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Revision 1

South Railroad Project

Form 43-101F1 Technical Report
Feasibility Study

Elko County, Nevada

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DATE AND SIGNATURES PAGE

The effective date of this Technical Report is February 23, 2022. The issue date of this Technical Report is March 14, 2022.

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SOUTH RAILROAD PROJECT
FORM 43-101F1 TECHNICAL REPORT

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1 SUMMARY

This Technical Report ("Technical Report") has been prepared by M3 Engineering and Technology Corporation ("M3") with Gold Standard Ventures Corp. ("Gold Standard" or "GSV") in accordance with the National Instrument 43-101F1 Standards of Disclosures for Mineral Projects ("NI 43-101"). The Technical Report presents the results of the South Railroad feasibility study ("FS"), incorporating new design-work, scheduling, and projected costs, in support of mineral resource and mineral reserve estimates in the Dark Star and Pinion gold deposits.

Gold Standard's Railroad Pinion property is located in the Bullion mining district of the southern Carlin trend in Nevada. The property has two adjacent parts, the North Railroad portion ("North Railroad"), which includes POD, Sweet Hollow, South Lodes and North Bullion (collectively called the North Bullion deposits, or the North Bullion area), and the South Railroad portion ("South Railroad"), which includes Dark Star, Pinion, and Jasperoid Wash.

Gold Standard has drilled, or received assays, for 127 new holes since the effective dates of the databases for the respective deposits on the Railroad-Pinion property. In many cases, assay results were delayed significantly past the effective dates due to the COVID-19 pandemic. That drilling was primarily focused on obtaining metallurgy samples, generating geotechnical data, construction of water and monitor wells, infilling within modeled areas, or for exploration of secondary targets. The new drilling in the Dark Star, Pinion, North Bullion and Jasperoid Wash areas were evaluated with respect to the resource models and it was determined there would be minimal to no impact on estimated volumes and grades as reported within optimized pits in this Technical Report.

Extensive metallurgical testing has been completed for the Dark Star and Pinion deposits. On the other hand, the North Railroad portion of the property has not been tested comprehensively for metallurgical response.

Gold Standard reports mineral reserves for Dark Star and Pinion deposits in this Technical Report. The FS, which includes the mine schedule, process-plant design, and financial analysis, covers only these two deposits.

The proposed project is an open-pit gold mine operation that will deliver ore to a 71.9 million-ton heap leach facility over 8 years of mine life. The heap leach facility will treat Run-of-Mine (ROM) ore via leaching on a dedicated leach pad with cyanide-bearing solution.

Gold Standard selected M3 and other third-party consultants to prepare mineral resource/reserve estimates, mine plans, process plant design, and to complete environmental studies and cost estimates used for this Technical Report. All consultants have the capability to support the project, as required and within the confines of their expertise, from feasibility study to full operation.

1.1 PRINCIPAL FINDINGS

The key project parameters and findings are presented in Table 1-1, including a summary of the project size, productions, capital and operating costs, metal prices, and financial indicators.

Table 1-1: Key Project Data

Mine Life	8 Years + pre-strip (6 months)
Mine Type	Open Pit
Process Description	ROM heap leach Gold/silver recovery by ADR plant & Refinery, dual carbon column trains
Total Mineral Reserve Estimate	71.9 M Tons
Average Grade	0.022 oz Au/ton; 0.154 oz Ag/ton (Pinion – Representing 39.7 M tons of ore)
Contained Gold / Silver Ounces	1.604 M oz Au; 6.137 M oz Ag (Pinion)
Average Recovery	ROM: 64.5% Au, 10.8% Ag
Average Annual Tons Moved	44 Million Tons
Annual Mineral Reserve Estimate	8.8 Million Tons

Strip Ratio	4.10:1
Process (ROM) Throughput (tons/day)	32,700 (Design); 24,700 (Average)
Initial Capital Expenditures	$190.2 M
Sustaining Capital Expenditures	$186.7 M

Payable Metals	
Gold, oz	1,030,000
Silver, oz	651,000

Unit Operating Costs	
Average Life of Mine ("LOM") Mining Costs	$1.68 / ton mined
Average LOM Processing Costs	$2.05 / ore ton
G & A	$0.53 / ore ton
Refining	$0.07 / ore ton
Cash Costs	$794 / oz Au
Cash Costs After By-Product Credit	$792 / oz Au
All in Sustaining Costs ("AISC")	$1,021 / oz Au

Financial Indicators	Spot Price (Au) (Feb 22, 2022)	Base +150	**Base Case**	Base -150	Base -250
Gold Price (per troy oz)	$1,899	$1,800	**$1,650**	$1,500	$1,400
Silver Price (per troy oz)	$21.50	$21.50	**$21.50**	$21.50	$21.50
Pre-tax Cash Flow, $M	$753.9	$651.9	**$497.3**	$342.8	$239.8
Pre-tax NPV (5%) in $M	$603.0	$517.9	**$388.9**	$259.9	$173.9
Pre-tax Internal Rate of Return (IRR)	68.2%	60.8%	**49.2%**	36.5%	27.2%
Pre-tax Payback (Years)	1.6	1.7	**1.9**	2.1	2.4
After-tax Cash Flow, $M	$606.3	$526.1	**$403.2**	$280.9	$199.0
After-tax NPV (5%) in $M	$486.4	$418.7	**$314.8**	$211.2	$141.6
After-tax IRR	62.1%	55.3%	**44.3%**	32.6%	24.0%
After-tax Payback (Years)	1.6	1.7	**1.9**	2.2	2.4

The effective date of this FS is February 23, 2022, and the issue date of the Technical Report is March 14, 2022. The effective dates of the Pinion and Dark Star databases on which the mineral resources described in this Technical Report are estimated on, are June 2, 2021 and June 15, 2021, respectively. The effective date of the Jasperoid Wash database is October 6, 2018, and the effective date of the North Bullion deposits database is August 21, 2020. New optimized pits and underground shells were generated using current mining costs in 2022, so the effective dates of the reported mineral resource estimates for all deposits is January 31, 2022.

1.2 PROPERTY DESCRIPTION AND OWNERSHIP

The primary site access for South Railroad will be from Elko, NV using a 41.7-mile access route. This 41.7-mile route begins from its intersection with 12th Street in Elko, NV and continues approximately 5.5 miles along the existing paved State Route (SR) 227 (i.e., Lamoille Highway) to the intersection with SR 228 (i.e., Jiggs Highway). The route continues south along paved SR 228 for another 5.5 miles to the paved Elko County Road 715 (i.e., South Fork Road). The route follows southward along County Road 715 approximately 5.7 miles to the intersection with County Road 715B (i.e., Lucky Nugget Road/Grant Avenue). From this intersection, the route follows County Road 715B approximately 3.1 miles along the west shore of South Fork Reservoir through a semi-rural residential area to the intersection with BLM Road 1119, which continues southwest approximately 6 miles to its intersection with Elko County Road 720 (i.e., Bullion Road). The route follows the Bullion Road southwest approximately 10 miles to the intersection with the un-improved BLM Road 1053, then continues southward following the approximate alignment of BLM Road 1053 along the eastern flank of the Pinion Range approximately 6 miles to the South Railroad Project). The property is centered approximately at UTM NAD27 Zone 11 coordinates of 585,000E and 4,480,000N.

Gold Standard's contiguous North and South Railroad portions of the Railroad-Pinion property constitute a combined land position totaling 53,570 acres in Elko County, Nevada, centered approximately at UTM NAD27 Zone 11 with coordinates of 585,000E and 4,480,000N. This includes 1,454 claims owned by Gold Standard and 207 claims held under lease, a total of 30 claims are patented. There is also a total of 23,630 gross acres of private lands of which Gold Standard's ownership of the subsurface mineral rights varies from 49.2% to 100%.

1.3 EXPLORATION AND MINING HISTORY

The Railroad–Pinion property is being explored on an ongoing basis by Gold Standard using geological mapping, geochemical and geophysical surveying, and drilling. Exploration work by Gold Standard commenced in 2010 and has resulted in the identification of 17 prospect areas or zones of mineralization within the property.

Twenty-one different historical operators are known to have drilled 1,084 holes, for a total of 500,544. 1 ft, from 1969 through 2008. As of the database effective dates, Gold Standard has drilled 1,121 holes for a total of 953,112 ft. At least 80% of all drilling used RC methods. However, the amount of RC drilling may be understated because the hole-types are not known for a substantial number of holes drilled in the late 1980s and 1990s, when RC drilling was common.

1.4 GEOLOGY AND MINERALIZATION

The Railroad-Pinion property is located in the southern portion of the Carlin trend, centered on the Railroad dome in the Piñon Range, which is comprised of Ordovician through Permian marine sedimentary rocks. Eastern assemblage formations throughout the property include the Pogonip, Hanson Creek, Eureka Quartzite, Lone Mountain Dolomite, Oxyoke, Beacon Peak, Sentinel Mountain Dolomite, and Devils Gate Limestone and Tripon Pass formations. Siliceous clastic units include those of the Webb, Chainman, and Tonka formations. The north-south-striking Bullion fault corridor separates Tertiary volcanic rocks to the east from the Paleozoic sedimentary units in the range, which have been intruded by a complex of Eocene igneous rocks centered south of Bald Mountain, in the core and east flank of the range.

The gold-silver deposits within the Railroad-Pinion property that are the focus of this Technical Report are considered to be Carlin-type, sedimentary-rock-hosted deposits. Precious metal mineralization is generally submicroscopic, disseminated, and hosted principally in sedimentary rocks, with some mineralization in felsic dikes and sills as well.

In the South Railroad portion of the property, the Dark Star Main ("Dark Star Main") and Dark Star North ("Dark Star North") zones, which comprise the Dark Star deposit are hosted primarily within Pennsylvanian-Permian rocks, with minor amounts of gold mineralization found in the Chainman Formation and Tertiary conglomerates. The deposits are centered along the roughly north-south Dark Star fault corridor, within which is a horst block and associated silicified zone bounded by the West fault and Dark Star fault. Gold mineralization in the horst block is hosted in the middle, coarse-grained conglomeratic and bioclastic limestone-bearing unit of a Pennsylvanian-Permian undifferentiated sequence interpreted to be equivalent to the Tomera Formation. Mineralization dips steeply to the west near the surface at Dark Star Main and Dark Star North, but dips less steeply at depth at Dark Star Main.

Also, in the South Railroad portion of the property, the Pinion deposit is situated in a sequence of Paleozoic sedimentary rocks exposed within large horst blocks in which the sedimentary rocks have been broadly folded into a south- to southeastward-plunging, asymmetric anticline. The axis of this Pinion anticline trends approximately N50ºW to N60ºW and can be traced for approximately 2.0 mi (3.2 km). The limbs of the anticline dip shallowly at 10° to 25° to the west, and more steeply at 35° to 50° to the east. Disseminated gold and silver mineralization at the Pinion deposit is strongly controlled by a 10 ft to 400 ft-thick (3 m to 120 m-thick) dissolution-collapse breccia at the contact between calcarenite of the Devils Gate Limestone and the overlying silty micrite of the Tripon Pass Formation. Gold deposition was contemporaneous with breccia development, quartz veins formation, silica ± barite replacement and infill of open spaces.

The Jasperoid Wash disseminated gold deposit, also located in the South Railroad portion of the property, is hosted by altered Tertiary feldspar porphyry dikes and their host Pennsylvanian-Permian conglomeratic rocks of a Tomera Formation equivalent. The deposit has approximate extents of 4,600 ft (1,400 m) to the north and a width of about 3,600 ft (1,100 m), and is partially contained within an elongate, north to south, steeply dipping structural corridor. Drilling shows the deposit dips steeply to the west nearby and within Tertiary dikes; east of the dikes, the deposit dips gently to the west. The gold is Inferred to be submicroscopic in grain size, however, petrographic studies have yet to be performed.

In the North Railroad portion of the property, disseminated gold mineralization has been defined by drilling in the North Bullion, POD, and Sweet Hollow zones. The mineralization is focused in the footwall of the Bullion fault zone. Faults appear to be important controls on mineralization. In general, gold-silver mineralization is localized in gently to moderately dipping, strongly sheared rocks of the Webb and Tripon Pass formations, in dissolution-collapse breccia developed above and within silty micrite of the Tripon Pass Formation, and calcarenite of the Devils Gate Limestone. The top of gold mineralization varies from 350 ft to 1,300 ft (105 m to 400 m) below the surface and varies in dip from 10° to 45° to the east. Gold is associated with "sooty" sulfide minerals, silica, carbon, clay, barite, realgar, and orpiment.

1.5 DATA VERIFICATION

Mr. Lindholm is satisfied that the Pinion, Dark Star, Jasperoid Wash and North Bullion drilling databases are in good condition. Various audits and checks were performed by Mine Development Associates Inc., a division of RESPEC, LLC ("MDA") to verify collar coordinates, down-hole deviation surveys, geology and assay data in the drill-hole database. All Gold Standard gold assay data was verified using digital laboratory certificates. However, about one third of the Pinion assays and one quarter of the Dark Star assays from historical drill campaigns were unsupported with original assay certificates. The same is true at North Bullion, where Gold Standard drilling makes up only 28% of the database, almost all of which is in the North Bullion deposit. The drill-hole data at the POD, Sweet Hollow and South Lodes deposits is almost entirely historical. Drill-hole data lacking adequate supporting documentation, as well as data from holes observed during sectional modeling to be inconsistent with surrounding holes, were treated as lower confidence, or excluded from use in modeling and estimation.

