ 77	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 261
Total Mining Capital Costs	K USD	$ 3,665	$ -	$ 267	$ -	$ -	$ -	$ -	$ -	$ 127	$ -	$ 4,059

21.2 Three Hills Process Capital

Process capital costs for the Three Hills Mine have been estimated by KCA and NewFields with input from WKM. Capital cost estimates have been made using budgetary supplier quotes for all major and most minor equipment items. Where supplier quotes were not available for minor equipment items, reasonable cost estimates based on experience from other recent projects were made. All capital cost estimates are based on the purchase of equipment quoted new from the manufacturer, or estimated to be fabricated new. All costs are in fourth quarter 2014 US dollars except for the cost of diesel fuel, which has been updated for the second quarter of 2016. .

Process capital and operating costs are considered to have an accuracy of +/-15% for the laboratory and CIC circuit, and +/-25% for all other areas. Three Hills process plant capital cost is $11.6 million (including indirects, contingencies, initial fills, and EPCM, but excluding working capital).

Each area in the process cost build-up is separated into the following disciplines, as applicable:

- Contractor Mobilization;
- Earthworks;
- Liners and ponds;
- Civils and Foundations;
- Structural steel;
- Platework;
- Mechanical equipment;
- Piping, Electrical and Instrumentation;
- Installation and Commissioning;

- Freight; and
- Sales and Other Taxes.

The Three Hills Mine Process Capital Cost summary is presented by area in Table 21.4. The cost summary by discipline is presented in Table 21.5.

Table 21.4 KCA Three Hills Mine Process Capital Costs by Area

Plant Totals Direct Costs	Total Supply Cost	Install	Grand Total
	US$	US$	US$
Area 0000 - Site & Utilities General	$181,882	$17,440	$199,322
Area 1403 - Laboratory	$642,879	$369,985	$1,012,864
Area 4179 - Electrical	$52,495	$4,240	$56,735
Area 4290 - Mobile Equipment	$1,483,618	$0	$1,483,618
Area 4301 - Water Distribution	$178,610	$14,320	$192,930
Area 5150 - Heap Leach & Solution Handling	$2,311,022	$1,059,982	$3,371,004
Area 5184 - Carbon Handling & Regeneration (Processed Off-Site)	$0	$0	$0
Area 5184 - Adsorption	$529,438	$292,097	$821,536
Area 5184 - Acid Wash & Elution (Processed Off-Site)	$0	$0	$0
Area 5186 - Electrowinning & Refining (Processed Off-Site)	$0	$0	$0
Area 6051 - Reagents	$116,502	$63,701	$180,202
Ancillaries	$312,386	$29,510	$341,896
Plant Total Direct Costs	**$5,808,832**	**$1,851,275**	**$7,660,107**
Sales Tax & Other Taxes	$405,586		$405,586
Spare Parts	$224,719		$224,719
Sub Total with Spare Parts			**$8,290,412**
Contingency	$1,760,000		$1,760,000
Plant Total Direct Costs with Contingency			**$10,050,412**
Indirect Field Costs			**$530,000**
Initial Fills			**$291,896**
Sub Total Plant Cost Before EPCM			**$10,872,308**
EPCM			**$700,000**
TOTAL Pre-Production Capital Cost			**$11,572,308**
Total Attached Power (kW)			**1,121**

Table 21.5 KCA Three Hills Mine Process Capital Costs by Discipline

Discipline	Cost @ Source	Freight	Total Supply Cost	Sales & Other Taxes	Install	Grand Total
	US$	US$	US$	US$	US$	US$
Major Earthworks			$0		$0	$0
Liner, GCL & Miscellaneous	$0		$0		$0	$0
Civils (Supply & Install)	$111,093		$111,093			$111,093
Structural Steelwork (Supply & Install) - Majority included in Mechanical Equipment	$0		$0			$0
Platework (Supply & Install)	$62,500		$62,500	$4,281	$0	$66,781
Mechanical Equipment	$4,398,509	$221,830	$4,620,339	$360,435	$1,641,115	$6,621,889
Piping	$467,603	$14,923	$483,811	$32,031	$168,000	$683,842
Electrical	$396,225	$0	$396,225	$2,455	$17,360	$416,040
Instrumentation	$17,888	$0	$18,943	$1,054	$6,560	$26,557
Infrastructure	$0	$0	$0	$0	$0	$0
Facilities	$115,297	$625	$115,922	$5,329	$18,240	$139,491
Spare Parts			$224,719			$224,719
Contingency			$1,760,000			$1,760,000
Plant Total Direct Costs	**$5,569,116**	**$237,378**	**$7,793,551**	**$405,586**	**$1,851,275**	**$10,050,412**

Capital costs for the heap-leach process facility at Three Hills have been estimated by KCA and NewFields. Newfield's scope of work was the construction of the leach pad and ponds, earthworks, liner, civils, gravity piping, and off-site water supply. KCA's scope of work was the solution application equipment (pumps, tanks, etc.), pressure piping, laboratory and laboratory equipment, reagent mixing and storage, the CIC circuit, on-site power supply and distribution, and certain infrastructure.

Three Hills capital costs estimated by NewFields are shown in Table 21.6. This includes capital costs for access roads to and around the Three Hills Mine site.

Table 21.6 NewFields Estimated Capital for Three Hills Mine (K USD)

Roads	$ 1,013
Heap Leach Facility	$ 7,617
Event Ponds & Site Infrastructure	$ 1,948
Water Supply	$ 1,740
Total	$ 12,317
Indirects	$ 699
EPCM	$ 830
Contingency	$ 2,287
Total Estimated by NewFields	$ 16,135

21.2.1 Three Hills Mine HLF

The HLF includes the earthworks, HDPE geomembrane, gravity drain piping and gravel overliner materials within the leach pad. Quantity take-offs were completed on each component, based upon the design drawings that have been completed. Unit rates for the construction activities were prepared based upon labor rates seen on recent, similar projects, equipment production rates derived from the CAT handbook, and budgetary quotes provided by material vendors.

21.2.2 Three Hills Mine Event Pond

The event pond includes the earthworks, HDPE geomembrane, and miscellaneous piping. Quantity take-offs were completed on each component, based upon the design drawings that have been completed. Unit rates for the construction activities were prepared based upon labor rates seen on recent, similar projects, equipment production rates derived from the CAT handbook, and budgetary quotes provided by material vendors.

21.2.3 Three Hills Mine Civils and Foundations

Civils include detailed earthworks and concrete. Concrete in KCA's scope includes the reagent storage area concrete slab and containment berms, and the process plant workshop foundation; concrete is also included for the substations. Concrete for the carbon absorption circuit and heap-leach handling equipment have been included in KCA's equipment supply quote. Concrete quantities estimated by KCA are based on similar installations, major equipment weights and on slab areas. Concrete costs have been estimated by KCA based on supplier quotes from recent projects completed by KCA in the area. These costs include all form work, footing excavation, concrete supply, rebar, water stops, and curing costs.

21.2.4 Three Hills Mine Structural Steel

Structural steel includes steel grating, handrails and structural steel. Structural steel for all areas within KCA's scope has been included in KCA's equipment supply package quote.

21.2.5 Three Hills Mine Platework

The platework discipline includes costs for the supply and installation of steel tanks, bins, and chutes. Platework costs for items in KCA's scope have been included in KCA's quoted equipment supply package.

21.2.6 Three Hills Mine Mechanical Equipment

Costs for mechanical equipment are based on an equipment list developed of all major equipment for the processing facility. Costs for most major items are for new equipment and based on budgetary quotes from vendors. Costs for minor equipment items are based on supplier quotes or KCA's in-house database, or else reasonable allowances for the equipment were made.

Installation hourly costs for mechanical equipment are factored based on the equipment supply cost and include installation labor and equipment usage.

21.2.7 Three Hills Mine Piping, Electrical and Instrumentation

Major piping in KCA's scope includes the main header to the heap leach, the solution irrigation piping and the fire water distribution piping. Costs for major piping are based on material takeoffs developed by KCA and supplier quotes. Ancillary piping, fittings, and valve costs have been estimated on a percentage basis of the mechanical equipment costs. Varying factors ranging up to 25% of the mechanical equipment supply were used to estimate the ancillary piping purchase costs for each area.

On-site electrical costs for the project are primarily based on supplier quotes based on material takeoffs and information developed by KCA. These include site distribution power lines, transformers, and substations. Off-site electrical infrastructure for delivery of grid power to the Hasbrouck Mine site has been quoted by NV Energy. Miscellaneous electrical costs have been estimated as a percentage of the equipment supply cost. Varying factors ranging up to 15% of the equipment supply package have been used for miscellaneous electrical costs.

Instrumentation costs are based on a percentage of the mechanical equipment and range up to 3% of the mechanical equipment cost. An allowance of $5,000 has been included for a valve and control for the site water supply. An allowance of $50,000 has been included for a security system, which includes a closed circuit television system. Minimal instrumentation is planned for the project.

21.2.8 Three Hills Mine Installation and Commissioning

Installation costs have been included for all items in KCA's equipment supply package. Installation estimates for all other items are based on a sliding scale factored from the supply cost and include all installation labor and equipment usage. The hourly installation labor rates are estimated to be $80.00/hour and include provisions for wages, burdens, overhead and contractor profit. The estimated unit cost is based on information in KCA's database and current proprietary cost guide data.

21.2.9 Three Hills Mine Freight

Freight costs have been included in KCA's equipment supply package. Freight estimates for other equipment, including major piping, are based on loads as bulk freight at an average percentage of equipment cost. The cost for transport of equipment items to the jobsite in Tonopah, Nevada has been estimated at an average of 6% of the equipment cost.

21.2.10 Three Hills Mine Sales Tax and Other Taxes

Nevada sales tax in Esmeralda County has been applied to all material supply costs for the items in this area. Sales tax was applied to 50% of the value of any allowance that did not have a breakdown between supply and installation costs. The effective sales tax in Esmeralda County as of 1 April, 2014 is 6.850%.

21.2.11 Three Hills Mine Site Earthworks Capital Costs

The site earthworks include site access roads, the haul road between the lime storage silo and the HLF, general site grading at the buildings and other facilities around the plant site and the explosives storage magazine road. The earthworks costs include shaping and grading, road wearing coarse, and any drainage components required to control and convey storm water runoff. Quantity take-offs were completed on each component, based upon the design drawings that have been completed. Unit rates for the construction activities were prepared based upon labor rates seen on recent, similar projects, equipment production rates derived from the CAT handbook, and budgetary quotes provided by material vendors.

21.2.12 Three Hills Mine Power Supply & Distribution Capital Costs

Power for the Three Hills Mine will be by a rented on-site LNG-powered generator, and has been quoted by Aggreko.

Power distribution onsite has been quoted by Jensen Engineering and includes the site distribution power lines and transformers. Capital costs for the site power distribution are included in the project direct costs.

A 750kW backup generator is included in the cost estimate to provide power to the critical pumping systems and facilities in the event of a power outage.

21.2.13 Three Hills Mine Water Capital Costs

Raw water for the project, including fire water, will be sourced from a groundwater well located approximately 3,700ft north of the process facilities. NewFields has estimated the costs of the well drilling and development, pump and electrical power installation, and pipeline and delivery system. These costs were derived from quantity take-offs from the design drawings and estimated labor and equipment rates based upon recent, similar, project experience and from vendor quotes. Costs for the raw water system within the buildings and process facilities are included in the mechanical equipment and piping disciplines.

21.2.14 Three Hills Mine Buildings, Lighting, Fire Fighting, Support Equipment

21.2.14.1 Three Hills Mine Buildings

Process buildings in KCA's scope for Three Hills include the process workshop. Costs for the process workshop are based on steel building quotes and estimates for furnishings based on KCA's experience with similar installations. Costs for this building have been included in the project direct costs.

21.2.14.2 Three Hills Mine Support Equipment – Mobile Equipment

The mobile equipment capital cost estimate is based primarily on cost guide information. The equipment prices include the cost of purchase, assembly/commissioning and some operator training. Transportation costs are included in the General Services costs.

Process mobile equipment for Three Hills includes the following:

- 1 ea. 40 ton mobile crane;
- ea. ¾ ton pickup trucks;

- 2 ea. 2.5 ton forklifts;
- 1 ea. flatbed maintenance truck;
- 1 ea. 10 ton boom truck;
- 1 ea. backhoe;
- 1 ea. utility trailer; and
- 1 ea. all-terrain forklift (telehandler).

21.2.14.3 Three Hills Mine Support Equipment –Communications

A lump sum allowance for communications in the form of telephones, radios, and cell phones has been made based on recent experience of similar operations.

21.3 Three Hills Mine Indirect Capital Costs

Indirect capital costs include costs for items such as equipment rentals, temporary construction facilities, construction quality assurance/quality control and construction surveying, and consumables such as fuel power, and security. The costs have been estimated based on experience with recent, similar projects. For the facilities included in the NewFields scope of work, these costs are presented as a percentage of the capital costs for each facility/area. These vary between 3.5% and 6.3%.

21.3.1 Three Hills Mine Spare Parts

Spare parts costs for items in KCA's scope were estimated at approximately 5% of the mechanical equipment supply. Spare parts costs provided or recommended by the supplier were used when available. Spare part costs cover all classes of spare parts.

21.3.2 Three Hills Mine Initial Fills Inventory

The initial fills consists of consumable items stored on site at the commencement of operations. This inventory of initial fills is in place to insure that adequate consumables are available for the first stage of operation. Details of the initial fills are presented in Table 21.7. Note that \$146,000 of the initial fills occurs in year -1 and is categorized as initial capital. The remaining \$146,000 of initial fills occurs in month 1 of production, and is thus categorized as growth capital.

Table 21.7 Initial Fills – Three Hills Mine

Item	Basis	Needed Weight	Truck Loads	Quantity to Order	Unit Price	Tax, Duty	Shipping	Total Cost
		lb or gal		lb or gal	US$			US$ (1,000)
NaCN	Full Tank			8,339	1.31	0.09		$ 12
Pebble Lime	Full Silo	200,000		200,000	0.08	0.01		$ 18
Carbon	Full Circuit + 16 tons	52,000		52,000	1.20	0.08		$ 67
Antiscalant	4 weeks			6,000	20.85	1.43		$ 134
Lab Consumables				1	$ 21,179.38	1,451	1,271	$ 24
Lab Supplies, Process				1	$ 33,602.01	2,302	2,016	$ 38
TOTAL								**$ 292**

21.3.3 Three Hills Mine Engineering, Procurement and Construction Management

The EPCM cost for the processing facility at Three Hills is factored from the direct costs for the plant. A factor of 3% was used for items that were bid as turnkey and a factor of 10% was used on all other items. NewFields has estimated the engineering, procurement and construction management costs for the HLF, event pond, site infrastructure and roads as a percentage of the capital costs. These percentages are based upon recent, similar, experience and vary by facility/area. The engineering varies between 1.5% and 10% and it largely based upon the level of design that exists at each facility. The construction management/procurement is estimated to be between 3% and 3.5% of the capital costs.

21.3.4 Three Hills Mine Contingency

KCA has estimated the contingency for the processing facility at Three Hills to be $1,760,000. The contingency for the processing facility was estimated as a percentage of the direct and indirect capital costs by discipline, varying between 20% and 25%. Based on the level of detail incorporated into the engineering performed to date on the site infrastructure, NewFields recommends using a 20% contingency on the roads, Event Pond and site facilities and a 25% contingency on the water supply system. The HLF engineering has been advanced farther than the other components designed by NewFields and the contingency for this facility is recommended to be 15%.

21.3.5 Three Hills Mine Sustaining Capital

Due to the short mine life (approximately 2 years) there is no sustaining capital for the Three Hills operation.

21.3.5.1 Three Hills Mine Exclusions

The following capital costs have been excluded from the scope of the process capital estimate for Three Hills:

- Finance charges and interest during construction;
- Escalation costs; and
- Currency exchange fluctuations.

21.4 Hasbrouck Mine Process Capital Costs

Capital expenditures for items in KCA's scope for the Hasbrouck Mine are summarized by area in Table 21.8. Capital costs have been based on the design presented in Section 17.0 and are considered to have an accuracy of +/-15% for the recovery plant and +/-25% for all other areas. Process capital costs for the Hasbrouck Mine (excluding the heap-leach facility) are estimated to be $53.2 million (including indirects, contingencies, initial fills, and EPCM, but excluding working capital).

Capital costs have been estimated by KCA and NewFields. Equipment and material requirements and specifications are described in previous sections of this study. Capital cost estimates have been made primarily using budgetary supplier quotes for all major and most minor equipment items. It is assumed that most crushing and stacking equipment excluding in-plant conveyors and the HPGR can be purchased used and refurbished at 80% of the cost of new equipment. All other equipment is assumed to be purchased new. Where supplier quotes were not available for minor items, a reasonable cost estimate has been made based on supplier quotes in KCA's files. All costs are in fourth quarter 2014 US dollars except for diesel fuel, which has been updated for the second quarter of 2016.

The capital costs are summarized by discipline in Table 21.9.

Each area in the Hasbrouck Mine process cost build-up is separated into the following disciplines, as applicable:

- Earthworks;
- Civils and foundations;
- Structural steel;
- Platework;
- Mechanical equipment;
- Piping, Electrical and Instrumentation;
- Installation and Commissioning;
- Freight; and
- Sales and Other Taxes.

NewField's scope of work included costs for the construction of the leach pad and ponds, liner, and gravity pipe. KCA's scope of work included the recovery plant, all solution application equipment (pumps, tanks, etc.), pressure piping, crushing, screening and agglomeration, reagent storage, power supply and distribution, and water supply and some infrastructure.

Table 21.8 KCA Hasbrouck Mine Process Capital Costs by Area

Plant Totals Direct Costs	Total Supply Cost	Install	Grand Total
	US$	US$	US$
Area 0000 - Site & Utilities General	$50,000	$110,365	$160,365
Area 1403 - Laboratory (Shared w/ Three Hills)	$0	$0	$0
Area 4179 - Electrical	$1,857,944	$2,112	$1,860,056
Area 4290 - Mobile Equipment	$614,493	$0	$614,493
Area 4301 - Water Distribution	$363,205	$91,840	$455,045
Area 5004 - Primary Crushing	$3,081,261	$871,715	$3,952,976
Area 5023 - Secondary & Tertiary Crushing	$10,703,952	$1,578,364	$12,282,316
Area 5041 - Ore Reclaim & Stacking	$5,192,704	$872,480	$6,065,184
Area 5150 - Heap Leach Solution Handling	$2,323,558	$706,076	$3,029,634
Area 5184 - Carbon Handling & Regeneration	$597,424	$296,947	$894,371
Area 5184 - Adsorption (Incl. Area 5150)	$1,046,708	$340,929	$1,387,637
Area 5184 - Acid Wash & Elution	$622,508	$330,733	$953,241
Area 5186 - Electrowinning & Refining	$2,709,644	$728,104	$3,437,747
Area 6051 - Reagents	$261,561	$73,150	$334,711
Ancillaries	$482,799	$83,000	$565,799
Plant Total Direct Costs	**$29,907,761**	**$6,085,814**	**$35,993,575**
Sales Tax & Other Taxes	$1,763,851		$1,763,851
Spare Parts	$338,045		$338,045
Sub Total with Spare Parts			**$38,095,471**
Contingency	$7,560,000		$7,560,000
Plant Total Direct Costs with Contingency			**$45,655,471**
Indirect Field Costs			**$1,790,000**
Initial Fills			**$1,617,819**
Sub Total Plant Cost Before EPCM			**$49,063,290**
EPCM			**$4,109,000**
TOTAL Pre-Production Capital Cost			**$53,172,290**
Total Attached Power (kW)			**6,729**

Table 21.9 KCA Hasbrouck Mine Process Capital Costs by Discipline

Discipline	Cost @ Source	Freight	Total Supply Cost	Sales & Other Taxes	Install	Grand Total
	US$	US$	US$	US$	US$	US$
Major Earthworks			$0		$695,684	$695,684
Civils (Supply & Install)	$1,177,147		$1,177,147	$38,846		$1,215,993
Structural Steelwork (Supply & Install) - Majority included in Mechanical Equipment	$282,238		$282,238	$9,667		$291,904
Platework (Supply & Install)	$787,580		$787,580	$50,896	$146,280	$984,756
Mechanical Equipment	$19,953,650	$1,180,519	$21,172,050	$1,414,514	$4,639,707	$27,226,271
Piping	$1,102,886	$17,215	$1,120,101	$75,548	$322,320	$1,517,969
Electrical	$0	$0	$4,864,988	$158,487	$308,880	$4,081,183
Instrumentation	$212,450	$0	$212,450	$9,244	$70,960	$292,654
Facilities	$0		$1,419,341	$6,650	$25,024	$1,451,014
Spare Parts			$338,045			$338,045
Contingency			$7,560,000			$7,560,000
Plant Total Direct Costs	**$23,515,951**	**$1,197,733**	**$38,933,938**	**$1,763,851**	**$6,208,854**	**$45,655,471**

Earthworks in KCA's scope of work include a portion of the haul road from the mine to the crushing area and earthworks for the crushing area. The earthworks quantities have been based on quantities estimated by KCA for the following tasks:

- Topsoil stripping (12in depth);
- Material cut to fill; and
- Material placement and compaction (including 1-mile haul).

Unit costs for the above activities were provided to KCA by NewFields.

The site earthworks include site access roads, general site grading at the buildings and other facilities around the plant site, and the explosives storage magazine road. The earthworks costs include shaping and grading, road wearing coarse, and any drainage components required to control and convey storm water runoff. Quantity take-offs were completed on each component, based upon the design drawings that have been completed. Unit rates for the construction activities were prepared based upon labor rates seen on recent, similar projects, equipment production rates derived from the CAT handbook, and budgetary quotes provided by material vendors.

Hasbrouck Mine capital costs estimated by NewFields include the heap-leach facility, event ponds and associated infrastructure, water supply, and access roads. These capital costs estimates are shown in Table 21.10.

Table 21.10 NewFields Estimated Capital for Hasbrouck Mine (K USD)

	Phase 1	Phase 2	Total
Roads	$ 1,039		$ 1,039
Heap Leach Facility	$ 10,048	$ 9,348	$ 19,395
Event Ponds & Site Infrastructure	$ 2,910		$ 2,910
Water Supply	$ 3,030		$ 3,030
Total	$ 17,027	$ 9,348	$ 26,375
Indirects	$ 825	$ 421	$ 1,246
EPCM	$ 1,292	$ 514	$ 1,806
Contingency	$ 4,209	$ 2,337	$ 6,546
Total Estimated by NewFields	$ 23,353	$ 12,619	$ 35,972

21.4.1 Hasbrouck Mine HLF and Event Ponds

The HLF includes the earthworks, HDPE geomembrane, gravity drain piping and gravel overliner materials within the leach pad. Quantity take-offs were completed on each component, based upon the design drawings that have been completed. Unit rates for the construction activities were prepared based upon labor rates seen on recent, similar projects, equipment production rates derived from the CAT handbook, and budgetary quotes provided by material vendors.

The event pond includes the earthworks, HDPE geomembrane, and miscellaneous piping. Quantity take-offs were completed on each component, based upon the design drawings that have been completed. Unit rates for the construction activities were prepared based upon labor rates seen on recent, similar projects, equipment production rates derived from the CAT handbook, and budgetary quotes provided by material vendors.

21.4.2 Hasbrouck Mine Civils and Foundations

Civils include detailed earthworks, concrete and the retaining wall for the primary crusher. Civils in KCA's scope include concrete for the crushing area, concrete for the pug mill slab foundation, concrete sleepers for the overland conveyors, the recovery plant foundation, concrete for the site substations, and a concrete slab for the process workshop. Concrete quantities estimated by KCA are based on similar installations, major equipment weights and on slab areas. Concrete costs have been estimated by KCA based on supplier quotes from recent projects completed by KCA in the area. These costs include all form work, footing excavation, concrete supply, rebar, and curing costs. The cost for a Hilfiker-type retaining wall at the primary crusher was based on supplier quotes from recent projects.

21.4.3 Hasbrouck Mine Structural Steel

Structural steel, including steel grating, structural steel, and handrails has been estimated based layout drawings and equipment loads. Table 21.11 shows the unit rates for structural steel. These costs are estimated based on KCA's in-house structural steel costs.

Table 21.11 Structural Steel Unit Rates

Description	Unit	Unit Cost (USD)
Grating	ft^2	$ 21.55
Structural Steel	lb	$ 2.27
Handrails	ft	$17.68

21.4.4 Hasbrouck Mine Platework

The plate-work discipline includes costs for the supply and installation of steel tanks, bins, and chutes. Plate-work costs for the crushing plant have been primarily included in the vendor supply package with some items estimated by KCA based on experience with similar sized projects. Plate-work costs for the HPGR feed bin were based on the weight of steel required by the design. The plate-work costs for the pregnant tank, barren tank and adsorption columns were included in the quote for the adsorption circuit from KCA.

21.4.5 Hasbrouck Mine Mechanical Equipment

Costs for mechanical equipment are based on an equipment list developed of all major equipment for the processing facility. Costs for most major items of new equipment are based on budgetary quotes from vendors. Used equipment costs for crushing and stacking equipment (excluding crushing plant conveyors and the HPGR) are estimated at 80% of the new equipment cost. Costs for minor equipment items are based on supplier quotes or KCA's in-house database, or else reasonable allowances were made for the equipment.

Installation hourly costs for mechanical equipment were factored based on the equipment supply cost and include installation labor and equipment usage.

21.4.6 Hasbrouck Mine Piping, Electrical and Instrumentation

Major piping costs, including process solution piping, fire water piping and heap irrigation, are based on estimated material takeoffs and supplier quotes. Additional ancillary piping, fittings, and valve costs have been estimated on a percentage basis of the mechanical equipment costs. Varying factors ranging up to 25% of the mechanical equipment supply were used to estimate the ancillary piping purchase costs for each area.

Electrical costs for the project are primarily based on supplier quotes based on material takeoffs and information developed by KCA. These include the site distribution power lines and transformers. Delivery of power to the site has been quoted by NV energy. Varying factors ranging up to 15% of the mechanical equipment supply were used to estimate the miscellaneous electrical costs for each process area.

Varying factors ranging up to 3% of the mechanical equipment supply were used to estimate the instrumentation costs. Allowances of $5,000 and $50,000 have been included for the water supply valves and site security system, respectively. Minimal instrumentation is planned for the Hasbrouck Mine.

21.4.7 Hasbrouck Mine Installation

Installation costs have been included for all items in KCA's equipment supply package. Installation estimates for all other items are based on a sliding scale factored from the supply cost and include all installation labor and equipment usage. The hourly installation labor rates are estimated to be $80.00/h and include provisions for wages, burdens, overhead and contractor profit. The estimated unit cost is based on information in KCA's database and recent cost guide data.

21.4.8 Hasbrouck Mine Freight

Estimates for equipment freight costs are based on loads as bulk freight at an average percentage of equipment cost. The cost for transport of equipment items to the jobsite in Tonopah, Nevada is estimated to average 6% of the equipment cost.

Where applicable, supplier quoted freight cost estimates for equipment packages are used in place of the freight estimate. Freight costs have been included in KCA's equipment supply package.

21.4.9 Hasbrouck Sales Mine Tax and Other Taxes

Nevada sales tax in Esmeralda County has been applied to all material supply costs for the Hasbrouck Mine. Sales tax was applied to 50% of the value of any allowance that did not have a breakdown between supply and install costs. The effective sales tax in Esmeralda County as of 1 April, 2014 is 6.850%.

A 24% Contribution in Aid of Construction Tax has been applied to the applicable parts of the quoted supply costs for the delivery of power to the Hasbrouck Mine by NV Energy.

21.4.10 Hasbrouck Mine Power Supply and Distribution Capital Costs

Capital costs for the infrastructure involved in the supply of grid power to the Hasbrouck Mine have been provided by NV Energy. Grid power will be delivered to a mine substation from a 120kV switching station to be constructed 2 miles to the north. NV Energy's cost study includes permitting review, new transmission line to the project site, a new 120kV switching station, and installation of communications at the switching station.

Costs for power distribution onsite have been estimated by Jensen Engineering and include the site distribution power lines, switchgear, and transformers. Costs for the site power distribution are included in the project direct costs.

A 750kW backup generator has been included in the cost estimate to provide power to the critical pumping systems and facilities in the event of a power outage.

21.4.11 Hasbrouck Mine Water Capital Costs

The Hasbrouck Mine raw water will be sourced from a groundwater well located approximately 7,500ft west of the process facilities. The capital costs for the raw water system include the pipeline from the well to the water storage tank and the raw and fire water distribution pipelines at the mine.

Capital costs for the supply of raw water to the Hasbrouck Mine include well drilling and development, pump and electrical power installation, and pipeline and delivery system. Costs for the raw water system within the buildings and process facilities are included in the mechanical equipment and piping disciplines. NewFields has estimated the costs of the well, pump, pipeline, water storage tank and delivery system. These costs were derived from quantity take-offs from the design drawings and estimated labor and equipment rates based upon recent, similar, project experience and vendor quotes.

21.4.12 Hasbrouck Mine Buildings, Lighting, Fire Fighting, Support Equipment Capital Costs

21.4.12.1 Hasbrouck Mine Buildings

KCA's scope included the process warehouse and workshop building, ADR building and reagent storage building for the Hasbrouck Mine. The cost for the building is based on a steel building quote and an estimate for furnishings based on KCA's experience with similar installations. Costs for the workshop building have been included in the project direct costs. Costs for the ADR and refinery buildings were included in the supplier quote package.

21.4.12.2 Hasbrouck Mine Fire Fighting

A raw water tank is included in the design which will have a reserve capacity for use as fire water. Fire water will be delivered by a gravity system.

Costs for the fire water systems within the buildings and facilities are included in the mechanical equipment and plate-work disciplines. Costs for the water delivery pipeline are included with the water supply capital costs.

21.4.12.3 Hasbrouck Mine Mobile Equipment

The majority of mobile equipment for the Hasbrouck Mine will be shared with or transferred from the Three Hills Mine. Mobile equipment includes a 40ton crane, a boom truck, flatbed maintenance truck, light vehicles, two indoor forklifts, a backhoe, and an all-terrain forklift. The additional mobile equipment needed for Hasbrouck includes a Cat D6 Dozer, a 2.5ton forklift and 3 pickups.

21.5 Hasbrouck Mine Indirect Capital Costs

Indirect capital costs include costs for items such as equipment rentals, temporary construction facilities, construction quality assurance/quality control and construction surveying, and consumables such as fuel and power, and security. These costs have been estimated based on experience with recent, similar projects. NewFields has estimated these costs as a percentage of the capital costs for each facility/area. These vary between 3.5% and 6.3%.

21.5.1 Hasbrouck Mine Spare Parts

Spare parts costs for items in KCA's scope were estimated at approximately 5% of the mechanical equipment supply. Where available, costs for spare parts were provided or recommended by the supplier.

21.5.2 Hasbrouck Mine Initial Fills Inventory

Initial fills consist of consumable items to be stored on site at the outset of operations; this includes sodium cyanide, cement for pH control and agglomeration, carbon, antiscalant, and diesel fuel. The Hasbrouck Mine initial fills also include a spare set of rolls for the HPGR. This inventory of initial fills is to insure that adequate consumables are available for the first stage of operation. Details of the initial fills are presented in Table 21.12.

Table 21.12 Hasbrouck Mine Initial Fills

Item	Basis	Needed Weight lb or gal	Truck Loads	Quantity to Order lb or gal	Unit Price US$	Tax, Duty	Shipping	Total Cost US$ (1,000)
NaCN	Full Tank		-	8,339	1.31	0.09		$ 12
Cement	Full Silo	200,000	10.0	200,000	0.08	0.01		$ 16
Carbon	Full Circuit	35	0.0	30,000	1.20	0.08		$ 38
Antiscalant	4 weeks		-	6,000	20.85	1.43		$ 134
Caustic Soda	4 weeks	7,224		7,200	0.47	0.03		$ 3.62
Hydrochloric Acid	2 weeks	1,708		1,680	2.10	0.14		$ 3.77
Diesel (gal)	Total Fill	1,800	0.1	1,800	1.70	0.12		$ 3
Flux	2 weeks							
SiO2				300	0.50	0.03		$ 0.16
Borax				300	0.98	0.07		$ 0.31
Niter				150	1.75	0.12		$ 0.28
Soda Ash				150	1.70	0.12		$ 0.27
Foam	2 weeks							$ 6
HPGR Spare Rolls	1 set				$ 1,400,000			$ 1,400
TOTAL								**$ 1,618**

21.5.3 Hasbrouck Mine Engineering, Procurement and Construction Management

The EPCM cost for the processing facility at Hasbrouck is factored from the direct costs for the plant. A factor of 2% was used for items that were bid as turnkey and a factor of 10% was used on all other items. NewFields has estimated the engineering, procurement and construction management costs for the HLF, event pond, site infrastructure and roads as a percentage of the capital costs. These percentages are based upon recent, similar, experience and vary by facility/area. The engineering varies between 2.5% and 15% and it is largely based upon the level of design that exists at each facility. The construction management/procurement is estimated to be between 3% and 3.5% of the capital costs.

21.5.4 Hasbrouck Mine Contingency

The contingency for the processing facility at Hasbrouck is $7,560,000, or 20% of the direct and indirect capital costs. Based on the level of detail incorporated into the engineering performed to date on the site infrastructure, NewFields recommends using a 25% contingency on the roads, water supply system and the HLF. A 20% contingency is recommended for the event pond and site facilities.

21.5.5 Hasbrouck Mine Sustaining Capital

Sustaining capital in KCA's scope of work includes an additional overland conveyor and barren solution header pipe to the heap. The total estimated cost for these items is $900,000.

Phase 2 of the HLF has been included as sustaining capital. The HLF Phase 2 includes the earthworks, HDPE geomembrane, gravity drain piping and gravel overliner materials within the leach pad expansion area. Quantity take-offs were completed on each component, based upon the design drawings that have been completed. Unit rates for the construction activities were prepared based upon labor rates seen on recent, similar projects, equipment production rates derived from the CAT handbook, and budgetary quotes provided by material vendors.

21.5.5.1 Hasbrouck Mine Exclusions

The following capital costs have been excluded from the scope of supply and estimate:

- Finance charges and interest during construction;
- Escalation costs; and
- Currency exchange fluctuations.

21.6 Other Capital Costs

MDA estimated other capital costs for light vehicles, site and administration, safety and security, and owners capital with input from vendors and WKM.

Administration capital costs are shown in Table 21.13 and in Year -1 assume that the main administration office would be located in the town of Tonopah. During Year 2, the main administration office would be located in a double- to triple- wide office trailer that will be installed at the Hasbrouck Mine and will remain there for the LOM.

Table 21.13 Administration Capital

	Units	Pre-Prod	Yr 1	Yr 2	Yr 3	Yr 4	Total
Administration Building	K USD	$ -	$ -	$ 77	$ -	$ -	$ 77
Computers, Printers, and Plotters	K USD	$ 45	$ -	$ -	$ -	$ -	$ 45
Communications (phones, internet, etc)	K USD	$ 2	$ -	$ -	$ -	$ -	$ 2
Site and Administration Total	K USD	$ 47	$ -	$ 77	$ -	$ -	$ 124

Safety and security capital costs are shown in Table 21.14. This includes a used double wide trailer for offices and a training room, as well as furnishings, office network supplies, an allocation for communications, and initial safety supplies. Additional safety supplies and equipment costs are estimated for Year 2 and Year 3 when operations commence at Hasbrouck.

Table 21.14 Safety and Security Capital Costs

	Units	Pre-Prod	Yr 1	Yr 2	Yr 3	Yr 4	Total
Safety and Training Building	K USD	$ 40	$ -	$ -	$ -	$ -	$ 40
Computers, Printers, and Plotters	K USD	$ 15	$ -	$ -	$ -	$ -	$ 15
Communications (phones, internet, etc)	K USD	$ 2	$ -	$ -	$ -	$ -	$ 2
Initial Safety Supplies and Equipment	K USD	$ 25	$ -	$ 5	$ 10	$ -	$ 40
Total Safety and Security	K USD	$ 82	$ -	$ 5	$ 10	$ -	$ 97

Site security fencing is included within the event pond and facilities costing prepared by NewFields. Material quantity take-offs were calculated from engineering design drawings with unit rates being derived from recent, similar, projects.

Owner's capital costs were developed using inputs from WKM and are shown in Table 21.15. These include the land acquisition cost to complete the lease-purchase agreement with Eastfield Resources, as described in Section 4.3. Feasibility study costs for the Hasbrouck project are assumed to occur prior to the start of construction and are not included in the construction costs. However, these costs are shown in the Recommendations (Section 26.0). In addition, some permitting costs for base line studies at the Hasbrouck Mine are also expected to occur prior to construction of the Hasbrouck Mine and are also included in the Recommendations (Section 26.0).

Bonding costs are assumed to be covered in part at commencement of construction and fully at Year 2 by the use of surety bonds as discussed at the start of Section 21.0. Prior to demonstrating an operating history, the surety bond will be possible for only half of the bonding required. A bonding cost of $2,279,000 has been included in owner's capital, which is two thirds of the predicted bonding amount. The balance is to be covered by a surety bond. The cost to maintain the surety bonding has been included in general and administrative operating costs. Once WKM switches to a surety bond for all bonding costs at the end of Year 2, it is assumed that the cash provided as the initial Three Hills bond will be released.

Fiber optic lines, power generation at Three Hills, and offsite electrical supply costs for Hasbrouck are based on vendor quotations. Note that onsite electrical distribution has been estimated by KCA and are included in the process capital estimate. Power generation at Three Hills assumes leasing of a LNG fuel station and a generator. Capital costs include a charge every two years to swap out the generator for major overhauls.

Table 21.15 Owner's Capital Costs

	Units	Pre-Prod	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Total
Metallurgy	K USD	$ 325	$ 65	$ -	$ -	$ -	$ -	$ 390
Geotech	K USD	$ -	$ 358	$ 161	$ -	$ -	$ -	$ 519
Permitting - Three Hills	K USD	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Permitting - Hasbrouck	K USD	$ 651	$ 1,490	$ 848	$ -	$ -	$ -	$ 2,989
Land Acquisition (Eastfield, Korn)	K USD	$ 155	$ -	$ -	$ -	$ -	$ -	$ 155
Monitor Wells - Three Hills	K USD	$ 413	$ -	$ -	$ -	$ -	$ -	$ 413
Monitor Wells - Hasbrouck	K USD	$ -	$ 682	$ -	$ -	$ -	$ -	$ 682
Fiber Optic Move	K USD	$ 200	$ -	$ -	$ -	$ -	$ -	$ 200
Onsite Electrical Power Generation	K USD	$ 69	$ -	$ 32	$ -	$ 32	$ -	$ 133
G&A During Pre-Production	K USD	$ 2,292	$ -	$ -	$ -	$ -	$ -	$ 2,292
Bonding Costs - Three Hills	K USD	$ 2,279	$ -	$ -	$ (2,279)	$ -	$ -	$ -
Bonding Costs - Hasbrouck	K USD	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Owners Capital	K USD	$ 6,383	$ 6,041	$ 4,466	$ (2,279)	$ 32	$ -	$ 14,642

Light vehicle costs were estimated by MDA and are shown in Table 21.16. These costs are based on the number of vehicles required for each department and vendor quotations. KCA estimated the number of vehicles required for processing personnel. Taxes and fleet purchase discounts are included.

Table 21.16 Light Vehicles

	Units	Pre-Prod	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Total
Mining	K USD	$ 143	$ -	$ -	$ -	$ -	$ 107	$ -	$ 251
Processing	K USD	$ 230	$ -	$ 113	$ -	$ -	$ 77	$ -	$ 420
Administration	K USD	$ 116	$ -	$ -	$ -	$ -	$ 152	$ -	$ 268
Total	K USD	$ 490	$ -	$ 113	$ -	$ -	$ 336	$ -	$ 938

21.7 Mine Operating Costs

Mine operating costs in the 2015 PFS were estimated based on quotations from contractors and additional owner's mining costs that will be required for mining operations. Mine operating costs for the 2016 PFS assume contractor mining, but have been estimated using first principle costing. Production parameters and assumptions were discussed in Section 16.7. Costs were estimated for equipment based on vendor quotations, estimation guides, and MDA experience. Personnel costs were based on inputs from estimation guides and input from WKM. In addition, the operating costs include contractor's recovery of capital. This was estimated based on assumed total hours for equipment and applying those toward CAT quotations for the capital cost on equipment.

A contractor profit of 15% was assumed and applied to the contractor-related equipment operating costs, personnel costs, and capital recovery costs. The mining cost is based on a $1.70 per gallon fuel costs. The resulting contractor costs are shown in Table 21.17. The cost at $2.50

per gallon was compared with the costs in the 2015 PFS and are reasonably similar. At $1.70 per gallon for fuel, the resulting total mine operating cost is $1.81/ton.

Table 21.17 Mining Cost Summary

	Units	Yr -1	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Total
Mine General Service	K USD	$ 413	$ 552	$ 552	$ 555	$ 552	$ 552	$ 552	$ 552	$ 323	$ -	$ 4,602
Mine Maintenance	K USD	$ 472	$ 962	$ 941	$ 962	$ 962	$ 962	$ 962	$ 962	$ 540	$ -	$ 7,726
Engineering	K USD	$ 251	$ 335	$ 335	$ 335	$ 335	$ 335	$ 335	$ 335	$ 195	$ -	$ 2,789
Geology	K USD	$ 261	$ 564	$ 564	$ 564	$ 564	$ 564	$ 564	$ 564	$ 329	$ -	$ 4,539
Drilling	K USD	$ 448	$ 2,612	$ 2,402	$ 4,003	$ 2,717	$ 2,691	$ 3,799	$ 4,253	$ 1,472	$ -	$ 24,396
Blasting	K USD	$ 374	$ 1,565	$ 1,576	$ 2,247	$ 1,553	$ 1,566	$ 2,047	$ 2,216	$ 802	$ -	$ 13,946
Loading	K USD	$ 574	$ 3,234	$ 3,043	$ 4,841	$ 3,249	$ 3,273	$ 4,351	$ 4,580	$ 1,629	$ -	$ 28,773
Hauling	K USD	$ 1,179	$ 6,204	$ 6,596	$ 9,785	$ 7,201	$ 7,152	$ 9,581	$ 10,499	$ 3,580	$ -	$ 61,778
Mine Support	K USD	$ 1,127	$ 2,236	$ 2,296	$ 2,239	$ 2,236	$ 2,236	$ 2,236	$ 2,239	$ 1,316	$ -	$ 18,163
Total Mining Cost	K USD	$ 5,100	$ 18,263	$ 18,305	$ 25,530	$ 19,369	$ 19,331	$ 24,427	$ 26,200	$ 10,186	$ -	$ 166,712
Loading Rehandle	K USD	$ -	$ -	$ 26	$ 176	$ 199	$ 199	$ 190	$ 182	$ 98	$ -	$ 1,071
Haulage Rehandle	K USD	$ -	$ -	$ 26	$ 181	$ 257	$ 260	$ 227	$ 217	$ 101	$ -	$ 1,269
Total Rehandle	K USD	$ -	$ -	$ 52	$ 357	$ 457	$ 459	$ 417	$ 398	$ 199	$ -	$ 2,340
Total Mining Cost w/ Rehandle	K USD	$ 5,100	$ 18,263	$ 18,357	$ 25,888	$ 19,826	$ 19,790	$ 24,845	$ 26,599	$ 10,385	$ -	$ 169,052
Cost per Ton Mined												
Mine General Service	$/ton	$ 0.27	$ 0.05	$ 0.06	$ 0.03	$ 0.05	$ 0.05	$ 0.04	$ 0.03	$ 0.06	$ -	$ 0.05
Mine Maintenance	$/ton	$ 0.31	$ 0.09	$ 0.09	$ 0.06	$ 0.10	$ 0.09	$ 0.07	$ 0.06	$ 0.11	$ -	$ 0.08
Engineering	$/ton	$ 0.17	$ 0.03	$ 0.03	$ 0.02	$ 0.03	$ 0.03	$ 0.02	$ 0.02	$ 0.04	$ -	$ 0.03
Geology	$/ton	$ 0.17	$ 0.06	$ 0.06	$ 0.04	$ 0.06	$ 0.06	$ 0.04	$ 0.04	$ 0.07	$ -	$ 0.05
Drilling	$/ton	$ 0.30	$ 0.26	$ 0.24	$ 0.25	$ 0.27	$ 0.26	$ 0.26	$ 0.27	$ 0.29	$ -	$ 0.26
Blasting	$/ton	$ 0.25	$ 0.15	$ 0.16	$ 0.14	$ 0.15	$ 0.15	$ 0.14	$ 0.14	$ 0.16	$ -	$ 0.15
Loading	$/ton	$ 0.38	$ 0.32	$ 0.31	$ 0.30	$ 0.32	$ 0.32	$ 0.30	$ 0.29	$ 0.32	$ -	$ 0.31
Hauling	$/ton	$ 0.78	$ 0.61	$ 0.66	$ 0.61	$ 0.71	$ 0.70	$ 0.67	$ 0.66	$ 0.71	$ -	$ 0.66
Mine Support	$/ton	$ 0.75	$ 0.22	$ 0.23	$ 0.14	$ 0.22	$ 0.22	$ 0.16	$ 0.14	$ 0.26	$ -	$ 0.19
Total Mining Cost	$/ton	$ 3.39	$ 1.79	$ 1.84	$ 1.59	$ 1.92	$ 1.90	$ 1.70	$ 1.66	$ 2.01	$ -	$ 1.79
Loading Rehandle	$/ton	$ -	$ -	$ 0.00	$ 0.01	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.02	$ -	$ 0.01
Haulage Rehandle	$/ton	$ -	$ -	$ 0.00	$ 0.01	$ 0.03	$ 0.03	$ 0.02	$ 0.01	$ 0.02	$ -	$ 0.01
Total Rehandle	$/ton	$ -	$ -	$ 0.01	$ 0.02	$ 0.05	$ 0.05	$ 0.03	$ 0.03	$ 0.04	$ -	$ 0.03
Total Rehandle / ton Rehandle	$/ton	$ -	$ -	$ 0.58	$ 0.59	$ 0.71	$ 0.72	$ 0.65	$ 0.62	$ 0.64	$ -	$ 0.66
Total Mining Cost w/ Rehandle	$/ton	$ 3.39	$ 1.79	$ 1.85	$ 1.61	$ 1.97	$ 1.94	$ 1.73	$ 1.68	$ 2.05	$ -	$ 1.81

Owner's operating mining costs were estimated by MDA based on the personnel and supplies required to achieve the mine production schedule. These costs include mining supervision, engineering and geology requirements, an allocation for contractor "forced work", light vehicles, and outside services.

21.8 Process Operating Costs

The estimated, annual process operating cost for the Three Hills Mine is $2.20 per ton of ore processed, and after allocation of fixed costs through the rinsing of leach pads the LOM cost is $2.59 per ton of ore. The estimated first year process operating cost for the Hasbrouck Mine is $3.55 per ton of ore processed and the remaining LOM process annual operating cost is $3.79 per ton of ore processed. After allocation of fixed costs through the rinsing of leach pads the Hasbrouck Mine LOM cost is $3.93 per ton of ore. Sales tax has not been included in the operating cost estimate.

21.8.1 Three Hills Mine Process and Support Services Operating Costs

Process operating cost requirements for Three Hills were estimated by KCA based upon unit consumption, and, where possible, have been broken down by area. The annual operating costs for the process, laboratory, and service and support were estimated by KCA to be $2.20 per ton of ore, not including costs for make-up water supply. MDA applied these costs using fixed and variable portions through the LOM, which includes final rinsing of the leach pad at the end of processing. The resulting LOM processing cost for Three Hills is $2.59 per ton of ore.

Process operating costs for the project have been estimated from first principles. Labor costs were estimated using project-specific staffing, salary, wage, and benefit requirements. Unit consumption of materials, supplies, power, water, and delivered supply costs were also estimated.

The process operating costs are based upon ownership of all process production equipment and site facilities (some mobile equipment including a dozer for the heap leach to be supplied by the mining contractor), except for desorption and recovery equipment, which will be the responsibility of a contractor for toll stripping and carbon ashing, if required. The costs are based on the Owner employing and directing all operating, maintenance, and support personnel.

The process operating costs have been estimated without contingency allowances and are considered to have an accuracy range of +/- 15% for the laboratory and recovery plant, and +/- 25% for all other areas.

Operating costs estimates have been based upon information obtained from the following sources:

- Project metallurgical tests and process engineering;
- Budgetary quotations from potential suppliers of project operating and maintenance supplies and materials;
- Recent KCA project file data; and
- Experience of KCA staff with other similar operations.

Where specific data do not exist, cost allowances have been based upon consumption and operating data from other similar properties for which reliable data exists. Freight costs have been estimated where delivered prices were not available.

All operating costs are presented in 4th quarter 2014 US dollars except for diesel fuel which has been updated for the 2nd quarter of 2016. These operating costs do not include Nevada sales tax.

Table 21.18 shows the process and support services operating costs by area.

Table 21.18 Three Hills Mine Process and Support Operating Costs

	Units	Qty	Unit Costs, US$	Annual Costs, US$	US$ per Ton Ore
Labor					
Process	ea	24		**$1,772,179**	**$0.32**
Lab	ea	9		**$553,800**	**$0.10**
SUBTOTAL				**$2,325,979**	**$0.42**
Water Supply & Distribution					
Supply	gal/d	440,000			**$0.00**
Power	kWh/ton	0.26	$0.280	**$395,284**	**$0.07**
Maintenance Supplies	lot			**$50,000**	**$0.01**
SUBTOTAL				**$445,284**	**$0.08**
Heap-leach-pad & Ponds					
Power	kWh/ton	0.62	$0.280	**$947,863**	**$0.17**
Piping	lot			**$219,000**	**$0.04**
Pad Gravel (haul and spread only)	t	-	$2.00		
Maintenance Supplies	lot			**$50,000**	**$0.01**
Dozer (supplied by mining contractor)					
SUBTOTAL				**$1,216,863**	**$0.22**
Adsorption					
Power	kWh/ton	0.001	$0.280	**$1,166**	**$0.00**
Misc. Operating Supplies	lot			**$100,000**	**$0.02**
Maintenance Supplies	lot			**$100,000**	**$0.02**
SUBTOTAL				**$201,166**	**$0.04**
Recovery					
Power	kWh/ton	0.000	$0.280	**$0**	**$0.00**
Carbon Transportation Cost	US$/ton	478	$500.000	**$238,750**	**$0.04**
Toll-Stripping	ton/mo, dry	39.8	$1,500.00	**$716,220**	**$0.13**
Carbon Ashing	ton/mo, wet	0.0	$9,177.25	**$0**	**$0.00**
Safety Supplies	lot			**$25,000**	**$0.005**
SUBTOTAL				**$979,970**	**$0.18**
Reagents					
Power	kWh/ton	0.001	$0.280	**$1,874**	**$0.00**
Cyanide (Ore Consumption)	lb/ton	0.45	$1.31	**$3,228,005**	**$0.59**
Carbon	lb/mo	22031	$1.20	**$317,246**	**$0.058**
Lime	lb/ton	4	$0.08	**$1,850,550**	**$0.34**
Anti-Scalant	gal/day	65.0	$20.85	**$487,890**	**$0.09**
Safety Supplies	lot			**$50,000**	**$0.01**
Misc. Operating Supplies	lot			**$30,000**	**$0.01**
Maintenance Supplies	lot			**$50,000**	**$0.01**
SUBTOTAL				**$6,015,566**	**$1.09**

	Units	Qty	Unit Costs, US$	Annual Costs, US$	US$ per Ton Ore
Laboratory (At Tonopah)					
Power	kWh/ton	0.16	$0.063	**$53,712**	**$0.01**
Assays, Solids	No./day	100	$7.00	**$252,000**	**$0.05**
Assays, Solutions	No./day	100	$1.00	**$36,000**	**$0.01**
Carbon Assay	No./day	5	$7.00	**$12,600**	**$0.00**
Consumables	Per Year			**$50,000**	**$0.01**
SUBTOTAL				**$404,312**	**$0.07**
Mobile Equipment / Support Services					
Power	kWh/ton	0.01	$0.280	**$10,118**	**$0.00**
Maintenance Supplies	lot			**$10,000**	**$0.002**
Fork lift	hr/d	12	$11.43	**$49,378**	**$0.009**
Maintenance Trucks	hr/d	12	$12.19	**$52,661**	**$0.010**
Crane (40-t)	hr/month	4	$29.73	**$1,427**	**$0.000**
Boom Truck 10 ton crane	hr/d	6	$23.20	**$50,112**	**$0.009**
Telehandler	hr/d	4	$20.00	**$28,800**	**$0.005**
Back Hoe	hr/d	4	$20.49	**$29,506**	**$0.005**
Pick Ups	hr/d	40	$18.56	**$267,264**	**$0.049**
SUBTOTAL				**$499,265**	**$0.09**
TOTAL COST (Excluding Sales Tax)				**$12,088,405**	**$2.20**

21.8.1.1 Three Hills Mine Process Personnel and Staffing

Staffing requirements for process and administration have been estimated by KCA with input from WKM and H.C. Osborne and Associates. Wage, salary, and burden information for personnel was provided by WKM and has been included in the wage and salary data. Staffing levels, wages, and wage burdens of several operating mines in the area have been reviewed by management and found to accurately reflect current costs.

The work force will consist of approximately 24 persons in the process areas and 9 persons in the laboratory. Yearly staffing costs are estimated at $1,722,000 for the process area and $554,000 for the laboratory.

21.8.1.2 Three Hills Mine Power

Power usage for the process and process-related infrastructure was derived from estimated connected loads assigned to powered equipment from the mechanical equipment list. Equipment power demands under normal operation were assigned and coupled with estimated on-stream times to determine the average energy usage and cost.

The total attached power for the process and infrastructure is estimated at 0.9 MW, with an average draw of 0.6 MW. Additionally, the laboratory in Tonopah will have an attached power of 0.23 MW with an average power draw of 0.1 MW. The total consumed power for these areas is estimated at approximately1.04 kWh/ton ore. Power generation costs, based on a quote from

Aggreko, are estimated to be $0.28/kWh. Power costs for the laboratory are $0.0625 based on a quote from NV Energy. Emergency power will be provided by an onsite generator.

Power requirements are presented in Table 21.19.

Table 21.19 Three Hills Mine Process Power and Consumption

Area / Description	Attached Power (kW)	Average Demand (kW)
Area 4301 - Water Supply & Distribution	337	161
Area 5150 – Heap Leach & Solution Handling	526	428
Area 5184 - Adsorption	5	4
Area 6051 - Reagents	4	5
Area 1403 - Laboratory	234	108
Ancillaries	16	12
Total	1121	705

21.8.1.3 Three Hills Mine Consumable Items

Operating supplies costs have been estimated based upon unit costs and consumption rates predicted by metallurgical tests, and have been broken down by area. Freight costs have been included. Reagent consumptions have been derived from test work and from the Design Criteria. Other costs have been estimated from past KCA experience with similar operations. Consumable quantities are summarized in Table 21.20.

Table 21.20 Three Hills Process Consumable Items

Item	Form	Storage Capacity	Annual Consumption
Lime	Bulk	150 tons	10,950 tons
Sodium Cyanide (30%)	30% Liquid, Delivered	12.3 tons	1,232 tons
Activated Carbon	1,100 lb super sack	22 tons + Columns	132 tons
Antiscalant	Liquid Tote, 240 gal bins	8 totes (1,920 gal)	23,400 gal

Operating costs for these items have been distributed based on tonnage and gold production, or smelting batches, as appropriate.

Three Hills Mine Heap-Leach Consumables

Pipes, Fittings and Emitters – The heap pipe costs include expenses for broken pipe, fittings and valves, and abandoned tubing. The heap pipe costs are estimated to be $0.04/ton of ore, and are based on previous detailed studies conducted by KCA on similar projects.

Sodium Cyanide (NaCN) – Delivered sodium cyanide is quoted at $1.31/lb. Cyanide is consumed in the heap leach and ADR. Cyanide consumption for the heap is 0.45 lb/ton of ore.

Lime – Pebble lime is added to the heap at 4lb/ton of ore for pH control based on metallurgical test work evaluations. A delivered price of $0.08/lb has been used based on a budgetary quotation.

Antiscale Agent (Scale Inhibitor) – Antiscalant consumption is based on an average dosage rate of 6 ppm to the suctions of the barren and pregnant pumps. A delivered price of $20.85/gal was has been used based on a supplier quote.

Three Hills Mine Process Consumables

Carbon – Carbon will be used for the adsorption of gold from the pregnant solution and is estimated to be consumed at an average of 132 tons per year. Most of the carbon consumption is due to replacement of spent carbon due to toll stripping. It is assumed that carbon can be reused three times before activity levels are unacceptable. Carbon is quoted at $1.20/lb.

Costs for processing carbon by troll stripping are approximately $1,500 per dry ton, plus transportation costs. Based on recent discussions with a reputable toll stripping company, there is currently capacity at their facility to process 16 tons of carbon per month with 32 tons potentially available within the next few months. It is currently assumed in this cost estimate that all carbon loaded at Three Hills (approximately 40 tons per month) will be able to be processed by toll stripping despite current quoted capacities. It is possible to increase carbon processing by accepting higher tail loadings.

If required, the cost for processing carbon by a carbon ashing refiner is $9,177 per wet ton of carbon, which includes $1,075 per wet tonne of carbon, $8.00 per ounce of gold, and 5% of the metals value not including transportation. Carbon ashing, due to the high processing costs, will be avoided as much as possible.

Transportation of carbon is estimated at $500 per dry ton of carbon.

21.8.1.4 Three Hills Mine Laboratory

Fire assaying and solution assaying of samples will be conducted in a laboratory that will be located in Tonopah. It is estimated that each day approximately 100 solids assays at $7/assay, and 100 solutions assays at $1/assay, will be performed. The cost of an assay only includes supplies; the associated labor cost is included under Labor in the operating costs. Costs for renting the laboratory building in Tonopah are not included.

21.8.1.5 Three Hills Mine Fuel

The primary fuel source for the project will be diesel fuel and LNG. Diesel will be used by mobile equipment and the backup generator. Diesel price has been assumed to be $1.70/gal. LNG will be used in the main generator for power supply to Three Hills.

Fuel costs for mobile equipment have been included in the hourly operating costs for these units.

21.8.1.6 Three Hills Mine Mobile Equipment

Numerous pieces of support equipment are required for the processing areas. The costs to operate and maintain this equipment have been estimated primarily using published information. Otherwise, allowances have been made based upon experience in similar operations.

Support equipment annual operating costs have been estimated to average $479,000 per year, or $0.09/ton of ore. Table 21.21 presents the support equipment operating costs.

Table 21.21 Support Equipment Operating Costs – Three Hills

	Units	Qty	Unit Costs, USD	Costs, USD	USD per Ton Ore
Fork lift	hr/d	12	$11.43	$49,378	$0.009
Maintenance Trucks	hr/d	12	$12.19	$52,661	$0.010
Crane (40ton)	hr/month	4	$29.73	$1,427	$0.000
Boom Truck 10ton crane	hr/d	6	$23.20	$50,112	$0.009
Telehandler	hr/d	4	$20.00	$28,800	$0.005
Back Hoe	hr/d	4	$20.49	$29,506	$0.005
Pick Ups	hr/d	40	$18.56	$267,264	$0.049
TOTAL				**$479,147**	**$0.09**

21.8.1.7 Three Hills Mine Repair Materials

Overhaul and maintenance costs of equipment, along with miscellaneous operating supplies for each area, were based on a unit cost per ton of material processed. The unit cost for each area was developed from data obtained from other similar operations.

Maintenance and repair costs for all areas are estimated to average $0.14 per ton of ore.

21.8.2 Hasbrouck Mine Process and Support Services Operating Costs

Process operating costs for the Hasbrouck Mine were estimated by KCA based upon unit consumption, and, where possible, have been broken down by area. First year operating cost for the process, laboratory, and service and support is $3.55 per ton of ore processed, and the remaining annual operating cost is $3.79 per ton of ore processed. These costs do not include water supply costs for make-up water. MDA applied these costs using fixed and variable portions through the LOM, which includes final rinsing of the leach pad at the end of processing. The resulting LOM processing cost for Hasbrouck is $3.93 per ton of ore. The increase in operating cost per ton is a function of applying the fixed costs through the end of mine rinsing of the leach pad.

Process operating costs for the project have been estimated from first principles. Labor costs are estimated using project specific staffing, salary, wage, and benefit requirements. Unit consumption of materials, supplies, power, water, and delivered supply costs are also estimated.

Operating costs are based upon ownership of all process production equipment and site facilities (some mobile equipment including the crushing area loader and the dozer for the heap leach will be supplied by the mining contractor), as well as the owner employing and paying for all operating, maintenance, and support personnel.

Operating costs have been estimated and are presented without contingency allowances and are considered to have an accuracy range of +/- 15% for the laboratory and recovery plant, and +/- 25% for all other areas.

Operating costs estimates have been based upon information obtained from the following sources:

- Project metallurgical test work and process engineering;
- Budgetary quotations from potential suppliers of project operating and maintenance supplies and materials;
- Recent KCA project file data; and
- Experience of KCA staff with other similar operations.

Where specific data does not exist, cost allowances have been based upon consumption and operating requirements from other similar properties for which reliable data exists. Freight costs have been estimated where delivered prices were not available.

All costs are presented in 4th quarter 2014 US dollars except diesel fuel, which has been updated for the 2nd quarter of 2106. These costs do not include Nevada sales tax.

Table 21.22 Shows the process and support services operating costs by area.

Table 21.22 Hasbrouck Mine Process & Support Operating Cost

		Year 1	Years 2 On		**Year 1**	**Years 2 On**	**Year 1**	**Years 2 On**
	Units	Qty	Qty	Unit Costs, US$	**Annual Costs, US$**	**Annual Costs, US$**	**US$ per Ton Ore**	**US$ per Ton Ore**
Labor								
Process	ea	54	54		**$3,912,952**	**$3,912,952**	**$0.62**	**$0.62**
Lab	ea	9	9		**$553,800**	**$553,800**	**$0.09**	**$0.09**
SUBTOTAL					**$4,466,752**	**$4,466,752**	**$0.71**	**$0.71**
Water Supply & Distribution								
Supply	gal/d	430,000	430,000					**$0.00**
Power	kWh/ton	0.323	0.32	$0.063	**$127,080**	**$127,080**	**$0.02**	**$0.02**
Maintenance Supplies	lot				**$58,590**	**$58,590**	**$0.01**	**$0.01**
SUBTOTAL					**$185,670**	**$185,670**	**$0.03**	**$0.03**
Crushing								
Power	kWh/ton	3.566	3.57	$0.063	**$1,403,924**	**$1,403,924**	**$0.22**	**$0.22**
Wear	$/ton Ore				**$2,444,346**	**$3,958,067**	**$0.39**	**$0.63**
Overhaul & Maintenance	lot				**$819,000**	**$819,000**	**$0.13**	**$0.13**
992 Loader (supplied by mine contractor)	hr/d							
SUBTOTAL					**$4,667,271**	**$6,180,992**	**$0.74**	**$0.98**
Conveying, Agglomeration & Stacking								
Power	kWh/ton	1.35	1.35	$0.063	**$532,204**	**$532,204**	**$0.08**	**$0.08**
Foam Dust Suppression					**$189,000**	**$189,000**	**$0.03**	**$0.03**
Maintenance Supplies	lot				**$415,800**	**$415,800**	**$0.07**	**$0.07**
SUBTOTAL					**$1,137,004**	**$1,137,004**	**$0.18**	**$0.18**
Heap-leach pad & Ponds								
Power	kWh/ton	0.37	0.37	$0.063	**$143,745**	**$143,745**	**$0.02**	**$0.02**
Piping	lot				**$252,000**	**$252,000**	**$0.04**	**$0.04**
Pad Gravel (haul and spread only)	ton	-	-	$2.00				
Maintenance Supplies	lot				**$126,000**	**$126,000**	**$0.02**	**$0.02**
Dozer	hr/d	6	6	$75.29	**$162,626**	**$162,626**	**$0.03**	**$0.03**
SUBTOTAL					**$684,372**	**$684,372**	**$0.11**	**$0.11**
Adsorption								
Power	kWh/ton	0.002	0.00	$0.063	**$685**	**$685**	**$0.00**	**$0.00**
Misc. Operating Supplies	lot				**$50,000**	**$50,000**	**$0.01**	**$0.01**
Maintenance Supplies	lot				**$50,000**	**$50,000**	**$0.01**	**$0.01**
SUBTOTAL					**$100,685**	**$100,685**	**$0.02**	**$0.02**
Desorption & Recovery								

Power	kWh/ton	0.178	0.18	$0.063	**$70,262**	**$70,262**	**$0.01**	**$0.01**
Misc. Operating Supplies	lot				**$200,000**	**$200,000**	**$0.03**	**$0.03**
Maintenance Supplies	lot				**$100,000**	**$100,000**	**$0.02**	**$0.02**
Sodium Hydroxide	lb/day	516.0	516.0	$0.47	**$87,307**	**$87,307**	**$0.01**	**$0.01**
Hydrochloric Acid @ 28-30%	gal/day	122	122	$2.10	**$92,232**	**$92,232**	**$0.01**	**$0.01**
Soda Ash	lb/day	13.7	13.7	$0.24	**$1,186**	**$1,186**	**$0.000**	**$0.000**
Borax	lb/day	36.4	36.4	$0.52	**$6,836**	**$6,836**	**$0.001**	**$0.001**
Silica	lb/day	22.8	22.8	$2.95	**$24,200**	**$24,200**	**$0.004**	**$0.004**
Niter	lb/day	18.2	18.2	$0.91	**$5,944**	**$5,944**	**$0.001**	**$0.001**
Safety Supplies	lot				**$50,000**	**$50,000**	**$0.01**	**$0.01**
Diesel Fuel	gal/day	366.9	366.9	$1.70	**$227,661**	**$227,661**	**$0.04**	**$0.04**
SUBTOTAL					**$865,628**	**$865,628**	**$0.14**	**$0.14**
Reagents								
Power	kWh/ton	0.004	0.00	$0.063	**$1,591**	**$1,591**	**$0.00**	**$0.00**
Cyanide (Ore Consumption)	lb/ton	0.75	0.75	$1.31	**$6,190,695**	**$6,190,695**	**$0.98**	**$0.98**
Carbon	lb/wk	1106	1106	$1.20	**$69,014**	**$69,014**	**$0.01**	**$0.01**
Cement	lb/ton	5	5	$0.08	**$2,362,500**	**$2,362,500**	**$0.38**	**$0.38**
Anti-Scalant	gal/day	65.0	65.0	$20.85	**$487,890**	**$487,890**	**$0.08**	**$0.08**
Safety Supplies	lot				**$50,000**	**$50,000**	**$0.01**	**$0.01**
Misc. Operating Supplies	lot				**$28,980**	**$28,980**	**$0.00**	**$0.00**
Maintenance Supplies	lot				**$31,500**	**$31,500**	**$0.01**	**$0.01**
SUBTOTAL					**$9,222,170**	**$9,222,170**	**$1.46**	**$1.46**
Laboratory (At Tonopah)								
Power	kWh/ton	0.157	0.16	$0.063	**$61,805**	**$61,805**	**$0.01**	**$0.01**
Assays, Solids	No./day	100	100	$7.00	**$252,000**	**$252,000**	**$0.04**	**$0.04**
Assays, Solutions	No./day	100	100	$1.00	**$36,000**	**$36,000**	**$0.01**	**$0.01**
Carbon Assay	No./day	5	5	$7.00	**$12,600**	**$12,600**	**$0.00**	**$0.00**
Consumables	Per Year				**$65,000**	**$65,000**	**$0.01**	**$0.01**
SUBTOTAL					**$427,405**	**$427,405**	**$0.07**	**$0.07**
Mobile Equipment / Support Services								
Power	kWh/ton	0.071	0.07	$0.063	**$28,055**	**$28,055**	**$0.004**	**$0.004**
Maintenance Supplies	lot				**$10,000**	**$10,000**	**$0.002**	**$0.002**
Fork lift	hr/d	12	12	$11.43	**$49,378**	**$49,378**	**$0.008**	**$0.008**
Telehandler	hr/d	4	4	$20.00	**$28,800**	**$28,800**	**$0.005**	**$0.005**
Maintenance Trucks	hr/d	16	16	$12.19	**$70,214**	**$70,214**	**$0.011**	**$0.011**
Crane (40-ton)	hr/month	12	12	$29.73	**$4,281**	**$4,281**	**$0.001**	**$0.001**
Boom Truck 10ton crane	hr/d	6	6	$23.20	**$50,112**	**$50,112**	**$0.008**	**$0.008**
Back Hoe	hr/d	8	8	$20.49	**$59,011**	**$59,011**	**$0.009**	**$0.009**
Pick Ups	hr/d	50	50	$18.56	**$334,080**	**$334,080**	**$0.053**	**$0.053**
SUBTOTAL					**$633,931**	**$633,931**	**$0.10**	**$0.10**
TOTAL COST					**$22,390,888**	**$23,904,609**	**$3.55**	**$3.79**

21.8.2.1 Hasbrouck Mine Process Personnel and Staffing

Staffing requirements for process and administration personnel have been estimated by KCA with input from WKM and review by H.C. Osborne & Associates and Paul Sterling. Wage, salary, and burden information for personnel was provided by WKM, based on input from current data from mines operating in the region. Staffing levels, wages, and wage burdens of several operating mines in the region have been reviewed by management and found to reasonably reflect current costs.

The work force will consist of approximately 54 persons in the plant areas and 9 persons in the laboratory. The staffing costs for the process plant are estimated at $3,913,000 and for the laboratory at $554,000.

21.8.2.2 Hasbrouck Mine Power

Power usage for the process and process-related infrastructure was derived from estimated connected loads assigned to powered equipment from the mechanical equipment list. Equipment power demands under normal operation were assigned and coupled with estimated on-stream times to determine the average energy usage and cost.