In 2019, Gold Standard supplemented their Pinion silver database with re-assayed individual samples for which composites of multiple intervals had previously been analyzed. Over 50% of the original certificates were available for all silver data and were used for verification. Quality assurance/quality control ("QA/QC") data was also evaluated, and the silver data was deemed acceptable for use in estimation of classified mineral resources.

There is no evidence of significant historical QA/QC programs for drilling prior to 2014. For Gold Standard programs at Dark Star, Pinion and Jasperoid Wash, the QA/QC program was minimal in 2014 through 2016 but was more comprehensive in 2017 to 2020. Similarly at North Bullion, over the full-time span of the Gold Standard drilling from 2010 to 2012 there is a reasonable implementation of QA/QC protocols, but during some periods of time it is less substantial. The results and amount of QA/QC data, as well as non-remedied QA/QC "failures," were considered in mineral resource classification for the Dark Star, Pinion, Jasperoid Wash and North Bullion deposits. Mr. Lindholm concludes that the Dark Star, Pinion, and Jasperoid Wash analytical data are adequate for the purposes used in this Technical Report, subject to issues described in Section 12.

Cyanide-soluble gold assays at Dark Star and Pinion were verified, but no QA/QC data was available for evaluation. Carbon and sulfur species data were audited and determined to be adequate for use in their respective estimates done for waste handling and metallurgical characterization. No QA/QC data was associated with the carbon and sulfur analyses.

Barium was estimated in the Pinion deposit block model for metallurgical characterization. Barium analyses were done using pressed-powder energy-dispersive x-ray fluorescence (“XRF-ED”) and loose-powder NITON XRF analytical methods. These methods were evaluated by running additional analyses on duplicate pulp samples by various methods. After evaluating the reliability and relationship of barium assays produced by the two methods, and verification of the data, the data was used to model and estimate NITON XRF-derived barium grades.

1.6 PROCESSING AND METALLURGICAL TESTING

The current study of the South Railroad portion of the Railroad-Pinion project focuses on two main sources of ore, for which mineral reserves are declared: The Pinion and Dark Star deposits. These deposits have different geo-metallurgical characteristics, which are briefly summarized as follows:

The Pinion deposit can be characterized as hard and abrasive material, with a steep feed P80 vs. gold recovery response. Much of the gold is contained in the rock ground mass and requires fine crushing (-1/4” inch) to liberate gold for the most efficient cyanide-leach extraction. Gold recovery has proven to be sensitive to high barite/silica content in the mulilithic breccia (mlbx) ore type. Gold recovery from the high-barite/silica materials benefits the most from fine crushing. This deposit can be heap leached without crushing, at low gold recovery, conventionally crushed and leached at modestly higher gold recovery, or HPGR-crushed at higher gold recovery.

The Dark Star deposit can be characterized as hard and moderately abrasive material, with a flat feed P80 vs. gold recovery response. Most of the gold is contained in fractures that have been oxidized and accessible to cyanide solutions that easily pass through the rock matrix. Consequently, high gold extractions are achieved at coarse particle size, requiring no crushing prior to heap leaching.

A large number of variability and master composites (mostly from PQ core) were selected by Gold Standard Ventures for feasibility level testing on the Dark Star and Pinion Deposits. Standard metallurgical testing protocols consisted of bottle roll leach testing at 80 percent passing (P_{80}) size targets of 75 microns (200 mesh) and 1,700 microns (10 mesh), and column leaching testing at various P_{80} sizes ranging from 0.375 inch to 1.0 inch (9.5 mm to 25 mm). Additional composites were crushed using High Pressure Grinding Rolls (HPGR), at medium press force, and subjected to column leaching. The total number of metallurgical tests, by deposit, is presented in Table 1-2 below.

Table 1-2: Summary of Leach Tests Performed

Test Procedure	Number of Tests	
	Dark Star	Pinion
Bottle Roll P_{80} Target = 75 microns (200 mesh)	121	195
Bottle Roll P_{80} Target = 1,700 microns (10 mesh)	121	207
Conv. Crush Columns P_{80} Target = 0.375-1.0 inch (9.5-25 mm)	99	90
HPGR Crush Columns P_{80} Target = 0.20-0.24 inch (5-6 mm)	11	23

ROM heap leach head grade vs. gold recovery models were developed for Dark Star and Pinion and silver recovery models were developed for Pinion. Silver recovery was not modelled for Dark Star as silver grades are too low to be of economic significance.

Due to the multiple material types, and the dependence of gold recoveries on head grades and crush size, 71 gold and silver recovery vs head grade equations were developed, along with recovery vs solution-to-ore ratio equations. Of the recovery equations, 28 are for Pinion oxide and transition ROM ores and 16 are for Dark Star oxide and transition ROM ores. The recovery equations can be found in Section 13 of this Technical Report.

The gold and silver recovery equations for each ore type were delivered to the mine modelers for incorporation into the block calculations.

The overall life-of-mine ROM average gold recovery for the Dark Star deposit is estimated at 71.9 percent and the Pinion deposit is estimated at 56.3 percent.

The major reagent consumptions for heap leaching of Pinion and Dark Star ore have been taken from available metallurgical test results from column leach tests on crushed material. No test data exists at the ROM particle size, so the selected reagent consumptions have been estimated based on test results on the coarsest samples tests 1.5 inch (37 mm). Cyanide consumptions have been estimated at 0.44 lb/ton (0.22 kg/tonne) for Pinion and 0.46 lb/ton (0.23 kg/tonne) for Dark Star. Lime consumption is estimated at 2.0 lb/ton (1.0 kg/tonne) for both Pinion and Dark Star ores.

1.7 RECOVERY METHODS

The process selected for recovery of gold and silver from the Pinion and Dark Star ore is a conventional ROM heap leach. Oxide and transition ore types will be mined by standard open pit mining methods from two separate pits. The ore will be truck-stacked on the heap as ROM ore directly, without crushing, in 30-foot lifts. Lime will be added directly to the haul trucks for pH control.

The stacking rate will be in accordance with the mine plan. The ROM ore placement is equivalent to a LOM average of 24,700 tons per day, with the peak in Year 5 of an average of 32,700 tons per day.

Gold and silver in the stacked ore will be leached with a dilute cyanide solution using a drip irrigation system at application rates in the range of 4,800-6,100 gallons per minute. The leached gold and silver will be recovered from solution using a carbon adsorption circuit. The gold and silver will be stripped from carbon using a desorption process, followed by electrowinning to produce a precipitate sludge. The precipitate sludge will be processed using a retort oven for drying and mercury recovery, and then refined in a melting furnace to produce gold and silver doré bars.

1.8 MINERAL RESOURCE ESTIMATE AND MINERAL RESERVE ESTIMATE

1.8.1 Mineral Resource Estimate

The estimated mineral resources presented in this Technical Report were classified in order of increasing geological and quantitative confidence into Inferred, Indicated, and Measured 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 resources are reported 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 mineral resource exists "*in such form and quantity and of such a grade or quality that it has reasonable prospects for eventual economic extraction.*"

MDA modeled geology and metal domains for the Dark Star, Pinion, and Jasperoid Wash deposits, then estimated and classified gold mineral resources. A silver estimate was also produced for the Pinion deposit. Gold Standard provided the geologic modeling for the various deposits and were intimately involved with metal domain modeling. Block sizes were 30 ft x 30 ft x 30 ft for Dark Star and Pinion, and 20 ft x 20 ft x 20 ft for Jasperoid Wash. The block size for modeling and estimation at the North Bullion deposits model was 10 ft x 10 ft x 10 ft for evaluation of underground potential, but reblocked to 30 ft x 30 ft x 30 ft to optimize open pits. Estimation was done using inverse-distance methods with powers ranging from two to four. Multiple models were estimated in order to optimize the estimation parameters.

The estimate of mineral resources for the Railroad-Pinion property is the block-diluted inverse-distance estimate and is reported at variable cutoffs for open-pit and underground mining. The cutoff for oxidized and transitional redox material in an open pit is 0.005 oz Au/ton, whereas the cutoff for sulfide material is 0.045 oz Au/ton. Potential sulfide underground resources, present only at the North Bullion deposit, are reported at a cutoff of 0.100 oz Au/ton. Mineral resources were classified as Measured, Indicated or Inferred for each deposit separately. Factors considered for classification include results of data verification and QA/QC results, the level of geologic understanding of each deposit, and performance of past mineral resource block models with new drilling. Table 1-3 presents the optimized pit- and underground grade shell-constrained estimated mineral resources for the Dark Star, Pinion, Jasperoid Wash and North Bullion deposits based on a $1,750/oz gold price. Mineral resources that are not mineral reserves do not have demonstrated economic viability.

Table 1-3: Dark Star, Pinion, Jasperoid Wash and North Bullion Estimated Mineral Resources

Dark Star Mineral Resources				
	Cutoff			
	oz Au/ton	Tons	oz Au/ton	oz Au
Measured*	0.005	7,964,000	0.036	288,000
Indicated*	variable**	27,081,000	0.023	625,000
Measured & Indicated*	variable**	35,045,000	0.026	913,000
Inferred	variable**	1,296,000	0.015	19,000
Mineral resources are inclusive of mineral reserves				
***Cutoff for oxide and transitional resources is 0.005 oz Au/ton, and for sulfide resources at 0.045 oz Au/ton*				

Pinion Mineral Resources						
	Cutoff					
	oz Au/ton	Tons	oz Au/ton	oz Au	oz Ag/ton	oz Ag
Measured*	0.005	2,575,000	0.021	55,000	0.19	488,000
Indicated*	0.005	45,408,000	0.018	816,000	0.15	6,617,000
Measured & Indicated*	0.005	47,983,000	0.018	871,000	0.15	7,105,000
Inferred	0.005	1,299,000	0.012	15,000	0.07	92,000
**mineral resources are inclusive of mineral reserves*						

Jasperoid Wash Mineral Resources				
	Cutoff			
	oz Au/ton	Tons	oz Au/ton	oz Au
Inferred	0.005	13,160,000	0.01	130,000

North Bullion Inferred Mineral Resources				
	Cutoff			
	oz Au/ton	Tons	oz Au/ton	oz Au
North Bullion Open Pit	variable*	3,214,000	0.107	345,000
North Bullion Underground	0.100	504,000	0.131	66,000
Sweet Hollow	variable*	2,884,000	0.016	45,000
POD	variable*	1,459,000	0.06	87,000
South Lodes	0.005	800,000	0.016	13,000
***Cutoff for open pit oxide and transitional resources is 0.005 oz Au/ton, and for sulfide resources at 0.045 oz Au/ton*				

Barium was estimated into the Pinion deposit block model for use in metallurgical characterization of the Pinion mineralized material. The average barium grade is ~2.25% for the gold mineralization grading at least 0.005 oz Au/ton. Factoring between barium analytical results were required, which added some uncertainty to the model.

Cyanide-soluble gold block models were produced for the Pinion and Dark Star deposits. These estimates appear reasonable in areas with Gold Standard drilling, however, there is less confidence in some areas where cyanide-soluble gold data is lacking, such as where historical drilling is predominant.

An acid-base accounting (“ABA”) model was generated for Pinion and Dark Star to characterize waste material for mine planning and handling. An organic carbon model was also produced to evaluate effects on metallurgy at Pinion. Because of limited data, these estimates can only be considered as guides for environmental planning and metallurgy.

1.8.2 Mineral Reserve Estimate

Measured and Indicated mineral resources were used as the basis to define mineral reserves for both the Dark Star and Pinion deposits. Mineral reserve definition was done by first identifying ultimate pit limits using economic parameters and applying pit optimization techniques. The resulting optimized pit shells were then used for guidance in pit design to allow access for equipment and personnel. Modifying factors including mining, processing, metallurgical, infrastructure, economic, marketing, legal, environmental, social, and governmental factors have been applied in the estimate of mineral reserves.

RESPEC provided the final production schedule to M3 who developed the final cash-flow model which demonstrates that the Pinion and Dark Star deposits make a positive cash flow and are reasonable with respect to statement of mineral reserves for these deposits.

The total Proven and Probable mineral reserves reported for the FS are shown in Table 1-4. Within the designed pits there are a total of 294.5 million tons of waste associated with the in-pit mineral reserves. This results in an overall project strip ratio of 4.1 tons of waste for each ton of material processed.