The total attached power for the process and infrastructure is estimated at 6.7 MW (including the laboratory at Tonopah), with an average draw of 4.2 MW. The total consumed power for these areas is estimated to be 6.0 kWh/ton of ore. Power costs at the Hasbrouck site are quoted by NV Energy at $0.0625/kWh. Emergency power will be provided by an on-site diesel or LNG generator.

Power requirements are presented in Table 21.23.

Table 21.23 Hasbrouck Mine Process Power and Consumption

Area / Description	Attached Power (kW)	Average Demand (kW)
Area 4301 - Water Distribution	491	270
Area 5004 - Primary Crushing	409	218
Area 5023 - Secondary & Tertiary Crushing	3,268	2,041
Area 5041 - Ore Reclaim & Stacking	1,246	845
Area 5150 - Heap-leach & Solution Handling	533	396
Area 5184 - Adsorption	5	4
Area 5184 - Acid Wash & Elution	31	24
Area 5186 - Electrowinning & Refining	215	160
Area 5184 - Carbon Handling & Regeneration	67	53
Area 6051 - Reagents	7	3
Area 1403 - Laboratory (At Tonopah)	234	113
Ancillaries	224	89
Total	**6,729**	**4,217**

21.8.2.3 Hasbrouck Mine Consumable Items

Operating supplies have been estimated based upon unit costs and consumption, where possible, and have been broken down by area. In the sections below the assumptions and unit costs associated with the development of the operating costs are presented. All freight costs have been included. Reagent consumptions are derived from test work and from the Design Criteria. Other costs were estimated from past KCA experience with similar operations. Table 21.24 shows the consumption of major consumables

Table 21.24 Process Consumable Items – Hasbrouck

Item	Form	Storage Capacity	Annual Consumption
Cement - Portland Type II	Bulk	100 tons	15,750 tons
Sodium Cyanide (30%)	30% Bulk Liquid Delivery	12.0 tons	2,400 tons
Activated Carbon	1,100 lb Super sack	22 tons	30 tons
Diesel	Bulk Delivery Truck	1,791 gal	134,000 gal
Antiscalant	Liquid Tote, 240 gal bins	8 totes (1,920 gal)	23,400 gal
Hydrochloric Acid (32%)	240 gal Liquid Tote bins	6 totes (1,440 gal)	44,000 gal
Sodium Hydroxide	50% Liquid Delivered	15.3 tons	93 tons
Silica	Dry Solid Sacks	1 ton	4.1 tons
Borax	Dry Solid Sacks	2 tons	6.6 tons
Soda Ash	Dry Solid Sacks	1 ton	2.5 tons
Niter	Dry Solid Sacks	1 ton	3.3 tons

Operating costs for these items have been distributed based on tonnage and gold production, or smelting batches, as appropriate.

Hasbrouck Mine Heap-Leach Consumables

Pipes, Fittings and Emitters – The heap pipe costs include expenses for broken pipe, fittings and valves, and abandoned tubing. The heap pipe costs are estimated to be $0.04/ton of ore, and are based on previous detailed studies conducted by KCA on similar projects.

Sodium Cyanide (NaCN) – Delivered sodium cyanide is quoted at $1.31/lb. Cyanide is consumed in the heap leach and ADR. Cyanide consumptions for the heap is 0.75lb/ton of ore.

Cement – Portland Type II cement is added to the heap at 5lb/ton for agglomeration and pH control based on metallurgical test work evaluations. A delivered price of $0.08/lb has been used based on supplier budgetary pricing.

Antiscale Agent (Scale Inhibitor) – Antiscale consumption is based on an average dosage rate of 6 ppm to the suctions of the barren and pregnant pumps. A delivered price of $20.85/gal has been used based on a supplier quote.

Hasbrouck Mine Process Consumables

The Hasbrouck Mine will utilize an ADR plant located at the mine site. All process consumables will be stored and consumed at Hasbrouck.

Carbon – Carbon is used for the adsorption of gold from the pregnant solution in the ADR and is estimated to be consumed at an average of 30 tons per year. Carbon is quoted at $1.20/lb.

Loaded carbon is transported to the Three Hills ADR plant for stripping and refining; stripped carbon is regenerated and transferred back to Hasbrouck. The estimated cost for carbon transport is $10 per haul.

Caustic Soda (NaOH) – Caustic NaOH consumption is estimated to be 93 tons per year and is quoted at $0.47/lb. Caustic consumption is calculated based on the number of strips per year and varies based on metal production.

Hydrochloric Acid - Hydrochloric acid consumption for the ADR circuit is estimated to be 44,000 gal/year. Hydrochloric acid for the carbon acid wash circuit is supplied at a cost of $2.10/gal. Hydrochloric acid consumption is based on 41 gal of acid per ton carbon stripped and varies based on metal production.

Smelting Fluxes - It has been estimated that 1.0 lb of mixed fluxes per lb of precious metal precipitate produced will be required. The estimated delivered cost of these fluxes, which includes borax, silica, niter, and soda ash, is $1.16/lb, which is based on data from similar previous KCA projects.

21.8.2.4 Hasbrouck Mine Laboratory

Fire assaying and solution assaying of samples will be conducted at the laboratory to be located in Tonopah. It is estimated that approximately 100 solids assays at $7/assay, 5 carbon assays at $7.00/assay, and 100 solutions assays at $1/assay, will be performed each day. The cost of an assay only includes supplies; the associated labor is included under Labor in the operating costs. These costs do not include the cost to rent the building.

21.8.2.5 Hasbrouck Mine Fuel

The primary fuel source for the project will be diesel fuel. Diesel will be used by the mobile equipment, as well as by the boiler and kiln at Three Hills, and the backup generator in the process area. Diesel is estimated at $1.70/gal.

Fuel costs for mobile equipment have been included in the hourly operating costs for these units.

21.8.2.6 Hasbrouck Mine Spare HPGR Parts

It is recommended that a spare set of rolls for the HPGR be kept on site. A spare set of rolls has been included in the capital costs.

21.8.2.7 Hasbrouck Mine Mobile Equipment

Numerous pieces of support equipment are required for the processing areas. The majority of the mobile equipment will be transferred to Hasbrouck from the Three Hills Mine and include light vehicles, a maintenance truck, forklifts, one 40-ton crane, a boom truck, a telehandler and a backhoe. The costs to operate and maintain each of these pieces of equipment have been estimated using primarily published information. Otherwise, allowances have been made based upon experience in similar operations.

Support equipment annual operating costs have been estimated to average $596,000 per year, or $0.09/ton of ore. Table 21.25 presents the Hasbrouck support equipment operating costs.

Table 21.25 Hasbrouck Mine Support Equipment Operating Costs

	Units	Qty	Unit Costs, USD	Costs, USD	USD per Tonne Ore
Fork lift	hr/d	12	$11.43	$49,378	$0.008
Telehandler	hr/d	4	$20.00	$28,800	$0.005
Maintenance Trucks	hr/d	16	$12.19	$70,214	$0.011
Crane (40 ton)	hr/month	12	$29.73	$4,281	$0.001
Boom Truck 10 ton crane	hr/d	6	$23.20	$50,112	$0.008
Back Hoe	hr/d	8	$20.49	$59,011	$0.009
Pick Up Trucks	hr/d	50	$18.56	$334,080	$0.053
TOTAL				**$595,876**	**$0.09**

21.8.2.8 Hasbrouck Mine Repair Materials

Overhaul and maintenance of equipment, along with miscellaneous operating supplies for each area, were based on a unit cost per ton of material processed. The unit cost for each area was developed from data obtained from other operations, as applicable.

Maintenance and repair costs are estimated to average $0.92 per ton or ore.

21.9 Other Operating Costs

Other operating costs are included as general and administration costs and presented in Table 21.26. These costs are based on administration personnel required to manage operations as well as supplies, land holding fees, legal and auditing costs, site communication and IT costs, environmental compliance, surety bond, fees, licensing, travel, light vehicle, site maintenance, janitorial services, and office power. Cost bases were provided by WKM and vendor quotations. WKM inputs were primarily for personnel requirements and salaries, legal and auditing charges, and surety bond costs. Environmental and communication costs were provided by potential contractors that would provide these services. Total general and administration costs are estimated to be about $2,265,000 per year (average of Year 1 through Year 7) once Hasbrouck mining has started.

Table 21.26 General and Administration Costs

Personnel Costs	Units	Pre-Prod	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10	Yr 11	Total
Admin Salaried Personnel	K USD	$ 386	$ 469	$ 469	$ 469	$ 469	$ 469	$ 469	$ 469	$ 469	$ 251	$ 207	$ 35	$ 4,632
Admin Hourly Personnel	K USD	$ 130	$ 195	$ 195	$ 195	$ 195	$ 195	$ 195	$ 195	$ 168	$ 75	$ 65	$ 11	$ 1,816
Safety & Security Salaried Personnel	K USD	$ 67	$ 90	$ 90	$ 90	$ 90	$ 90	$ 90	$ 90	$ 90	$ 15	$ -	$ -	$ 800
Environmental Salaried Personnel	K USD	$ 83	$ 110	$ 110	$ 110	$ 110	$ 110	$ 110	$ 110	$ 110	$ 110	$ 110	$ 18	$ 1,205
Recruitment Costs	K USD	$ 40	$ 40	$ 20	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 100
Total Personnel Costs	K USD	$ 706	$ 905	$ 885	$ 865	$ 865	$ 865	$ 865	$ 865	$ 837	$ 451	$ 382	$ 64	$ 8,553
General G&A Costs														
Supplies & General Maintenance	K USD	$ 108	$ 144	$ 144	$ 144	$ 144	$ 144	$ 144	$ 144	$ 114	$ 72	$ 72	$ 12	$ 1,386
Land Holdings	K USD	$ 86	$ 115	$ 115	$ 115	$ 115	$ 115	$ 115	$ 115	$ 91	$ 58	$ 58	$ 10	$ 1,107
Off Site Overhead	K USD	$ 45	$ 60	$ 60	$ 32	$ 18	$ 18	$ 18	$ 18	$ 18	$ 18	$ 18	$ 3	$ 326
Legal, Audits, Consulting	K USD	$ 37	$ 49	$ 49	$ 49	$ 49	$ 49	$ 49	$ 49	$ 49	$ 49	$ 49	$ 8	$ 535
Computers, IT, Internet, Software, Hardware	K USD	$ 50	$ 66	$ 66	$ 66	$ 66	$ 66	$ 66	$ 66	$ 52	$ 33	$ 33	$ 6	$ 635
Environmental, Montoring Wells, Reporting	K USD	$ 150	$ 200	$ 200	$ 200	$ 200	$ 200	$ 200	$ 200	$ 117	$ -	$ -	$ -	$ 1,667
Bond Surety Payments	K USD	$ 68	$ 68	$ 68	$ 68	$ 68	$ 68	$ 17	$ -	$ -	$ -	$ -	$ -	$ 427
Donations, Dues, PR	K USD	$ 23	$ 30	$ 30	$ 30	$ 30	$ 30	$ 30	$ 30	$ 18	$ -	$ -	$ -	$ 250
Fees, Licenses, Misc Taxes, Insurance	K USD	$ 180	$ 240	$ 240	$ 240	$ 240	$ 240	$ 240	$ 240	$ 190	$ 120	$ 120	$ 20	$ 2,310
Travel, Lodging, Meals	K USD	$ 41	$ 54	$ 54	$ 54	$ 54	$ 54	$ 54	$ 54	$ 32	$ -	$ -	$ -	$ 450
Telephones, Computers, Cell Phones	K USD	$ 59	$ 78	$ 78	$ 78	$ 78	$ 78	$ 78	$ 78	$ 46	$ -	$ -	$ -	$ 650
Light Vehicle Maintenance, Fuel	K USD	$ 81	$ 108	$ 108	$ 108	$ 108	$ 108	$ 108	$ 108	$ 63	$ -	$ -	$ -	$ 900
Small Tools, Janitorial, Safety Supplies	K USD	$ 50	$ 66	$ 66	$ 66	$ 66	$ 66	$ 66	$ 66	$ 39	$ -	$ -	$ -	$ 550
Equipment Rentals	K USD	$ 45	$ 60	$ 60	$ 60	$ 60	$ 60	$ 60	$ 60	$ 35	$ -	$ -	$ -	$ 500
Access Road Maintenance	K USD	$ 36	$ 48	$ 48	$ 48	$ 48	$ 48	$ 48	$ 48	$ 38	$ 24	$ 24	$ 4	$ 462
Office Power	K USD	$ 39	$ 53	$ 53	$ 53	$ 49	$ 49	$ 49	$ 49	$ 39	$ 25	$ 25	$ 4	$ 485
Total General G&A Costs	K USD	$ 1,096	$ 1,439	$ 1,440	$ 1,411	$ 1,393	$ 1,393	$ 1,342	$ 1,325	$ 939	$ 398	$ 398	$ 66	$ 12,641
Total G&A	K USD	$ 1,803	$ 2,344	$ 2,324	$ 2,276	$ 2,258	$ 2,258	$ 2,207	$ 2,190	$ 1,776	$ 849	$ 780	$ 130	$ 21,194

Reclamation costs were estimated based on BLM RCE spreadsheets prepared by Enviroscientists, Inc. These costs were included in the cash-flow spreadsheets as a capital cost. Reclamation costs were estimated to be $3,419,000 and $5,519,000 for Three Hills and Hasbrouck respectively. Three Hills reclamation costs were applied to years 4 through 6 to reclaim waste dumps and leach pads after final leaching of ore. These costs are assumed to pay for the drain down of leach pads and ultimate reclamation. Note that the costs of administration and offices during the drain-down period are included in the G&A costs.

Reclamation costs for Hasbrouck were applied equally over the last 2 years of the mine life.

22.0 ECONOMIC ANALYSIS

MDA completed an economic analysis based on the cash flow developed from the production schedule and the capital and operating costs previously discussed. Table 22.1 summarizes project economics. These values are based on 100% of the project; WKM has a 75% interest in the project and has the right to make an offer on the remaining 25%.

Table 22.1 Hasbrouck Project Economic Summary

	Units	Three Hills Mine	Hasbrouck Mine	Total Hasbrouck Project
PROJECT STATISTICS				
HEADGRADE	oz Au/ton - g Au/t	0.018 - 0.62	0.017 - 0.57	0.017 - 0.58
Ore	million tons	10	36	45
Annual Ore	million tons	5	6	6
Processing Rate	tons per day	15,000	17,500	15,986
Stripping Ratio	waste:ore	0.9	1.1	1.1
Contained Metal				
Gold Grade	oz Au/ton - g Au/t	0.018 - 0.62	0.017 - 0.57	0.017 - 0.58
Silver Grade	oz Ag/ton - g Ag/t	NA	0.297 - 10.17	0.233 - 8.00
Gold Equivalent Grade (1)	oz AuEq/ton - g AuEq/t	0.018 - 0.62	0.017 - 0.59	0.017 - 0.59
Gold	kOz	175	588	762
Silver	kOz	NA	10,569	10,569
Gold Equivalent (1)	kOz	175	610	784
Recoverable Metal				
Gold Recovery	%	81.5%	74.0%	75.7%
Silver Recovery	%		11.0%	11.0%
Gold	kOz	142	435	577
Silver	kOz	NA	1,163	1,163
Gold Equivalent ($1,275/$18.21)	kOz	142	452	594
Average Annual Gold Production	kOz	69	71	71
Averge Annual Silver Production (2)	kOz	NA	194	194
Average Annual AuEq Production	kOz	69	74	74
Gold Price	US$/oz	$ 1,275	$ 1,275	$ 1,275
Silver Price	US$/oz	NA	$ 18.21	$ 18.21
CAPITAL				
Initial Capex	US$ million	$ 47		
Growth Capex	US$ million		$ 83	
Sustaining Capex	US$ million		$ 13	
LOM Capex	US$ million			$ 143
Contingency (included)	US$ million	$ 6	$ 15	$ 21
Contingency (included)	%	14%	19%	17%
OPERATING COST				
Adjusted Operating Cost per Ton of Ore (3)	US$/ton ore	$ 7.40	$ 8.71	$ 8.43
Mining	US$/ton ore	$ 3.18	$ 3.74	$ 3.62
Processing	US$/ton ore	$ 2.55	$ 3.93	$ 3.63
G&A	US$/ton ore	$ 0.44	$ 0.46	$ 0.46
Other (4)	US$/ton ore	$ 1.23	$ 0.58	$ 0.72
Adjusted Operating Cost (3)	US$/oz Au net of by-products	$ 502	$ 714	$ 661
All-in Sustaining Cost (5)	US$/oz Au net of by-products	$ 544	$ 774	$ 717
Mine Life	year	1.7	7.1	8.8
PROJECT ECONOMICS				
NPV (5%) - after tax	US$ million			$ 120.4
IRR - after tax	%			43%
Payback Period	year			3.1

Notes:

(1) Gold equivalent calculations are made using the ratio of recovered silver / gold and metal prices.

(2) Silver production is averaged over the Hasbrouck mine life only

(3) World Gold Council - Adjusted Operating Costs include:
On-site mining and G&A, royalties and production taxes, permitting and community cost related to current operations, 3rd party smelting, refining and transport costs, stock-piles and inventory write-downs, site-based non-cash remuneration, operational stripping costs and by-product credits.
(4) Other category includes royalties, production taxes, permitting, refining, and by-product credit
(5) World Gold Council All-in Sustaining Costs includes:
Adjusted Operating Costs (above) plus corporate G&A, reclamation & remediation—accretion & amortization, expenditures sustaining exploration and study costs, capital exploration, capitalized stripping and sustaining capital.
(6) Project economics are presented for 100% of the project which is jointly owned by WKM (75%) and Waterton Precious Metals Fund(25%).
(7) Some totals may not sum properly due to rounding.

22.1 Economic Parameters and Assumptions

The economic analysis has been based on economic parameters including metal prices, capital and operating costs, royalties, and application of depreciation, depletion and tax rates. The remaining assumptions come from the mining and processing production schedules. Capital and operating costs have been discussed previously in Section 21.0.

The economic analysis was based on a gold price of $1,275 per ounce and a silver price of $18.21 per ounce. These prices were selected according to the criteria described in Section 19.0.

22.1.1 Royalties

Royalties were based on a 4% net smelter return royalty as discussed in Section 4.3. The royalty has been applied by calculating the total recovered ounces of gold and silver, multiplied by the metal prices and payable percentage, and then subtracting transportation and refining costs.

22.1.2 Taxes

Taxes include both Nevada net proceeds tax and federal corporate taxes. Nevada requires payment of a tax on proceeds from minerals. This is typically referred to as the Nevada net proceeds tax or “NPT”. This tax was established in 1989 in lieu of property taxes on mineral land. The Nevada constitution was amended to establish the tax on proceeds of all minerals, including oil and gas, at a rate not to exceed 5%.

For operations with annual gross proceeds over $4,000,000, the NPT tax rate is 5%. For operations with gross proceeds less than $4,000,000 annually, the NPT tax rate is dependent on the ratio of net proceeds to gross proceeds. The net proceeds were calculated by taking the total net revenue (after refining costs and royalties) and subtracting the operating costs. The gross proceeds were calculated by taking the gross revenues less the royalties paid (net revenue does not include cost of production).

The NPT tax applied to the net proceeds less than $4,000,000 is applied with an adjustable rate shown in Table 22.2. As per Nevada tax laws, the minimum NPT is based on the property tax rate for the county, which is 3.0195% for Esmerelda County.

Table 22.2 NPT Tax Rate Base on Net Proceeds to Gross Proceeds Ratio

Ratio of Net Proceeds to Gross Proceeds	Tax rate
Minimum *	3.0195%
Greater or equal to 26, less than 34	3.50%
Greater or equal to 34, less than 42	4.00%
Greater or equal to 42, less than 50	4.50%
50 or more	5.00%

For the Hasbrouck project, positive cash-flow years are projected to have net proceeds greater than $4,000,000, and even though equations in the cash-flow model are designed to capture lower tax rates, the net effect is that a 5% net proceeds tax has been applied throughout.

Federal income taxes were based on either a straight tax rate of 35% or an alternate minimum tax of 20%. The straight federal tax rate of 35% has been applied to a taxable income after adjustments for depreciation and depletion. Depreciation has been applied to the initial capital for both Three Hills and Hasbrouck mines over the life of both mines. Depreciation has been based on the ratio of ounces produced in each year to the total LOM recoverable ounces.

Depletion has been based on the larger amount of either: percent reserve depletion, or cost depletion. The percent reserve depletion has been assumed to be the minimum of 50% of the yearly depreciation (depletion limit) or 15% of the yearly gross revenue. Cost depletion has been based on the Hasbrouck project purchase price of $20 million, which has been depleted through the life of the mine based on the yearly depletion of recoverable equivalent ounces of gold.

The alternative minimum tax has been based on an alternate depreciation method: depreciating the initial capital for each mine over a straight 10 year period. This depreciation is used to calculate the taxable income for the alternate minimum income, with tax calculated at 20%. The final federal corporate tax has been assumed to be the greater amount of the “normal” federal corporate tax at 35% or the alternate minimum tax.

WKM has determined it is possible to make use of a tax credit of $4,741,000 based on previous year’s losses. This credit is based on 35% of the past 5 years of losses totaling $13.5 million. The credit is applied to the first 3 years of production.

22.1.3 Project Physical Values

The pre-feasibility physical values included quantities of mined and processed material, along with produced metals that provide the basis for the cash-flow analysis. These values were derived from the mining and processing schedules previously discussed in the Mining Methods section. They were reformatted into the cash-flow sheet as shown in Table 22.3.

Table 22.3 Project Physicals

Material Mined		Units	Pre-Prod	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10	Yr 11	Total
Three Hills	Ore Mined	K Tons	540	5,450	3,664	-	-	-	-	-	-	-	-	-	9,653
		oz Au/ton	0.014	0.015	0.023	-	-	-	-	-	-	-	-	-	0.018
		K Ozs Au	8	84	83	-	-	-	-	-	-	-	-	-	175
	Waste	K Tons	966	4,735	2,630	-	-	-	-	-	-	-	-	-	8,331
	Total	K Tons	1,506	10,185	6,293	-	-	-	-	-	-	-	-	-	17,984
	Strip Ratio	W:O	1.79	0.87	0.72										0.86
Hasbrouck	Ore Mined	K Tons	-	-	905	6,045	6,388	6,388	6,388	6,405	3,099	-	-	-	35,617
		oz Au/ton	-	-	0.011	0.016	0.019	0.020	0.015	0.014	0.016	-	-	-	0.017
		K Ozs Au	-	-	10	98	120	126	98	87	49	-	-	-	588
		oz Ag/ton	-	-	0.099	0.293	0.304	0.338	0.324	0.252	0.299	-	-	-	0.297
		K Ozs Ag	-	-	89	1,770	1,944	2,156	2,071	1,611	927	-	-	-	10,569
	Waste	K Tons	-	-	2,740	10,053	3,687	3,798	7,959	9,403	1,962	-	-	-	39,602
	Total	K Tons	-	-	3,645	16,099	10,075	10,185	14,347	15,808	5,061	-	-	-	75,219
	Strip Ratio	W:O			3.03	1.66	0.58	0.59	1.25	1.47	0.63				1.11
Total Mining	Ore Mined	K Tons	540	5,450	4,568	6,045	6,388	6,388	6,388	6,405	3,099	-	-	-	45,270
		oz Au/ton	0.014	0.015	0.020	0.016	0.019	0.020	0.015	0.014	0.016	-	-	-	0.017
		K Ozs Au	8	84	93	98	120	126	98	87	49	-	-	-	762
		oz Ag/ton	-	-	0.020	0.293	0.304	0.338	0.324	0.252	0.299	-	-	-	0.233
		K Ozs Ag	-	-	89	1,770	1,944	2,156	2,071	1,611	927	-	-	-	10,569
	Waste	K Tons	966	4,735	5,370	10,053	3,687	3,798	7,959	9,403	1,962	-	-	-	47,933
	Total	K Tons	1,506	10,185	9,938	16,099	10,075	10,185	14,347	15,808	5,061	-	-	-	93,203
	Strip Ratio	W:O	1.79	0.87	1.18	1.66	0.58	0.59	1.25	1.47	0.63				1.06
Material Processed															
	Three Hills Leach														
	Material	K Tons	540	5,450	3,664	-	-	-	-	-	-	-	-	-	9,653
	Placed on	oz Au/ton	0.014	0.015	0.023	-	-	-	-	-	-	-	-	-	0.018
	Pad	K Ozs Au	8	84	83	-	-	-	-	-	-	-	-	-	175
	Recoverable	K Ozs Au	6	67	65	-	-	-	-	-	-	-	-	-	138
	Recovered	K Ozs Au	-	54	83	5	-	-	-	-	-	-	-	-	142
	Cumulative Recovery	%	0.0%	59.0%	78.6%	81.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
	Hasbrouck Leach														
	Material	K Tons	-	-	905	6,045	6,388	6,388	6,388	6,405	3,099	-	-	-	35,617
	Placed on	oz Au/ton	-	-	0.011	0.016	0.019	0.020	0.015	0.014	0.016	-	-	-	0.017
	Pad	K Ozs Au	-	-	10	98	120	126	98	87	49	-	-	-	588
		oz Ag/ton	-	-	0.099	0.293	0.304	0.338	0.324	0.252	0.299	-	-	-	0.297
		K Ozs Ag	-	-	89	1,770	1,944	2,156	2,071	1,611	927	-	-	-	10,569
	Recoverable Au	K Ozs Au	-	-	5	61	85	96	75	66	38	-	-	-	426
	Recovered Au	K Ozs Au	-	-	0	50	81	98	81	65	51	4	5	0	435
	Cumulative Au Recovery	%	0.0%	0.0%	3.0%	46.8%	57.7%	64.9%	68.6%	69.6%	72.5%	73.1%	74.0%	74.0%	
	Recoverable Ag	K Ozs Ag	-	-	10	195	214	237	228	177	102	-	-	-	1,163
	Recovered Ag	K Ozs Ag	-	-	0	155	215	234	243	191	125	-	-	-	1,163
	Cumulative Ag Recovery	%	0.0%	0.0%	0.1%	8.3%	9.7%	10.1%	10.5%	10.8%	11.0%	0.0%	0.0%	0.0%	
	Total Au Production	K Ozs Au	-	54	83	55	81	98	81	65	51	4	5	0	577
	Total Ag Production	K Ozs Ag	-	-	0	155	215	234	243	191	125	-	-	-	1,163
	Total AuEq Production	K Ozs AuEq	-	54	83	57	84	102	84	68	53	4	5	0	594

22.1.4 Other Economic Assumptions

MDA used multiple discount rates for calculating Net Present Value ("NPV"), including 5%, 8%, and 10%. The economic model was completed in Excel (version 14.0.7145.5000) using basic Excel functions and formulas to calculate the NPV and Internal Rate of Return ("IRR"). Sensitivity tables were developed using Excel data table analysis.

22.2 Preliminary Feasibility Cash Flow

The PFS cash flow is presented in Table 22.4 and is based on the economic parameters and assumptions previously discussed. The after-tax NPV at 5% discount rate is $120,384,000, with an after-tax IRR of 43%.

Table 22.4 Hasbrouck Project Cash Flow

Revenues	Units	Pre-Prod	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10	Yr 11	Total
Payable Metal - Au	K Ozs Au	-	54	83	55	81	98	81	65	51	4	5	0	577
Payable Metal - Ag	K Ozs Ag	-	-	0	154	214	233	242	190	124	-	-	-	1,157
Gold Revenue	K USD	$ -	$ 69,068	$106,230	$ 70,171	$102,966	$125,055	$102,925	$ 82,653	$ 65,022	$ 4,551	$ 6,400	$ 337	$735,377
Silver Revenue	K USD	$ -	$ -	$ 2	$ 2,808	$ 3,900	$ 4,237	$ 4,405	$ 3,460	$ 2,258	$ -	$ -	$ -	$ 21,070
Gross Revenue	K USD	$ -	$ 69,068	$106,232	$ 72,979	$106,866	$129,292	$107,329	$ 86,113	$ 67,280	$ 4,551	$ 6,400	$ 337	$756,447
Off-Site Costs														
Transp. & Refining - Au	K USD	$ -	$ 60	$ 92	$ 61	$ 89	$ 108	$ 89	$ 71	$ 56	$ 4	$ 6	$ 0	$ 635
Transp. & Refining - Ag	K USD	$ -	$ -	$ 0	$ 93	$ 129	$ 140	$ 146	$ 115	$ 75	$ -	$ -	$ -	$ 698
Total Off-Site Costs	K USD	$ -	$ 60	$ 92	$ 154	$ 218	$ 248	$ 235	$ 186	$ 131	$ 4	$ 6	$ 0	$ 1,333
Royalties	K USD	$ -	$ 2,760	$ 4,246	$ 2,913	$ 4,266	$ 5,162	$ 4,284	$ 3,437	$ 2,686	$ 182	$ 256	$ 13	$ 30,205
Net Revenue														
Net Revenue	K USD	$ -	$ 66,248	$101,894	$ 69,913	$102,382	$123,882	$102,811	$ 82,490	$ 64,463	$ 4,365	$ 6,139	$ 323	$724,910
Operating Costs														
Three Hills Mining Cost	K USD	$ -	$ 18,263	$ 12,407	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 30,670
Process Cost	K USD	$ -	$ 12,470	$ 10,059	$ 2,045	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 24,575
Hasbrouck Mining Cost	K USD	$ -	$ -	$ 5,898	$ 25,530	$ 19,369	$ 19,331	$ 24,427	$ 26,200	$ 10,186	$ -	$ -	$ -	$130,943
Process Cost	K USD	$ -	$ -	$ -	$ 5,313	$ 22,132	$ 24,111	$ 24,111	$ 24,111	$ 24,177	$ 15,021	$ 986	$ -	$139,963
Re-handle	K USD	$ -	$ -	$ 52	$ 357	$ 457	$ 459	$ 417	$ 398	$ 199	$ -	$ -	$ -	$ 2,340
Total Mining Cost	K USD	$ -	$ 18,263	$ 18,305	$ 25,530	$ 19,369	$ 19,331	$ 24,427	$ 26,200	$ 10,186	$ -	$ -	$ -	$161,613
Process Cost	K USD	$ -	$ 12,470	$ 10,059	$ 7,359	$ 22,132	$ 24,111	$ 24,111	$ 24,111	$ 24,177	$ 15,021	$ 986	$ -	$164,538
Re-handle	K USD	$ -	$ -	$ 52	$ 357	$ 457	$ 459	$ 417	$ 398	$ 199	$ -	$ -	$ -	$ 2,340
G&A Cost	K USD	$ -	$ 2,344	$ 2,395	$ 2,418	$ 2,400	$ 2,400	$ 2,349	$ 2,331	$ 1,918	$ 991	$ 922	$ 154	$ 20,621
Reclamation - Three Hills	K USD	$ -	$ -	$ -	$ -	$ 1,282	$ 1,709	$ 427	$ -	$ -	$ -	$ -	$ -	$ 3,419
Reclamation - Hasbrouck	K USD	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 4,337	$ 1,183	$ 5,519
Net / Gross Proceeds	%	0%	50%	70%	49%	55%	61%	50%	36%	43%	0%	69%	52%	51%
Nevada Net Proceeds Tax	K USD	$ -	$ 1,659	$ 3,554	$ 1,712	$ 2,837	$ 3,794	$ 2,554	$ 1,472	$ 1,399	$ -	$ 212	$ 8	$ 19,201
Net Operating Cost	K USD	$ -	$ 34,736	$ 34,365	$ 37,377	$ 48,477	$ 51,804	$ 54,286	$ 54,514	$ 37,879	$ 16,012	$ 6,456	$ 1,345	$377,251
Net Operating Cash Flow	K USD	$ -	$ 31,513	$ 67,529	$ 32,536	$ 53,905	$ 72,078	$ 48,525	$ 27,976	$ 26,584	$ (11,647)	$ (317)	$ (1,022)	$347,659
Capital Costs														
Mine Pre-Stripping	K USD	$ 5,813	$ -	$ 190	$ -	$ -	$ -	$ -	$ -	$ 127	$ -	$ -	$ -	$ 6,130
Mining Capital	K USD	$ 184	$ -	$ 77	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 261
Three Hills Process Capital	K USD	$ 15,690	$ 217	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 15,907
Hasbrouck Process Capital	K USD	$ -	$ 3,091	$ 45,052	$ -	$ 9,348	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 57,491
Other Capital	K USD	$ 14,544	$ 9,852	$ 18,673	$ (2,269)	$ 967	$ 336	$ -	$ -	$ -	$ -	$ -	$ -	$ 42,102
Sub-Total	K USD	$ 36,230	$ 13,161	$ 63,991	$ (2,269)	$ 10,314	$ 336	$ -	$ -	$ 127	$ -	$ -	$ -	$121,891
Working Capital	K USD	$ 4,864	$ (4,864)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 0
Contingency	K USD	$ 5,647	$ 906	$ 12,497	$ (340)	$ 2,342	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ 21,103
Salvage	K USD	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Capital	K USD	$ 46,742	$ 9,203	$ 76,489	$ (2,610)	$ 12,656	$ 386	$ -	$ -	$ 127	$ -	$ -	$ -	$142,993
Pre-Tax Cash Flow	K USD	$(46,742)	$ 22,309	$ (8,960)	$ 35,145	$ 41,249	$ 71,692	$ 48,525	$ 27,976	$ 26,457	$ (11,647)	$ (317)	$ (1,022)	$204,666
Cumulative Pre-Tax Cash Flow	K USD	$(46,742)	$(24,432)	$(33,392)	$ 1,754	$ 43,002	$114,694	$163,219	$191,195	$217,652	$206,005	$205,688	$204,666	
Payback	Years	1.0	1.0	1.0	1.0	-	-	-	-	-	-	-	-	
Depreciation and Depletion (D&D)														
Recoverable Equiv. Au (Start of Yr)	Ozs AuEq	594	594	540	456	399	315	214	129	62	9	5	0	
Produced Equivalent Au Ozs	Ozs AuEq	-	54	83	57	84	102	84	68	53	4	5	0	
Depreciation Factor (LOM)	%	0.0%	9.1%	14.0%	9.6%	14.1%	17.1%	14.2%	11.4%	8.9%	0.6%	0.8%	0.0%	
Depreciation Factor (Yr 2 Capex)	%			15.5%	10.6%	15.5%	18.8%	15.6%	12.5%	9.8%	0.7%	0.9%	0.0%	
Global Depreciation Factor	%	0.0%	4.6%	14.7%	10.1%	14.8%	18.0%	14.9%	12.0%	9.3%	0.6%	0.9%	0.0%	
Depreciation of Original Capex	K USD	$ -	$ 5,108	$ 7,856	$ 5,398	$ 7,904	$ 9,562	$ 7,938	$ 6,369	$ 4,976	$ 337	$ 473	$ 25	$ 55,945
Depreciation of Capex (Hasbrouck)	K USD		$ -	$ 13,451	$ 9,242	$ 13,534	$ 16,374	$ 13,593	$ 10,906	$ 8,520	$ 576	$ 810	$ 43	$ 87,049
Total Depreciation	K USD	$ -	$ 5,108	$ 21,307	$ 14,640	$ 21,437	$ 25,936	$ 21,531	$ 17,275	$ 13,496	$ 913	$ 1,284	$ 68	$142,993
Taxable Income after Depreciation	K USD	$ -	$ 17,202	$ -	$ 20,506	$ 19,811	$ 45,756	$ 26,994	$ 10,701	$ 12,961	$ -	$ -	$ -	$153,932
Depletion Limit	K USD	$ -	$ 8,601	$ -	$ 10,253	$ 9,906	$ 22,878	$ 13,497	$ 5,351	$ 6,480	$ -	$ -	$ -	$ 76,966
% Reserve Depletion	K USD	$ -	$ 10,360	$ 15,935	$ 10,947	$ 16,030	$ 19,394	$ 16,099	$ 12,917	$ 10,092	$ 683	$ 960	$ 51	$113,467
Cost Depletion	K USD	$ -	$ 924	$ 2,986	$ 2,052	$ 3,005	$ 3,635	$ 3,018	$ 2,421	$ 1,892	$ 128	$ 180	$ 9	$ 20,251
Smaller of Limit vs % Depletion	K USD	$ -	$ 8,601	$ -	$ 10,253	$ 9,906	$ 19,394	$ 13,497	$ 5,351	$ 6,480	$ -	$ -	$ -	$ 73,482
Net Reserve Depletion	K USD	$ -	$ 8,601	$ 2,986	$ 10,253	$ 9,906	$ 19,394	$ 13,497	$ 5,351	$ 6,480	$ 128	$ 180	$ 9	$ 76,785
Taxable Income after D&D	K USD	$ -	$ 8,601	$ -	$ 10,253	$ 9,906	$ 26,362	$ 13,497	$ 5,351	$ 6,480	$ -	$ -	$ -	$ 80,450
Taxes														
'Normal' Federal Corporate Tax	K USD	$ -	$ 3,010	$ -	$ 3,588	$ 3,467	$ 9,227	$ 4,724	$ 1,873	$ 2,268	$ -	$ -	$ -	$ 28,157
AMT Depreciation (10-year)	K USD	$ -	$ 4,674	$ 4,674	$ 4,674	$ 4,674	$ 4,674	$ 4,674	$ 4,674	$ 4,674	$ 4,674	$ 4,674	$ 4,674	$ 51,416
AMT Taxable Income	K USD	$ -	$ 9,034	$ 16,633	$ 20,219	$ 26,669	$ 47,624	$ 30,354	$ 17,951	$ 15,303	$ -	$ -	$ -	$183,786
Alternate Minimum Tax (AMT)	K USD	$ -	$ 1,807	$ 3,327	$ 4,044	$ 5,334	$ 9,525	$ 6,071	$ 3,590	$ 3,061	$ -	$ -	$ -	$ 36,757
US Federal Corporate Tax	K USD	$ -	$ 3,010	$ 3,327	$ 4,044	$ 5,334	$ 9,525	$ 6,071	$ 3,590	$ 3,061	$ -	$ -	$ -	$ 37,961
Capital Pool as a Tax Credit	K USD		$ 0	$ 3,327	$ 1,414	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 4,741
Net Taxes Paid	K USD	$ -	$ 3,010	$ -	$ 2,630	$ 5,334	$ 9,525	$ 6,071	$ 3,590	$ 3,061	$ -	$ -	$ -	$ 33,220
After-Tax Cash Flow	K USD	$(46,742)	$ 19,299	$ (8,960)	$ 32,516	$ 35,915	$ 62,167	$ 42,454	$ 24,386	$ 23,397	$ (11,647)	$ (317)	$ (1,022)	$171,446
Cumulative After-Tax Cash Flow	K USD	$(46,742)	$(27,442)	$(36,402)	$ (3,886)	$ 32,029	$ 94,196	$136,650	$161,036	$184,433	$172,785	$172,468	$171,446	
Payback	Years	1.0	1.0	1.0	1.0	0.1	-	-	-	-	-	-	-	
Pre-Tax Payback Period	Years	2.95	***(From start of production)***											
After-Tax Payback Period	Years	3.11	***(From start of production)***											
Pre-Tax Net Present Value	5%	$145,282												
	8%	$118,546												
	10%	$103,544												
Pre-Tax Internal Rate of Return	IRR	49%												
After-Tax Net Present Value	5%	$120,384												
	8%	$ 97,387												
	10%	$ 84,484												
After-Tax Internal Rate of Return	IRR	43.2%												

22.3 Comparison of 2016 PFS to 2015 PFS

Table 22.5 shows a comparison between the 2015 PFS and the current, 2016 PFS, and the factors that impacted the NPV (5%), IRR, initial capital, and LOM cash flows. The NPV in this study has increased by $45 million, primarily due to higher metal prices used in the study and assumptions for drain-down recovery of gold. The next largest differences are the reduction of mining costs due to lower fuel prices and savings on water costs due to sourcing water from water wells instead of from the town of Tonopah.

Table 22.5 Economic Comparisons – 2015 PFS vs 2016 PFS

Item	NPV (5%) (US $M)	IRR (%)	Initial Capital (US $M)	LOM Cash Flow (US $M)	Payback (years)
2015 Prefeasibility Study	**$75**	**25.6%**	**$54**	**$117**	**3.7**
Impact on After Tax					
Changes Made in 2016 PFS					
Diesel Cost Reduced	$7	2.3%	$0	$10	
Pre-Production Mining Cost Increased	$1	-0.6%	$5	$1	
Gold Plant Deferred (2 Years)	$1	2.3%	-$6	$0	
Refurbished Crushing & Conveying Plant	$3	1.6%	$0	$4	
Water Sourced from Wells	$7	7.1%	-$1	$3	
Gold Recovered During Drain Down Recognized	$10	1.7%	$0	$15	
Reclamation Bond Amounts Recalculated	$0	0.3%	-$2	$0	
Metal Price Increased ($1,275/$18.21 vs $1,225/$17.50)	$19	5.2%	$0	$24	
Other *	-$3	-2.4%	-$4	-$2	
Summed Changes Made in 2016 PFS	**$45**	**17.6%**	**-$8**	**$55**	
2016 Prefeasibility Study	**$120**	**43.2%**	**$47**	**$171**	**3.1**

** Other is due to consequential impacts on working capital, contingencies, and indirects due to changes above.*

22.4 Cash-Flow Sensitivity

Pre-tax and after-tax cash-flow ("CF") sensitivities to revenue were evaluated by varying the gold price from $1,000 to $1,500 per ounce in $50.00 increments, with one additional price of $1,275 per ounce (used as the final gold price in this study). The silver price was also modified in these sensitivities based on a constant gold to silver price ratio of $1,275:$18.21 (70:1 gold to silver price ratio). After-tax metal price sensitivities are shown in Table 22.6.

Operating and capital cost sensitivities were evaluated from +/- 30% of the values in 10% increments. Results from changes to operating costs are shown in Table 22.7 and results from changes to capital costs are shown in Table 22.8.

Sensitivities to changes in revenues, operating costs, and capital costs are shown as both pre-tax and after-tax in Figure 22.1and Figure 22.2, respectively.

Table 22.6 Metal Price Sensitivity

	After Tax Sensitivity - Metal Price (K USD)					
Au Price	**Undisc. CF**	**NPV 5%**	**NPV 8%**	**NPV 10%**	**IRR**	**Ag Price**
$ 1,000	$ 36,130	$ 16,779	$ 8,124	$ 3,313	12%	$ 14.29
$ 1,050	$ 61,589	$ 36,237	$ 24,870	$ 18,530	18%	$ 15.00
$ 1,100	$ 86,063	$ 54,971	$ 41,009	$ 33,204	24%	$ 15.71
$ 1,150	$ 110,847	$ 73,937	$ 57,345	$ 48,057	30%	$ 16.43
$ 1,200	$ 135,024	$ 92,477	$ 73,332	$ 62,603	35%	$ 17.14
$ 1,225	$ 147,164	$ 101,779	$ 81,350	$ 69,896	38%	$ 17.50
$ 1,250	$ 159,305	$ 111,082	$ 89,369	$ 77,190	41%	$ 17.86
$ 1,275	**$ 171,446**	**$ 120,384**	**$ 97,387**	**$ 84,484**	**43%**	**$ 18.21**
$ 1,300	$ 183,587	$ 129,687	$ 105,406	$ 91,778	46%	$ 18.57
$ 1,350	$ 207,174	$ 147,764	$ 120,992	$ 105,958	51%	$ 19.29
$ 1,400	$ 230,210	$ 165,393	$ 136,179	$ 119,768	56%	$ 20.00
$ 1,500	$ 275,060	$ 199,698	$ 165,723	$ 146,628	65%	$ 21.43

Table 22.7 Operating Cost Sensitivities

	After Tax Sensitivity - Operating Cost (K USD)				
% of Base	**Undisc. CF**	**NPV 5%**	**NPV 8%**	**NPV 10%**	**IRR**
70%	$ 264,363	$ 189,767	$ 156,379	$ 137,691	60%
80%	$ 235,331	$ 168,060	$ 137,908	$ 121,023	55%
90%	$ 204,464	$ 145,089	$ 118,416	$ 103,465	49%
100%	**$ 171,446**	**$ 120,384**	**$ 97,387**	**$ 84,484**	**43%**
110%	$ 137,691	$ 95,112	$ 75,870	$ 65,059	37%
120%	$ 103,575	$ 69,573	$ 54,128	$ 45,434	30%
130%	$ 68,990	$ 43,706	$ 32,120	$ 25,577	22%

Table 22.8 Capital Cost Sensitivities

	After Tax Sensitivity - Capital Cost (K USD)				
% of Base	**Undisc. CF**	**NPV 5%**	**NPV 8%**	**NPV 10%**	**IRR**
70%	211,719	156,414	131,212	116,960	75%
80%	198,992	144,945	120,406	106,563	62%
90%	185,519	132,900	109,102	95,711	52%
100%	**171,446**	**120,384**	**97,387**	**84,484**	**43%**
110%	156,851	107,479	85,344	72,962	36%
120%	142,256	94,574	73,301	61,441	30%
130%	127,569	81,599	61,199	49,867	25%

Figure 22.1 Pre-Tax Project Sensitivities

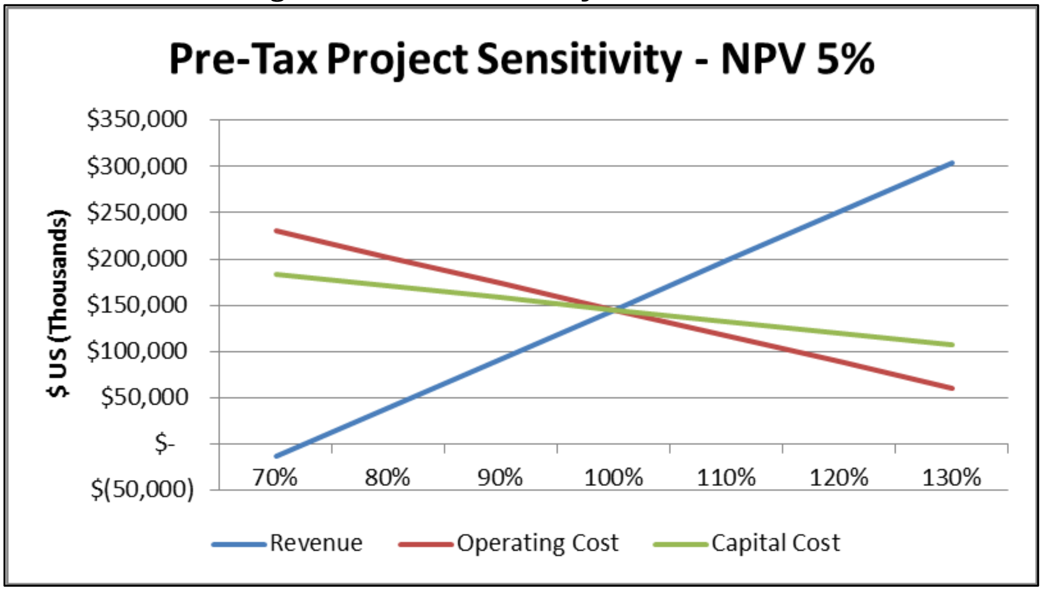
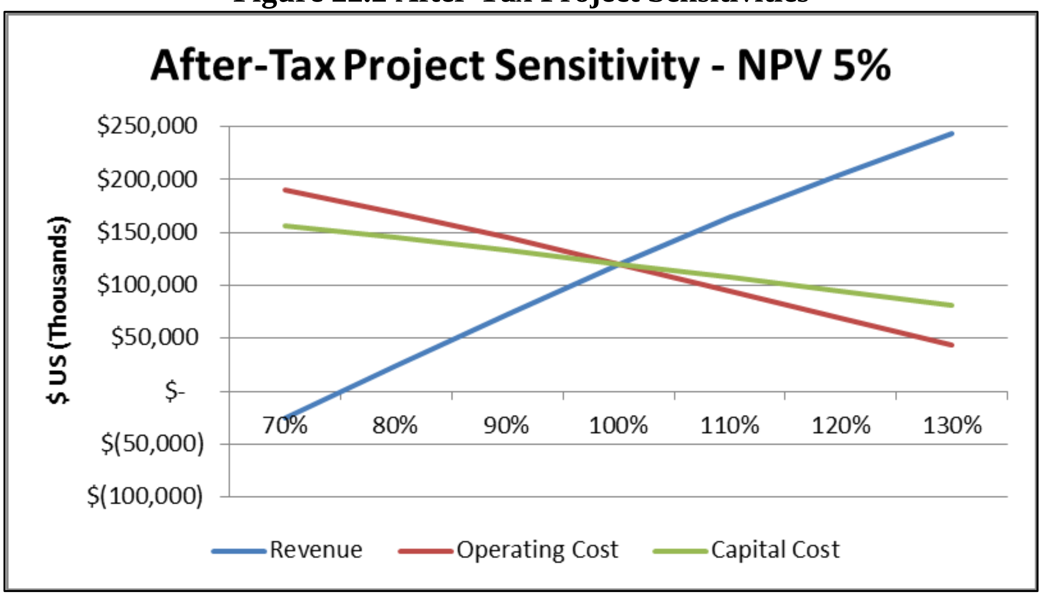


Figure 22.2 After-Tax Project Sensitivities



23.0 ADJACENT PROPERTIES

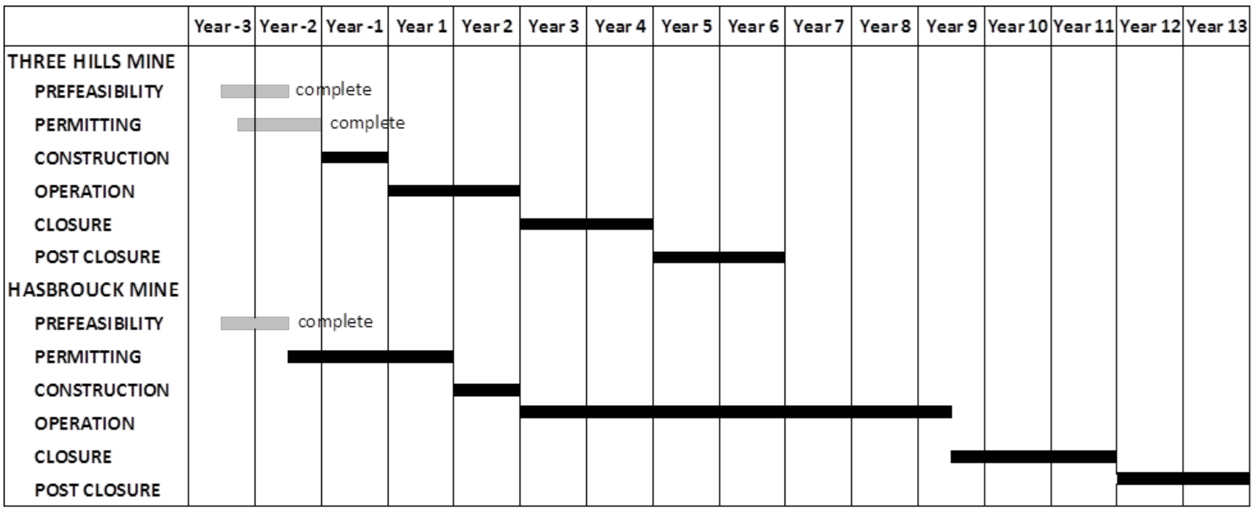
WKM's Hasbrouck Mine property is adjacent to third-party patented and unpatented mining claims in the Divide Mining District owned by the Tonopah Divide Mining Company. The most recent mining in the district took place in the early 1980's from the Falcon pit, on the northeast slope of Gold Mountain, approximately 1.3mi east of Hasbrouck Mountain. The pit was developed by Falcon Exploration on the northwest trending Tonopah Divide lode, from which underground mining prior to the 1940's produced mainly silver. In 1982 and 1983 material from the Falcon pit was trucked by Falcon Exploration to a cyanide heap-leach and recovery site in the valley 5mi southwest of Hasbrouck Peak. Falcon Exploration produced an estimated total of 400,000 oz of silver and 3,000 oz of gold (Bonham et al., 1987). No information is available to MDA on the gold and silver grades, or the quantities of metals recovered from the Falcon operation.

24.0 OTHER RELEVANT DATA AND INFORMATION

24.1 Project Execution

A project execution plan has been developed for the Hasbrouck project. This includes tasks for completing this pre-feasibility study, permitting, and a feasibility study prior to construction. The project execution plan is shown in Table 24.1.

Table 24.1 Pre-Feasibility Schedule for the Three Hills and Hasbrouck Mines



24.2 Three Hills Construction Schedule

NewFields and MDA produced a detailed construction schedule for the Three Hills Mine using inputs from WKM and other consultants. WKM requested this schedule to ensure that the various construction tasks and their interactions were understood, and the timing of the startup of operations was achievable.

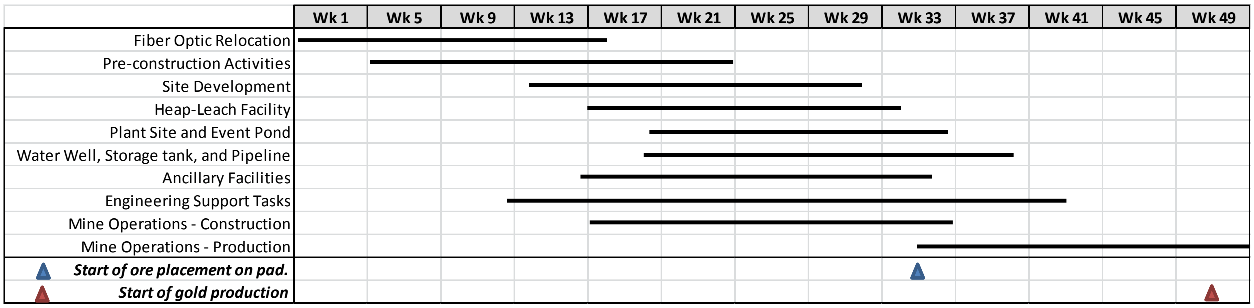
NewFields provided the main schedule of activities, which defined when certain material would be required for use as overliner, road wearing coarse and general fill materials. MDA used this information to adjust the mine designs and production schedule to ensure that the material was available for construction.

Figure 24.1 shows an approximation of the schedule graphically. Key scheduled tasks are:

- Fiber optic relocation;
- Pre-construction activities;
- Site development;
- Heap-leach facility construction;
- Plant site and event pond construction;
- Water well, storage tank, and pipeline installation;

- Ancillary facilities construction;
- Engineering support tasks; and
- Mine operations.

Figure 24.1 Three Hills Production Schedule



Realignment of the fiber optic cable is a critical-path item for the project; the work involved moving it will be done by AT&T. As such, this item has been given a heading of its own. The task has been assigned an 88-day duration. Realignment is to be completed before mining encroaches too closely to the existing fiber optic cable, which runs through the Three Hills project area (see Figure 18.1). For mining purposes, the initial pit used to obtain construction material has been designed so that the crest is offset by a minimum of 300ft from the existing fiber optic cable. This initial crest is approximately 100ft higher than the fiber optic cable, and the lowest bench is about 30ft above the cable providing a buffer against direct shock waves to the cable from blasting operations.

Pre-construction activities will commence upon WKM Board of Directors approval. These activities will include tasks such as establishing an office, generating contract documents, receiving bids for various activities, contract negotiations, and the mobilization of contractors.

Site development requires removal of vegetation and stockpiling of top soil removed from within the footprints of the various facilities. Mobilization and setup of a portable crushing and screening plant for the manufacturing of overliner and road wearing coarse materials will also occur under this task.

Heap-leach facility construction will involve regrading and fill placement, construction of a diversion channel, and installation of geomembrane, pipework, and overliner materials. Near completion of the leach pad, a request will be made to allow placement of ore onto the facility to enable quicker production of gold once the plant area is complete.

Plant site construction will include site grading and civil/concrete construction along with construction of carbon columns and associated utilities. This task includes procurement and setup of the LNG generator and installation of the barren and pregnant solution tanks within the event pond.

A well will be drilled and developed for the Three Hills Mine water supply and a pipeline installed to convey the water to a storage tank that will be erected on site concurrent with drilling the well.

Ancillary facilities include the construction and installation of the security office and associated infrastructure, project fencing, power to the well, lime silo, and the petroleum-contaminated soil containment area.

Engineering tasks will occur during construction to support the construction management and project execution. These tasks will include quality control testing and inspections, survey and preparation of the as-built documentation for the facilities.

Mine operations will start with mining waste rock required for construction of facilities. NewFields provided waste rock requirements, and MDA created a monthly schedule to meet the construction needs. The resulting monthly mining schedule is shown in Table 24.2.

Table 24.2 Monthly Three Hills Construction Mining Schedule

Construction Mining	Units	Total	Mth_-10	Mth_-9	Mth_-8	Mth_-7	Mth_-6	Mth_-5	Mth_-4	Mth_-3	Mth_-2	Mth_-1
Overliner - Brougher Rhyolite	K Tons	334	-	113	109	113						
Road Coarse - Brougher Rhyolite	K Tons	34		11	11	11						
Fill - Pond/Plant	K Tons	185					65	120				
Fill - HLF	K Tons	59					59					
Fill - Roads	K Tons	90							90			
Total	K Tons	702	-	124	120	124	124	120	90	-	-	-
Overliner - Brougher Rhyolite	K Cu Yrds (Placed)*	235		79	77	79						
Road Coarse - Brougher Rhyolite	K Cu Yrds (Placed)*	24		8	8	8						
Fill - Pond/Plant	K Cu Yrds (Placed)*	134					46	88				
Fill - HLF	K Cu Yrds (Placed)*	42					42					
Fill - Roads	K Cu Yrds (Placed)*	69							69			
Total	K Cu Yrds (Placed)*	504	-	87	84	87	88	88	69	-	-	-
Remaining to Dump	K Tons	47,231	-	-	-	-	-	-	-	-	220	44
Remaining to Dump	K Cu Yrds (Placed)**	35,280	-	-	-	-	-	-	-	-	168	34

**** Construction material placed assumed a 1.3 swell to represent placement and compaction***

***** Tonnage to dumps use a 1.4 swell reflecting loose material placed at the dump compcated by haul trucks***

24.3 Other Relevant Information

There is no other relevant information known to the authors that is not included in this report.

25.0 INTERPRETATION AND CONCLUSIONS

MDA considers the Hasbrouck project to be a project of merit and economically viable. The Three Hills and Hasbrouck gold-silver deposits consist of near-surface, epithermal mineralization of the low-sulfidation type hosted within Miocene-age volcaniclastic and tuffaceous rocks of the Siebert Formation, and the underlying, uppermost part of the Fraction Tuff. At the Three Hills deposit, the higher gold grades are associated with discontinuous, irregular veinlets, vein stockworks, and erratic breccia veins of chalcedony and quartz within a broad zone of pervasive silicification. At the Hasbrouck deposit, the highest gold grades are associated with narrow, generally near-vertical, discontinuous silica-pyrite veinlets, sheeted veinlets and stockworks, all closely associated with multiple, larger and coalesced, but erratic bodies of hydrothermal breccias. Stratigraphic control, whereby the porous volcaniclastic units are preferentially mineralized, is prevalent, but is especially evident in many of the moderate-grade zones along the peripheries of the deposit. The mineralization at the Hasbrouck deposit is accompanied by strong pervasive silicification, with associated adularia and pyrite. Subsequent to mineralization, oxidation has largely to completely destroyed the pyrite and other sulfide minerals at Hasbrouck and Three Hills, respectively.

The core of the Three Hills and Hasbrouck deposits are relatively well-defined and infill drilling is not expected to materially change the current resource model and estimate other than to increase the confidence level of the resource.

25.1 Data and Mineral Resources

The current mineral resources for the Three Hills deposit are based on a database consisting of 291 drill holes totaling 88,199ft of drilling. Some form of rotary percussion drilling was used for 273 of the drill holes, accounting for a large majority (82,787ft) of the drilling. Eighteen diamond core holes for 5,412ft are included in the Three Hills drilling database.

For the Hasbrouck deposit, the current mineral resources are estimated from a drilling database containing 317 drill holes, totaling 216,761ft. The large majority of the drilling has been by reverse circulation (252 holes for 179,174ft), along with 43 diamond core holes for 26,807ft and 22 air-track holes for 8,980ft.

MDA has evaluated and performed verification of the Three Hills and Hasbrouck databases, and considers the assay data to be adequate for the estimation of the current mineral resources.

25.2 Hasbrouck Mine Estimated Mineral Resources

The current Hasbrouck Mine block model estimate, fully diluted to 20ft by 20ft by 20ft blocks, is inclusive of reserves and includes the following Measured, Indicated, and Inferred Resources, at a cutoff grade of 0.006 gold equivalent ounces per ton, as shown in Table 25.1.

Table 25.1 Hasbrouck Mine Reported Mineral Resources (0.006oz AuEq/ton cutoff grade)

Class	Tons	oz Au/ton	oz Au	oz Ag/ton	oz Ag
Measured	8,261,000	0.017	143,000	0.357	2,949,000
Indicated	45,924,000	0.013	595,000	0.243	11,147,000
M+I	54,185,000	0.014	738,000	0.260	14,096,000
Inferred	11,772,000	0.009	104,000	0.191	2,249,000

Note: rounding may cause apparent inconsistencies

The AuEq cutoff grade was calculated using the individual gold and silver grades of each block, along with a gold price of $1,300.00 per ounce gold and a silver price of $22 per ounce silver.

The Hasbrouck Mine resource consists of a single, irregularly shaped deposit that extends for more than 2,800ft in an east-west direction and about 2,400ft north-south. The core of the deposit is relatively well-defined and infill drilling is not expected to materially change the current resource model and estimate. However, additional drilling along the periphery of the deposit has the potential to extend the resource to the east and west.

25.3 Three Hills Mine Estimated Mineral Resources

The current Three Hills Mine block model estimate, fully diluted to 20ft by 20ft by 20ft blocks, is inclusive of reserves and includes the following Indicated and Inferred Resources, at a cutoff grade of 0.005 gold equivalent ounces per ton, as shown in Table 25.2:

Table 25.2 Three Hills Mine Reported Mineral Resources (0.005oz Au/ton Cutoff)

Class	Tons	oz Au/ton	oz Au
Indicated	10,897,000	0.017	189,000
Inferred	2,568,000	0.013	32,000

Note: rounding may cause apparent inconsistencies

The cutoff grade of 0.005 oz Au/ton was chosen to capture mineralization potentially available to open-pit extraction and heap-leach processing. There are no resources classified as Measured due to the general lack of QA/QC data that could be used for verification purposes and to some uncertainties related to historical drill hole locations. Indicated Resources are limited to the north-south core of the deposit; Inferred Resources comprise the mineralization at depth along the east side of the deposit and the scattered mineralization to the northwest. There are no silver resources estimated at Three Hills.

At a cutoff grade of 0.005 oz Au/ton, Three Hills mineralization consists of a single, irregularly shaped deposit that extends for more than 2,700ft north-south and 1,000ft east-west. The deposit remains open at depth to the east and southeast, along the Siebert-Fraction contact.

25.4 Mineral Reserves

Metallurgical testing demonstrates that mineralized material at Three Hills is amenable to cyanidation for gold extraction. An average operational gold recovery of 79.0% is expected. Silver contents are low and have not been modelled; silver recovery for Three Hills has not been estimated.

Gold recovery at the Hasbrouck deposit varies with the stratigraphic position of the host rock. The average operational gold recovery from mineralization within the upper Siebert is expected to be 55.6%. A higher average gold recovery of 76.6% is expected for mineralization hosted by the lower Siebert. Silver recoveries from the upper and lower Siebert are expected to be the same, with an average of 11% recovery expected from both stratigraphic units.

Table 25.3 Three Hills and Hasbrouck Combined Proven and Probable Reserves

	K Tons	oz Au/ton	K Ozs Au	oz Ag/ton	K Ozs Ag
Proven	6,242	0.020	127	0.410	2,562
Probable	39,028	0.016	635	0.205	8,007
Proven & Probable	45,270	0.017	762	0.233	10,569

Three Hills cutoff used: 0.005 oz Au/ton
Three Hills cutoff used: Upper Seibert 0.008 oz Au/ton; Lower Seibert 0.007 oz Au/ton

MDA concludes that mineralization in the Three Hills and Hasbrouck deposits is amenable to extraction by open-pit mining. MDA has used Measured and Indicated resources to define mineral reserves for both the Three Hills and Hasbrouck mines, which together compose the Hasbrouck project (Table 25.3). Reserve definition was done by first identifying ultimate pit limits using economic parameters and pit optimization techniques. Pit designs were then created based on the pit optimizations, from which production schedules and cash-flow analysis were produced. These form the basis of the reserves statement and details of the calculation methods are presented in Section 15.2.

Because Three Hills ore will be processed using ROM leaching, there will be no crushing and stacking costs at Three Hills. Gold and silver recoveries were applied based on estimates provided by Herbert Osborne of H.C. Osborne and Associates, the Qualified Person responsible for Section 13.0. Table 15.2 shows the recoveries used for each deposit.

There are no stated silver resources for the Three Hills Mine; therefore silver was not used to generate value in Three Hills. However, for Hasbrouck the value from silver was calculated with constant silver to gold ratio based on $1,275/oz Au to $18.21/oz Ag prices.

Based on optimized pits, MDA developed phased pit designs to define the production schedules for both Three Hills and Hasbrouck, which were then used for cash-flow analysis for the pre-feasibility study. All Inferred material was considered to be waste. The final metal prices used for the Hasbrouck project cash flow was $1,275 per ounce Au and $18.21 per ounce Ag. MDA believes the final cash-flow model demonstrates that the deposits will have a positive cash flow and are reasonable with respect to statement of reserves for the Hasbrouck project.

25.5 Processing and Recovery Methods

The Hasbrouck project includes two separate facilities to be located 5 miles apart. The Three Hills Mine will be constructed and operated first, and will be a 15,000 ton per day, ROM operation, utilizing conventional, cyanide heap-leaching of ore stacked on a single-use pad. Gold will be leached with dilute cyanide solution and recovered from the solution using a carbon adsorption circuit. Loaded carbon will be processed by toll stripping or carbon ashing, if required, to produce doré bars.

The Hasbrouck Mine will be constructed after production commences at the Three Hills Mine and will be a 17,500 ton per day heap-leach operation utilizing conventional heap leaching of crushed ore stacked on a single use pad. Crushing will be performed in three stages: mined material will pass first through a primary jaw crusher, then two secondary cone crushers, and then through a HPGR unit. Agglomeration with cement will be required prior to stacking of ore on the heap. Gold and silver will be leached with a dilute cyanide solution and recovered using a carbon adsorption-desorption-recovery process to produce doré bars.

25.6 Capital and Operating Costs

Detailed capital and operating costs have been estimated based on vendor and contractor quotations for all significant cost items and MDA consider them appropriate for a pre-feasibility study. Total estimated capital costs are $143 million. Adjusted operating costs are estimated to be $8.43 per ton of ore or $661 per recovered ounce of gold (based on World Gold Council Non-GAPP Metrics). All-in sustaining cost is estimated to be $709 and all-in cost is $925 per recovered ounce of gold (based on World Gold Council Non-GAPP Metrics).

25.7 Economic Analysis and Sensitivity

The economic analysis is based on 100% of the project. WKM has a 75% interest in the project and has the right to make an offer on the remaining 25%. The economic analysis shows that the Hasbrouck project provides a 43% internal rate of return with a $120 million dollar net present value (5% discount rate). After completion of construction, the mine life is estimated to be 1.9 years for Three Hills and 6.1 years for Hasbrouck, for a total project mine life of 8.0 years, not including for construction or closure. The payback period is 3.1 years (not including the construction period).

25.8 Risks and Opportunities

MDA has identified a number of risks and opportunities that may affect the economics of the Hasbrouck project.

25.8.1 External Risks

- The project's economic viability is generally at risk from changes in external factors which would lead to increases in input costs (construction costs, operating costs), or a fall in the price of gold or silver which would reduce revenue.
- A decrease in gold or silver price would not only reduce revenue, but would also reduce the amount of economically minable ore as a decrease in metal prices would result in a higher cut-off grade Under the current gold price environment, the reserves are considered robust. Sensitivity to gold prices is given in Table 22.6.
- While no environmental and permitting risks are currently identified, and permits are in-hand for the Three Hills Mine, this is an area where risk to cost and schedule generally exist. Typical environmental and permitting risks include items being discovered on the project site such as sensitive or endangered botany, or cultural artifacts, which would have the effect of extending schedules, increasing permitting costs, and potentially making permitting impossible at the Hasbrouck Mine.

25.8.2 Internal, Project-Specific Risks

Internal risks specific to this project are identified here:

Decrease in Resources:

- Current drill spacing is adequate and there is a low risk of a decrease in resources due to additional drilling and subsequent re-modeling and re-estimations.

Construction Execution and Operational Risk

- The project economics may be at risk from internal factors such as poor construction or operational execution, with resultant cost and schedule over-runs, scope creep, and increased operating costs. This is mitigated by supplying management to oversee construction.

Metallurgical and Processing Efficiency Risks:

- Should the metallurgical efficiencies and reagent consumption rates assumed in this study not be generally achieved, the project would not achieve the economic performance predicted in this study.
- There is a risk that permeability in a full-scale heap leach at Three Hills Mine will be inadequate, based on testing done on a bulk sample by KCA in 2014. The particle size distribution of ROM ore will be coarser than that tested, and the risk of poor permeability at full-scale is deemed to be low. It is not possible to be certain about percolation through ROM ore as no compacted permeability test equipment exists capable of handling material of this particle size. The risk of low percolation rates can be mitigated by performing field permeability tests on ROM ore during the early phase of mining and making appropriate adjustments to methods of stacking and leaching. Thus, during initial leaching operations at Three Hills, percolation will be closely monitored to observe the

percolation rate, allowing early adjustments to be made as necessary. Early adjustments include installing intermediate drains in the heap at various elevations as the heap grows in height. While this would increase costs somewhat, it is a viable and proven technique which can be implemented simply and quickly should percolation decrease to unacceptable rates as stacking height increases.