Table 1-4 Proven and Probable Mineral Reserves

Dark Star	K Tons	oz Au/ton	K Ozs Au
Proven	7,618	0.037	282
Probable	24,524	0.023	557
P&P	32,142	0.026	840

Pinion	K Tons	oz Au/ton	K Ozs Au	oz Ag/ton	K Ozs Ag
Proven	2,258	0.022	50	0.194	437
Probable	37,469	0.019	714	0.152	5,700
P&P	39,728	0.019	764	0.154	6,137

Consolidated Gold Reserves

Dark Star & Pinion	K Tons	oz Au/ton	K Ozs Au
Proven	9,877	0.034	333
Probable	61,993	0.021	1,271
P&P	71,870	0.022	1,604

Note: Cutoff grades are applied by material type as described in Section 15.2.3; Proven and Probable mineral reserves for Pinion include silver as reported above; and Due to lack of silver at Dark Star, consolidated gold reserves are reported without silver to avoid reporting erroneous average silver grade.

1.9 MINING METHODS

The FS includes mining at both the Dark Star and Pinion deposits; both are planned as open-pit, truck and shovel operations. The truck and shovel method provides reasonable costs and selectivity for these deposits.

The production schedule considers the processing of material by ROM. All ROM material will be dumped in place directly on the ROM leach pad. Monthly periods were used to create the production schedule with pre-stripping starting in Dark Star at month -6. Start of ROM processing is assumed to be month 2.

The total Dark Star mining rate would ramp up from 20,000 tons per day to about 80,000 tons per day over a period of 6 months. A maximum of 109,000 tons per day is used in the production schedule during the peak mining of deeper Dark Star material. Pre-production mining is planned to start in Dark Star North and then progress to Pinion in Year 1. The maximum mining rate required in Pinion is 126,000 tons per day.

The FS has assumed owner mining to keep the cost lower than it would be with contract mining. The production schedule was used along with additional efficiency factors, cycle times, and productivity rates to develop the first principle hours required for primary mining equipment to achieve the production schedule. Primary mining equipment includes drills, loaders, hydraulic shovels, and 200-ton capacity haul trucks.

Waste storage facility designs were created for the FS to contain the material that is not processed. A 1.3 swell factor was assumed which provides for both swell when mined and re-compaction when placed into the facility.

1.10 INFRASTRUCTURE

Project infrastructure for South Railroad has been developed to support the mining and heap leaching operations. Electrical power will be generated onsite by generators powered by liquified natural gas (LNG). Project buildings located at the site will include Security and Emergency services, Administration, Change House, Crushing, Truck Shop, ADR/Refinery Plant, and Laboratory buildings. These will mainly be located between Pinion and Dark Star pits for ease of access and be connected by local roads and haul routes.

1.11 ENVIRONMENT AND PERMITTING

Gold Standard has been conducting environmental baseline studies over the past several years as part of their ongoing permitting efforts and in preparation for the submittal of permit applications for conduct mining operations. The main portion for the project area has been surveyed for surface water resources, including Waters of the United States ("WOTUS"), biological resources, and cultural resources. The project access road, and the water management area remain to be surveyed. In 2018, Gold Standard commenced material characterization testing of the mineralized material and waste rock to determine the metal leaching and acid generation potential. Additionally, an evaluation of the groundwater resources was commenced to determine groundwater supply potential, as well as the potential impacts from groundwater pumping and pit lake development. Gold Standard has had several meetings with the United States Bureau of Land Management ("BLM") since January 2019 to determine any additional baseline data collection needs for the permitting process.

Within and adjacent to the project area there are Greater Sage Grouse and Golden Eagles. These species will have an effect on how the project is permitted and what mitigation in required or proposed. Gold Standard is working with the BLM on the management of these species.

The review and approval process for the Plan Application 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 the NEPA and prepare either an Environmental Assessment ("EA"), or an Environmental Impact Statement ("EIS"). The BLM has determined that this process requires an EIS, due to the mine dewatering and potential pit lake. Gold Standard will also need an Individual Section 404 Permit from the United States Army Corps of Engineers, and this agency will be a cooperating agency on the NEPA documents.

There are a number of environmental permits issued by the Nevada Department of Environmental Protection ("NDEP") that are necessary to develop the project and which Gold Standard needs to permit the project. The NDEP issues permits that address water and air pollution, as well as land reclamation. The Nevada Division of Water Resources ("NDWR") issues water rights for the use and management of water.

The SRMP (as defined below) is a previously explored minerals property with exploration related disturbance. However, there have been very long periods of non-operation. There are no known ongoing environmental issues with any of the regulatory agencies. Gold Standard has been conducting baseline data collection for a couple of years for environmental studies required to support the Plan Application and permitting process. The waste and mineralized material characterization and the hydrogeologic evaluation are currently in their latter stages of development. Material characterization indicates the need to manage a significant portion of the waste rock as potentially acid generating in engineered facilities. Additional results to date indicate limited 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.

Social and community impacts have been and are being considered and evaluated for the Plan Amendment and Plan Application performed for the project in accordance with the NEPA and other federal laws. Potentially affected Native American tribes, tribal organizations and/or individuals are consulted during the preparation of all plan amendments to advise on the proposed projects that may have an effect on cultural sites, resources, and traditional activities.

Potential community impacts to existing population and demographics, income, employment, economy, public finance, housing, community facilities and community services are evaluated for potential impacts as part of the NEPA process. There are no known social or community issues that would have a material impact on the project's ability to extract mineral resources. Identified socioeconomic issues (employment, payroll, services and supply purchases, and state and local tax payments) are anticipated to be positive.

A Tentative Plan for Permanent Closure ("TPPC") for the project would be submitted to the NEDP with the Water Pollution Control Permit ("WPCP") application. In the TPPC, the proposed heap leach closure approach would consist of fluid management through evaporation, covering the heap leach pad and waste rock facilities with growth media, and then revegetating. The design of the process components is not sufficiently advanced to determine the closure costs. Any residual heap leach or waste rock facilities drainage will be managed with evaporation cells.

1.12 WATER MANAGEMENT

Gold Standard developed a Water Management Plan for South Railroad in support of the FS. The Water Management Plan formed the basis for evaluating the infrastructure and associated cost to manage water through the life cycle of the mine. The purpose of the Water Management Plan is to present the water management strategies that focus on water as an asset and allow Gold Standard to proactively plan and manage water from development to post-closure such that operational and stakeholder water needs are met, and that human health and the environment are protected.

To support the development of water management strategies for the project, the following pre-design studies/activities were completed:

- Analytical and numerical groundwater model to estimate pit dewatering requirements and potential impacts for the Dark Star North pit and the Pinion Phase 4/5 expansion;
- Evaluation and modeling of long-term climate records and 24-hour design storms used as input for event-based stormwater modeling, continuous water balance modeling, and infiltration modeling;
- Stormwater modeling and calculations for locating and sizing stormwater management infrastructure;
- Infiltration modeling to predict the amount of seepage from the Water Rock Disposal Facility ("WRDF"s) that will require management during operation, closure, and post-closure periods;
- Water balance modeling to evaluate the supplies of and demands of site water over the LOM; and
- Closure and 404 mitigation cost evaluation.

The water management strategy and technical investigations to support the Water Management Plan resulted in the following FS level infrastructure:

- Stormwater management and seepage collection facilities, such as channels, ponds, culverts, attenuation structures, down drains, and other related open-channel stormwater controls;
- A groundwater dewatering system needed to mine ore below the groundwater table in the Dark Star pits and the Pinion Phase 4/5 expansion; and
- A site-wide water conveyance system.

1.13 CAPITAL COST SUMMARY

The capital expenditure schedule for the LOM is shown in Table 1-5 below.

Table 1-5: Capital Expenditure Schedule

Capital Expenditure ($000)	Initial	Sustaining										Total
	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	
Mine Pre-Prod.	$22,640	-	-	-	-	-	-	-	-	-	-	**$22,640**
Mine Capital	$13,943	$10,703	$16,798	$16,306	$16,914	$16,284	$10,884	$9,147	$5,588	-	-	**$116,568**
Process	$152,458	$27,169	$8,953	$15,149	$6,798	$13,850	$5,375	$2,563	$1,329	$1,223	$1,644	**$236,511**
Owner's Cost	$1,157	-	-	-	-	-	-	-	-	-	-	**$1,157**
Total	**$190,197**	$37,872	$25,751	$31,455	$23,712	$30,133	$16,259	$11,710	$6,918	$1,223	$1,644	**$376,873**

1.14 OPERATING COST SUMMARY

The total production cost includes mine operations, process plant operations, general and administration, reclamation and closure, and government fees. Table 1-6 below shows the operating costs over the LOM by area.

Table 1-6: LOM Operating Costs

LOM Operating Cost ($000)	
Mining	$616,504
Process Plant	$147,424
G&A	$37,750
$5,153Refining	$5,153
Total Operating Cost	**$806,832**
Royalty	$10,911
Salvage Value	-$12,410
Reclamation/Closure	$22,569
Total Production Cost	**$827,901**

1.15 CONCLUSIONS AND RECOMMENDATIONS

The results of this study indicate that South Railroad is both technically and economically feasible and demonstrates robust returns, even at the moderate metal prices. The authors recommend that the South Railroad project be advanced to basic engineering, with a list of specific recommendations to achieve that goal (see Section 26).

Presently there are 1.60 million proven and probable ounces of gold and 6.1 million ounces of silver in the Dark Star and Pinion deposits estimated mineral reserves combined, 1.78 million Measured and Indicated ounces of gold in the Dark Star and Pinion deposits estimated mineral resources combined, inclusive of mineral reserves in the Dark Star and Pinion deposits, and there are 0.72 million Inferred ounces of gold in the Dark Star, Pinion, Jasperoid Wash and North Bullion deposits estimated mineral resources combined. There are also 7.1 million Measured and Indicated and 0.9 million Inferred ounces of silver in the Pinion resource. Mineral resources that are not mineral reserves do not have demonstrated economic viability.

The FS indicates an average gold production over the estimated 8-year LOM of about 124,000 ounces per year, with peak production in Year 2 of 197,000 ounces of gold. Cash costs are estimated to be $792 per ounce of gold after by-product credit, and AISC are estimated to be $1,021 per ounce of gold. The resulting after-tax cash flow is $403.2 million, for an after-tax NPV (5%) of $314.8 million and an estimated payback period of 1.9 years. A summary of the pre-tax and after-tax FS economic indicators is shown in Table 1-7.

Table 1-7: Economic Analysis Summary

Indicators	Before-Tax	After-Tax
LOM Cash Flow ($000)	$497,330	$403,162
NPV @ 5% ($000)	$388,866	$314,791
NPV @ 10% ($000)	$307,248	$247,592
IRR	49.2%	44.3%
Payback (years)	1.9	1.93

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2 INTRODUCTION AND TERMS OF REFERENCE

2.1 PURPOSE OF REPORT

This NI 43-101 Technical Report was prepared by M3 for Gold Standard of Vancouver, British Columbia, a corporation that is listed in TSX Venture Exchange (TSX.V: GSV) and the New York Stock Exchange (NYSE: GSV).

Gold Standard owns the Railroad-Pinion project in the southern Carlin trend, in Elko County, Nevada, USA.

This Technical Report for the Railroad-Pinion project describes the feasibility of extracting and processing the oxide mineral reserve at the South Railroad property, which includes the Dark Star and Pinion gold deposits. This study incorporates new design-work, scheduling, and projected costs.

This update is based on the resource estimates and pit optimizations as of January 31, 2022. This includes the updated 2022 mineral resource and mineral reserve estimates for the Dark Star and Pinion gold deposits, and updated mineral resource estimates for the North Bullion deposit.

Gold Standard has drilled or received assays for 127 new holes since the effective dates of the databases for the respective deposits on the Railroad-Pinion property. In many cases, assay results were delayed significantly past the effective dates due to the COVID-19 pandemic. That drilling was primarily focused on obtaining metallurgy samples, generating geotechnical data, construction of water and monitor wells, infilling within modeled areas, or for exploration of secondary targets. The new drilling in the Dark Star, Pinion, North Bullion and Jasperoid Wash areas were evaluated with respect to the resource models and it was determined there would be minimal to no impact on estimated volumes and grades as reported within optimized pits in this report. Further discussion is given in Section 14.

The North Railroad portion of Gold Standard's property includes the POD (formerly Railroad deposit), Sweet Hollow, South Lodes, and North Bullion cluster of gold deposits. Together these four deposits are referred to as the North Bullion deposits or North Bullion area. The first-time estimates of POD, Sweet Hollow, and North Bullion gold mineral resources were originally reported by Dufresne and Nicholls (2017b). The POD, Sweet Hollow, South Lodes, and North Bullion deposits were remodeled by MDA, a Division of RESPEC, LLC. ("MDA"), and new mineral resources, are presented herein.

Other targets mentioned in this Technical Report include Bald Mountain, in the North Railroad portion of the Railroad-Pinion property, and JR Buttes, Dixie, Irene, Sentinel, Ski Track, and East Jasperoid in the South Railroad portion of the Railroad-Pinion project.

References to Tomera Formation equivalent stratigraphy have been noted historically. However, recent work suggests these units in the Railroad-Pinion area may not be of equivalent age, so all usage of Tomera Formation equivalent in this Technical Report refer to units that are Pennsylvanian-Permian undifferentiated.

This Technical Report has been prepared in accordance with the disclosure and reporting requirements set forth in 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.