- Predicted gold recovery from Three Hills ore is based on the results of a column-leach test on material that was somewhat finer than ROM ore is expected to be. The expected gold recovery predicted by the test could therefore be biased high. This risk is deemed to be low, given the flat Three Hills particle size/gold recovery curve.
- This study contemplates using certain pieces of mobile crushing and screening equipment at the Hasbrouck Mine that will tend to have a fall-off in availability and higher maintenance costs over time when compared to non-mobile equipment. Thus the availability factor in this study may have been overstated. This risk can be mitigated by increasing the robustness of foundations that mobile equipment will be mounted on to approximate those of non-mobile equipment.
- Increased gold recovery of 2.5% and 1.5% from drain down of heap-leach pads at the Three Hills and Hasbrouck mines, respectively, was included in this PFS. These values were derived from the gold recovery-time curves at each mine. Drain-down recovery is generally not included in economic studies, but additional recovery is realized in most leaching operations. There is a risk that the full drain-down recovery will not be realized in actual production.

Risk of Increased Operating Costs

- If the current off-site toll carbon processor cannot handle all the loaded carbon, then the operating costs will increase due to the higher cost of selling the loaded carbon to an ashing refiner.
- Fuel price used in this study for contract mining is $1.70 per gallon (note that fuel taxes are not applicable and have not been included) based on markets and quotations at the time of publication. If the cost of fuel rises, mining costs will be adversely affected.
- Geotechnical studies are preliminary at Hasbrouck Mine and additional drilling is recommended to raise the level of certainty for final pit slope angles. There is a risk that additional geotechnical studies might result in flatter pit slopes than used in this study, which would have an adverse impact on costs and reserves. This risk is considered minimal because a large portion of the mining is above the crest of the ultimate pit.
- Contract mining costs are based on first principle costs estimated by MDA and adjusted to include a contractor return on capital and profit. These costs have not been vetted by contractors. This risk needs to be mitigated by obtaining contractual costs through competitive bidding by qualified mining contractors.
- Finding and keeping the skilled employees required to operate the Hasbrouck project might prove challenging, given its rural location. Inadequate staffing would tend to increase operating costs by reducing operating efficiencies and increasing repair and maintenance costs. Recruiting costs might be higher than predicted.

25.8.3 Opportunities

The following opportunities have been identified.

Potential for Resource Expansion and Upgrade:

- Additional drilling along the periphery of the Hasbrouck and Three Hills deposits has the potential to extend the resources to the east and west at the Hasbrouck Mine, and to the east and southeast at the Three Hills Mine. Such expansion could improve the project economics by reducing waste, extending the LOM and increasing overall revenues.
- Additional drilling could also result in reclassification of resources from Inferred to Indicated, and from Indicated to Measured. Within the 2 pits there are 3.3 million tons of Inferred resources that are currently treated as waste. Any upgrade of Inferred material to Indicated or higher classification, could improve the project economics by increasing ore tonnage and reducing waste tonnage, extending the LOM and increasing overall revenues.

Potential Decrease in Mining Costs

- Engaging contractors more closely in the mine planning and design might result in identifying cost-reductions.
- Mining costs may be reduced by WKM deciding to operate the mine using their own equipment and employees, thus avoiding paying the contractor's profit. The increase in initial and sustaining capital for mining equipment might be mitigated by leasing equipment.
- Additional geotechnical studies might result in pit slopes being steepened, leading to a smaller amount of waste rock to be mined per ton of ore. Geotechnical information gained from mining operations at Three Hills may help geotechnical understanding of the Hasbrouck mine in common geotechnical domains, which may allow for further steepening of the Hasbrouck Mine pit slopes.

Potential to Increase Metallurgical Efficiency

- HPGR crushing and micro-fracturing performance might be understated in the laboratory due to the very short time that samples take to be crushed by the laboratory-scale HPGR, typically measured in seconds or, for larger samples, several minutes. Such short runs do not allow time to optimize HPGR settings. It is expected that under steady-state running at full-scale, fine tuning of crushing parameters, such as the amount of choke feeding, recirculation, roll rotation speed, and roll closing force, will result in greater efficiency in crushing and micro-fracturing which in turn will result in higher gold and silver recovery than indicated by laboratory scale tests.
- The HPGR model selected for this study was a first-pass choice. A larger machine would allow a greater amount of recirculation which would result in a finer product size and consequently a greater recovery of gold and silver.

- Bottle roll tests on HPGR crushed lower Siebert material may have understated gold recovery relative to gold recovery that could be expected from column leach tests, perhaps by an amount similar to the 6% increase demonstrated with upper Siebert ore. The 2% allowance made for this effect in this study might therefore be too low.
- Faster gold recovery from solution, and hence more efficient operation, might be achieved at the Hasbrouck Mine by increasing the number of carbon columns in the adsorption plant from 5 to 6.
- Additional metal recovery from both the Three Hills and Hasbrouck mines might occur beyond the leach cycle time assumed in this study.

Potential to Decrease Processing Construction Costs

- The overall design of the crushing and screening plant presented in this study is a first-pass design and was not reviewed by other equipment suppliers. The opportunity exists to optimize the crushing and screening plant general arrangement and individual components, with the help of other equipment suppliers' input. Areas that are especially targeted for review include the configuration of grizzlies at the primary crusher (both static and vibrating), and conveyor layouts to and from the secondary crushers.
- A pug mill was included in the Hasbrouck Mine process plant to address the concern that the HPGR might produce "cake" rather than granular particles, which might occur when there is sufficient clay-sized material and moisture in the HPGR feed. Caked material would tend to reduce agglomeration and access of solutions to the ore once place in the heap. Planning to pass all crushed ore through the pug mill, as has been assumed in this study, is conservative as in reality the pug mill will only be required under moist conditions when clay is present in the ore, which is a small percentage of the time; for the majority of the time ore can by-pass the pug mill, with mixing of cement and ore being achieved at the various conveyor transfer points. Reducing the operating time of the pug mill would reduce operating costs.
- The various construction and capital equipment costs used in this study are based on budget costs obtained from one source in each case. It is possible that lower costs might be achieved by competitive bidding.
- The earthworks component of civil construction might be performed in part, or all, by mining equipment. This could reduce construction costs as mining equipment tends to operate at lower unit costs than civil equipment. Additionally, using mining equipment might eliminate the need for mobilization and de-mobilization of construction equipment, which would offer further cost savings.

Potential to Decrease Processing Operating Costs

- Predicted consumption of cyanide at the Three Hills and Hasbrouck mines was based on data from column leach tests using 500 ppm NaCN concentrations. It is common in many heap leach operations to utilize a lower cyanide concentration than predicted by laboratory-scale testing. Typical field concentrations can be in the range of 125-250 ppm where the ore is relatively free of significant cyanide-consuming constituents. Actual consumption may be lower than has been assumed in this study; a lower cyanide concentration would lead to lower operating costs.

- It may be possible to reduce operating costs by optimizing crew rotations and hours.
- Mobile equipment has been included in the Hasbrouck crushing circuit design. A thorough review of the crushing system using stationary equipment could identify possible design changes that could result in lower operating costs.

26.0 RECOMMENDATIONS

MDA does not recommend any specific work or studies that would be required prior to construction of the Three Hills Mine. However, some additional studies may improve value, which include: additional drilling to convert Inferred material to a higher classification; detailed bids from mining contractors may reduce mining costs; additional geotechnical studies to steepen pit slopes; and compacted permeability tests during operations.

MDA makes the following recommendations for studies in advance of commencing construction and operation at the Hasbrouck Mine as shown in Table 26.1. The estimated costs of the recommendations total $750,000.

Table 26.1 Cost Estimate for Recommendations

Hasbrouck Mine Metallurgy Test Work	$ 390,000
Hasbrouck Mine Geotechnical Work	$ 360,000
Total Recommended Budget	**$ 750,000**

26.1 Resource Upgrade

Additional exploration drilling is not included in the immediate production recommendations. However, Three Hills will benefit from additional drilling to the east and northeast of the main deposit in the future, and there is potential for resource expansion along trend to the west and east at Hasbrouck.

Resources should be updated during operations if additional exploration drilling is completed. The cost of this type of work has not been included in the recommendations or cash-flow model.

26.2 Mining

Mining contractors should provide full proposals for costs based on a fuller understanding of the project in order that efficiencies may be identified. A study of a leased, owner-operated fleet should be completed to compare with contract mining costs to select the option that provides the maximum return on investment.

26.3 Pit Slope Confirmation and Steepening

Golder Associates recommended that further geotechnical studies be performed at the Hasbrouck Mine to raise confidence in predicted pit slopes to feasibility level for the deposit, and to potentially steepen currently assumed pit slopes. Three Hills Mine pit slopes were intentionally designed using flatter slopes than the Golder Associates recommendations. Golder Associates' recommended work does not include further drilling at the Three Hills Mine, but involves certain field work and a review of existing core, which could result in steeper slopes, should WKM decide to carry out the studies. At the Hasbrouck Mine, recommended work includes drilling four diamond drill holes and associated field work and engineering studies. The slope parameters used in this study are conservatively chosen due to the amount of available information.

26.4 Metallurgical Testing

Once mining has commenced at Three Hills Mine, to confirm the test performed by KCA (2015) on ROM ore, WKM will collect and send a blasted bulk sample to KCA for testing work using a 48 inch diameter column.

To determine the optimum settings of the HPGR, such as the amount of choke feeding, recirculation, roll rotation speed, and roll closing force, tests are recommended to be performed in which the effects of varying settings are measured. These tests will entail larger samples than have been used to date.

Bottle roll tests on HPGR crushed lower Siebert material may have understated gold recovery compared to gold recovery that could be expected from column leach tests, perhaps by an amount similar to the 6% increase demonstrated with upper Siebert ore. To evaluate this effect, column leach tests are recommended on the Lower Siebert ore that was used in in bottle roll tests.

Compacted permeability and column leach tests should be conducted on screened, 3-inch ROM ore during operations to confirm that adequate percolation will occur in a heap leach of the designed height. Close monitoring of the ROM heap is recommended if these permeability tests indicate inadequate percolation is likely.

26.5 Processing

The crushing circuit design should be reviewed. Using permanently installed equipment versus mobile equipment should be examined to maximize circuit availability.

26.6 Crushing and Screening Plant Optimization

The overall design of the crushing and screening plant presented in this study is a first-pass design and was not reviewed by equipment suppliers. The opportunity exists to optimize the crushing and screening plant general arrangement with the help of equipment suppliers' input, which may lead to lower capital and operating costs. Areas that are targeted for this analysis include the configuration of grizzlies at the primary crusher (both static and vibrating), and conveyor layouts to and from the secondary crushers.

26.7 HPGR Size

The HPGR model selected for this study was a first-pass choice. It is possible that a larger machine would allow greater recirculation, which would result in finer product size and hence greater gold and silver recovery. Further test work is recommended to select the optimum size HPGR.

HPGR machine specifications and operating costs should be confirmed by further testing, including abrasion and power-consumption studies.

26.8 Hasbrouck Pug Mill

Tests are recommended to determine the probability of "cake" being produced by the HPGR under various conditions of clay content and moisture, and hence confirm or otherwise eliminate the need for a pug mill.

26.9 Hasbrouck Mine Adsorption Plant

Analysis is recommended to select the optimum numbers, size, and configuration of carbon columns in the Hasbrouck Mine adsorption plant.

26.10 Used Equipment

The purchase or securing in similar manner of used equipment is recommended, allowing the cost of such equipment to be used in future studies of the project.

26.11 Civil Construction Using Mining Equipment

Mining contractors should be approached for budget prices for the earthworks component of civil construction to establish if cost savings might be made in this way.

26.12 Water Supply

Securing the necessary water rights for the project will be required. This may involve purchasing or leasing from the owner of an existing water right if the Nevada state engineer does not authorize an allocation. This can be done upon completion or concurrent with drilling of the raw water wells.

26.13 Environmental

Permitting should continue for the Hasbrouck Mines, with the target of obtaining key construction and operating permits as needed to maintain the project schedule.

26.14 Land Ownership

Land ownership and/or the rights to install infrastructure on non-owned land are recommended to be secured where these are necessary for the project.

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28.0 DATE AND SIGNATURE PAGE

Effective Date of report: September 1, 2016

Completion Date of report: September 14, 2016

"*Paul Tietz*" Date Signed: September 14, 2016
Paul Tietz, C.P.G.

"*Thomas L. Dyer*" Date Signed: September 14, 2016
Thomas L. Dyer, P.E.

"*Herbert C. Osborne*" Date Signed: September 14, 2016
Herbert C. Osborne

"*Ryan T. Baker*" Date Signed: September 14, 2016
Ryan T. Baker

"*Carl E. Defilippi*" Date Signed: September 14, 2016
Carl E. Defilippi

Table 28.1 List of Responsibilities of Qualified Persons

Technical Report Section	Company	Responsible Qualified Persons
1 Executive Summary	MDA, KCA, NewFields, HCOA	Sign-off by Section
2 Introduction	MDA	Paul Tietz
3 Reliance on Other Experts	MDA	Paul Tietz
4 Property Description and Location	MDA	Paul Tietz
5 Accessibility, Physiography, Climate Local Resources and Infrastructure	MDA	Paul Tietz
6 History	MDA	Paul Tietz
7 Geologic Setting and Mineralization	MDA	Paul Tietz
8 Deposit Types	MDA	Paul Tietz
9 Exploration	MDA	Paul Tietz
10 Drilling	MDA	Paul Tietz
11 Sample Preparation, Analyses, and Security	MDA	Paul Tietz
12 Data Verification	MDA	Paul Tietz
13 Metallurgical Testing and Mineral Processing	HCOA	Herbert Osborne
14 Mineral Resources	MDA	Paul Tietz
15 Mineral Reserve Estimates	MDA	Thomas Dyer
16 Mining Methods	MDA	Thomas Dyer
17 Recovery Methods	KCA, NewFields	Carl Defilippi, Ryan Baker
18 Project Infrastructure	NewFields, MDA, KCA	Ryan Baker, Carl Defilippi, Thomas Dyer
19 Market Studies and Contracts	MDA	Thomas Dyer
20 Environmental Studies, Permitting, and Social or Community Impact	MDA	Paul Tietz, Thomas Dyer
21 Capital and Operating Costs	MDA	Thomas Dyer, Carl Defilippi, Ryan Baker
22 Economic Analysis	MDA	Thomas Dyer
23 Adjacent Properties	MDA	Paul Tietz
24 Other Relevant Data and Information	MDA	Thomas Dyer
25 Interpretations and Conclusions	MDA, KCA, NewFields, HCOA	Sign-off by Section
26 Recommendations	MDA, KCA, NewFields, HCOA	Sign-off by Section
27 References	MDA	Paul Tietz

Note: HCOA = Herb Osborne and Associates

29.0 CERTIFICATE OF QUALIFIED PERSON

PAUL TIETZ, C.P.G.

I, Paul Tietz, C.P.G., do hereby certify that:

1. I am currently employed as Senior Geologist for Mine Development Associates, Inc. located at 210 South Rock Blvd., Reno, Nevada 89502 and

2. I graduated with a Bachelor of Science degree in Biology/Geology from the University of Rochester in 1977, a Master of Science degree in Geology from the University of North Carolina, Chapel Hill in 1981, and a Master of Science degree in Geological Engineering from the University of Nevada, Reno in 2004.

3. I am a Certified Professional Geologist (#11004) with the American Institute of Professional Geologists and have worked as a geologist in the mining industry for more than 30 years.

4. I have read the definition of "qualified person" set out in National Instrument 43-101 ("NI 43-101"). I have previously explored, drilled, evaluated and modelled similar gold deposits in volcanic rocks in Nevada and elsewhere. I certify that by reason of my education, affiliation with certified professional associations, and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.

5. I am one of the authors of the technical report titled *"Technical Report and Updated Preliminary Feasibility Study: Hasbrouck and Three Hills Gold-Silver Project, Esmeralda County, Nevada"* prepared for West Kirkland Mining Inc., dated effective September 1, 2016. Subject to those issues discussed in Section 3.0, I am responsible for Sections 2 through 12, 14, 23, and 27, and take co-responsibility for Sections 1, 20, 25, and 26 of the Technical Report. I visited the Hasbrouck project site on July 25, 2014, after inspections in June, 2014 of project drill core stored at Allied's Hycroft Mine near Gerlach, Nevada, and at Kappes Cassiday and Associates in Reno, Nevada.

6. I have had prior involvement with the Hasbrouck project that is subject to this Report. I was one of the authors of the technical report titled *"Technical Report and Preliminary Feasibility Study: Hasbrouck and Three Hills Gold-Silver Project, Esmeralda County, Nevada"* dated effective June 19, 2015.

7. To the best of my knowledge, information and belief, the technical report contains the necessary scientific and technical information to make the technical report not misleading.

8. I am independent of West Kirkland Mining Inc. and related companies applying all of the tests in Section 1.5 of National Instrument 43-101 and in Section 1.5 of the Companion Policy to NI 43-101.

9. I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in accordance with the requirements of that instrument and

form. Dated this September 14, 2016.

"Paul Tietz"

Signature of Qualified Person

Paul Tietz

Print Name of Qualified Person

CERTIFICATE OF QUALIFIED PERSON

THOMAS L. DYER, P.E.

I, Thomas Dyer, P. E., do hereby certify that I am currently employed as Senior Engineer by Mine Development Associates, Inc., 210 South Rock Blvd., Reno, Nevada 89502 and:

1. I graduated with a Bachelors of Science degree in Mine Engineering from South Dakota School of Mines & Technology in 1996. I have worked as a Mining Engineer for 19 years since graduation. During my Engineering career I have held various positions of increasing responsibility at operating mines performing life of mine planning and cost estimates. During the last 8 years I have been engaged in consulting on various lead, zinc, gold, silver, copper, and limestone deposits both for underground and open pit operations. This consulting work has primarily consisted of providing production schedules, mine cost estimates, and cash-flow analysis.

2. I am registered as a Professional Engineer – Mining in the State of Nevada (# 15729). I am also a Registered Member of SME (# 4029995RM) in good standing.

3. I have read the definition of "qualified person" set out in National Instrument 43-101 ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101. I am independent of the issuer applying all of the tests in section 1.5 of National Instrument 43-101.

4. I am one of the authors of the Technical Report titled *"Technical Report and Updated Preliminary Feasibility Study: Hasbrouck and Three Hills Gold-Silver Project, Esmeralda County, Nevada"* dated effective September 1, 2016 (the "Technical Report"). I am responsible for the preparation of the sections 15, 16, 19, 22, and 24, and portions of sections 1, 18, 20, 21, 25, and 26, subject to those issues discussed in Section 3.0. I have visited the property on May 1, 2014 to review current infrastructure and scope out future infrastructure and road requirements.

5. I have had prior involvement with the Hasbrouck project that is subject to this Report. I was one of the authors of the technical report titled *"Technical Report and Preliminary Feasibility Study: Hasbrouck and Three Hills Gold-Silver Project, Esmeralda County, Nevada"* dated effective June 19, 2015.

6. I am not aware of any material fact or material change with respect to the subject matter of the Technical Report that is not reflected in the Technical Report, the omission to disclose which makes the Technical Report misleading.

7. I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.

Dated this September 14, 2016

"Thomas L. Dyer"
Signature of Qualified Person

Thomas L. Dyer
Print Name of Qualified Person

CERTIFICATE OF QUALIFIED PERSON

HERBERT C. OSBORNE

I, Herbert C. Osborne, do hereby certify that I am currently employed as a Metallurgical Engineer by H.C. Osborne and Associates, with a business address of 12885 Lanewood Street, Commerce City, Colorado 80022 and:

1. I am a graduate of Colorado School of Mines with a degree in Metallurgical Engineering (1961). I am a Registered Member of the Society for Mining, Metallurgy, and Exploration (SME, 2430050RM). My relevant experience includes more than 20 heap leach designs and operations since 1978.
2. I have read the definition of "qualified person" set out in National Instrument 43-101 ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
3. I am responsible for preparing Section 13, and I am co-responsible for portions of Section 1, 25 and 26 of the report titled *"Technical Report and Updated Preliminary Feasibility Study: Hasbrouck and Three Hills Gold-Silver Project, Esmeralda County, Nevada"* dated effective September 1, 2016. I have not visited the site for this report, but I am familiar with the district from previous projects.
4. I have had prior involvement with the Hasbrouck project that is subject to this Report. I was one of the authors of the technical report titled *"Technical Report and Preliminary Feasibility Study: Hasbrouck and Three Hills Gold-Silver Project, Esmeralda County, Nevada"* dated effective June 19, 2015.
5. As of the effective date of the Technical Report, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.
6. I am independent of West Kirkland Mining Inc. and related companies applying all of the tests in Section 1.5 of National Instrument 43-101 and in Section 1.5 of the Companion Policy to NI 43-101.
7. I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in accordance with the requirements of that instrument and form.

Dated this September 14, 2016.

"Herbert C. Osborne"
Signature of Qualified Person

Herbert C. Osborne
Print Name of Qualified Person

CERTIFICATE OF QUALIFIED PERSON

RYAN T. BAKER

I, Ryan T. Baker, do hereby certify that I am currently employed as Principal Engineer by NewFields Mining Design & Technical Services, LLC, with a business address of 9400 Station Street, Suite 300, Lone Tree, CO 80124 and:

1. I am a graduate of Colorado State University with a Bachelor of Science degree in Civil Engineering (1993). I am a registered Professional Engineer in Nevada (#13947), Alaska (#11172), Idaho (#10226), Colorado (#36988), Missouri (PE2008000049), and New Mexico (#22110). I am a Registered Member of the Society for Mining, Metallurgy, and Exploration (SME, #4204584) and the American Society of Civil Engineers (ASCE, #307827). My relevant experience includes heap leach and tailings storage facility and mine surface infrastructure design and inspection since 1994.
2. I have read the definition of "qualified person" set out in National Instrument 43-101 ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
3. I am responsible for preparing portions of portions of Sections 17, 18, and 21 of the report titled *"Technical Report and Updated Preliminary Feasibility Study: Hasbrouck and Three Hills Gold-Silver Project, Esmeralda County, Nevada"* dated effective September 1, 2016 and I am co-responsible for portions of Section 1. I visited the Hasbrouck Mine and Three Hills Mine sites on May 1, 2014.
4. I have had prior involvement with the Hasbrouck project that is subject to this Report. I was one of the authors of the technical report titled *"Technical Report and Preliminary Feasibility Study: Hasbrouck and Three Hills Gold-Silver Project, Esmeralda County, Nevada"* dated effective June 19, 2015.
5. As of the effective date of the Technical Report, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.
6. I am independent of West Kirkland Mining Inc. and related companies applying all of the tests in Section 1.5 of National Instrument 43-101 and in Section 1.5 of the Companion Policy to NI 43-101.
7. I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in accordance with the requirements of that instrument and form.

Dated this September 14, 2016.

"Ryan T, Baker"
Signature of Qualified Person

Ryan T, Baker
Print Name of Qualified Person

CERTIFICATE OF QUALIFIED PERSON

CARL E. DEFILIPPI

I, Carl E. Defilippi, M.Sc., C.E.M., do hereby certify that I am currently employed as Senior Engineer for Kappes, Cassiday & Associates located at 7950 Security Circle, Reno, Nevada 89506 and:

1. I graduated with a Bachelor of Science degree in Chemical Engineering from the University of Nevada in 1978 and a Master of Science degree in Metallurgical Engineering from the University of Nevada in 1981;

2. I am a Registered Member of the Society for Mining, Metallurgy and Exploration (775870 RM) and I have worked as a Metallurgical Engineer for 36 years;

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

4. I am independent of West Kirkland Mining Ltd. and related companies applying all of the tests in section 1.5 of National Instrument 43-101. I participated in a scoping study on Hasbrouck for Allied Nevada in 2011.

5. I am one of the authors of the Technical Report entitled *"Technical Report and Updated Preliminary Feasibility Study: Hasbrouck and Three Hills Gold-Silver Project, Esmeralda County, Nevada"*, prepared for West Kirkland Mining Inc., dated effective September 1, 2016. I am responsible for Section 17 (except 17.1.6.2 and 17.2.9), Sections 18.1.10.1, 18.1.10.2, 18.2.2, 18.2.3, and applicable sections of 1, 21, 25, 26 and 27 of the Technical Report. I visited the Three Hills and Hasbrouck Project sites on May 1, 2014;

6. I have had prior involvement with the Hasbrouck project that is subject to this Report. I was one of the authors of the technical report titled *"Technical Report and Preliminary Feasibility Study: Hasbrouck and Three Hills Gold-Silver Project, Esmeralda County, Nevada"* dated effective June 19, 2015.

7. As of the effective date of this Technical Report, to the best of my knowledge, information and belief, the part of the Technical Report for which I am responsible contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading;

8. I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in accordance with the requirements that Instrument and Form.

Dated this September 14, 2016.

"Carl Defillipi"
Signature of Qualified Person

Carl Defillipi
Print Name of Qualified Person

APPENDIX A
List of Claims for the Hasbrouck Project

Location: All claims are located in Esmeralda County and Nye County, Nevada

Hasbrouck Unpatented Claims

AREA	Claim Name	Claim Owner	Location Date	BLM Serial No.	Filing County
Hasbrouck	HSB 1	WK Mining (USA)	3/14/2011	NMC1043485	Esmeralda
Hasbrouck	HSB 2	WK Mining (USA)	3/14/2011	NMC1043486	Esmeralda
Hasbrouck	HSB 3	WK Mining (USA)	3/14/2011	NMC1043487	Esmeralda
Hasbrouck	HSB 4	WK Mining (USA)	3/14/2011	NMC1043488	Esmeralda
Hasbrouck	HSB 5	WK Mining (USA)	3/14/2011	NMC1043489	Esmeralda
Hasbrouck	HSB 6	WK Mining (USA)	3/14/2011	NMC1043490	Esmeralda
Hasbrouck	HSB 7	WK Mining (USA)	3/14/2011	NMC1043491	Esmeralda
Hasbrouck	HSB 8	WK Mining (USA)	3/14/2011	NMC1043492	Esmeralda
Hasbrouck	HSB 9	WK Mining (USA)	3/14/2011	NMC1043493	Esmeralda
Hasbrouck	HSB 10	WK Mining (USA)	3/14/2011	NMC1043494	Esmeralda
Hasbrouck	HSB 11	WK Mining (USA)	3/14/2011	NMC1043495	Esmeralda
Hasbrouck	HSB 12	WK Mining (USA)	3/14/2011	NMC1043496	Esmeralda
Hasbrouck	HSB 13	WK Mining (USA)	3/14/2011	NMC1043497	Esmeralda
Hasbrouck	HSB 14	WK Mining (USA)	3/14/2011	NMC1043498	Esmeralda
Hasbrouck	HSB 15	WK Mining (USA)	3/14/2011	NMC1043499	Esmeralda
Hasbrouck	HSB 16	WK Mining (USA)	3/13/2011	NMC1043500	Esmeralda
Hasbrouck	HSB 17	WK Mining (USA)	3/13/2011	NMC1043501	Esmeralda
Hasbrouck	HSB 18	WK Mining (USA)	3/13/2011	NMC1043502	Esmeralda
Hasbrouck	HSB 19	WK Mining (USA)	3/13/2011	NMC1043503	Esmeralda
Hasbrouck	HSB 20	WK Mining (USA)	3/13/2011	NMC1043504	Esmeralda
Hasbrouck	HSB 21	WK Mining (USA)	3/13/2011	NMC1043505	Esmeralda
Hasbrouck	HSB 22	WK Mining (USA)	3/13/2011	NMC1043506	Esmeralda
Hasbrouck	HSB 23	WK Mining (USA)	3/13/2011	NMC1043507	Esmeralda
Hasbrouck	HSB 24	WK Mining (USA)	3/13/2011	NMC1043508	Esmeralda
Hasbrouck	HSB 25	WK Mining (USA)	3/13/2011	NMC1043509	Esmeralda
Hasbrouck	HSB 26	WK Mining (USA)	3/13/2011	NMC1043510	Esmeralda
Hasbrouck	HSB 27	WK Mining (USA)	3/13/2011	NMC1043511	Esmeralda
Hasbrouck	HSB 28	WK Mining (USA)	3/13/2011	NMC1043512	Esmeralda
Hasbrouck	HSB 29	WK Mining (USA)	3/13/2011	NMC1043513	Esmeralda
Hasbrouck	HSB 30	WK Mining (USA)	3/13/2011	NMC1043514	Esmeralda
Hasbrouck	HSB 31	WK Mining (USA)	3/13/2011	NMC1043515	Esmeralda
Hasbrouck	HSB 32	WK Mining (USA)	3/13/2011	NMC1043516	Esmeralda
Hasbrouck	HSB 33	WK Mining (USA)	3/13/2011	NMC1043517	Esmeralda
Hasbrouck	HSB 34	WK Mining (USA)	3/13/2011	NMC1043518	Esmeralda
Hasbrouck	HSB 35	WK Mining (USA)	3/13/2011	NMC1043519	Esmeralda
Hasbrouck	HSB 36	WK Mining (USA)	3/13/2011	NMC1043520	Esmeralda
Hasbrouck	HSB 37	WK Mining (USA)	3/13/2011	NMC1043521	Esmeralda
Hasbrouck	HSB 38	WK Mining (USA)	3/13/2011	NMC1043522	Esmeralda
Hasbrouck	HSB 39	WK Mining (USA)	3/13/2011	NMC1043523	Esmeralda
Hasbrouck	HSB 40	WK Mining (USA)	3/13/2011	NMC1043524	Esmeralda
Hasbrouck	HSB 41	WK Mining (USA)	3/13/2011	NMC1043525	Esmeralda
Hasbrouck	HSB 42	WK Mining (USA)	3/13/2011	NMC1043526	Esmeralda

AREA	Claim Name	Claim Owner	Location Date	BLM Serial No.	Filing County
Hasbrouck	HSB 43	WK Mining (USA)	3/13/2011	NMC1043527	Esmeralda
Hasbrouck	HSB 44	WK Mining (USA)	3/13/2011	NMC1043528	Esmeralda
Hasbrouck	HSB 45	WK Mining (USA)	3/13/2011	NMC1043529	Esmeralda
Hasbrouck	HSB 46	WK Mining (USA)	3/13/2011	NMC1043530	Esmeralda
Hasbrouck	HSB 47	WK Mining (USA)	3/13/2011	NMC1043531	Esmeralda
Hasbrouck	HSB 48	WK Mining (USA)	3/13/2011	NMC1043532	Esmeralda
Hasbrouck	HSB 49	WK Mining (USA)	3/13/2011	NMC1043533	Esmeralda
Hasbrouck	HSB 50	WK Mining (USA)	3/13/2011	NMC1043534	Esmeralda
Hasbrouck	HSB 51	WK Mining (USA)	3/13/2011	NMC1043535	Esmeralda
Hasbrouck	HSB 52	WK Mining (USA)	3/13/2011	NMC1043536	Esmeralda
Hasbrouck	HSB 53	WK Mining (USA)	3/13/2011	NMC1043537	Esmeralda
Hasbrouck	HSB 54	WK Mining (USA)	3/13/2011	NMC1043538	Esmeralda
Hasbrouck	HSB 55	WK Mining (USA)	3/13/2011	NMC1043539	Esmeralda
Hasbrouck	HSB 56	WK Mining (USA)	3/13/2011	NMC1043540	Esmeralda
Hasbrouck	HSB 57	WK Mining (USA)	3/13/2011	NMC1043541	Esmeralda
Hasbrouck	HSB 58	WK Mining (USA)	3/13/2011	NMC1043542	Esmeralda
Hasbrouck	HSB 59	WK Mining (USA)	3/13/2011	NMC1043543	Esmeralda
Hasbrouck	HSB 60	WK Mining (USA)	3/13/2011	NMC1043544	Esmeralda
Hasbrouck	HSB 61	WK Mining (USA)	3/13/2011	NMC1043545	Esmeralda
Hasbrouck	HSB 62	WK Mining (USA)	3/13/2011	NMC1043546	Esmeralda
Hasbrouck	HSB 63	WK Mining (USA)	3/13/2011	NMC1043547	Esmeralda
Hasbrouck	HSB 64	WK Mining (USA)	3/13/2011	NMC1043548	Esmeralda
Hasbrouck	HSB 65	WK Mining (USA)	3/13/2011	NMC1043549	Esmeralda
Hasbrouck	HSB 66	WK Mining (USA)	3/13/2011	NMC1043550	Esmeralda
Hasbrouck	HSB 67	WK Mining (USA)	3/13/2011	NMC1043551	Esmeralda
Hasbrouck	HSB 68	WK Mining (USA)	3/13/2011	NMC1043552	Esmeralda
Hasbrouck	HSB 69	WK Mining (USA)	3/13/2011	NMC1043553	Esmeralda
Hasbrouck	HSB 70	WK Mining (USA)	3/13/2011	NMC1043554	Esmeralda
Hasbrouck	HSB 71	WK Mining (USA)	3/13/2011	NMC1043555	Esmeralda
Hasbrouck	HSB 72	WK Mining (USA)	3/13/2011	NMC1043556	Esmeralda
Hasbrouck	HSB 73	WK Mining (USA)	3/13/2011	NMC1043557	Esmeralda
Hasbrouck	HSB 74	WK Mining (USA)	3/13/2011	NMC1043558	Esmeralda
Hasbrouck	HSB 75	WK Mining (USA)	3/13/2011	NMC1043559	Esmeralda
Hasbrouck	HSB 76	WK Mining (USA)	3/13/2011	NMC1043560	Esmeralda
Hasbrouck	HSB 77	WK Mining (USA)	3/13/2011	NMC1043561	Esmeralda
Hasbrouck	HSB 78	WK Mining (USA)	3/13/2011	NMC1043562	Esmeralda
Hasbrouck	HSB 79	WK Mining (USA)	3/13/2011	NMC1043563	Esmeralda
Hasbrouck	HSB 80	WK Mining (USA)	3/13/2011	NMC1043564	Esmeralda
Hasbrouck	HSB 81	WK Mining (USA)	3/13/2011	NMC1043565	Esmeralda
Hasbrouck	HSB 82	WK Mining (USA)	3/13/2011	NMC1043566	Esmeralda
Hasbrouck	HSB 83	WK Mining (USA)	3/13/2011	NMC1043567	Esmeralda
Hasbrouck	HSB 84	WK Mining (USA)	3/13/2011	NMC1043568	Esmeralda
Hasbrouck	HSB 85	WK Mining (USA)	3/13/2011	NMC1043569	Esmeralda
Hasbrouck	HSB 86	WK Mining (USA)	3/13/2011	NMC1043570	Esmeralda
Hasbrouck	HSB 87	WK Mining (USA)	3/13/2011	NMC1043571	Esmeralda
Hasbrouck	HSB 88	WK Mining (USA)	3/13/2011	NMC1043572	Esmeralda