2.2 SOURCES OF INFORMATION

In compiling the background information for this Technical Report, the authors fully relied on information provided by Gold Standard and on other references as cited in Section 3, including technical reports by APEX (Dufresne and Turner, 2014; Dufresne et al., 2014; Dufresne et al., 2015; Dufresne and Nicholls, 2016; Dufresne et al., 2017; and Dufresne and Nicholls, 2017a, 2017b, 2018).

The Pinion, Dark Star, Jasperoid Wash and North Bullion deposits mineral resource estimates presented in this Technical Report were estimated and classified under the supervision of Mr. Michael S. Lindholm, C.P.G. and Senior Geologist for MDA, Mr. Thomas L. Dyer, P.E., Senior Engineer for MDA, prepared the mining and economic studies for the FS.

Table 2-1 is a list of qualified persons who contributed to this Technical Report.

Table 2-1: List of Qualified Persons

QP Name	Company	Qualification	Site Visit Date	Area of Responsibility
Matthew Sletten	M3 Engineering & Technology Corporation, Chandler, AZ	PE	No site visit	Sections 1.1, 1.10, 1.13, 1.14, 1.15, 4, 5, 18.1, 18.2, 18.3, 18.4, 18.5, 18.8, 19, 21 except (21.1 and 21.4), 22, 23, 24, 25, and 26
Benjamin Bermudez	M3 Engineering & Technology Corporation, Chandler, AZ	PE	No site visit	Section 1.7 and 17
Art Ibrado	Fort Lowell Consulting PLLC, Tucson, AZ	PE	September 25, 2019	Sections 2, 3, and 27
Michael S. Lindholm	Mine Development Associates (a division of RESPEC), Reno, NV	CPG	July 16, 2020	Sections 1.3, 1.4, 1.5, 1.8.1, 6, 7, 8, 9, 10, 11, 12, and 14
Thomas Dyer	Mine Development Associates (a division of RESPEC), Reno, NV	PE	November 18, 2016	Sections 1.8, 1.9, 15, 16, 21.1, and 21.4
Jordan Anderson	Mine Development Associates (a division of RESPEC), Reno, NV	QP RM-SME	February 23, 2022	Sections 1.8, 1.9, 15, 16, 21.1, and 21.4
Gary L. Simmons	GL Simmons Consulting, LLC	QP-MMSA	October 9, 2020	Section 1.6 and 13
Richard DeLong	EM Strategies, Inc., Reno, NV	QP-MMSA, RG, PG	No site visit	Sections 1.2, 1.11, 1.12 and 20
Kevin Lutes	NewFields	PE	February of 2021	Section 18.6 and 18.7

2.3 PROJECT SCOPE AND TERMS OF REFERENCE

Gold Standard has been actively exploring the North Railroad portion of the property since 2010 and the South Railroad portion of the property since 2014 (Koehler *et al.*, 2014; Turner *et al.*, 2015).

The scope of this study includes a review of pertinent technical reports and data provided to MDA by Gold Standard relative to the general setting, geology, project history, exploration activities and results, methodology, quality assurance, interpretations, drilling programs, metallurgy, and estimated mineral resources.

The authors have relied almost entirely on data and information derived from work done by Gold Standard and its predecessor operators of the amalgamated South Railroad and North Railroad portions of the Railroad-Pinion property. The authors have reviewed much of the available data and made site visits 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. The authors have made such independent investigations as deemed necessary in their professional judgment to be able to reasonably present the conclusions discussed herein.

The effective date of this FS is February 23, 2022, and the issue date of the Technical Report is March 14, 2022. The effective dates of the Pinion and Dark Star databases on which the mineral resources described in this Technical Report are estimated on are June 2, 2021, and June 15, 2021, respectively. The effective dates of the Jasperoid Wash database is October 6, 2018, and the effective date of the North Bullion deposits database is August 21, 2020. New optimized pits and underground shells were generated using current mining costs in 2022, so the effective dates of the reported mineral resource estimates for all deposits is January 31, 2022.

2.4 FREQUENTLY USED ACRONYMS, ABBREVIATIONS, DEFINITIONS, AND UNITS OF MEASURE

In this Technical Report, measurements are generally reported in metric units. Where information was originally reported in imperial units, MDA has made the conversions as shown below. In the case of metallurgical test data and historical mineral resource estimates the units are as originally reported in order to preserve historical accuracy and avoid errors that can result from rounding converted data.

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

Linear Measure		
1 inch	= 2.54 centimeter	
1 foot	= 0.3048 meter	= 0.3333 yard
1 mile	= 1.6093 kilometer	
Area Measure		
1 acre	= 0.40469 hectares	= 0.001562 square mile
Capacity Measure (liquid)		
1 gallon	= 3.7846 liters	
Weight		
1 ton	= 1 imperial short ton	=2,000 pounds
1 tonne	= 1.1023 short tons	= 2,205 pounds or = 1,000 kilograms
1 kilogram	= 2.205 pounds	

Regarding currency, unless otherwise indicated, all references to dollars ($) in this Technical Report refer to currency of the United States.

Frequently used acronyms and abbreviations are as shown in Table 2-2.

Table 2-2: Acronyms and Abbreviations

Abbreviation	Description
2SD	two times the standard deviation
3SD	three times the standard deviation
AA	atomic absorption spectrometry
ABA	acid-base accounting
Ag	silver
Ag_{CN}	cyanide-soluble silver
Ag_{FA}	silver analysis by fire assay, total silver content
Au	gold
Au_{CN}	cyanide-soluble gold
Au_{FA}	gold analysis by fire assay, total gold content
Calc, calc	calculated
CINO	inorganic carbon
cm	centimeters
core	diamond core-drilling method
˚C	degrees Celsius
Ext	extracted
°F	degrees Fahrenheit
FA	fire assay
ft	foot or feet
ft^2, sf	square feet
gal	gallon(s)
g	gram
gpl	grams per liter
GPM, gpm	gallons per minute
g/t	grams per metric tonne
Ha	hectares
hd	head
HP	horsepower
Hr., hr., hrs	hour, hours
ICP	inductively-coupled plasma-emission spectrometric method
ICP-MS	inductively-coupled plasma-emission and mass spectrometry
in	inch or inches
kg	kilograms
km	kilometers
kW	kilowatts
kWh/m^3	kilowatt-hours per cubic meter
kWh/yr	kilowatt-hours per year
l	liter (L in metallurgical use)
lb or lbs.	Pounds
m	Meters
Ma	million years
mi	mile or miles
mm	millimeters
µm	micron or 10^{-6} meters
NAG	non-acid generating, (neutralizing potential)
NSR	net smelter return
Opt, oz/ton	troy ounce per short ton
org	Organic
oz	troy ounce
P_{80}	the theoretical square screen-opening, through which 80 weight percent of the particles will pass.

Abbreviation	Description
PAG	potential acid generating
ppm	parts per million
ppb	parts per billion
QA/QC	quality assurance and quality control
RC	reverse-circulation drilling method
RQD	rock-quality designation
SO_4	Sulfate
st	Imperial short ton (2,000 pounds)
SSUL	sulfide sulfur
t	metric tonne or tonnes
tot	total

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3 RELIANCE ON OTHER EXPERTS

Mr. Ekins, who is an independent registered professional landman (RPL#32306) and president of GIS Land Services in Reno, Nevada, assisted with the preparation of the summary land description and property maps discussed below. Mr. Ekins and Gold Standard have relied upon title opinions prepared by Mr. Jeff N. Faillers of Erwin Thompson Faillers, of Reno, Nevada, Mr. Richard Thompson of Harris & Thompson, of Reno, Nevada, and Ms. Tracy Guinand, an independent registered professional landman of Tracy Guinand Land LLC, of Reno, Nevada. The most recent of these title opinions are dated September 5, 2018. The opinions provided on surface ownership and subsurface mineral ownership, along with royalty information, are current as of the effective date of this Technical Report. Additional details with respect to the surface and subsurface ownership are provided in Gold Standard's most recent Annual Information Form ("AIF"), which can be found on the SEDAR website at www.sedar.com.

The sample collection, security, transportation, preparation, and analytical procedures are judged by the authors to be acceptable and to have produced data suitable for use in the estimation of the mineral resources reported in Section 11, subject to those exclusions or modifications discussed in Section 14. The authors consider the procedures utilized by Gold Standard and the assay laboratories to be appropriate for use as described.

The QPs of this report relied upon contributions from other consultants as well as Gold Standard Ventures. The QPs have reviewed the work of the other contributors and find that this work has been performed to normal and acceptable industry and professional standards. The authors are not aware of any reason why the information provided by these contributors cannot be relied upon.

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4 PROPERTY DESCRIPTION AND LOCATION

4.1 LOCATION AND LAND AREA

The property that is the subject of this Technical Report comprises two contiguous areas of mineral tenure held by Gold Standard (Figure 4-1) that straddle the Piñon Range in the Railroad mining district at the southeast end of the Carlin trend, a northwest-southeast trending belt of prolific gold endowment in northern Nevada. In previous Technical Reports, the northern portion of the land holdings, now referred to as the North Railroad portion of the property (Figure 4-1), has been referred to as the Railroad project and the Railroad property (Dufresne *et al*., 2017). The southern portion of the Railroad-Pinion property, now referred to as the South Railroad portion of the property (Figure 4-1), was referred to as the Pinion project and the Pinion property in previous technical reports (Dufresne *et al*., 2017). In November 2017, Gold Standard published a technical report on the Railroad-Pinion property, which included a mineral resource estimate for the North Bullion, POD, and Sweet Hollow gold deposits (Dufresne and Nicholls, 2017b), located in the North Railroad portion of the Railroad-Pinion property, approximately 6 miles north of the Dark Star and Pinion deposits. Based on available information, North Bullion, POD, and Sweet Hollow would not likely share a common mining infrastructure with Dark Star and Pinion.

The Railroad-Pinion property in the Piñon Range is accessed primarily from the four-lane transcontinental U.S. Interstate 80 ("I-80"), approximately 275 miles west of Salt Lake City, Utah, and 290 miles east of Reno, Nevada (Figure 4-1). The project is located between 8 and 18 miles south of I-80 and can be reached by a series of paved and gravel roads from Elko, Nevada (population 18,300). The property is centered approximately at UTM NAD27 Zone 11 coordinates of 585,000E and 4,480,000N.

The North and South Railroad properties combined constitute a land position totaling 53,570 acres, and with partial interests taken into consideration, 50,600 acres net acres of land in Elko County, Nevada. The properties are located within Section 13 in Township ("T") 28N, Range ("R") 52E; Sections 10, 11, 14, 16, 17, 18, 23, and 24 in T28N, R53E; Sections 1 to 21, 23, 24, 25, 29, 30, 31, 33, 35, and 36 in T29N, R53E; Sections 7, 18, 19, and 30 in T29N, R54E; Section 12 in T30N, R52E; Sections 1 to 10, 13 to 33, and 36 in T30N, R53E; Sections 24 and 36 in T31N, R52E; and Sections 8, 10, 14 to 22 and 26 to 35 in T31N, R53E, as shown in Figure 4-2. Gold Standard owns, or otherwise controls 100% of the subsurface mineral rights on a total of 29,942 acres of land held as patented and unpatented lode claims. This includes 1,455 unpatented claims owned by Gold Standard and 207 unpatented claims held under lease (Appendix B). Gold Standard also owns or leases 30 patented claims (Appendix B).

There is also a total of 23,628 gross acres of private lands of which Gold Standard's ownership of the subsurface mineral rights varies from 49.2% to 100% (Figure 4-2), for a net position of approximately 20,658 gross acres.

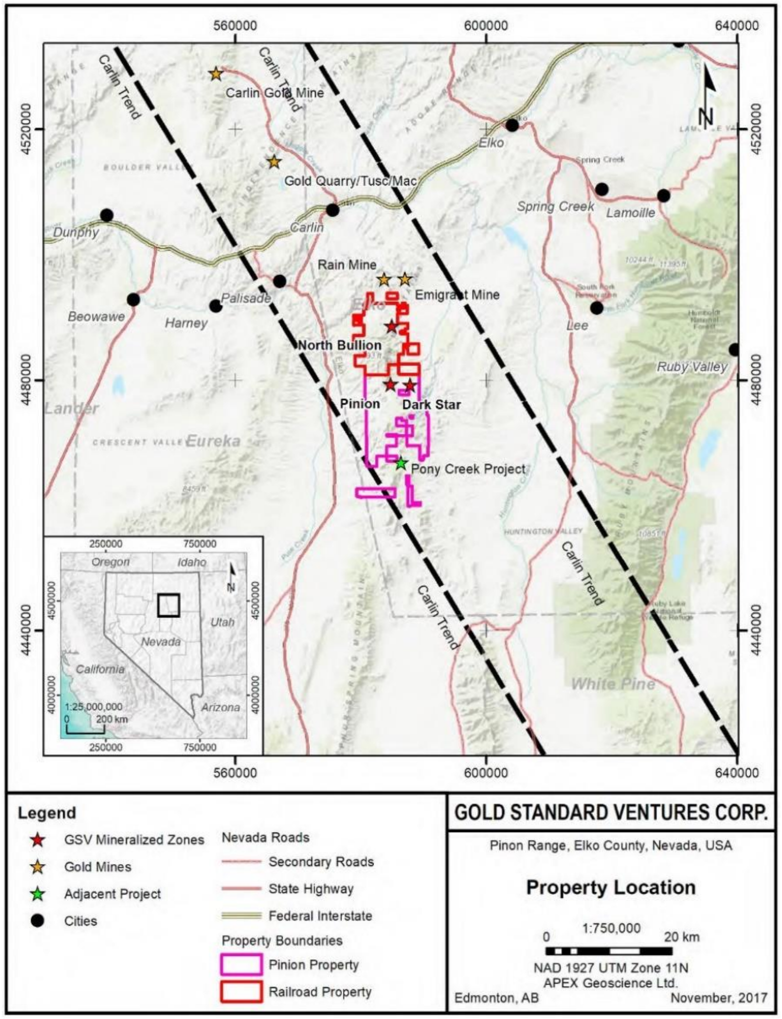


Figure 4-1: Location Map for the Railroad-Pinion Property

(from Dufresne and Nicholls, 2017b)

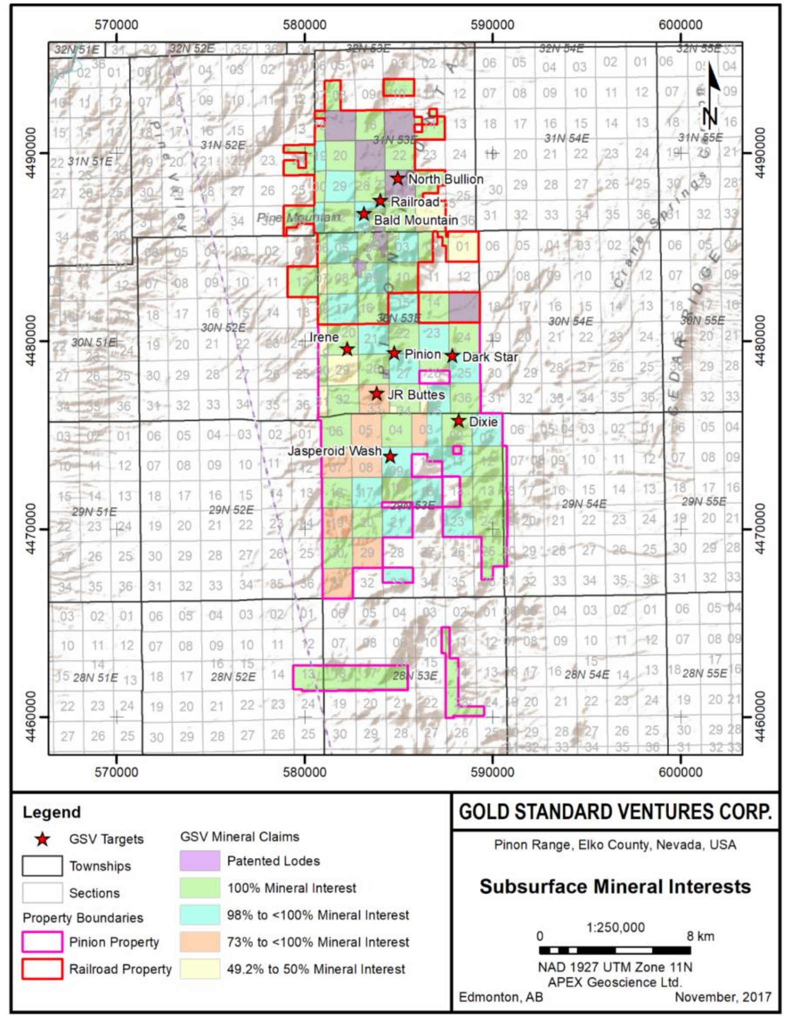


Figure 4-2: Railroad-Pinion Property with Ownership Percentages, Elko County, Nevada

(from Dufresne and Nicholls, 2017b)

Private surface and private mineral property are wholly owned and subject to lease agreement payments (see Section 4.2) and property taxes (paid on an annual basis) as determined by Elko County. Unpatented lode mining claims grant the holder 100% of the locatable mineral rights and access to the surface for exploration activities which cause insignificant surface disturbance. Ownership of the unpatented mining claims is in the name of the holder (locator), subject to the paramount title of the United States of America, under the administration of the BLM. Under the Mining Law of 1872, which governs the location of unpatented mining claims on federal lands, the locator has the right to explore, develop, and mine minerals on unpatented mining claims without payments of production royalties to the U.S. government, subject to the surface management regulation of the BLM. Currently, annual claim-maintenance fees are the only federal payments related to unpatented mining claims. The mineral rights do not expire if the unpatented claims are maintained by paying an annual fee of $165 per claim to the U.S. Department of Interior, BLM prior to the end of the business day on August 31 every year. A notice of intent to hold must also be filed with the Elko County Recorder on or before November 1 annually, along with a filing fee of $12.00 per claim, plus a $4.00 document fee.

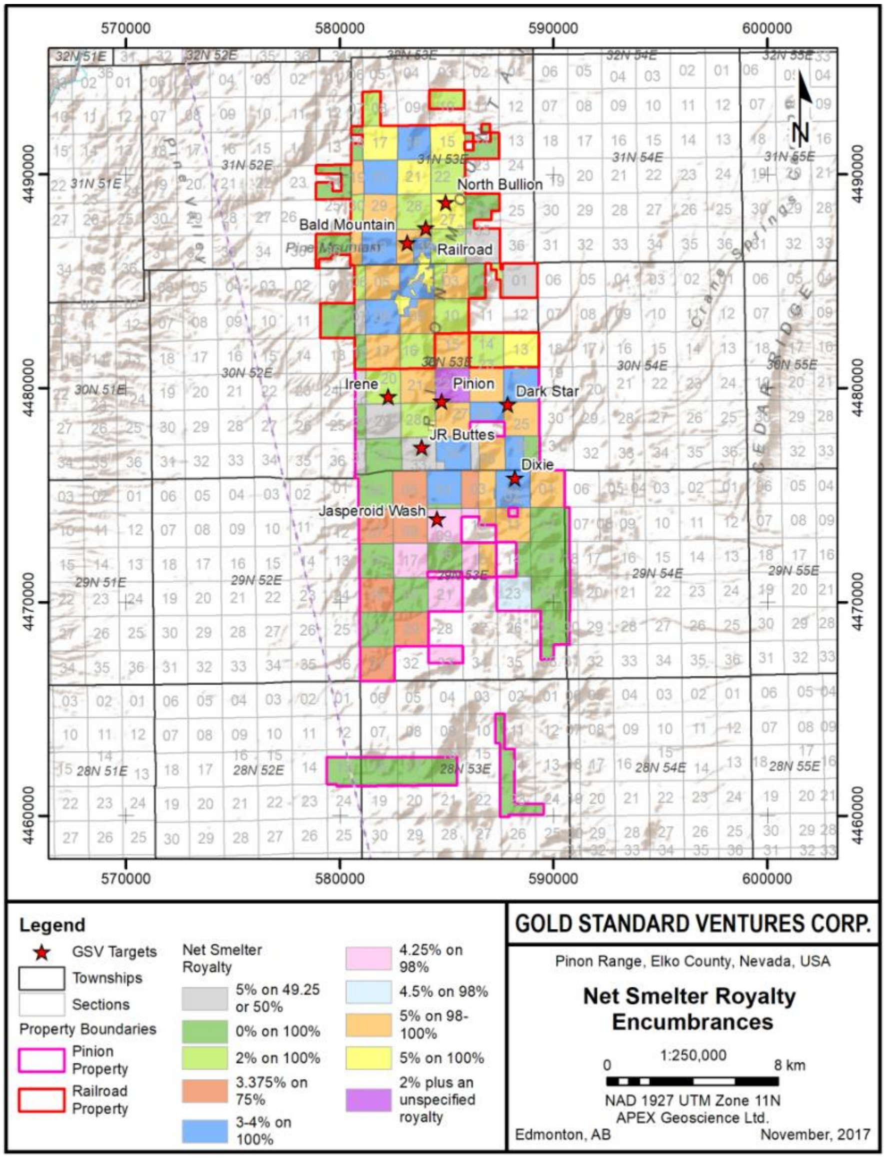
Gold Standard has completed its federal claim maintenance fee obligations for the owned and leased unpatented claims for 2021-2022 assessment year. The federal claim maintenance fees for the claims for the 2022-2023 assessment year are due on or before September 1, 2022. Gold Standard's estimated claim maintenance fee cost for the owned and leased unpatented claims is $294,414 per annum, and the company's total estimated annual cost to maintain its property package is $1,572,834.

4.2 AGREEMENTS AND ENCUMBRANCES

Portions of the unpatented and private lands are encumbered with royalties predominantly in the form of standard Net (or Gross) Smelter Return ("NSR" or "GSR") and Mineral Production ("MP") royalty agreements, or Net Profit Interest ("NPI") agreements. The locations and aerial distribution of the currently relevant royalty encumbrances for the Railroad-Pinion property are shown in Figure 4-3. These are summarized as follows:

- 1.0% NSR royalty to Franco-Nevada U.S. Corporation, as successor-in-interest to Royal Standard Minerals, Inc. and Manhattan Mining Co. on the portion of the property acquired by statutory plan of arrangement;
- 1.5% MP royalty to Kennecott Holdings Corporation on claims noted as the Selco Group;
- 5.0% NSR royalty to the owners of the undivided private mineral interests;
- Gold Standard owns an approximate 99.2% mineral interest in Sections 21 and 27 by way of several lease agreements. Pursuant to the terms of the relevant lease agreements, Sections 21 and 27 are subject to a 5.0% NSR royalty to the lessors of the leased property;
- Section 22 is comprised of the TC 1 through 39, and TC 37R and 38R unpatented lode mining claims owned by Gold Standard. The TC claims are subject to an unknown/unspecified NSR royalty to "GSI, Inc., of Virginia";
- 1.0% NSR royalty to Aladdin Sweepstake Consolidated Mining Company on the portion of the property acquired by statutory plan of arrangement, including the PIN#1 to PIN#12 lode mining claims;
- 4.0% NSR royalty to ANG Pony LLC for mining claims leased by Gold Standard in Sections 34 and 36 in T30N, R53E, and Sections 2 and 4 in T29, R53E;
- 3.0% NSR royalty to Peter Maciulaitis for certain mining claims in Sections 24 and 26 in T30N, R53E;
- A 3.0% NSR royalty (relative to mineral interest) to Linda Zunino and Tony Zunino, Trustees of the Delert J. Zunino and Linda Zunino Family Trusts dated October 11, 1994, and a 3.0% NSR royalty (relative to mineral interest) to John C. Carpenter and Roseann Carpenter, husband and wife, on Section 23 in T29N, R53E;

- 2.0% NSR royalty to Maverix Metals Inc., a successor-in-interest to Amax Gold Inc., on certain patented and unpatented mining claims owned by the company;
- A 3.0% NSR royalty to Nevada Sunrise LLC on the 14 WMH claims situated in Sections 1, 2, 3, and 11 in T29N, R53E; and
- A 3.5% NSR royalty (relative to mineral interest) to Dominek Pieretti and the heirs of Tusca Sullivan on Sections 3, 5, 7, 8, 9, 10, 15, 17, 19, 21, 29, 31, and 33 in T29N, R53E, and Section 33 in T30N, R53E.



(from Dufresne & Nicholls, 20147b)

Figure 4-3: Railroad-Pinion Property Map with Royalty Encumbrances

4.3 ENVIRONMENTAL PERMITS

As of the effective date of this Technical Report, the authors are not aware of any significant factors or risks that may affect access, title, or the right or ability to perform work on the property. Gold Standard controls sufficient ground and has sufficient permitting in place to access the project and continue future exploration programs. Details on permitting are provided below. The following section discusses land use permitting and other regulatory information specific to the South Railroad portion of the property.

A Plan of Operations for the South Railroad Mining Project was submitted to BLM in November 2020. BLM issued a letter of completeness in December 2020 and determined that due to the scope of the project, an Environmental Impact Statement would need to be prepared under the National Environmental Policy Act prior to approval. Additional State and Federal Permit applications are being prepared concurrently with the EIS preparation and are expected to be submitted in 2022. These include; Air Operating Permits, a Water Pollution Control Permit, Jurisdictional Water (404) permit, Groundwater Discharge (NPDES) permit and several others.

Exploration

Gold Standard currently has a Plan of Operations (PoO) in place with the BLM and a Surface Area Disturbance Permit with the Nevada Division of Environmental Protection (NDEP) for the South Railroad portion of the property (Figure 4-4).