AREA	Claim Name	Claim Owner	Location Date	BLM Serial No.	Filing County
Hasbrouck	HSB 89	WK Mining (USA)	3/13/2011	NMC1043573	Esmeralda
Hasbrouck	HSB 90	WK Mining (USA)	3/13/2011	NMC1043574	Esmeralda
Hasbrouck	HSB 91	WK Mining (USA)	3/13/2011	NMC1043575	Esmeralda
Hasbrouck	HSB 92	WK Mining (USA)	3/13/2011	NMC1043576	Esmeralda
Hasbrouck	HSB 93	WK Mining (USA)	3/13/2011	NMC1043577	Esmeralda
Hasbrouck	HSB 94	WK Mining (USA)	3/13/2011	NMC1043578	Esmeralda
Hasbrouck	HSB 95	WK Mining (USA)	3/13/2011	NMC1043579	Esmeralda
Hasbrouck	HSB 96	WK Mining (USA)	3/13/2011	NMC1043580	Esmeralda
Hasbrouck	HSB 97	WK Mining (USA)	3/13/2011	NMC1043581	Esmeralda
Hasbrouck	HSB 98	WK Mining (USA)	3/13/2011	NMC1043582	Esmeralda
Hasbrouck	HSB 99	WK Mining (USA)	3/13/2011	NMC1043583	Esmeralda
Hasbrouck	HSB 100	WK Mining (USA)	3/13/2011	NMC1043584	Esmeralda
Hasbrouck	HSB 101	WK Mining (USA)	3/13/2011	NMC1043585	Esmeralda
Hasbrouck	HSB 102	WK Mining (USA)	3/13/2011	NMC1043586	Esmeralda
Hasbrouck	HSB 103	WK Mining (USA)	3/13/2011	NMC1043587	Esmeralda
Hasbrouck	HSB 104	WK Mining (USA)	3/13/2011	NMC1043588	Esmeralda
Hasbrouck	HSB 105	WK Mining (USA)	3/13/2011	NMC1043589	Esmeralda
Hasbrouck	HSB 106	WK Mining (USA)	3/13/2011	NMC1043590	Esmeralda
Hasbrouck	HSB 107	WK Mining (USA)	3/13/2011	NMC1043591	Esmeralda
Hasbrouck	HSB 108	WK Mining (USA)	3/13/2011	NMC1043592	Esmeralda
Hasbrouck	HSB 109	WK Mining (USA)	3/13/2011	NMC1043593	Esmeralda
Hasbrouck	HSB 110	WK Mining (USA)	3/13/2011	NMC1043594	Esmeralda
Hasbrouck	HSB 111	WK Mining (USA)	3/13/2011	NMC1043595	Esmeralda
Hasbrouck	HSB 112	WK Mining (USA)	3/13/2011	NMC1043596	Esmeralda
Hasbrouck	HSB 113	WK Mining (USA)	3/13/2011	NMC1043597	Esmeralda
Hasbrouck	HSB 114	WK Mining (USA)	3/13/2011	NMC1043598	Esmeralda
Hasbrouck	HSB 115	WK Mining (USA)	3/13/2011	NMC1043599	Esmeralda
Hasbrouck	HSB 116	WK Mining (USA)	3/13/2011	NMC1043600	Esmeralda
Hasbrouck	HSB 117	WK Mining (USA)	3/13/2011	NMC1043601	Esmeralda
Hasbrouck	HSB 118	WK Mining (USA)	3/13/2011	NMC1043602	Esmeralda
Hasbrouck	HSB 119	WK Mining (USA)	3/13/2011	NMC1043603	Esmeralda
Hasbrouck	HSB 120	WK Mining (USA)	3/13/2011	NMC1043604	Esmeralda
Hasbrouck	HSB 121	WK Mining (USA)	3/13/2011	NMC1043605	Esmeralda
Hasbrouck	HSB 122	WK Mining (USA)	3/13/2011	NMC1043606	Esmeralda
Hasbrouck	HSB 123	WK Mining (USA)	3/13/2011	NMC1043607	Esmeralda
Hasbrouck	HSB 124	WK Mining (USA)	3/13/2011	NMC1043608	Esmeralda
Hasbrouck	HSB 125	WK Mining (USA)	3/13/2011	NMC1043609	Esmeralda
Hasbrouck	HSB 126	WK Mining (USA)	3/13/2011	NMC1043610	Esmeralda
Hasbrouck	HSB 127	WK Mining (USA)	3/13/2011	NMC1043611	Esmeralda
Hasbrouck	HSB 128	WK Mining (USA)	3/13/2011	NMC1043612	Esmeralda
Hasbrouck	HSB 129	WK Mining (USA)	3/13/2011	NMC1043613	Esmeralda
Hasbrouck	HSB 130	WK Mining (USA)	3/13/2011	NMC1043614	Esmeralda
Hasbrouck	HSB 131	WK Mining (USA)	3/13/2011	NMC1043615	Esmeralda
Hasbrouck	HSB 132	WK Mining (USA)	3/13/2011	NMC1043616	Esmeralda
Hasbrouck	HSB 133	WK Mining (USA)	3/13/2011	NMC1043617	Esmeralda
Hasbrouck	HSB 134	WK Mining (USA)	3/13/2011	NMC1043618	Esmeralda

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Hasbrouck	HSB 135	WK Mining (USA)	3/13/2011	NMC1043619	Esmeralda
Hasbrouck	HSB 136	WK Mining (USA)	3/13/2011	NMC1043620	Esmeralda
Hasbrouck	HSB 137	WK Mining (USA)	3/13/2011	NMC1043621	Esmeralda
Hasbrouck	HSB 138	WK Mining (USA)	3/13/2011	NMC1043622	Esmeralda
Hasbrouck	HSB 139	WK Mining (USA)	3/13/2011	NMC1043623	Esmeralda
Hasbrouck	HSB 140	WK Mining (USA)	3/13/2011	NMC1043624	Esmeralda
Hasbrouck	HSB 141	WK Mining (USA)	3/13/2011	NMC1043625	Esmeralda
Hasbrouck	HSB 142	WK Mining (USA)	3/13/2011	NMC1043626	Esmeralda
Hasbrouck	HSB 143	WK Mining (USA)	3/13/2011	NMC1043627	Esmeralda
Hasbrouck	HSB 144	WK Mining (USA)	3/13/2011	NMC1043628	Esmeralda
Hasbrouck	HSB 145	WK Mining (USA)	3/13/2011	NMC1043629	Esmeralda
Hasbrouck	HSB 146	WK Mining (USA)	3/13/2011	NMC1043630	Esmeralda
Hasbrouck	HSB 147	WK Mining (USA)	3/13/2011	NMC1043631	Esmeralda
Hasbrouck	HSB 148	WK Mining (USA)	3/13/2011	NMC1043632	Esmeralda
Hasbrouck	HSB 149	WK Mining (USA)	3/13/2011	NMC1043633	Esmeralda
Hasbrouck	HSB 150	WK Mining (USA)	3/13/2011	NMC1043634	Esmeralda
Hasbrouck	HSB 151	WK Mining (USA)	3/13/2011	NMC1043635	Esmeralda
Hasbrouck	HSB 152	WK Mining (USA)	3/13/2011	NMC1043636	Esmeralda
Hasbrouck	HSB 153	WK Mining (USA)	3/13/2011	NMC1043637	Esmeralda
Hasbrouck	HSB 154	WK Mining (USA)	3/13/2011	NMC1043638	Esmeralda
Hasbrouck	HSB 155	WK Mining (USA)	3/13/2011	NMC1043639	Esmeralda
Hasbrouck	HSB 156	WK Mining (USA)	3/13/2011	NMC1043640	Esmeralda
Hasbrouck	HSB 157	WK Mining (USA)	3/13/2011	NMC1043641	Esmeralda
Hasbrouck	HSB 158	WK Mining (USA)	3/13/2011	NMC1043642	Esmeralda
Hasbrouck	HSB 159	WK Mining (USA)	3/13/2011	NMC1043643	Esmeralda
Hasbrouck	HSB 160	WK Mining (USA)	3/13/2011	NMC1043644	Esmeralda
Hasbrouck	HSB 161	WK Mining (USA)	3/13/2011	NMC1043645	Esmeralda
Hasbrouck	HSB 162	WK Mining (USA)	3/13/2011	NMC1043646	Esmeralda
Hasbrouck	HSB 163	WK Mining (USA)	3/13/2011	NMC1043647	Esmeralda
Hasbrouck	HSB 164	WK Mining (USA)	3/13/2011	NMC1043648	Esmeralda
Hasbrouck	HSB 165	WK Mining (USA)	3/13/2011	NMC1043649	Esmeralda
Hasbrouck	HSB 166	WK Mining (USA)	3/13/2011	NMC1043650	Esmeralda
Hasbrouck	HSB 167	WK Mining (USA)	3/13/2011	NMC1043651	Esmeralda
Hasbrouck	HSB 168	WK Mining (USA)	3/13/2011	NMC1043652	Esmeralda
Hasbrouck	HSB 169	WK Mining (USA)	3/13/2011	NMC1043653	Esmeralda
Hasbrouck	HSB 170	WK Mining (USA)	3/13/2011	NMC1043654	Esmeralda
Hasbrouck	HSB 171	WK Mining (USA)	3/13/2011	NMC1043655	Esmeralda
Hasbrouck	HSB 172	WK Mining (USA)	3/13/2011	NMC1043656	Esmeralda
Hasbrouck	HSB 173	WK Mining (USA)	3/13/2011	NMC1043657	Esmeralda
Hasbrouck	HSB 174	WK Mining (USA)	3/13/2011	NMC1043658	Esmeralda
Hasbrouck	HSB 175	WK Mining (USA)	3/13/2011	NMC1043659	Esmeralda
Hasbrouck	HSB 176	WK Mining (USA)	3/13/2011	NMC1043660	Esmeralda
Hasbrouck	HSB 177	WK Mining (USA)	3/13/2011	NMC1043661	Esmeralda
Hasbrouck	HSB 178	WK Mining (USA)	3/13/2011	NMC1043662	Esmeralda
Hasbrouck	HSB 179	WK Mining (USA)	3/13/2011	NMC1043663	Esmeralda
Hasbrouck	HSB 180	WK Mining (USA)	3/13/2011	NMC1043664	Esmeralda

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Hasbrouck	HSB 181	WK Mining (USA)	3/14/2011	NMC1043665	Esmeralda
Hasbrouck	HSB 182	WK Mining (USA)	3/14/2011	NMC1043666	Esmeralda
Hasbrouck	HSB 183	WK Mining (USA)	3/14/2011	NMC1043667	Esmeralda
Hasbrouck	HSB 184	WK Mining (USA)	3/14/2011	NMC1043668	Esmeralda
Hasbrouck	HSB 185	WK Mining (USA)	3/14/2011	NMC1043669	Esmeralda
Hasbrouck	HSB 186	WK Mining (USA)	3/14/2011	NMC1043670	Esmeralda
Hasbrouck	HSB 187	WK Mining (USA)	3/14/2011	NMC1043671	Esmeralda
Hasbrouck	HSB 188	WK Mining (USA)	3/14/2011	NMC1043672	Esmeralda
Hasbrouck	HSB 189	WK Mining (USA)	3/14/2011	NMC1043673	Esmeralda
Hasbrouck	HSB 190	WK Mining (USA)	3/14/2011	NMC1043674	Esmeralda
Hasbrouck	HSB 191	WK Mining (USA)	3/14/2011	NMC1043675	Esmeralda
Hasbrouck	HSB 192	WK Mining (USA)	3/14/2011	NMC1043676	Esmeralda
Hasbrouck	HSB 193	WK Mining (USA)	3/14/2011	NMC1043677	Esmeralda
Hasbrouck	HSB 194	WK Mining (USA)	3/14/2011	NMC1043678	Esmeralda
Hasbrouck	HSB 195	WK Mining (USA)	3/14/2011	NMC1043679	Esmeralda
Hasbrouck	HSB 196	WK Mining (USA)	3/14/2011	NMC1043680	Esmeralda
Hasbrouck	HSB 197	WK Mining (USA)	3/14/2011	NMC1043681	Esmeralda
Hasbrouck	HSB 198	WK Mining (USA)	3/14/2011	NMC1043682	Esmeralda
Hasbrouck	HSB 199	WK Mining (USA)	3/14/2011	NMC1043683	Esmeralda
Hasbrouck	HSB 200	WK Mining (USA)	3/14/2011	NMC1043684	Esmeralda
Hasbrouck	HSB 201	WK Mining (USA)	3/14/2011	NMC1043685	Esmeralda
Hasbrouck	HSB 202	WK Mining (USA)	4/9/2011	NMC1043686	Esmeralda
Hasbrouck	HSB 203	WK Mining (USA)	4/9/2011	NMC1043687	Esmeralda
Hasbrouck	HSB 204	WK Mining (USA)	4/9/2011	NMC1043688	Esmeralda
Hasbrouck	HSB 205	WK Mining (USA)	4/9/2011	NMC1043689	Esmeralda
Hasbrouck	HSB 206	WK Mining (USA)	4/9/2011	NMC1043690	Esmeralda
Hasbrouck	HSB 207	WK Mining (USA)	4/9/2011	NMC1043691	Esmeralda
Hasbrouck	HSB 208	WK Mining (USA)	4/9/2011	NMC1043692	Esmeralda
Hasbrouck	HSB 209	WK Mining (USA)	4/9/2011	NMC1043693	Esmeralda
Hasbrouck	HSB 210	WK Mining (USA)	4/9/2011	NMC1043694	Esmeralda
Hasbrouck	HSB 211	WK Mining (USA)	4/9/2011	NMC1043695	Esmeralda
Hasbrouck	HSB 212	WK Mining (USA)	4/9/2011	NMC1043696	Esmeralda
Hasbrouck	HSB 213	WK Mining (USA)	4/9/2011	NMC1043697	Esmeralda
Hasbrouck	HSB 214	WK Mining (USA)	4/9/2011	NMC1043698	Esmeralda
Hasbrouck	HSB 215	WK Mining (USA)	4/9/2011	NMC1043699	Esmeralda
Hasbrouck	HSB 216	WK Mining (USA)	4/9/2011	NMC1043700	Esmeralda
Hasbrouck	HSB 217	WK Mining (USA)	4/9/2011	NMC1043701	Esmeralda
Hasbrouck	HSB 218	WK Mining (USA)	4/9/2011	NMC1043702	Esmeralda
Hasbrouck	HSB 219	WK Mining (USA)	4/9/2011	NMC1043703	Esmeralda
Hasbrouck	HSB 220	WK Mining (USA)	4/9/2011	NMC1043704	Esmeralda
Hasbrouck	HSB 221	WK Mining (USA)	4/9/2011	NMC1043705	Esmeralda
Hasbrouck	HSB 222	WK Mining (USA)	4/9/2011	NMC1043706	Esmeralda
Hasbrouck	HSB 223	WK Mining (USA)	4/9/2011	NMC1043707	Esmeralda
Hasbrouck	HSB 224	WK Mining (USA)	4/9/2011	NMC1043708	Esmeralda
Hasbrouck	HSB 225	WK Mining (USA)	4/9/2011	NMC1043709	Esmeralda
Hasbrouck	HSB 226	WK Mining (USA)	4/9/2011	NMC1043710	Esmeralda

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Hasbrouck	HSB 227	WK Mining (USA)	4/9/2011	NMC1043711	Esmeralda
Hasbrouck	HSB 228	WK Mining (USA)	4/9/2011	NMC1043712	Esmeralda
Hasbrouck	HSB 229	WK Mining (USA)	4/9/2011	NMC1043713	Esmeralda
Hasbrouck	HSB 230	WK Mining (USA)	4/9/2011	NMC1043714	Esmeralda
Hasbrouck	HSB 231	WK Mining (USA)	4/9/2011	NMC1043715	Esmeralda
Hasbrouck	HSB 232	WK Mining (USA)	4/9/2011	NMC1043716	Esmeralda
Hasbrouck	HSB 233	WK Mining (USA)	4/9/2011	NMC1043717	Esmeralda
Hasbrouck	HSB 234	WK Mining (USA)	4/9/2011	NMC1043718	Esmeralda
Hasbrouck	HSB 235	WK Mining (USA)	4/9/2011	NMC1043719	Esmeralda
Hasbrouck	HSB 236	WK Mining (USA)	4/9/2011	NMC1043720	Esmeralda
Hasbrouck	HSB 237	WK Mining (USA)	4/8/2011	NMC1043721	Esmeralda
Hasbrouck	HSB 238	WK Mining (USA)	4/8/2011	NMC1043722	Esmeralda
Hasbrouck	HSB 239	WK Mining (USA)	4/8/2011	NMC1043723	Esmeralda
Hasbrouck	HSB 240	WK Mining (USA)	4/8/2011	NMC1043724	Esmeralda
Hasbrouck	HSB 241	WK Mining (USA)	4/8/2011	NMC1043725	Esmeralda
Hasbrouck	HSB 242	WK Mining (USA)	4/8/2011	NMC1043726	Esmeralda
Hasbrouck	HSB 243	WK Mining (USA)	4/8/2011	NMC1043727	Esmeralda
Hasbrouck	HSB 244	WK Mining (USA)	4/8/2011	NMC1043728	Esmeralda
Hasbrouck	HSB 245	WK Mining (USA)	4/8/2011	NMC1043729	Esmeralda
Hasbrouck	HSB 246	WK Mining (USA)	4/8/2011	NMC1043730	Esmeralda
Hasbrouck	HSB 247	WK Mining (USA)	4/8/2011	NMC1043731	Esmeralda
Hasbrouck	HSB 248	WK Mining (USA)	4/8/2011	NMC1043732	Esmeralda
Hasbrouck	HSB 249	WK Mining (USA)	4/8/2011	NMC1043733	Esmeralda
Hasbrouck	HSB 250	WK Mining (USA)	4/8/2011	NMC1043734	Esmeralda
Hasbrouck	HSB 251	WK Mining (USA)	4/8/2011	NMC1043735	Esmeralda
Hasbrouck	HSB 252	WK Mining (USA)	4/8/2011	NMC1043736	Esmeralda
Hasbrouck	HSB 253	WK Mining (USA)	4/8/2011	NMC1043737	Esmeralda
Hasbrouck	HSB 254	WK Mining (USA)	4/8/2011	NMC1043738	Esmeralda
Hasbrouck	HSB 255	WK Mining (USA)	4/8/2011	NMC1043739	Esmeralda
Hasbrouck	HSB 256	WK Mining (USA)	4/8/2011	NMC1043740	Esmeralda
Hasbrouck	HSB 257	WK Mining (USA)	4/8/2011	NMC1043741	Esmeralda
Hasbrouck	HSB 258	WK Mining (USA)	4/8/2011	NMC1043742	Esmeralda
Hasbrouck	HSB 259	WK Mining (USA)	4/8/2011	NMC1043743	Esmeralda
Hasbrouck	HSB 260	WK Mining (USA)	4/8/2011	NMC1043744	Esmeralda
Hasbrouck	HSB 261	WK Mining (USA)	4/8/2011	NMC1043745	Esmeralda
Hasbrouck	HSB 262	WK Mining (USA)	4/8/2011	NMC1043746	Esmeralda
Hasbrouck	HSB 263	WK Mining (USA)	4/8/2011	NMC1043747	Esmeralda
Hasbrouck	HSB 264	WK Mining (USA)	4/8/2011	NMC1043748	Esmeralda
Hasbrouck	HSB 265	WK Mining (USA)	4/8/2011	NMC1043749	Esmeralda
Hasbrouck	HSB 266	WK Mining (USA)	4/8/2011	NMC1043750	Esmeralda
Hasbrouck	HSB 267	WK Mining (USA)	4/8/2011	NMC1043751	Esmeralda
Hasbrouck	HSB 268	WK Mining (USA)	4/8/2011	NMC1043752	Esmeralda
Hasbrouck	HSB 269	WK Mining (USA)	4/8/2011	NMC1043753	Esmeralda
Hasbrouck	HSB 270	WK Mining (USA)	4/8/2011	NMC1043754	Esmeralda
Hasbrouck	HSB 271	WK Mining (USA)	4/8/2011	NMC1043755	Esmeralda
Hasbrouck	HSB 272	WK Mining (USA)	4/8/2011	NMC1043756	Esmeralda

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Hasbrouck	HSB 273	WK Mining (USA)	4/8/2011	NMC1043757	Esmeralda
Hasbrouck	HSB 274	WK Mining (USA)	4/8/2011	NMC1043758	Esmeralda
Hasbrouck	HSB 275	WK Mining (USA)	4/8/2011	NMC1043759	Esmeralda
Hasbrouck	HSB 276	WK Mining (USA)	4/8/2011	NMC1043760	Esmeralda
Hasbrouck	HSB 277	WK Mining (USA)	4/8/2011	NMC1043761	Esmeralda
Hasbrouck	HSB 278	WK Mining (USA)	4/8/2011	NMC1043762	Esmeralda
Hasbrouck	HSB 279	WK Mining (USA)	4/8/2011	NMC1043763	Esmeralda
Hasbrouck	HSB 280	WK Mining (USA)	4/8/2011	NMC1043764	Esmeralda
Hasbrouck	HSB 281	WK Mining (USA)	4/8/2011	NMC1043765	Esmeralda
Hasbrouck	HSB 282	WK Mining (USA)	4/8/2011	NMC1043766	Esmeralda
Hasbrouck	HSB 283	WK Mining (USA)	4/8/2011	NMC1043767	Esmeralda
Hasbrouck	HSB 284	WK Mining (USA)	4/8/2011	NMC1043768	Esmeralda
Hasbrouck	HSB 285	WK Mining (USA)	4/8/2011	NMC1043769	Esmeralda
Hasbrouck	HSB 286	WK Mining (USA)	4/8/2011	NMC1043770	Esmeralda
Hasbrouck	HSB 287	WK Mining (USA)	4/8/2011	NMC1043771	Esmeralda
Hasbrouck	HSB 288	WK Mining (USA)	4/8/2011	NMC1043772	Esmeralda
Hasbrouck	HSB 289	WK Mining (USA)	4/8/2011	NMC1043773	Esmeralda
Hasbrouck	HSB 290	WK Mining (USA)	4/8/2011	NMC1043774	Esmeralda
Hasbrouck	HSB 291	WK Mining (USA)	4/8/2011	NMC1043775	Esmeralda
Hasbrouck	HSB 292	WK Mining (USA)	4/8/2011	NMC1043776	Esmeralda
Hasbrouck	HSB 293	WK Mining (USA)	4/8/2011	NMC1043777	Esmeralda
Hasbrouck	HSB 294	WK Mining (USA)	4/8/2011	NMC1043778	Esmeralda
Hasbrouck	HSB 295	WK Mining (USA)	4/8/2011	NMC1043779	Esmeralda
Hasbrouck	HSB 296	WK Mining (USA)	4/8/2011	NMC1043780	Esmeralda
Hasbrouck	HSB 297	WK Mining (USA)	4/8/2011	NMC1043781	Esmeralda
Hasbrouck	HSB 298	WK Mining (USA)	4/8/2011	NMC1043782	Esmeralda
Hasbrouck	HSB 299	WK Mining (USA)	4/8/2011	NMC1043783	Esmeralda
Hasbrouck	HSB 300	WK Mining (USA)	4/8/2011	NMC1043784	Esmeralda
Hasbrouck	HSB 301	WK Mining (USA)	4/8/2011	NMC1043785	Esmeralda
Hasbrouck	HSB 302	WK Mining (USA)	4/8/2011	NMC1043786	Esmeralda
Hasbrouck	HSB 303	WK Mining (USA)	4/8/2011	NMC1043787	Esmeralda
Hasbrouck	HSB 304	WK Mining (USA)	4/8/2011	NMC1043788	Esmeralda
Hasbrouck	HSB 305	WK Mining (USA)	4/8/2011	NMC1043789	Esmeralda
Hasbrouck	HSB 306	WK Mining (USA)	4/8/2011	NMC1043790	Esmeralda
Hasbrouck	HSB 307	WK Mining (USA)	4/8/2011	NMC1043791	Esmeralda
Hasbrouck	HSB 308	WK Mining (USA)	4/8/2011	NMC1043792	Esmeralda
Hasbrouck	HSB 309	WK Mining (USA)	4/8/2011	NMC1043793	Esmeralda
Hasbrouck	HSB 310	WK Mining (USA)	4/8/2011	NMC1043794	Esmeralda
Hasbrouck	HSB 311	WK Mining (USA)	4/8/2011	NMC1043795	Esmeralda
Hasbrouck	HSB 312	WK Mining (USA)	4/8/2011	NMC1043796	Esmeralda
Hasbrouck	HSB 313	WK Mining (USA)	4/8/2011	NMC1043797	Esmeralda
Hasbrouck	HSB 314	WK Mining (USA)	4/8/2011	NMC1043798	Esmeralda
Hasbrouck	HSB 315	WK Mining (USA)	4/8/2011	NMC1043799	Esmeralda
Hasbrouck	HSB 316	WK Mining (USA)	4/8/2011	NMC1043800	Esmeralda
Hasbrouck	HSB 317	WK Mining (USA)	4/8/2011	NMC1043801	Esmeralda
Hasbrouck	HSB 318	WK Mining (USA)	4/8/2011	NMC1043802	Esmeralda

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Hasbrouck	HSB 319	WK Mining (USA)	4/8/2011	NMC1043803	Esmeralda
Hasbrouck	HSB 320	WK Mining (USA)	4/8/2011	NMC1043804	Esmeralda
Hasbrouck	HSB 321	WK Mining (USA)	4/8/2011	NMC1043805	Esmeralda
Hasbrouck	HSB 322	WK Mining (USA)	4/8/2011	NMC1043806	Esmeralda
Hasbrouck	HSB 323	WK Mining (USA)	4/8/2011	NMC1043807	Esmeralda
Hasbrouck	HSB 324	WK Mining (USA)	4/8/2011	NMC1043808	Esmeralda
Hasbrouck	HSB 325	WK Mining (USA)	4/8/2011	NMC1043809	Esmeralda
Hasbrouck	HSB 326	WK Mining (USA)	4/8/2011	NMC1043810	Esmeralda
Hasbrouck	HSB 327	WK Mining (USA)	4/8/2011	NMC1043811	Esmeralda
Hasbrouck	HSB 328	WK Mining (USA)	4/8/2011	NMC1043812	Esmeralda
Hasbrouck	HSB 329	WK Mining (USA)	4/8/2011	NMC1043813	Esmeralda
Hasbrouck	HSB 330	WK Mining (USA)	4/8/2011	NMC1043814	Esmeralda
Hasbrouck	HSB 331	WK Mining (USA)	4/8/2011	NMC1043815	Esmeralda
Hasbrouck	HSB 332	WK Mining (USA)	4/8/2011	NMC1043816	Esmeralda
Hasbrouck	HSB 333	WK Mining (USA)	4/8/2011	NMC1043817	Esmeralda
Hasbrouck	HSB 334	WK Mining (USA)	4/8/2011	NMC1043818	Esmeralda
Hasbrouck	HSB 335	WK Mining (USA)	4/8/2011	NMC1043819	Esmeralda
Hasbrouck	HSB 336	WK Mining (USA)	4/8/2011	NMC1043820	Esmeralda
Hasbrouck	HSB 337	WK Mining (USA)	4/8/2011	NMC1043821	Esmeralda
Hasbrouck	HSB 338	WK Mining (USA)	4/8/2011	NMC1043822	Esmeralda
Hasbrouck	HSB 339	WK Mining (USA)	4/8/2011	NMC1043823	Esmeralda
Hasbrouck	HSB 340	WK Mining (USA)	4/8/2011	NMC1043824	Esmeralda
Hasbrouck	HSB 341	WK Mining (USA)	4/8/2011	NMC1043825	Esmeralda
Hasbrouck	HSB 342	WK Mining (USA)	4/8/2011	NMC1043826	Esmeralda
Hasbrouck	HSB 343	WK Mining (USA)	4/8/2011	NMC1043827	Esmeralda
Hasbrouck	HSB 344	WK Mining (USA)	4/8/2011	NMC1043828	Esmeralda
Hasbrouck	HSB 345	WK Mining (USA)	4/8/2011	NMC1043829	Esmeralda
Hasbrouck	HSB 346	WK Mining (USA)	4/8/2011	NMC1043830	Esmeralda
Hasbrouck	HSB 347	WK Mining (USA)	4/8/2011	NMC1043831	Esmeralda
Hasbrouck	HSB 348	WK Mining (USA)	4/8/2011	NMC1043832	Esmeralda
Hasbrouck	HSB 349	WK Mining (USA)	4/8/2011	NMC1043833	Esmeralda
Hasbrouck	HSB 350	WK Mining (USA)	4/8/2011	NMC1043834	Esmeralda
Hasbrouck	HSB 351	WK Mining (USA)	4/8/2011	NMC1043835	Esmeralda
Hasbrouck	HSB 352	WK Mining (USA)	4/8/2011	NMC1043836	Esmeralda
Hasbrouck	HSB 353	WK Mining (USA)	4/8/2011	NMC1043837	Esmeralda
Hasbrouck	HSB 354	WK Mining (USA)	4/8/2011	NMC1043838	Esmeralda
Hasbrouck	HSB 355	WK Mining (USA)	4/8/2011	NMC1043839	Esmeralda
Hasbrouck	HSB 356	WK Mining (USA)	4/8/2011	NMC1043840	Esmeralda
Hasbrouck	HSB 357	WK Mining (USA)	4/8/2011	NMC1043841	Esmeralda
Hasbrouck	HSB 358	WK Mining (USA)	4/8/2011	NMC1043842	Esmeralda
Hasbrouck	HSB 359	WK Mining (USA)	4/8/2011	NMC1043843	Esmeralda
Hasbrouck	HSB 360	WK Mining (USA)	4/8/2011	NMC1043844	Esmeralda
Hasbrouck	HSB 361	WK Mining (USA)	4/8/2011	NMC1043845	Esmeralda
Hasbrouck	HSB 362	WK Mining (USA)	4/8/2011	NMC1043846	Esmeralda
Hasbrouck	HSB 363	WK Mining (USA)	4/8/2011	NMC1043847	Esmeralda
Hasbrouck	HSB 364	WK Mining (USA)	4/8/2011	NMC1043848	Esmeralda

AREA	Claim Name	Claim Owner	Location Date	BLM Serial No.	Filing County
Hasbrouck	HSB 365	WK Mining (USA)	4/8/2011	NMC1043849	Esmeralda
Hasbrouck	HSB 366	WK Mining (USA)	4/7/2011	NMC1043850	Esmeralda
Hasbrouck	HSB 367	WK Mining (USA)	4/7/2011	NMC1043851	Esmeralda
Hasbrouck	HSB 368	WK Mining (USA)	4/7/2011	NMC1043852	Esmeralda
Hasbrouck	HSB 369	WK Mining (USA)	4/7/2011	NMC1043853	Esmeralda
Hasbrouck	HSB 370	WK Mining (USA)	4/7/2011	NMC1043854	Esmeralda
Hasbrouck	HSB 371	WK Mining (USA)	4/7/2011	NMC1043855	Esmeralda
Hasbrouck	HSB 372	WK Mining (USA)	4/7/2011	NMC1043856	Esmeralda
Hasbrouck	HSB 373	WK Mining (USA)	4/7/2011	NMC1043857	Esmeralda
Hasbrouck	HSB 374	WK Mining (USA)	4/7/2011	NMC1043858	Esmeralda
Hasbrouck	HSB 375	WK Mining (USA)	4/7/2011	NMC1043859	Esmeralda
Hasbrouck	HSB 376	WK Mining (USA)	4/7/2011	NMC1043860	Esmeralda
Hasbrouck	HSB 377	WK Mining (USA)	4/7/2011	NMC1043861	Esmeralda
Hasbrouck	HSB 378	WK Mining (USA)	4/7/2011	NMC1043862	Esmeralda
Hasbrouck	HSB 379	WK Mining (USA)	4/7/2011	NMC1043863	Esmeralda
Hasbrouck	HSB 380	WK Mining (USA)	4/8/2011	NMC1043864	Esmeralda
Hasbrouck	HSB 381	WK Mining (USA)	4/8/2011	NMC1043865	Esmeralda
Hasbrouck	HSB 382	WK Mining (USA)	4/8/2011	NMC1043866	Esmeralda
Hasbrouck	HSB 383	WK Mining (USA)	4/8/2011	NMC1043867	Esmeralda
Hasbrouck	HSB 384	WK Mining (USA)	4/8/2011	NMC1043868	Esmeralda
Hasbrouck	HSB 385	WK Mining (USA)	4/7/2011	NMC1043869	Esmeralda
Hasbrouck	HSB 386	WK Mining (USA)	4/7/2011	NMC1043870	Esmeralda
Hasbrouck	HSB 387	WK Mining (USA)	4/7/2011	NMC1043871	Esmeralda
Hasbrouck	HSB 388	WK Mining (USA)	4/7/2011	NMC1043872	Esmeralda
Hasbrouck	HSB 389	WK Mining (USA)	4/7/2011	NMC1043873	Esmeralda
Hasbrouck	HSB 390	WK Mining (USA)	4/7/2011	NMC1043874	Esmeralda
Hasbrouck	HSB 391	WK Mining (USA)	4/7/2011	NMC1043875	Esmeralda
Hasbrouck	HSB 392	WK Mining (USA)	4/7/2011	NMC1043876	Esmeralda
Hasbrouck	HSB 393	WK Mining (USA)	4/7/2011	NMC1043877	Esmeralda
Hasbrouck	HSB 394	WK Mining (USA)	4/7/2011	NMC1043878	Esmeralda
Hasbrouck	HSB 395	WK Mining (USA)	4/7/2011	NMC1043879	Esmeralda
Hasbrouck	HSB 396	WK Mining (USA)	4/7/2011	NMC1043880	Esmeralda
Hasbrouck	HSB 397	WK Mining (USA)	4/7/2011	NMC1043881	Esmeralda
Hasbrouck	HSB 398	WK Mining (USA)	4/7/2011	NMC1043882	Esmeralda
Hasbrouck	HSB 399	WK Mining (USA)	4/7/2011	NMC1043883	Esmeralda
Hasbrouck	HSB 400	WK Mining (USA)	4/7/2011	NMC1043884	Esmeralda
Hasbrouck	HSB 401	WK Mining (USA)	4/7/2011	NMC1043885	Esmeralda
Hasbrouck	HSB 402	WK Mining (USA)	4/7/2011	NMC1043886	Esmeralda
Hasbrouck	HSB 403	WK Mining (USA)	4/7/2011	NMC1043887	Esmeralda
Hasbrouck	HSB 404	WK Mining (USA)	4/7/2011	NMC1043888	Esmeralda
Hasbrouck	HSB 405	WK Mining (USA)	4/7/2011	NMC1043889	Esmeralda
Hasbrouck	HSB 406	WK Mining (USA)	4/7/2011	NMC1043890	Esmeralda
Hasbrouck	HSB 407	WK Mining (USA)	4/7/2011	NMC1043891	Esmeralda
Hasbrouck	HSB 408	WK Mining (USA)	4/7/2011	NMC1043892	Esmeralda
Hasbrouck	HSB 409	WK Mining (USA)	4/7/2011	NMC1043893	Esmeralda
Hasbrouck	HSB 410	WK Mining (USA)	4/7/2011	NMC1043894	Esmeralda