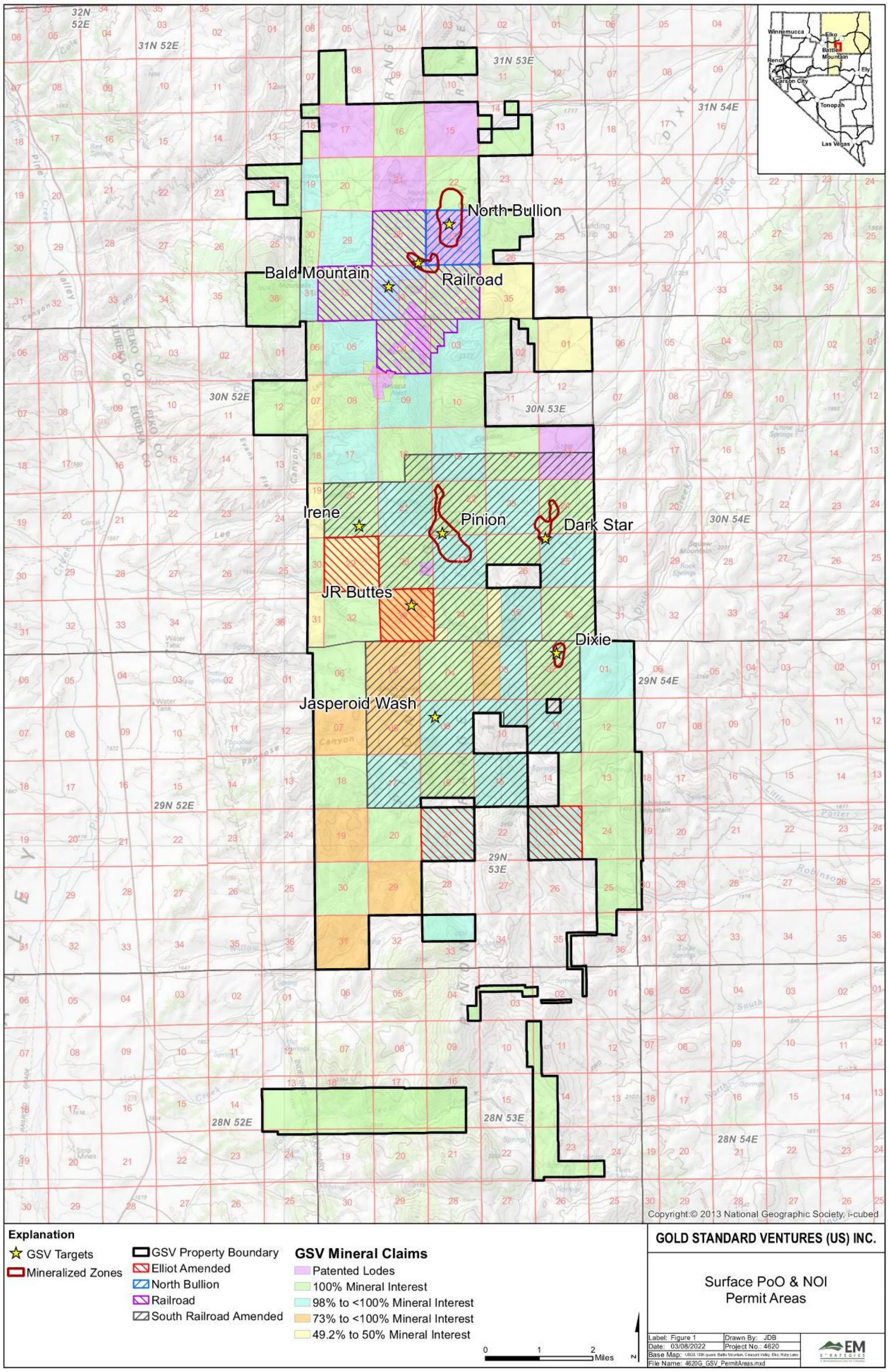
Gold Standard represents that the PoO for the “South Railroad” portion of the Railroad-Pinion project was approved by the BLM in December 2020. The approved PoO covers a total of 8,456 ac with 5,236 ac of public land and 3,072 ac of private land located in Section 2 in T29N, R53E, and Sections 20, 21, 22, 23, 24, 25, 27, 28, 34, 35, and 36, and portions of Sections 14, 16, and 26 in T30N, R53E. Within the area of the PoO exploration-related disturbance and reclamation bonding can be conducted in three phases totaling 500 acres. A reclamation bond in the amount of 1,448,735 has been posted with the BLM. This covers the initial 300 acres of exploration related disturbance in Phases One and Two.

4.3.1 Other Permits

A PoO and SAD permit are also held for the Railroad Exploration Area. Notices of Intent cover other exploration areas including Section 22, LT, Section 14, and Camp Douglas

4.3.2 Private Land Disturbance

As of the effective date of this Technical Report, Gold Standard has received a Reclamation Permit (“RP”) that includes the Pinion, Dark Star, and Irene reclamation plans. This RP covers both private land and public land disturbances. Previously approved reclamation plans associated with these areas will be closed by the respective permitting agency, either BLM or NDEP. These operated under an Interim Reclamation Permit (“IRP”) issued by the State of Nevada for disturbance greater than five acres on private land. The IRP allowed up to 11 acres of surface disturbance and covered portions of Sections 21 and 27 (not included in the PoO) in T30N, R53E.



(from Gold Standard, 2018)

Figure 4-4: Property Map with Railroad- Pinion Permit Boundaries

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5 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

5.1 ACCESS TO PROPERTY

The primary site access for South Railroad will be from Elko, NV using a 41.7-mile access route. This 41.7-mile route begins from its intersection with 12th Street in Elko, NV and continues approximately 5.5 miles along the existing paved State Route (SR) 227 (i.e., Lamoille Highway) to the intersection with SR 228 (i.e., Jiggs Highway). The route continues south along paved SR 228 for another 5.5 miles to the paved Elko County Road 715 (i.e., South Fork Road). The route follows southward along County Road 715 approximately 5.7 miles to the intersection with County Road 715B (i.e., Lucky Nugget Road/Grant Avenue). From this intersection, the route follows County Road 715B approximately 3.1 miles along the west shore of South Fork Reservoir through a semi-rural residential area to the intersection with BLM Road 1119, which continues southwest approximately 6 miles to its intersection with Elko County Road 720 (i.e., Bullion Road). The route follows the Bullion Road southwest approximately 10 miles to the intersection with the un-improved BLM Road 1053, then continues southward following the approximate alignment of BLM Road 1053 along the eastern flank of the Pinion Range approximately 6 miles to the South Railroad Project. Travel within the project area is currently via a network of historical and recently constructed direct roads and four-wheel drive tracks.

5.2 CLIMATE

The project area has a relatively dry and cool, high-desert climate. Weather records from the Newmont Mining Corporation ("Newmont") Carlin mine, 34 miles to the north, indicate that from 1966 through 2002, the average January maximum and minimum temperatures were 34ºF and 20ºF, respectively. July average maximum and minimum temperatures were 83ºF and 58ºF, respectively.

Rainfall in the region is generally light and infrequent between May and October. At Emigrant Pass, 10 miles west of the town of Carlin, Nevada and 12 miles northwest of the property, average annual precipitation has been 12.9 inches with average precipitation on January and July of 1.5 inches and 24 inches, respectively (US Climate Data). Much of the annual precipitation occurs as snowfall during the winter months.

Precipitation can vary dramatically with changes in elevation and season. Moist airflow from the south brings summer thunderstorms from July through September. A small number of these storms may carry heavy rains that can cause localized flooding in creeks and drainages. Winter snow and spring runoff may temporarily limit local access with respect to drilling and other geological fieldwork activities between November and April each year but are not considered to be significant issues. Mining and exploration can be conducted year-round with adequate snow removal and maintenance of access roads.

5.3 PHYSIOGRAPHY

Northern Nevada is within the Basin and Range physiographic province, an area characterized by gently sloping valleys bounded by generally north-south-trending mountain ranges. The project area is located within and adjacent to the Piñon Range at elevations ranging from 5,807 feet to nearly 8,694 feet above sea level. Lower elevations consist of gentle, rolling hills with little to no bedrock exposure. Higher elevations are characterized by steeper slopes, deeply incised drainages, and an increase in bedrock exposure.

Vegetation largely consists of sagebrush, rabbit brush, small cacti, and bunch grass communities, consistent with a high-desert climate. Cottonwood trees are present in canyon and creek bottoms, and near springs. Pinyon pine, juniper, mountain mahogany, and aspen trees are present in some areas at higher elevations.

5.4 LOCAL RESOURCES AND INFRASTRUCTURE

Elko, Nevada is a small, full-service city based on mining, ranching, and transportation that has served as the center for northern Nevada mining and exploration for more than half a century. Housing, hotels, groceries, restaurants, clinics, and a hospital, industrial supplies, a regional airport with daily flights to and from Salt Lake City, Utah, interstate highway and railway, local, state and federal government offices, fuel, telecommunications, engineering services, light and heavy equipment sales and services, and a community college are all present.

In this part of Nevada, there are local, regional, and international exploration and mining service companies, including assay laboratories, surveyors, suppliers, drilling contractors, and heavy equipment vendors supporting the exploration and mining industry. These companies are served by a skilled and experienced local labor force accustomed to the mining and exploration industries.

The North Railroad and South Railroad portions of the property are within 40 miles of several large, active open-pit and underground mines operated by Newmont and Barrick Gold Corp. ("Barrick") along the Carlin trend. These mine sites also include fully operational mill complexes designed to treat sulfide and/or carbon-sulfide refractory gold ores.

Water for drilling at Pinion, Dark Star, and Jasperoid Wash is available at the project site. For communications, a commercial cellular telephone and data network is available in select locations. There are sufficient and appropriate sites within the property to accommodate exploration and potential mining facilities, including waste rock disposal, heap-leach pads, and processing infrastructure. Surface rights controlled by Gold Standard are sufficient for potential mining operations.

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6 HISTORY

Historical exploration conducted at the North Railroad and South Railroad portions of the Railroad-Pinion property is summarized below and is largely derived from Dufresne and Nicholls (2016), Dufresne *et al*. (2017), Dufresne and Nicholls (2017b), Dufresne and Nicholls (2018), and other sources as cited. The authors have reviewed this information and believe it accurately represents the history of the property as presently understood. MDA has added details of drilling types, footage and number of holes based on Gold Standard's recently compiled project-wide database.

6.1 NORTH RAILROAD PORTION OF THE PROPERTY

This portion of the report is extracted and modified from Dufresne and Nicholls (2018) who provided the most recent summary of historical exploration in the North Railroad portion of the property using information taken largely from Hunsaker (2010, 2012a, 2012b), Shaddrick (2012), Koehler *et al.* (2014), and sources as cited. Details of types and amounts of drilling were derived from Gold Standard's project-wide drill database.

The earliest prospecting and mineral exploration in the North Railroad portion of the property likely dates to the mid-1860s. In 1869, the Railroad mining district was established in the area of Bunker Hill and the district was also known as the Bullion or Empire City district (LaPointe *et al.*, 1991). Initially silver, lead, and copper ore was shipped to Chicago and San Francisco. A smelter was built in 1872 at the nearby town of Bullion. Beginning in 1905, shipments from operating mines, old dumps, and slag were sent to Salt Lake City (Ketner and Smith, 1963).

Early production in the district was mainly silver, lead, and copper extracted from numerous underground mines on the northern flank of Bunker Hill. Emmons (1910) reported that the mines were reopened in 1906 and at the time of his review the Standing Elk, Tripoli, Red Bird, Copper Belle, and Delmas mines were accessible. The most important mines exploited replacement and skarn-type deposits in marbleized and dolomitized rocks in the vicinity of the Bullion stock (see Section 7.3). There were also minor, undeveloped gold veins in intrusive rocks.

Beginning in 1910, and until the mines quit production in the 1960s, zinc became the prominent metal mined (LaPointe *et al.*, 1991). In 1905, the Davis tunnel was started from a location approximately 4,400 ft northeast and 1,000 ft below the 600 level of the Standing Elk mine. Many lessors worked at extending the tunnel, which was driven southwest to reach a zone beneath the Standing Elk. In 1959, the zone was reached but no ore was found. Numerous oxidized faults and oxidized zones of base-metal mineralization were crossed.

Modern-era exploration began in 1967 when American Selco optioned claims from Aladdin Sweepstake Consolidated Mining, launching a period of surface sampling, geophysics, geological mapping, and surface drilling in the Railroad district and the North Railroad portion of the property that has continued to the date of this Technical Report. Records are incomplete but historical exploration was likely conducted in various areas at various times by 15 companies. These companies collected 6,260 soil samples, 3,508 rock samples, and drilled 382 holes, according to Dufresne and Nicholls (2018). Drilling in the North Railroad portion of the property by these operators is discussed in Section 10.2.

American Selco, Placer Amex, and El Paso Natural Gas Company with Louisiana Land and Exploration Company explored for porphyry copper and molybdenum in the Bullion stock and Grey Eagle intrusive rocks. They also looked for replacement sulfide "lenses" in limestone and "unknown replacement or disseminated" mineralization west of the Bullion stock (American Selco, 1970). American Selco completed an induced potential ("IP") and magnetic geophysical surveys and drilled seven core holes and seven holes of unknown type. Subsequent core holes, and several of the rotary holes completed to the desired depths, intersected up to 50% sulfides as well as molybdenum, copper, silver, and gold.

Placer Amex drilled a single 1,200 ft hole in 1972. In 1974, El Paso Natural Gas Company drilled 2203 ft in five holes of unknown type with the Louisiana Land and Exploration Company. In 1975, AMAX Inc. ("AMAX") optioned the claims and explored for tungsten, molybdenum, and base metals until 1980. Detailed mapping was completed in Sections 27, 28, 29, 32, 33, and 34 in T31N, R53E, and in Sections 3, 4, 5, 6, 8, and 9 in T30N, R53E (Dufresne and Nicholls, 2017b). AMAX also conducted surface dump and rock chip sampling, soil sampling, a vegetation geochemical survey, a ground magnetometer survey and drilled two core holes and 13 holes of unknown type in 1977 through 1980.

In 1980, Homestake Mining Company ("Homestake") entered into a joint venture arrangement with AMAX and exploration was focused on gold in the North Railroad area, particularly after Newmont discovered the Rain gold deposit about 6.2 mi north of Bunker Hill. Homestake drilled 22 holes (Galey, 1983) and collected rock and soil samples. The Homestake work identified what later became known as the POD deposit.

NICOR Mineral Ventures, Inc. ("NICOR") became AMAX's joint venture partner in 1983. As operator, NICOR continued the geologic mapping, soil geochemistry, and drilling initiated by Homestake. NICOR drilled 102 rotary and reverse-circulation holes ("RC") in 1983 through 1986, expanding the drill coverage at the POD deposit and estimating a mineral resource (see Section 6.3.3).

In 1986, Westmont Mining Inc. ("Westmont") took over NICOR's interests and operated until 1993. Some of NICOR's rock and soil sample data are recorded as Westmont data. Westmont drilled 42 RC holes and 31 holes of unknown type in the POD, North Bullion, Bald Mountain, and north of North Bullion areas during 1987-1992 and collected rock and soil samples. They developed a detailed stratigraphic interpretation for the late Paleozoic sedimentary units and also began to recognize low-angle reverse and low-angle normal faults, as well as prominent north-south-trending and northwest-trending high-angle normal and reverse faults. The interplay of the Webb-Devils Gate contact and complex faulting as controls to the mineralization were also identified late in the Westmont tenure.

At some time prior to 1993, Corona Gold ("Corona") reported on land held jointly with Pezgold mineral resource Corporation ("Pezgold") in Sections 16 and 20 in T31N, R53E, and which later became part of the Railroad-Pinion property. Available data indicate that six holes were drilled and geologic mapping, soil and rock sampling, and geophysics were conducted. Gold Standard's drilling database does not contain drill holes attributed to Corona or Pezgold. Specific drill locations are not known, and drill data indicates all the holes remained in the Mississippian Webb Formation above the target horizons. A northeast-trending corridor of subtle Carlin or Rain-type alteration and weak geochemistry was noted.

The Corona Gold area was acquired by Newmont in 1993. According to Dufresne and Nicholls (2017b), two holes were drilled, and additional geophysical surveys were conducted. The drilling reached as deep as 1,400 ft, but this was not deep enough to reach the target horizon in those locations. These holes are not in Gold Standard's drilling database. Gravity data outlined the northeast-trending zone and indicated a significant fault in the northeast corridor.

Ramrod Gold ("Ramrod") became operator in 1993 and drilled 10 RC holes in the POD-North Bullion area in 1994. Newmont drilled one hole north of the POD-North Bullion deposit in 1995.

Mirandor Exploration (U.S.A.) Inc. ("Mirandor") operated the project in 1996-1997 and drilled 42 RC holes in the POD-North Bullion, Bald Mountain, and north of North Bullion areas. The exploration for Ramrod and Mirandor was carried out by geologists who were previously employed by Westmont.

The Ramrod and Mirandor drilling tested greater depths than their predecessors and showed encouraging results along the northwest-trending POD zone. Elsewhere, the EMRR series of drill holes returned favorable results adjacent to the historic Sylvania mine which had historic production from replacement/skarn mineralization. Ramrod and Mirandor's deeper drilling and drill hole placement encountered higher gold values than earlier drilling.

Kinross Gold U.S.A, Inc. ("Kinross") took over the project during 1998 and 1999 under the terms of an earn-in agreement with Mirandor. Kinross drilled 64 RC holes and one core hole in the POD-North Bullion and Bald Mountain areas, according to the Gold Standard database and collected 871 rock and 2,531 soil samples according to Dufresne and Nicholls (2017b). The soil samples were collected using a uniform collection process and the analysis of both soils and rocks was consistent in analytical laboratory and procedures.

The Kinross surface-sample results were consistent with known mineralization geology across most of the historical project area. Gold in soil anomalies from the Kinross samples generally coincides with the known historical drilling. Ag, As, Sb, and Hg also gave a similar pattern and highlight the known areas. Cu, Pb, Zn, and Mo highlight the historical skarn and replacement area (Dufresne and Nicholls, 2017b). The Kinross drilling tested within the areas of historical estimates, on the extensions of those zones, as well as newer target areas. The results in the areas of known gold returned similar results (Bartels, 1999). Step-out drilling appeared to be encouraging. Kinross drilled deeper holes, and in many cases, tested more of the stratigraphy than had been tested by previous operators.

The authors have no information on historical exploration, if any, carried out in the North Railroad portion of the property from 1999 until 2007. In 2007 and 2008, Royal Standard Minerals ("RSM") drilled four core holes in the Bald Mountain area.

RSM, or its North Railroad property, was acquired by Scorpio Gold Corporation ("Scorpio"). In 2009, Gold Standard acquired the North Railroad property of Scorpio Gold and various private investors. MDA is not aware if this was the entire North Railroad portion of the current property, or if parts of the current North Railroad portion were acquired subsequent to 2009.

Gold Standard commenced exploration in the North Railroad portion of the property in 2009 (see Section 9.1 and Section 9.3) and began drilling in the North Bullion area in 2010 (see Section 10.4.1.1).

6.2 SOUTH RAILROAD PORTION OF THE PROPERTY

Various parts of the current South Railroad portion of the property have been held by at least 15 different successive operators at various times. The summaries in Table 6-1 and Table 6-2 provide a timeline of the historical operators that held ownership of various portions and conducted historical exploration work. In some cases, historical project and property names, and boundaries have been applied in different forms than have been in use by Gold Standard over the last several years. Drilling by historical operators is summarized in Section 10.

6.2.1 Pinion Area Exploration History

Exploration activity at the Pinion area dates back to the discovery of the Pinion prospect by Newmont in 1980. Newmont referred to the prospect as Trout Creek. The majority of the historical work was conducted in the late 1980s and early to mid-1990s and overlaps somewhat with that of the adjacent North Railroad portion of the property. Historical exploration work conducted in the Pinion area is summarized in Table 6-1. This work identified a Carlin-type gold deposit at the Pinion prospect in Sections 22 and 27 in T30N and R53E, which for a time was known as the South Bullion deposit. An additional zone of gold-silver mineralization was discovered and partly delineated at the Dark Star prospect in Section 25 in T30N, R53E.

Historical drilling began in 1980 with RC methods. Drilling by historical operators is summarized in Section 10. The mineral resource estimates mentioned in Table 6-1 and in Section 6.3 were estimated prior to the introduction of the standards set forth in NI 43-101 and are not in accordance with NI 43-101. The authors of this Technical Report have referred to these estimates as "historical resources" and are not treating them, or any part of them, as current mineral resources or mineral reserves. There is insufficient information available to properly assess data quality, estimation parameters, and standards by which the estimates were categorized, and the authors have not done sufficient work to classify these historical mineral resources as current mineral resources. The historical mineral resource estimates described above should not be relied upon and are relevant only for historical completeness.

Historical exploration in the Pinion area identified two discrete zones of mineralization (Main and North) with the majority of the historical drilling having been completed at the Main zone, including the testing of the jasperoid breccia outcrops located near the southern boundary of Section 22 in T30N and R53E. Historical drilling extended the Main zone gold mineralization well into Section 27 to the southeast. The north zone is located approximately ~1,000 ft northeast of the Jasperoid outcrops of the Main zone.

In 2014, Gold Standard acquired a large portion of the Pinion and surrounding area mineral rights from Scorpio. Subsequently, Gold Standard expanded their land position to include all of South Railroad.

Table 6-1: Summary of Historical Exploration, Pinion Area

(modified from DeMatties, 2003; Dufresne and Nicholls, 2017; and with data from Gold Standard, 2018 and 2019)

Year	Company	Exploration Work Performed
1980	Newmont	- Conducted a regional stream sediment survey within the Piñon Range, which revealed a geochemical anomaly along Trout Creek. - Further prospecting and discovery of the baritic jasperoid, Pinion Main zone.
1980-1981	Cyprus Exploration Co. (“Cyprus”)/ AMOCO	- 31 RC drill holes in Au-bearing jasperoid outcrops and soil geochemical anomalies.
1983	Freeport-McMoRan (“Freeport”)	- 8 RC holes; each intersected gold.
1985	Santa Fe Mining (“Santa Fe”)	- 14 RC holes were drilled
1987-1989	Newmont	- 61 RC holes, estimation of historical mineral resource known as South Bullion, 20 million tons grading 0.026 oz Au/ton * (see discussion below in Section 6.2.4).
1988	Battle Mountain Gold (“Battle Mountain”)	12 holes of unknown type were drilled.
1987-1989	Teck Resources (“Teck”)	- 39 RC drill holes, geological mapping, and performed a soil geochemical survey.
1989-1991	Westmont Resources (“Westmont”)	11 holes of unknown type were drilled.
1990-1994	Crown Resources (“Crown”)	- 130 RC holes, conducted metallurgical testing, detailed mapping, rock chip sampling, 800 soil samples, controlled-source audio-magnetotelluric (“CSAMT”), and an airborne magnetic-electromagnetic-radiometric survey. - Defined two small and shallow mineralized zones: Pinion Main and “Central" zone, also known as Pinion North zone; estimated historical mineral resource of 8.1 million tons @ 0.89 g Au/t (0.026 oz Au/ton)* (see discussion below in Section 6.2.4).
1994-1995	Cyprus Mining (“Cyprus”)	- 914 rock samples, compiled geochemical results of previous exploration, identified Au anomalies defining the Ridge zone and Northern Extension. - 74 RC holes in the South Bullion mineral resource area, expanded the historical mineral resource to 31 million tons at 0.89 g Au/t (0.026 oz Au/ton)* * (see discussion below in Section 6.2.4).
1996	Crown/Royal Standard Minerals Inc. (“RSM”)	- 225 rock chip samples along 100 ft spaced lines; conducted geologic mapping, drilled 7 diamond-core holes at the Main zone and North (Pod) zone not in the Gold Standard database; produced a historical mineral resource and preliminary scoping study.
1997-1999	Crown/RSM/Cameco	- Conducted geologic mapping, CSAMT surveys, rock chip sampling. Cameco drilled 18 RC holes and 8 core holes were completed; some may have started with RC.
1998-1998	Kinross Gold	- 1 RC hole and 1 hole of unknown type were drilled.
2002-2011	RSM	- 2003 drilled 10 RC holes, conducted metallurgy work with samples from drilling and trenches; obtained density measurements indicating historical mineral resources could have been understated. In 2007, 5 core holes drilled to determine the water table and to characterize the neutralization and acid generating potential of the mineralized and waste rocks. - Proposed leach pad drill testing was completed in 2007, holes not in database.

** The mineral resource estimates summarized in Table 6-2 were calculated prior to the introduction of the standards set forth in NI 43-101 and are not in accordance with that Instrument. The authors of this Technical Report have referred to these estimates as “historical resources” and are not treating them, or any part of them, as current mineral resources. There is insufficient information available to properly assess data quality, estimation parameters and standards by which the estimates were categorized, and the authors have not done sufficient work to classify these historical mineral resources as current mineral resources. The historical mineral resource estimates described above should not be relied upon and are relevant only for historical completeness.*

6.2.2 Dark Star Area Exploration History

The Dark Star deposit is located approximately 2 mi east of the Pinion Main zone (Figure 4-1). Historical exploration work was conducted at the Dark Star area from 1990 through 1999 by Crown, Westmont, Cyprus, Cameco and RSM, Mirandor, and Kinross, as summarized in Table 6-2. In 1990, Crown identified a surface gold anomaly through rock and soil sampling in what became the Dark Star deposit.

Drilling in 1991 confirmed the presence of subsurface gold mineralization at Dark Star. Further historical drilling identified an approximately north-south-trending mineralized zone that became known as the Dark Star Corridor. Historical drilling is summarized in Section 10.