AREA	Claim Name	Claim Owner	Location Date	BLM Serial No.	Filing County
Hasbrouck	HSB 411	WK Mining (USA)	4/7/2011	NMC1043895	Esmeralda
Hasbrouck	HSB 412	WK Mining (USA)	4/7/2011	NMC1043896	Esmeralda
Hasbrouck	HSB 413	WK Mining (USA)	4/7/2011	NMC1043897	Esmeralda
Hasbrouck	HSB 414	WK Mining (USA)	4/7/2011	NMC1043898	Esmeralda
Hasbrouck	HSB 415	WK Mining (USA)	4/7/2011	NMC1043899	Esmeralda
Hasbrouck	HSB 416	WK Mining (USA)	4/7/2011	NMC1043900	Esmeralda
Hasbrouck	HSB 417	WK Mining (USA)	4/7/2011	NMC1043901	Esmeralda
Hasbrouck	HSB 418	WK Mining (USA)	4/7/2011	NMC1043902	Esmeralda
Hasbrouck	HSB 419	WK Mining (USA)	4/7/2011	NMC1043903	Esmeralda
Hasbrouck	HSB 420	WK Mining (USA)	4/7/2011	NMC1043904	Esmeralda
Hasbrouck	HSB 421	WK Mining (USA)	4/7/2011	NMC1043905	Esmeralda
Hasbrouck	HSB 422	WK Mining (USA)	4/7/2011	NMC1043906	Esmeralda
Hasbrouck	HSB 423	WK Mining (USA)	4/7/2011	NMC1043907	Esmeralda
Hasbrouck	HSB 424	WK Mining (USA)	4/7/2011	NMC1043908	Esmeralda
Hasbrouck	HSB 427	WK Mining (USA)	4/7/2011	NMC1043911	Esmeralda
Hasbrouck	HSB 428	WK Mining (USA)	4/7/2011	NMC1043912	Esmeralda
Hasbrouck	MLTDR	WK Mining (USA)	08/27/13	NMC 1094006	Esmeralda
Hasbrouck	MLTD1R	WK Mining (USA)	08/27/13	NMC 1094005	Esmeralda
Hasbrouck	NHD #1	WK Mining (USA)	08/13/87	NMC 429920	Esmeralda
Hasbrouck	NHD #3	WK Mining (USA)	08/14/87	NMC 429922	Esmeralda
Hasbrouck	NHD #5	WK Mining (USA)	08/14/87	NMC 429924	Esmeralda
Hasbrouck	NHD #6	WK Mining (USA)	08/14/87	NMC 429925	Esmeralda
Hasbrouck	NHD #10	WK Mining (USA)	08/14/87	NMC 429927	Esmeralda
Hasbrouck	NHD #18	WK Mining (USA)	08/14/87	NMC 429930	Esmeralda
Hasbrouck	NHD #28	WK Mining (USA)	08/14/87	NMC 429931	Esmeralda
Hasbrouck	NHD-7	WK Mining (USA)	01/05/88	NMC 461706	Esmeralda
Hasbrouck	NHD #8	WK Mining (USA)	01/05/88	NMC 461707	Esmeralda
Hasbrouck	NHD #12	WK Mining (USA)	01/05/88	NMC 461708	Esmeralda
Hasbrouck	NHD #132	WK Mining (USA)	11/12/87	NMC 461745	Esmeralda
Hasbrouck	NHD #173	WK Mining (USA)	11/14/87	NMC 461786	Esmeralda
Hasbrouck	NHD #174	WK Mining (USA)	11/14/87	NMC 461787	Esmeralda
Hasbrouck	NHD #175	WK Mining (USA)	11/14/87	NMC 461788	Esmeralda
Hasbrouck	NHD #176	WK Mining (USA)	11/17/87	NMC 461789	Esmeralda
Hasbrouck	NHD #178	WK Mining (USA)	11/15/87	NMC 461790	Esmeralda
Hasbrouck	NHD #179	WK Mining (USA)	11/15/87	NMC 461791	Esmeralda
Hasbrouck	NHD #190	WK Mining (USA)	11/17/87	NMC 461796	Esmeralda
Hasbrouck	NHD #191	WK Mining (USA)	11/17/87	NMC 461797	Esmeralda
Hasbrouck	NHD #192	WK Mining (USA)	11/17/87	NMC 461798	Esmeralda
Hasbrouck	NHD #193	WK Mining (USA)	11/17/87	NMC 461799	Esmeralda
Hasbrouck	NHD #194	WK Mining (USA)	11/17/87	NMC 461800	Esmeralda
Hasbrouck	NHD #195	WK Mining (USA)	11/15/87	NMC 461801	Esmeralda
Hasbrouck	NHD #196	WK Mining (USA)	11/15/87	NMC 461802	Esmeralda
Hasbrouck	NHD #197	WK Mining (USA)	11/15/87	NMC 461803	Esmeralda
Hasbrouck	NHD #198	WK Mining (USA)	11/15/87	NMC 461804	Esmeralda
Hasbrouck	NHD #199	WK Mining (USA)	11/15/87	NMC 461805	Esmeralda
Hasbrouck	NHD #200	WK Mining (USA)	11/17/87	NMC 461806	Esmeralda

AREA	Claim Name	Claim Owner	Location Date	BLM Serial No.	Filing County
Hasbrouck	NHD #203	WK Mining (USA)	11/16/87	NMC 461809	Esmeralda
Hasbrouck	NHD #204	WK Mining (USA)	11/16/87	NMC 461810	Esmeralda
Hasbrouck	NHD #206	WK Mining (USA)	01/05/88	NMC 461812	Esmeralda
Hasbrouck	NHD #207	WK Mining (USA)	01/05/88	NMC 461813	Esmeralda
Hasbrouck	NHD #212	WK Mining (USA)	01/07/88	NMC 461818	Esmeralda
Hasbrouck	New Little Butte	WK Mining (USA)	09/23/92	NMC 670365	Esmeralda
Hasbrouck	New Ltl Butte Frac	WK Mining (USA)	09/23/92	NMC 670366	Esmeralda
Hasbrouck	NHD 154M	WK Mining (USA)	05/09/95	NMC 718388	Esmeralda
Hasbrouck	NHD 155M	WK Mining (USA)	05/09/95	NMC 718389	Esmeralda
Hasbrouck	NHD 156M	WK Mining (USA)	05/09/95	NMC 718390	Esmeralda
Hasbrouck	NHD 157M	WK Mining (USA)	05/09/95	NMC 718391	Esmeralda
Hasbrouck	NHD 158M	WK Mining (USA)	05/09/95	NMC 718392	Esmeralda
Hasbrouck	NHD 159M	WK Mining (USA)	05/09/95	NMC 718393	Esmeralda
Hasbrouck	NHD 169M	WK Mining (USA)	05/09/95	NMC 718394	Esmeralda
Hasbrouck	NHD 171M	WK Mining (USA)	05/09/95	NMC 718395	Esmeralda
Hasbrouck	NHD 186M	WK Mining (USA)	05/09/95	NMC 718396	Esmeralda
Hasbrouck	NHD 187M	WK Mining (USA)	05/09/95	NMC 718397	Esmeralda
Hasbrouck	NHD 188M	WK Mining (USA)	05/09/95	NMC 718398	Esmeralda
Hasbrouck	NHD 189M	WK Mining (USA)	05/09/95	NMC 718399	Esmeralda
Hasbrouck	NHD #167J	WK Mining (USA)	10/28/95	NMC 730689	Esmeralda
Hasbrouck	TP 1	WK Mining (USA)	08/18/03	NMC 853864	Esmeralda
Hasbrouck	TP 2	WK Mining (USA)	08/18/03	NMC 853865	Esmeralda
Hasbrouck	FF 1	WK Mining (USA)	1/22/2011	NMC1041621	Esmeralda
Hasbrouck	FF 2	WK Mining (USA)	1/22/2011	NMC1041622	Esmeralda
Hasbrouck	FF 3	WK Mining (USA)	1/22/2011	NMC1041623	Esmeralda
Hasbrouck	FF 4	WK Mining (USA)	1/22/2011	NMC1041624	Esmeralda
Hasbrouck	FF 5	WK Mining (USA)	1/22/2011	NMC1041625	Esmeralda
Hasbrouck	FF 6	WK Mining (USA)	1/22/2011	NMC1041626	Esmeralda
Hasbrouck	FF 7	WK Mining (USA)	1/22/2011	NMC1041627	Esmeralda
Hasbrouck	FF 8	WK Mining (USA)	1/22/2011	NMC1041628	Esmeralda
Hasbrouck	FF 9	WK Mining (USA)	1/22/2011	NMC1041629	Esmeralda
Hasbrouck	FF 10	WK Mining (USA)	1/22/2011	NMC1041630	Esmeralda
Hasbrouck	FF 11	WK Mining (USA)	1/22/2011	NMC1041631	Esmeralda
Hasbrouck	FF 12	WK Mining (USA)	1/23/2011	NMC1041632	Esmeralda
Hasbrouck	FF 13	WK Mining (USA)	1/23/2011	NMC1041633	Esmeralda
Hasbrouck	FF 14	WK Mining (USA)	1/23/2011	NMC1041634	Esmeralda
Hasbrouck	FF 15	WK Mining (USA)	1/24/2011	NMC1041635	Esmeralda
Hasbrouck	FF 16	WK Mining (USA)	1/24/2011	NMC1041636	Esmeralda
Hasbrouck	FF 17	WK Mining (USA)	1/24/2011	NMC1041637	Esmeralda
Hasbrouck	FF 19	WK Mining (USA)	1/24/2011	NMC1041638	Esmeralda
Hasbrouck	FF 20	WK Mining (USA)	1/25/2011	NMC1041639	Esmeralda
Hasbrouck	FF 21	WK Mining (USA)	1/25/2011	NMC1041640	Esmeralda
Hasbrouck	FF 22	WK Mining (USA)	4/12/2011	NMC1041641	Esmeralda
Hasbrouck	HAS 1	WK Mining (USA)	6/6/2010	NMC 1026485	Esmeralda
Hasbrouck	HAS 2	WK Mining (USA)	6/6/2010	NMC 1026486	Esmeralda

AREA	Claim Name	Claim Owner	Location Date	BLM Serial No.	Filing County
Hasbrouck	HAS 3	WK Mining (USA)	6/6/2010	NMC 1026487	Esmeralda
Hasbrouck	HAS 4	WK Mining (USA)	6/6/2010	NMC 1026488	Esmeralda
Hasbrouck	HAS 5	WK Mining (USA)	6/6/2010	NMC 1026489	Esmeralda
Hasbrouck	HAS 6	WK Mining (USA)	6/6/2010	NMC 1026490	Esmeralda
Hasbrouck	HAS 7	WK Mining (USA)	6/6/2010	NMC 1026491	Esmeralda
Hasbrouck	HAS 8	WK Mining (USA)	6/6/2010	NMC 1026492	Esmeralda
Hasbrouck	HAS 9	WK Mining (USA)	6/6/2010	NMC 1026493	Esmeralda
Hasbrouck	HAS 10	WK Mining (USA)	6/6/2010	NMC 1026494	Esmeralda
Hasbrouck	HAS 11	WK Mining (USA)	6/6/2010	NMC 1026495	Esmeralda
Hasbrouck	HAS 12	WK Mining (USA)	6/6/2010	NMC 1026496	Esmeralda
Hasbrouck	HAS 13	WK Mining (USA)	6/6/2010	NMC 1026497	Esmeralda
Hasbrouck	HAS 14	WK Mining (USA)	6/6/2010	NMC 1026498	Esmeralda
Hasbrouck	HAS 15	WK Mining (USA)	6/6/2010	NMC 1026499	Esmeralda
Hasbrouck	HAS 16	WK Mining (USA)	6/6/2010	NMC 1026500	Esmeralda
Hasbrouck	HAS 17	WK Mining (USA)	6/6/2010	NMC 1026501	Esmeralda
Hasbrouck	HAS 18	WK Mining (USA)	6/6/2010	NMC 1026502	Esmeralda
Hasbrouck	HAS 19	WK Mining (USA)	6/6/2010	NMC 1026503	Esmeralda
Hasbrouck	HAS 20	WK Mining (USA)	6/6/2010	NMC 1026504	Esmeralda
Hasbrouck	HAS 21	WK Mining (USA)	6/6/2010	NMC 1026505	Esmeralda
Hasbrouck	HAS 22	WK Mining (USA)	6/6/2010	NMC 1026506	Esmeralda
Hasbrouck	HAS 23	WK Mining (USA)	6/6/2010	NMC 1026507	Esmeralda
Hasbrouck	HAS 24	WK Mining (USA)	6/6/2010	NMC 1026508	Esmeralda
Hasbrouck	HAS 25	WK Mining (USA)	6/6/2010	NMC 1026509	Esmeralda
Hasbrouck	HAS 26	WK Mining (USA)	6/6/2010	NMC 1026510	Esmeralda
Hasbrouck	HAS 27	WK Mining (USA)	6/6/2010	NMC 1026511	Esmeralda
Hasbrouck	HAS 28	WK Mining (USA)	6/6/2010	NMC 1026512	Esmeralda
Hasbrouck	HAS 29	WK Mining (USA)	6/6/2010	NMC 1026513	Esmeralda
Hasbrouck	HAS 30	WK Mining (USA)	6/6/2010	NMC 1026514	Esmeralda
Hasbrouck	HAS 31	WK Mining (USA)	6/6/2010	NMC 1026515	Esmeralda
Hasbrouck	HAS 32	WK Mining (USA)	6/6/2010	NMC 1026516	Esmeralda
Hasbrouck	HAS 33	WK Mining (USA)	6/6/2010	NMC 1026517	Esmeralda
Hasbrouck	HAS 34	WK Mining (USA)	6/6/2010	NMC 1026518	Esmeralda
Hasbrouck	HAS 35	WK Mining (USA)	6/6/2010	NMC 1026519	Esmeralda
Hasbrouck	HAS 36	WK Mining (USA)	6/6/2010	NMC 1026520	Esmeralda
Hasbrouck	HAS 37	WK Mining (USA)	6/6/2010	NMC 1026521	Esmeralda
Hasbrouck	HAS 38	WK Mining (USA)	6/6/2010	NMC 1026522	Esmeralda
Hasbrouck	HAS 39	WK Mining (USA)	6/6/2010	NMC 1026523	Esmeralda
Hasbrouck	HAS 40	WK Mining (USA)	6/6/2010	NMC 1026524	Esmeralda
Hasbrouck	HAS 41	WK Mining (USA)	6/6/2010	NMC 1026525	Esmeralda
Hasbrouck	HAS 42	WK Mining (USA)	6/6/2010	NMC 1026526	Esmeralda
Hasbrouck	HAS 43	WK Mining (USA)	6/6/2010	NMC 1026527	Esmeralda
Hasbrouck	HAS 44	WK Mining (USA)	6/6/2010	NMC 1026528	Esmeralda
Hasbrouck	HAS 45	WK Mining (USA)	6/6/2010	NMC 1026529	Esmeralda
Hasbrouck	HAS 46	WK Mining (USA)	6/6/2010	NMC 1026530	Esmeralda
Hasbrouck	HAS 47	WK Mining (USA)	6/6/2010	NMC 1026531	Esmeralda
Hasbrouck	HAS 48	WK Mining (USA)	6/6/2010	NMC 1026532	Esmeralda

AREA	Claim Name	Claim Owner	Location Date	BLM Serial No.	Filing County
Hasbrouck	HAS 49	WK Mining (USA)	6/6/2010	NMC 1026533	Esmeralda
Hasbrouck	HAS 50	WK Mining (USA)	6/6/2010	NMC 1026534	Esmeralda
Hasbrouck	HAS 51	WK Mining (USA)	6/6/2010	NMC 1026535	Esmeralda
Hasbrouck	HAS 52	WK Mining (USA)	6/6/2010	NMC 1026536	Esmeralda
Hasbrouck	HAS 53	WK Mining (USA)	6/6/2010	NMC 1026537	Esmeralda
Hasbrouck	HAS 54	WK Mining (USA)	6/6/2010	NMC 1026538	Esmeralda
Hasbrouck	HAS 55	WK Mining (USA)	6/6/2010	NMC 1026539	Esmeralda
Hasbrouck	HAS 56	WK Mining (USA)	6/6/2010	NMC 1026540	Esmeralda
Hasbrouck	HAS 57	WK Mining (USA)	6/6/2010	NMC 1026541	Esmeralda
Hasbrouck	HAS 58	WK Mining (USA)	6/6/2010	NMC 1026542	Esmeralda
Hasbrouck	HAS 59	WK Mining (USA)	6/6/2010	NMC 1026543	Esmeralda
Hasbrouck	HSR 2	WK Mining (USA)	7/21/2011	NMC 1054626	Esmeralda
Hasbrouck	HSR 3	WK Mining (USA)	7/21/2011	NMC 1054627	Esmeralda
Hasbrouck	HSR 15	WK Mining (USA)	7/20/2011	NMC 1054628	Esmeralda
Hasbrouck	HSR 28	WK Mining (USA)	7/21/2011	NMC 1054629	Esmeralda
Hasbrouck	HSR 29	WK Mining (USA)	7/21/2011	NMC 1054630	Esmeralda
Hasbrouck	HSR 37	WK Mining (USA)	7/21/2011	NMC 1054631	Esmeralda
Hasbrouck	HSR 38	WK Mining (USA)	7/21/2011	NMC 1054632	Esmeralda
Hasbrouck	HSR 39	WK Mining (USA)	7/21/2011	NMC 1054633	Esmeralda
Hasbrouck	HSR 44	WK Mining (USA)	7/21/2011	NMC 1054634	Esmeralda
Hasbrouck	HSR 45	WK Mining (USA)	7/21/2011	NMC 1054635	Esmeralda
Hasbrouck	HSR 46	WK Mining (USA)	7/21/2011	NMC 1054636	Esmeralda
Hasbrouck	HSR 47	WK Mining (USA)	7/21/2011	NMC 1054637	Esmeralda
Hasbrouck	HSR 48	WK Mining (USA)	7/21/2011	NMC 1054638	Esmeralda
Hasbrouck	HSR 49	WK Mining (USA)	7/21/2011	NMC 1054639	Esmeralda
Hasbrouck	HSR 50	WK Mining (USA)	7/21/2011	NMC 1054640	Esmeralda
Hasbrouck	HSR 51	WK Mining (USA)	7/21/2011	NMC 1054641	Esmeralda
Hasbrouck	HSR 52	WK Mining (USA)	7/21/2011	NMC 1054642	Esmeralda
Hasbrouck	HSR 53	WK Mining (USA)	7/21/2011	NMC 1054643	Esmeralda
Hasbrouck	HSR 54	WK Mining (USA)	7/21/2011	NMC 1054644	Esmeralda
Hasbrouck	HSR 55	WK Mining (USA)	7/21/2011	NMC 1054645	Esmeralda
Hasbrouck	HSR 195	WK Mining (USA)	7/21/2011	NMC 1054646	Esmeralda
Hasbrouck	HSR 299	WK Mining (USA)	7/21/2011	NMC 1054647	Esmeralda
Hasbrouck	HSR 300	WK Mining (USA)	7/21/2011	NMC 1054648	Esmeralda
Hasbrouck	HSR 301	WK Mining (USA)	7/21/2011	NMC 1054649	Esmeralda
Hasbrouck	HSR 302	WK Mining (USA)	7/21/2011	NMC 1054650	Esmeralda

Hasbrouck Patented Claims

AREA	Claim Name	Claim Owner	Patent No.	MS#	APN#
Hasbrouck	Eliza Jane	WK Mining (USA)	443624	4143	000-005-83
Hasbrouck	Polo	WK Mining (USA)	443624	4143	000-005-83
Hasbrouck	Desert King	WK Mining (USA)	443624	4143	000-005-83
Hasbrouck	Star of the East	WK Mining (USA)	443624	4143	000-005-83
Hasbrouck	Sierra Nevada	WK Mining (USA)	703972	4337	000-005-83
Hasbrouck	Lode	WK Mining (USA)	703972	4337	000-005-83

Hasbrouck	San Jose	WK Mining (USA)	703972	4337	000-005-83
Hasbrouck	Nonpareil No. 1	WK Mining (USA)	899381	4385	000-005-83
Hasbrouck	Nonpareil No. 2	WK Mining (USA)	899381	4385	000-005-83
Hasbrouck	Royal	WK Mining (USA)	818585	4386	000-005-83
Hasbrouck	Last Chance	WK Mining (USA)	828482	4416	000-005-83
Hasbrouck	Last Chance No. 1	WK Mining (USA)	828482	4416	000-005-83
Hasbrouck	Last Chance No. 2	WK Mining (USA)	828482	4416	000-005-83
Hasbrouck	Last Chance No. 3	WK Mining (USA)	828482	4416	000-005-83
Hasbrouck	Nonpareil No. 3	WK Mining (USA)	809601	4436	000-005-83
Hasbrouck	Nonpareil No. 4	WK Mining (USA)	809601	4436	000-005-83
Hasbrouck	Nonpareil No. 5	WK Mining (USA)	857954	4437	000-005-83
Hasbrouck	Nonpareil No. 6	WK Mining (USA)	857954	4437	000-000-50
Hasbrouck	Nonpareil No. 7	WK Mining (USA)	857954	4437	000-000-50
Hasbrouck	Nonpareil No. 8	WK Mining (USA)	857954	4437	000-000-50
Hasbrouck	Nonpareil No. 9	WK Mining (USA)	857951	4437	000-003-38
Hasbrouck	Nonpareil No. 10	WK Mining (USA)	857951	4437	000-003-38
Hasbrouck	Nonpareil No. 11	WK Mining (USA)	857951	4437	000-003-38
Hasbrouck	Silver King	WK Mining (USA)	891082	4387	000-002-89
Hasbrouck	Silver King No.1	WK Mining (USA)	891082	4387	000-002-89
Hasbrouck	TFG	WK Mining (USA)	819102	4428	000-002-85 000-001-39
Hasbrouck	TFG1	WK Mining (USA)	819102	4428	000-002-85
Hasbrouck	TFG2	WK Mining (USA)	819102	4428	000-002-85

Three Hills Unpatented Claims

AREA	Claim Name	Claim Owner	Location Date	BLM Serial No.	Filing County
Three Hills	Three Hills #1	WK Mining (USA)	02/14/74	NMC 82240	Esmeralda
Three Hills	Three Hills #2	WK Mining (USA)	02/14/74	NMC 82241	Esmeralda
Three Hills	Three Hills #3	WK Mining (USA)	02/14/74	NMC 82242	Esmeralda
Three Hills	Three Hills #4	WK Mining (USA)	02/14/74	NMC 82243	Esmeralda
Three Hills	Three Hills #5	WK Mining (USA)	02/14/74	NMC 82244	Esmeralda
Three Hills	Three Hills #6	WK Mining (USA)	02/14/74	NMC 82245	Esmeralda
Three Hills	Three Hills #7	WK Mining (USA)	02/14/74	NMC 82246	Esmeralda
Three Hills	ABA #15	WK Mining (USA)	12/15/75	NMC 82247	Esmeralda
Three Hills	ABA #16	WK Mining (USA)	12/15/75	NMC 82248	Esmeralda
Three Hills	ABA #17	WK Mining (USA)	12/15/75	NMC 82249	Esmeralda
Three Hills	ABA #18	WK Mining (USA)	12/15/75	NMC 82250	Esmeralda
Three Hills	ABA #19	WK Mining (USA)	12/15/75	NMC 82251	Esmeralda
Three Hills	ABA #24	WK Mining (USA)	12/15/75	NMC 82252	Esmeralda
Three Hills	ABA #25	WK Mining (USA)	12/15/75	NMC 82253	Esmeralda
Three Hills	ABA #26	WK Mining (USA)	12/15/75	NMC 82254	Esmeralda
Three Hills	TH 1	WK Mining (USA)	4/16/2012	NMC1072691	Esmeralda
Three Hills	TH 2	WK Mining (USA)	4/16/2012	NMC1072692	Esmeralda
Three Hills	TH 3	WK Mining (USA)	4/16/2012	NMC1072693	Esmeralda
Three Hills	TH 4	WK Mining (USA)	4/16/2012	NMC1072694	Esmeralda
Three Hills	TH 5	WK Mining (USA)	4/16/2012	NMC1072695	Esmeralda
Three Hills	TH 6	WK Mining (USA)	4/16/2012	NMC1072696	Esmeralda
Three Hills	TH 7	WK Mining (USA)	4/16/2012	NMC1072697	Esmeralda
Three Hills	TH 8	WK Mining (USA)	4/16/2012	NMC1072698	Esmeralda
Three Hills	TH 9	WK Mining (USA)	4/16/2012	NMC1072699	Esmeralda
Three Hills	TH 10	WK Mining (USA)	4/16/2012	NMC1072700	Esmeralda
Three Hills	TH 11	WK Mining (USA)	4/16/2012	NMC1072701	Esmeralda
Three Hills	TH 12	WK Mining (USA)	4/16/2012	NMC1072702	Esmeralda
Three Hills	TH 13	WK Mining (USA)	4/16/2012	NMC1072703	Esmeralda
Three Hills	TH 14	WK Mining (USA)	4/16/2012	NMC1072704	Esmeralda
Three Hills	TH 15	WK Mining (USA)	4/16/2012	NMC1072705	Esmeralda
Three Hills	TH 16	WK Mining (USA)	4/16/2012	NMC1072706	Esmeralda
Three Hills	TH 17	WK Mining (USA)	4/16/2012	NMC1072707	Esmeralda
Three Hills	TH 18	WK Mining (USA)	4/16/2012	NMC1072708	Esmeralda
Three Hills	TH 19	WK Mining (USA)	4/16/2012	NMC1072709	Esmeralda
Three Hills	TH 20	WK Mining (USA)	4/16/2012	NMC1072710	Esmeralda
Three Hills	TH 21	WK Mining (USA)	4/16/2012	NMC1072711	Esmeralda
Three Hills	TH 22	WK Mining (USA)	4/16/2012	NMC1072712	Esmeralda
Three Hills	TH 23	WK Mining (USA)	4/16/2012	NMC1072713	Esmeralda
Three Hills	TH 24	WK Mining (USA)	4/16/2012	NMC1072714	Esmeralda
Three Hills	TH 25	WK Mining (USA)	4/16/2012	NMC1072715	Esmeralda
Three Hills	TH 26	WK Mining (USA)	4/16/2012	NMC1072716	Esmeralda
Three Hills	TH 27	WK Mining (USA)	4/16/2012	NMC1072717	Esmeralda
Three Hills	TH 28	WK Mining (USA)	4/16/2012	NMC1072718	Esmeralda
Three Hills	TH 29	WK Mining (USA)	4/16/2012	NMC1072719	Esmeralda

Three Hills	TH 30	WK Mining (USA)	4/16/2012	NMC1072720	Esmeralda
Three Hills	TH 31	WK Mining (USA)	4/17/2012	NMC1072721	Esmeralda
Three Hills	TH 32	WK Mining (USA)	4/17/2012	NMC1072722	Esmeralda
Three Hills	TH 33	WK Mining (USA)	4/17/2012	NMC1072723	Esmeralda
Three Hills	TH 34	WK Mining (USA)	4/17/2012	NMC1072724	Esmeralda
Three Hills	TH 35	WK Mining (USA)	4/17/2012	NMC1072725	Esmeralda
Three Hills	TH 36	WK Mining (USA)	4/17/2012	NMC1072726	Esmeralda
Three Hills	TH 37	WK Mining (USA)	4/17/2012	NMC1072727	Esmeralda
Three Hills	TH 38	WK Mining (USA)	4/17/2012	NMC1072728	Esmeralda
Three Hills	TH 39	WK Mining (USA)	4/17/2012	NMC1072729	Esmeralda
Three Hills	TH 40	WK Mining (USA)	4/17/2012	NMC1072730	Esmeralda
Three Hills	TH 41	WK Mining (USA)	4/17/2012	NMC1072731	Esmeralda
Three Hills	TH 42	WK Mining (USA)	4/17/2012	NMC1072732	Esmeralda
Three Hills	TH 43	WK Mining (USA)	4/17/2012	NMC1072733	Esmeralda
Three Hills	TH 44	WK Mining (USA)	4/17/2012	NMC1072734	Nye and Esmeralda
Three Hills	TH 45	WK Mining (USA)	4/17/2012	NMC1072735	Esmeralda
Three Hills	TH 46	WK Mining (USA)	4/17/2012	NMC1072736	Nye and Esmeralda
Three Hills	TH 47	WK Mining (USA)	4/17/2012	NMC1072737	Esmeralda
Three Hills	TH 48	WK Mining (USA)	4/17/2012	NMC1072738	Nye and Esmeralda
Three Hills	TH 49	WK Mining (USA)	4/17/2012	NMC1072739	Esmeralda
Three Hills	TH 50	WK Mining (USA)	4/17/2012	NMC1072740	Nye and Esmeralda
Three Hills	TH 51	WK Mining (USA)	4/17/2012	NMC1072741	Esmeralda
Three Hills	TH 52	WK Mining (USA)	4/17/2012	NMC1072742	Nye and Esmeralda
Three Hills	TH 53	WK Mining (USA)	4/17/2012	NMC1072743	Esmeralda
Three Hills	TH 54	WK Mining (USA)	4/17/2012	NMC1072744	Nye and Esmeralda
Three Hills	TH 55	WK Mining (USA)	4/17/2012	NMC1072745	Esmeralda
Three Hills	TH 56	WK Mining (USA)	4/17/2012	NMC1072746	Nye and Esmeralda
Three Hills	TH 57	WK Mining (USA)	4/17/2012	NMC1072747	Esmeralda
Three Hills	TH 58	WK Mining (USA)	4/17/2012	NMC1072748	Nye and Esmeralda
Three Hills	TH 59	WK Mining (USA)	4/17/2012	NMC1072749	Esmeralda
Three Hills	TH 60	WK Mining (USA)	4/17/2012	NMC1072750	Nye and Esmeralda
Three Hills	TH 61	WK Mining (USA)	4/17/2012	NMC1072751	Nye and Esmeralda
Three Hills	TH 61A	WK Mining (USA)	3/22/2013	NMC1089460	Esmeralda
Three Hills	TH 62	WK Mining (USA)	3/22/2013	NMC1089461	Esmeralda
Three Hills	TH 63	WK Mining (USA)	3/22/2013	NMC1089462	Esmeralda
Three Hills	TH 64	WK Mining (USA)	3/22/2013	NMC1089463	Esmeralda
Three Hills	TH 65	WK Mining (USA)	3/22/2013	NMC1089464	Esmeralda
Three Hills	TH 66	WK Mining (USA)	3/22/2013	NMC1089465	Esmeralda
Three Hills	TH 67	WK Mining (USA)	3/22/2013	NMC1089466	Esmeralda
Three Hills	TH 68	WK Mining (USA)	3/22/2013	NMC1089467	Esmeralda
Three Hills	TH 69	WK Mining (USA)	3/22/2013	NMC1089468	Esmeralda
Three Hills	TH 70	WK Mining (USA)	3/22/2013	NMC1089469	Esmeralda
Three Hills	TH 71	WK Mining (USA)	3/22/2013	NMC1089470	Esmeralda
Three Hills	TH 72	WK Mining (USA)	3/22/2013	NMC1089471	Esmeralda
Three Hills	TH 73	WK Mining (USA)	3/22/2013	NMC1089472	Esmeralda
Three Hills	TH 74	WK Mining (USA)	3/22/2013	NMC1089473	Esmeralda
Three Hills	TH 75	WK Mining (USA)	3/22/2013	NMC1089474	Esmeralda
Three Hills	TH 76	WK Mining (USA)	3/22/2013	NMC1089475	Esmeralda

Three Hills	TH 77	WK Mining (USA)	3/22/2013	NMC1089476	Esmeralda
Three Hills	TH 78	WK Mining (USA)	3/22/2013	NMC1089477	Esmeralda
Three Hills	TH 79	WK Mining (USA)	3/22/2013	NMC1089478	Esmeralda
Three Hills	TH 80	WK Mining (USA)	3/22/2013	NMC1089479	Esmeralda
Three Hills	TH 81	WK Mining (USA)	3/22/2013	NMC1089480	Esmeralda
Three Hills	TH 82	WK Mining (USA)	3/22/2013	NMC1089481	Esmeralda
Three Hills	TH 83	WK Mining (USA)	3/22/2013	NMC1089482	Esmeralda
Three Hills	TH 84	WK Mining (USA)	3/22/2013	NMC1089483	Esmeralda

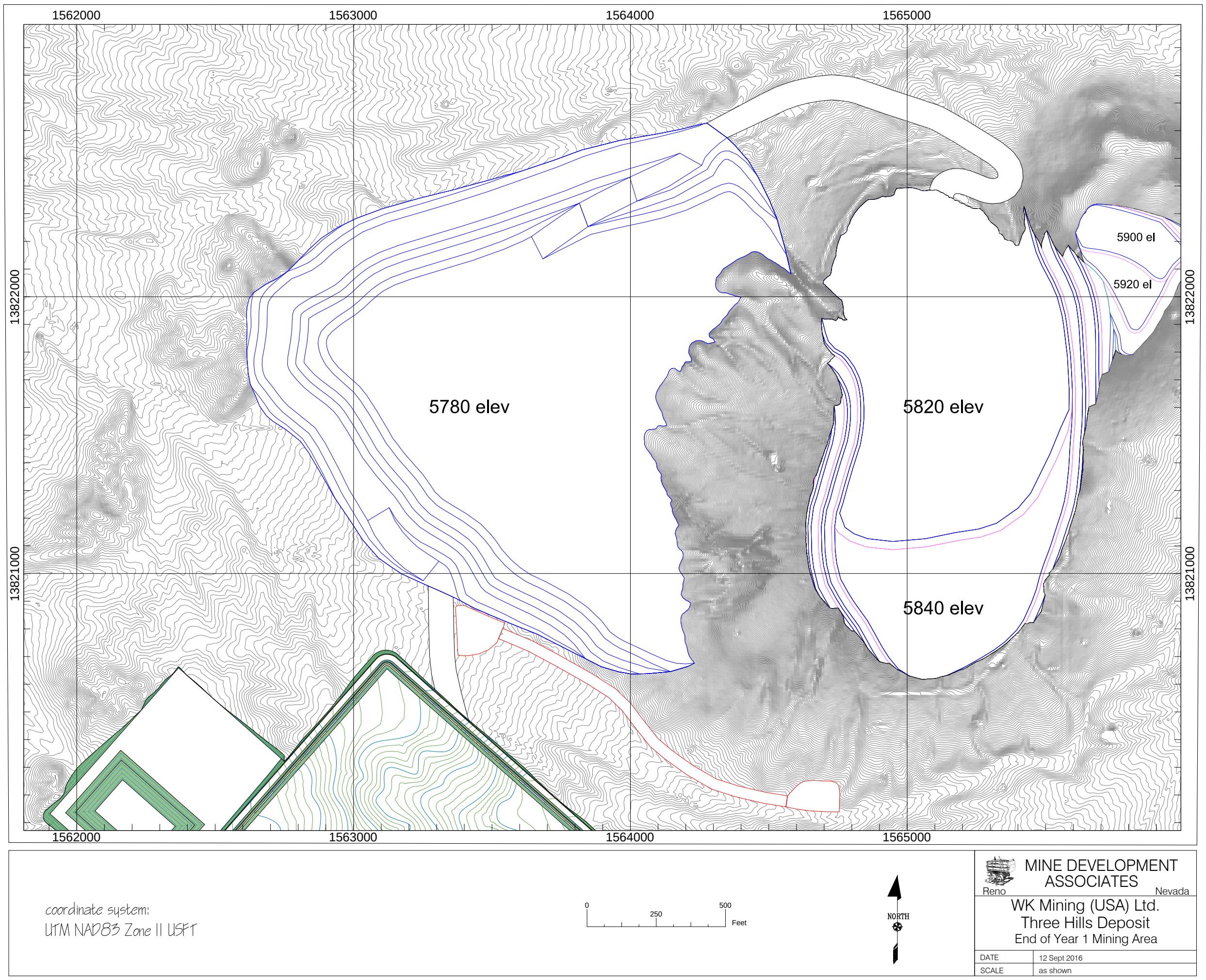
Three Hills Patented Claims

AREA	Claim Name	Claim Owner	Patent No.	MS#	APN#
Three Hills	Uranus	WK Mining (USA)	277076	3898	000-005-86
Three Hills	Jupiter	WK Mining (USA)	277076	3898	000-006-98
Three Hills	Ruby No. 3	WK Mining (USA)	848685	4463	000-001-02
Three Hills	Ruby No. 4	WK Mining (USA)	848685	4463	000-000-37
Three Hills	Ruby No. 5	WK Mining (USA)	848685	4463	000-000-58
Three Hills	Saturn	WK Mining (USA)	277076	3898	000-003-17
Three Hills	Rex	Eastfield Resources (USA)	654427, 848685	Eastfield Option	A Portion of 000-005-77
Three Hills	Ruby	Eastfield Resources (USA)	848685	Eastfield Option	A Portion of 000-005-77
Three Hills	Ruby 2	Eastfield Resources (USA)	848685	Eastfield Option	A Portion of 000-005-77
Three Hills	Great Western	Eastfield Resources (USA)	848685	Eastfield Option	A Portion of 000-005-77
Three Hills	Mars	Eastfield Resources (USA)	277076	Eastfield Option	A Portion of 000-005-77
Three Hills	Moon	Eastfield Resources (USA)	277076	Eastfield Option	A Portion of 000-005-77
Three Hills	Venus	Eastfield Resources (USA)	277076	Eastfield Option	A Portion of 000-005-77

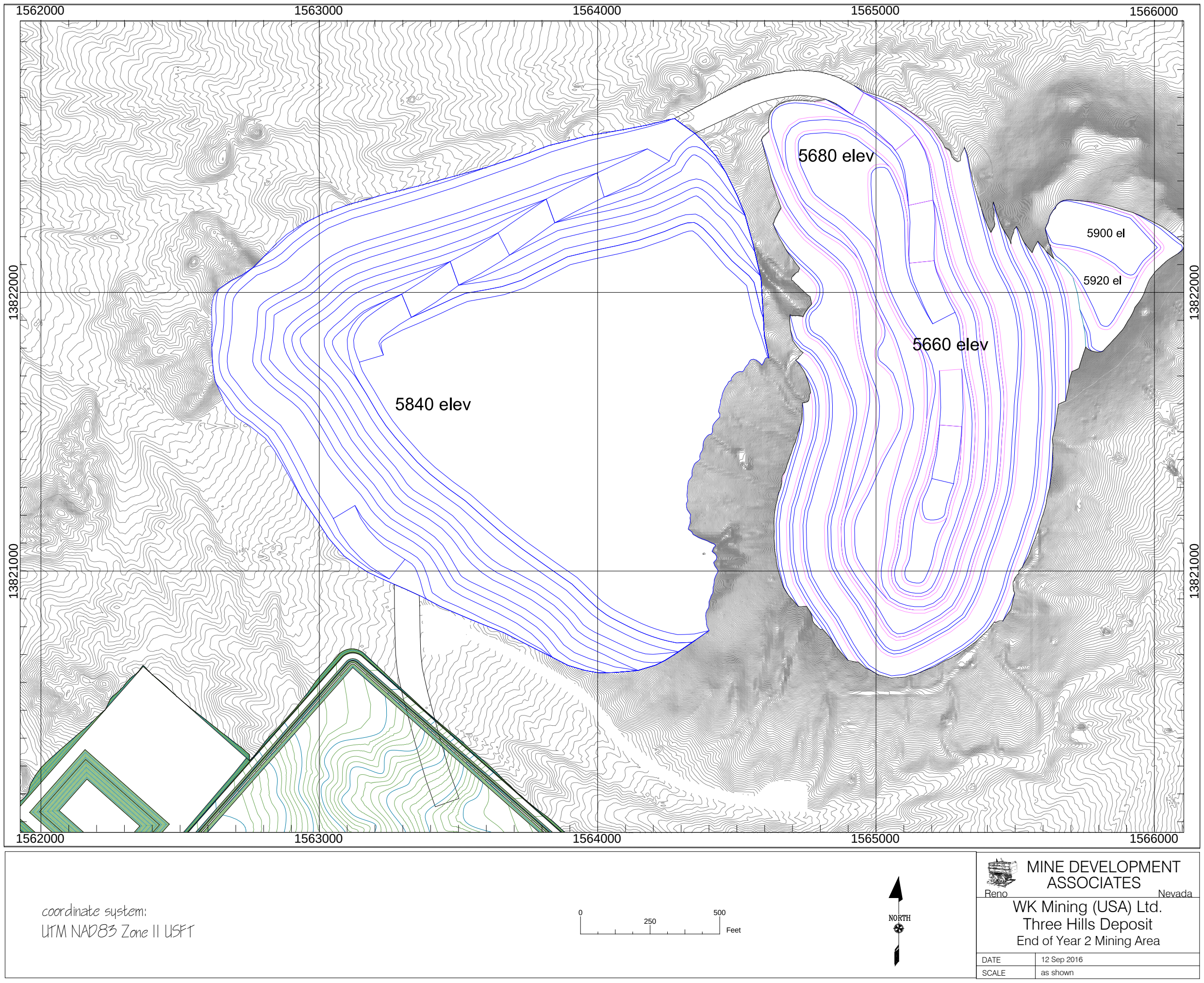
APPENDIX B

Three Hills Mine End of Year Pits and Dumps

Three Hills Mine: End of Year 1



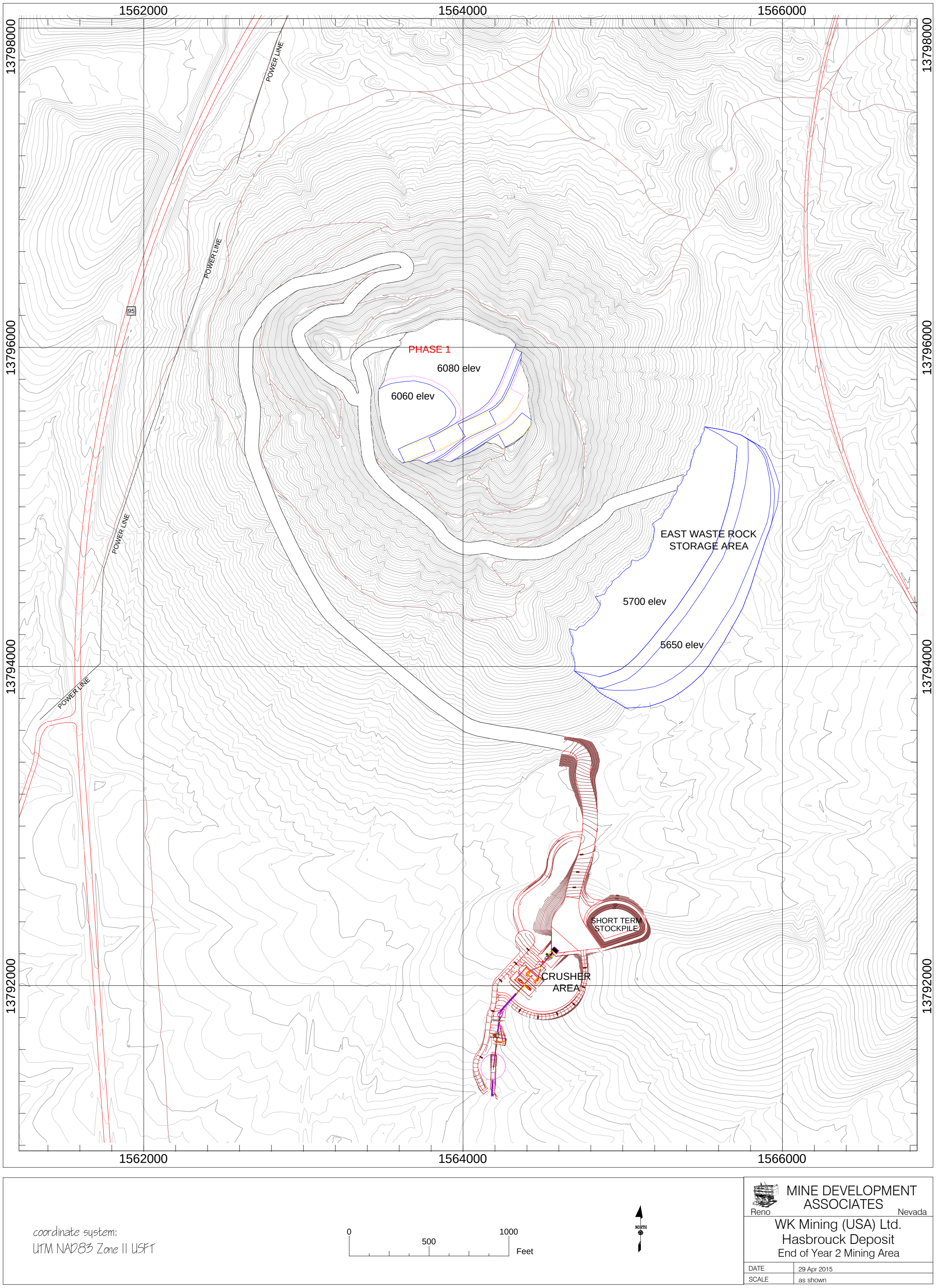
Three Hills Mine: End of Year 2



APPENDIX C

Hasbrouck Mine End of Year Pits and Dumps

Hasbrouck Mine: End of Year 2

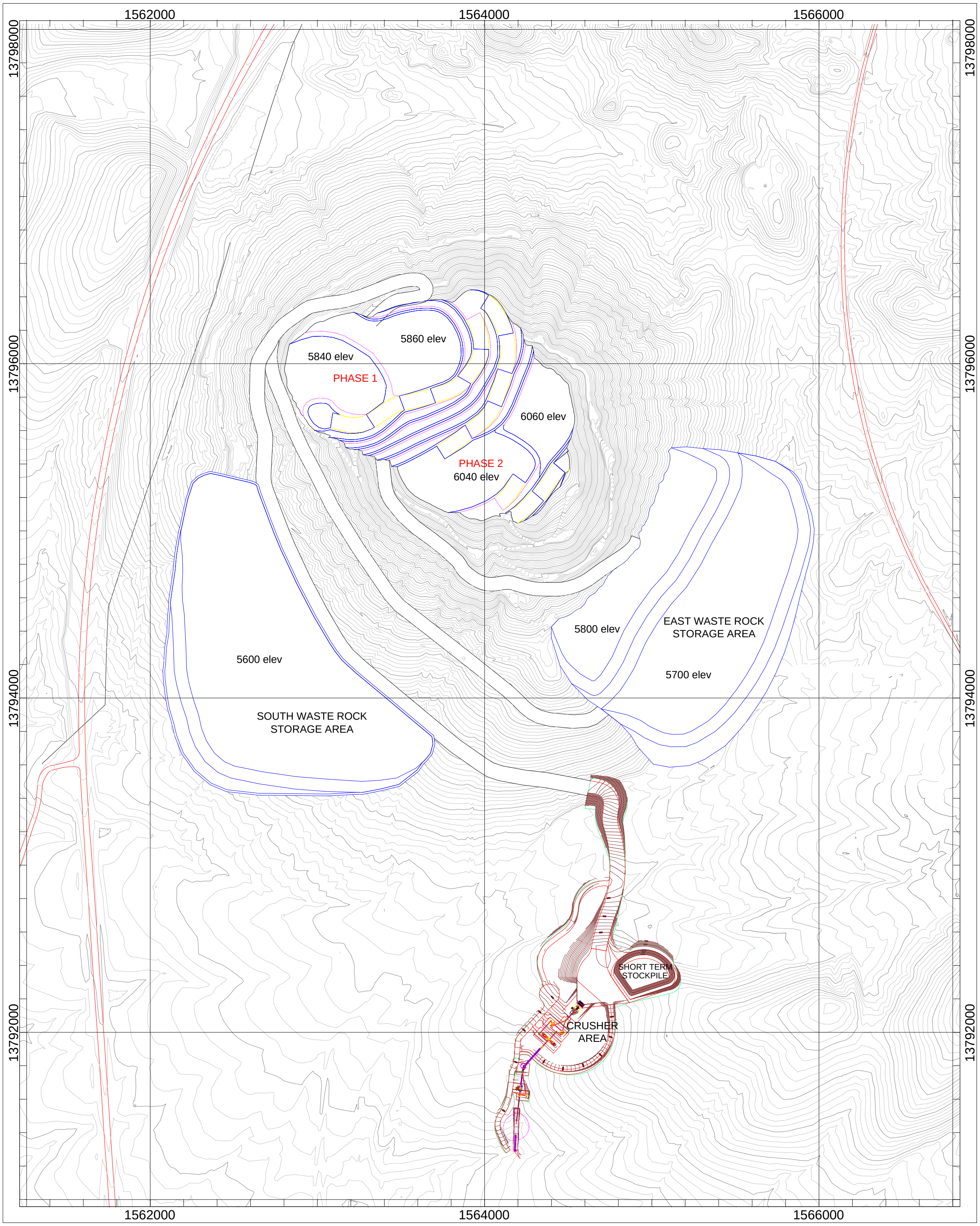


MINE DEVELOPMENT ASSOCIATES
Reno Nevada

WK Mining (USA) Ltd.
Hasbrouck Deposit
End of Year 2 Mining Area

DATE	29 Apr 2015
SCALE	as shown

Hasbrouck Mine: End of Year 3



coordinate system:
UTM NAD83 Zone 11 USFT

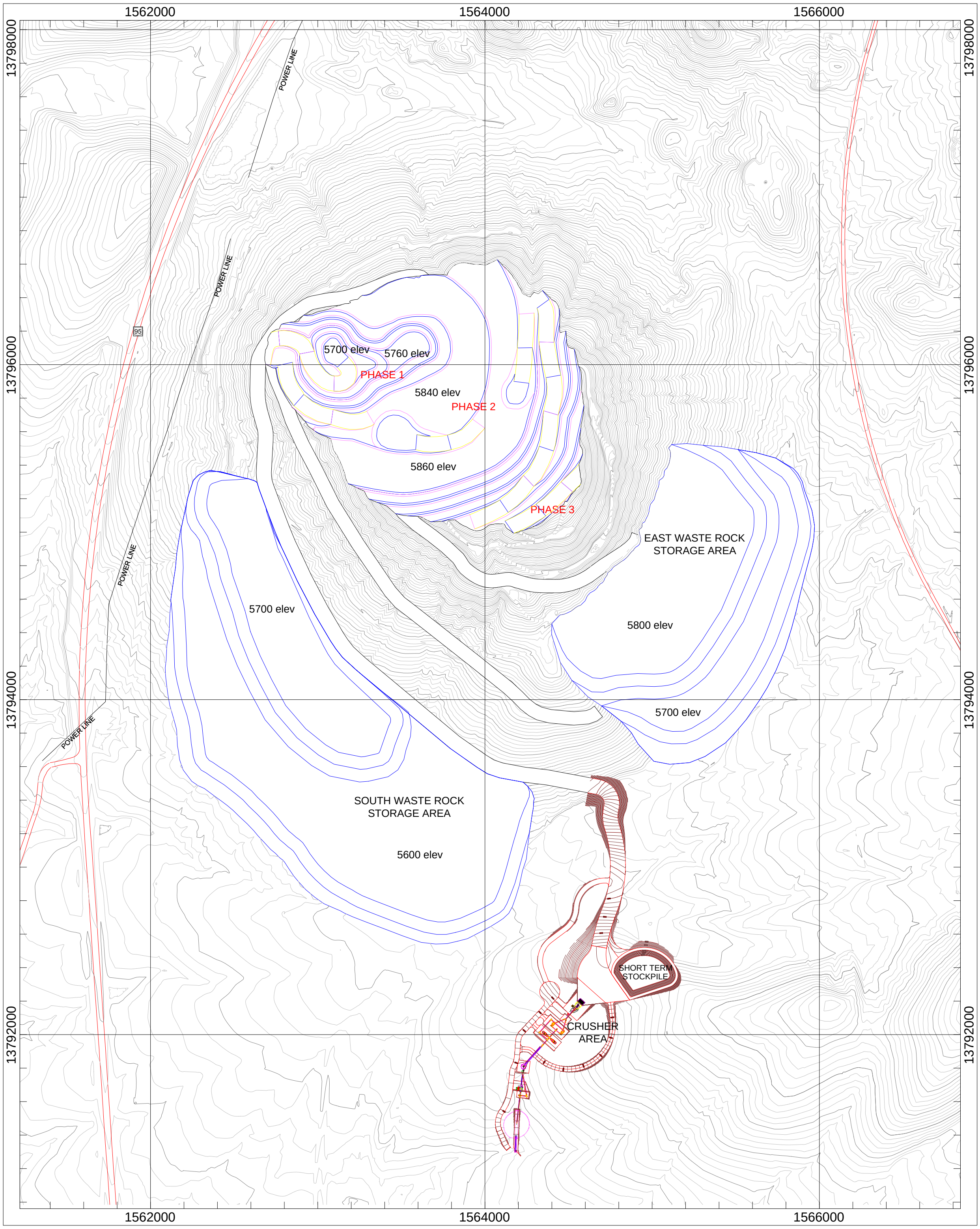
0 500 1000
Feet

MINE DEVELOPMENT ASSOCIATES
Reno Nevada

WK Mining (USA) Ltd.
Hasbrouck Deposit
End of Year 3 Mining Area

DATE	17 Apr 2015
SCALE	as shown

Hasbrouck Mine: End of Year 4



coordinate system:
UTM NAD83 Zone 11 USFT

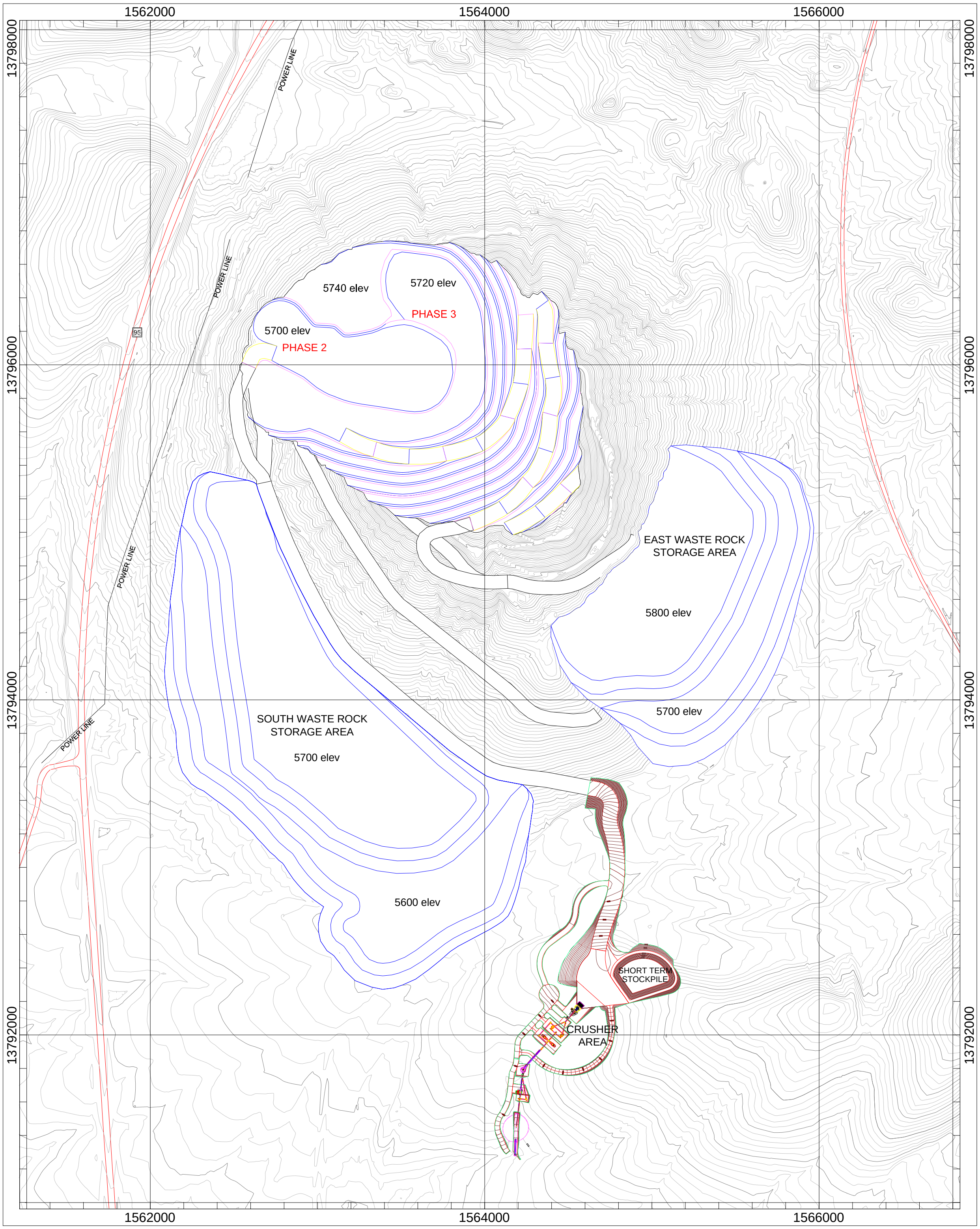
0 500 1000 Feet

MINE DEVELOPMENT ASSOCIATES
Reno Nevada

WK Mining (USA) Ltd.
Hasbrouck Deposit
End of Year 4 Mining Area

DATE	29 Apr 2015
SCALE	as shown

Hasbrouck Mine: End of Year 5



coordinate system:
UTM NAD83 Zone 11 USFT

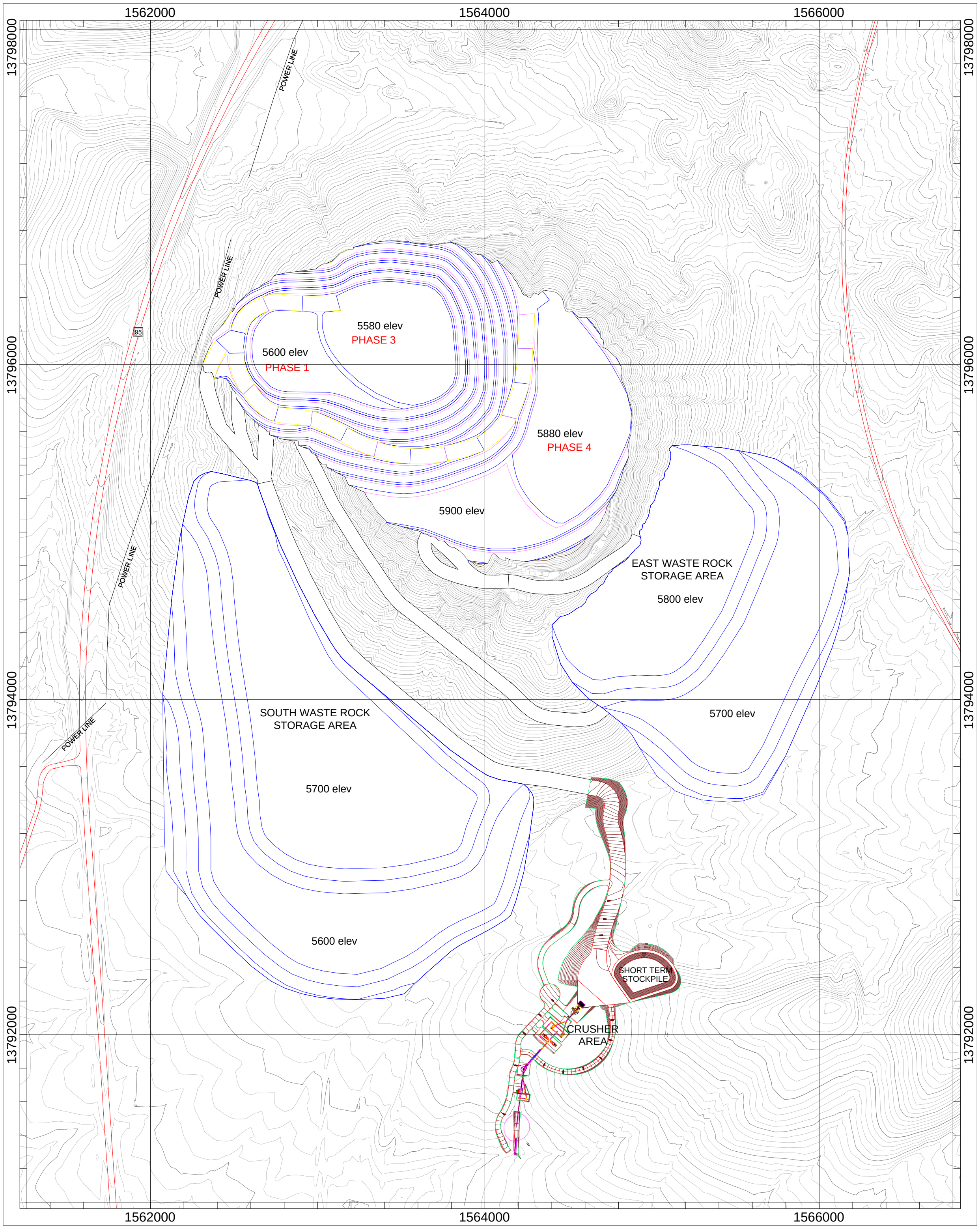
0 500 1000
Feet

MINE DEVELOPMENT ASSOCIATES
Reno Nevada

WK Mining (USA) Ltd.
Hasbrouck Deposit
End of Year 5 Mining Area

DATE	24 Apr 2015
SCALE	as shown

Hasbrouck Mine: End of Year 6



coordinate system:
UTM NAD83 Zone 11 USFT

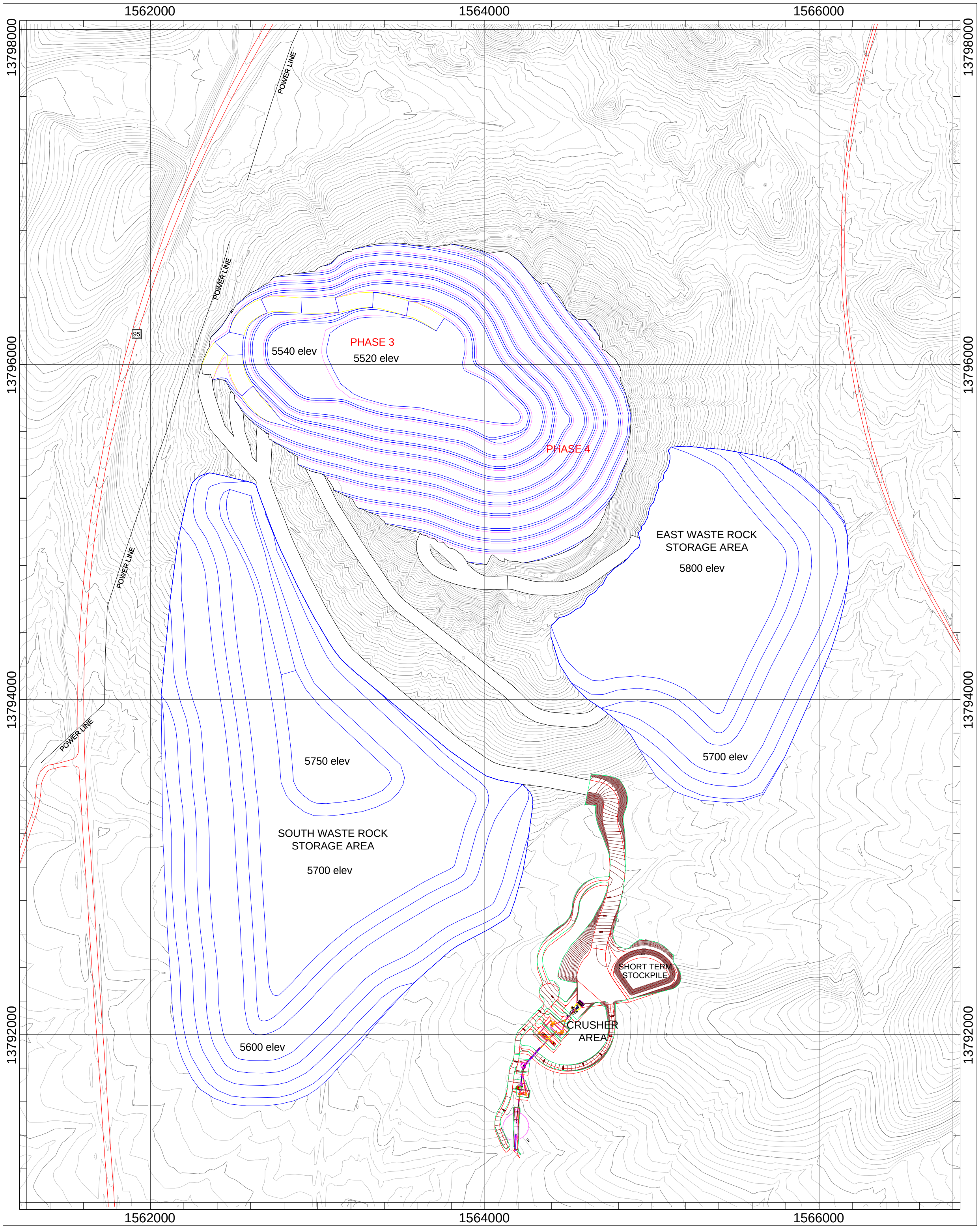
0 500 1000
Feet

MINE DEVELOPMENT ASSOCIATES
Reno Nevada

WK Mining (USA) Ltd.
Hasbrouck Deposit
End of Year 6 Mining Area

DATE	24 Apr 2015
SCALE	as shown

Hasbrouck Mine: End of Year 7



coordinate system:
UTM NAD83 Zone 11 USFT

0 500 1000 Feet

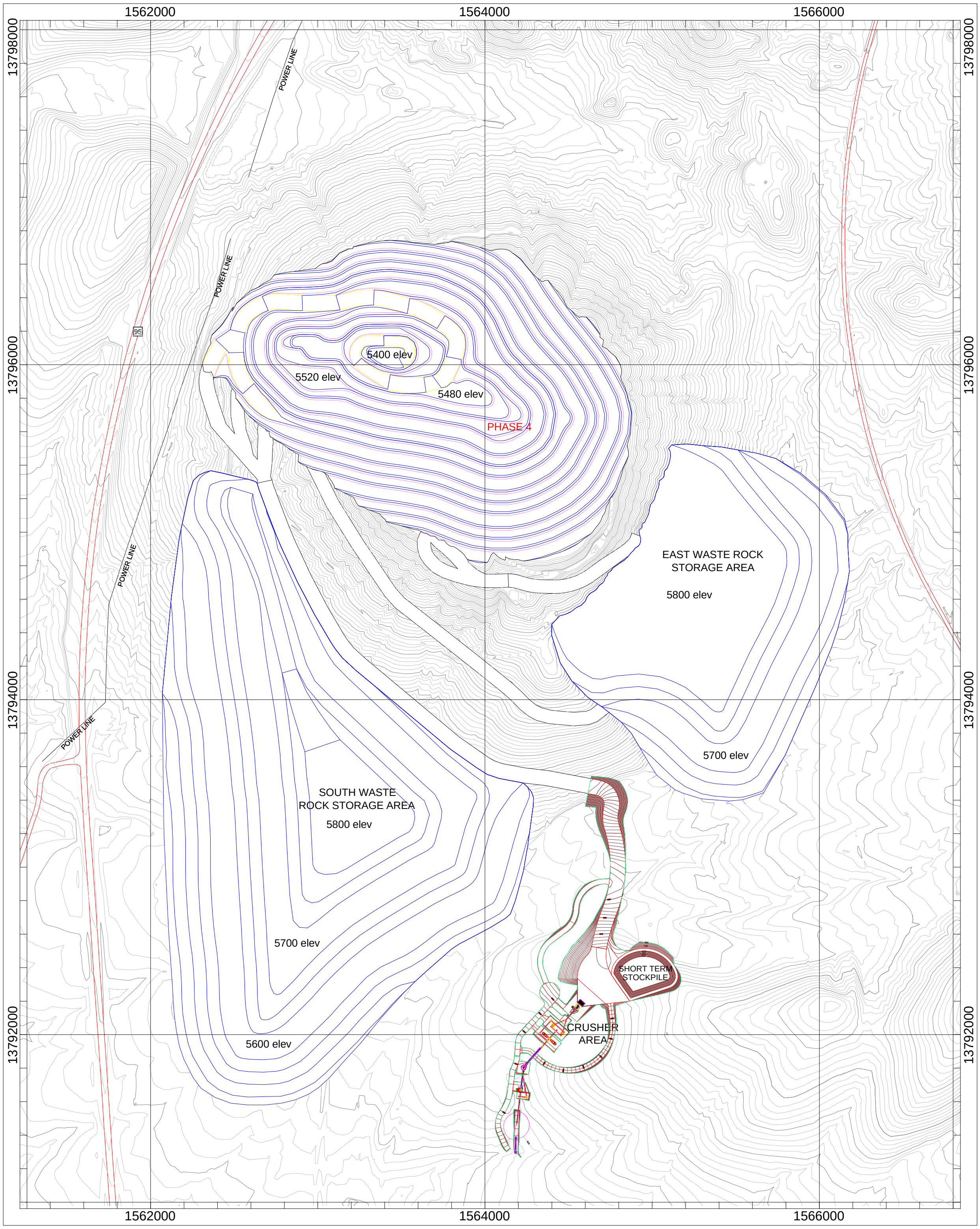
NORTH

MINE DEVELOPMENT ASSOCIATES
Reno Nevada

WK Mining (USA) Ltd.
Hasbrouck Deposit
End of Year 7 Mining Area

DATE	24 Apr 2015
SCALE	as shown

Hasbrouck Mine: End of Year 8



coordinate system:
UTM NAD83 Zone 11 USFT

0 500 1000
Feet

MINE DEVELOPMENT ASSOCIATES
Reno Nevada

WK Mining (USA) Ltd.
Hasbrouck Deposit
End of Year 8 Mining Area

DATE	24 Apr 2015
SCALE	as shown