Table 6-2: Summary of Historical Exploration in the Dark Star Area

Year	Company	Exploration
1984	Cyprus-AMAX	- 9 rotary holes drilled
1990	Crown	- Discovery and definition of Dark Star surface mineralization with rock chip and soil samples.
1991	Crown, Westmount Resources Inc.	- 38 holes; detailed rock and soil sampling; geologic mapping; drilled 6 reconnaissance holes peripheral to the Dark Star deposit. - 3 holes north of the Dark Star mineralized zone.
1992	Crown	- 33 holes; detailed CSAMT survey; detailed palynology studies to better define Dark Star stratigraphy; - Estimated mineral resource of 7.0 million tons at 0.75 g Au/t (0.022 oz Au/ton) or 154,00 oz of gold* in Section 25 (Calloway, 1992).
1994	Crown	- updated estimated mineral resource of Pan Antilles Resources of 7.5 million tons 0.69 g Au/t (0.0.020 oz Au/ton) or 151,000 oz Au* (McCusker and Drobeck, 2012).
1994-1995	Cyprus	- 9 holes drilled to the north of the Dark Star mineralized zone (not in Gold Standard's database); - Estimated a mineral resource of 7.7 million tons at 0.69 g Au/t or 170,000 oz Au*.
1997	Cameco, RSM	- Gradient IP/Resistivity survey completed between Dark Star and Dixie
1997	Mirandor	- 11 holes drilled north and west of Dark Star mineralized zone.
1998	Kinross, Mirandor	- 7 holes drilled just north of mineralized zone.
1999	Kinross, Mirandor	- 6 holes drilled northwest of mineralized zone.

** The mineral resource estimates summarized in Table 6-2 were calculated prior to the introduction of the standards set forth in NI 43-101 and are not in accordance with that Instrument. The authors of this Technical Report have referred to these estimates as "historical resources" and are not treating them, or any part of them, as current mineral resources. There is insufficient information available to properly assess data quality, estimation parameters and standards by which the estimates were categorized, and the authors have not done sufficient work to classify these historical mineral resources as current mineral resources. The historical mineral resource estimates described above should not be relied upon and are relevant only for historical completeness.*

6.2.3 Jasperoid Wash

The Jasperoid Wash prospect is located 4.7 mi southwest of the Dark Star deposit (Figure 4-1). In 1988, Westmont conducted geologic mapping, and rock and soil sampling over the Jasperoid Wash and Black Creek regional area. The geochemical sampling identified a large anomalous mineralized system and a 13-hole RC drilling program followed in 1989. Nine of the 13 holes drilled in 1989 intersected intervals of ≥0.01 to 0.03 oz Au/ton (0.34 to 1.03 g Au/t). Follow-up drilling programs were conducted in 1990, 1991, and 1992 by drilling 34 RC and three core holes. Low-grade gold mineralization was intersected in 22 of the holes (Jones and Postlethwaite, 1992). This historical drilling is summarized in Section 10.1.

In 1997, Cameco collected 35 rock-chip samples to test the anomaly within the hydrothermally altered Diamond Peak and Chainman-Dale Canyon formations of the Jasperoid Wash prospect. Four RC holes were drilled, totalling 1,825 ft, targeting structural intersections. Significant gold mineralization was not intersected in the 1997 drilling at Jasperoid Wash, although two of the holes intersected low-grade, anomalous mineralization (Parr, 1998).

In 1998, Cameco completed gradient IP/Resistivity geophysical surveys over the Jasperoid Wash area and identified a large zone of low chargeability and high resistivity in the western part of the survey area. This was reportedly tested in 1998 by four RC holes totalling 2,220 ft. Significant gold mineralization was not intersected in the drilling, although two of the drill holes intersected low-grade anomalous gold (Parr, 1999).

6.2.4 Other Prospects in the South Railroad Portion of the Property

Historical exploration has taken place intermittently since 1980 at several locations approximately 2.2 to 4.7 mi southwest and south of the Dark Star and Pinion deposits as summarized below, and at the Irene prospect west of the Pinion deposit.

6.2.4.1 Dixie

The Dixie or Dixie Creek area, which is located 2.2 mi south of the Dark Star deposit (Figure 4-1), has been explored intermittently since 1980 by various operators. The majority of the historical exploration work has been regional to semi-detailed in nature. In 1997, Cameco conducted rock sampling at the Pinion, Dark Star, and Dixie areas. The 1997 rock sampling at the Dixie area was intended to examine the nature of surface mineralization, in greater detail, and to compare this data with results of the then recently completed drill holes at the prospect. At the main Dixie area, a group of 32 rock samples defined a distinct, >1,500 ppb Hg anomaly with elevated Au, As, Sb, and Ag (Parr, 1999). This anomaly was found to roughly correspond with gold mineralization in the subsurface. Immediately to the north, a North Dixie anomaly was identified that was characterized by similar chemistry (elevated Hg, Au, As, and Sb). Farther north, a group of 15 rock samples collected between the Pinion and Dark Star areas defined a similar zone at the “CISS” area where six samples contained 20-135 ppb Au, including As values up to 940 ppm, Sb up to 161 ppm, and Hg up to 15 ppm.

In addition to the rock sampling, Cameco completed limited induced potential and resistivity (“IP/Resistivity”) geophysical surveys at several prospects including the Dixie area in 1997 and 1998. The IP/Resistivity surveys at Dixie identified broad zones of contrasting high and low resistivity, and corresponding zones of high chargeability (Parr, 1999).

The first documented drill program at the Dixie prospect was conducted by Freeport in 1988 and 1989, during which 26 holes were drilled in a joint venture with Crown. In 1991, Crown completed seven RC holes and later Cameco drilled 11 RC holes at the Dixie prospect. This historical drilling is summarized in Section 10. The drilling identified a zone of low-grade gold mineralization within Pennsylvanian siliciclastic and carbonate rocks above the contact between the Webb Formation and the underlying Devils Gate Limestone. This important contact between the Webb Formation and the underlying Devils Gate Limestone was not intersected by any of the historical Dixie Creek drilling (Redfern, 2002). The mineralization intersected at Dixie Creek is hosted in rocks that are similar in nature to the host rocks for the Dark Star gold mineralization (see Section 7.2.2.2).

6.2.4.2 JR Buttes

The JR Buttes prospect is located 2.8 mi southwest of the Dark Star deposit. Geological mapping was completed over the JR Buttes area by an unknown company in 1977. This work outlined a zone of intense silicification over an interpreted graben structure (Dufresne and Nicholls, 2017a). In 1992, Westmount conducted rock chip, reconnaissance soil sampling, and detailed mapping, followed by a 19-hole RC drill program of 8,365 ft. The drilling was designed to test for mineralization adjacent to the graben structural zone. Mineralization defined by silicification, arsenic, and gold concentrations was intersected along the western boundary fault of the graben. No mineralization was intersected along the eastern side of the graben (Jones and Postlethwaite, 1992). In 1994, Cyprus drilled three RC holes, and Cameco drilled one RC hole in 1998. The JR Buttes drilling is summarized in Section 10.3.

6.2.4.3 Irene

Newmont carried out drilling in the Irene area during 1981-1982 and 1987-1989. Altogether, a total of 42 holes were drilled as summarized in Section 10.3.2 and Section 10.3.6.

6.3 HISTORICAL MINERAL RESOURCE ESTIMATES

Several historical mineral resource estimates have been estimated by a variety of companies for the Pinion and Dark Star deposits prior to the implementation of NI 43-101. The reader is advised that the historical mineral resource estimates are not in accordance with NI 43-101 and should therefore not be relied upon. A qualified person has not done sufficient work to classify the historical mineral resources as current mineral resources or mineral reserves. Historical mineral resources at Dark Star and Pinion are superseded by the current mineral resources estimated by MDA and presented in this Technical Report. At POD, North Bullion, and Sweet Hollow the mineral resources by APEX presented in Section 13 of this Technical Report are current mineral resources. The historical mineral resources described below are relevant only for historical completeness and are not being treated as current mineral resources or mineral reserves by Gold Standard.

6.3.1 Pinion Deposit Historical Estimates

The first documented historical mineral resource estimate for the Pinion deposit was completed by Crown in 1991 (Calloway, 1992). The 1991 estimate included information from 194 drill holes in the Main zone and North zone. The estimate used a cross-sectional polygonal method, a gold cutoff grade of 0.001 oz Au/ton (0.34 g Au/t), and a tonnage factor of 13.0 ft^3/ton (density of 2.464 g/cm^3). A “geologic” mineral resource of 8.11 tons (7.36 million tonnes) of material averaging 0.026 oz Au/ton (0.89 g Au/t) was calculated, containing approximately 210,000 troy ounces of gold (Table 6-3). The authors have not done sufficient work to classify these historical estimates as current mineral resources or mineral reserves, and Gold Standard is not treating these historical estimates as current estimates. These historical mineral resource estimates are superseded by the current mineral resource estimate described in Section 14.3 and are relevant only for historical completeness.

Table 6-3: Historical Pinion Deposit Estimated Mineral Resources

Mineral Resource*	Year	Tons ($x10^6$)	Tonnes ($x10^6$)	Gold Grade oz Au/ton	Gold Grade g Au/t	Silver Grade oz Au/ton	Silver Grade g Au/t	Cut-off Grade oz Au/ton	Contained Ounces Au	Contained Ounces Ag
Crown (Calloway, 1992a)	1991	8.11	7.36	0.026	0.891	-	-	0.01	210,860	-
Polygonal (Wood,1995)	1995	30.64	27.8	0.026	0.89	-	-	0.01	796,640	-
MIK (Wells, 1995)	1995	18.26	16.56	0.0269	0.92	-	-	0.01	491,194	-
Bharti (Bharti Eng., 1996)	1996	10.8	9.8	0.025	0.857	0.157	5.383	-	270,000	1,695,600

**The mineral resource estimates summarized in Table 6-3 are not consistent with current CIM standards for mineral resource estimation and classification. The authors have not done sufficient work to classify these historical estimates as current mineral resources or mineral reserves, and Gold Standard is not treating these historical estimates as current estimates. These historical mineral resource estimates are superseded by the current mineral resource estimate described in Section 14.3 and are relevant only for historical completeness. Calloway (1992a) in table is Calloway (1992) of this Technical Report.*

Historical mineral resource estimates were updated for the Pinion deposit in 1995 by Cyprus (Table 6-3). They comprise a polygonal estimate (Wood, 1995) and a Multiple Indicator Kriging ("MIK") estimate that used Mintec's MED System software (Wells, 1995). The polygonal estimate incorporated high-density and low-density drilling at, and surrounding, the two zones of mineralization and utilized a tonnage factor of 12.50 ft^3/ton (density of 2.563 g/cm^3). Polygons were constructed using cross-sectional drill-hole information and were classified as "proven" in areas where drill density was 100 ft, and where polygons were projected 50 ft on either side of a section. Polygons with drill-hole spacing between 100 ft and 200 ft were classified as "probable" and those with drill hole spacing over 200 ft, were classified as "inferred." The mineral resource was calculated by summing all polygons with an average grade above a cutoff of 0.001 oz Au/ton (0.34 g Au/t). The original classification of the 1995 polygonal Pinion mineral resource is not consistent with CIM standards. The summary provided in Table 6-3 is taken from the original report and represents a summation of all three of the historical mineral resource categories into a global historical mineral resource.

The 1995 Cyprus polygonal mineral resource (Table 6-3) was calculated using ~350 drill holes, but the estimate incorporated very few density measurements and a very limited amount of quality control/quality assurance ("QA/QC") data were available. The Cyprus historical mineral resources included drill-hole data and estimates for mineral resources in Section 27. Cyprus also produced an MIK estimate for the Pinion deposit in 1995 utilizing a similar database to that of the 1995 Cyprus polygonal mineral resource described above. The same tonnage factor of 12.50 ft^3/ton (density of 2.563 g/cm^3) as the polygonal mineral resource was used and grade was applied to a 50 ft x 50 ft x 20 ft block model using Mintec's MED System software and an MIK grade-estimation algorithm. Following the estimation process, Lerchs-Grossman pit models were run for $400/oz and $700/oz gold price scenarios using various parameters including: a) 45˚ maximum pit slopes; b) a $2.51/short ton crushed ore cost (crushing processing, pad construction, and G&A); c) 48% recovery for ROM material; and d) 62% recovery for crushed material. A lower cutoff grade of 0.008 oz Au/ton (0.274 g Au/t) was employed for the ROM material and 0.014 oz Au/ton (0.49 g Au/t) was utilized for the crushed material for the $700/oz scenario. A lower cutoff of 0.009 oz Au/ton (0.31 g Au/t) was utilized for the combined ROM/crush material for the $400/oz scenario. In a mineral resource summary document by Wells (1995), it is clearly stated that the mineral resource work relied on estimations for key factors such as density, recovery, and optimal crush size due to limited test work.

In 1996, RSM contracted Bharti Engineering ("Bharti") of Toronto, Canada, to conduct mineral resource estimation on the Pinion Main and North zones within Section 22 in T30N, R53E and excluded data within Section 27 (Table 6-3; Bharti Engineering, 1996). The mineral resource estimate utilized GEMCOM mining software and although not clearly stated, it is thought that the Inverse Distance Squared (ID^2) grade-estimation algorithm was used to apply grade to a 50 ft x 50 ft x 20 ft block model. Samples (5 ft average length) were uncapped and composited to 20 ft, with a minimum of two and a maximum of 12 data points required for modeling. The Bharti estimate (Table 6-3) comprised a "global resource," without cutoff grade, of 9.8 million tonnes at 0.025 oz Au/ton (0.86 g Au/t), representing a total of 273,800 contained ounces of gold. A qualified person has not done sufficient work to classify the historical mineral resources as current mineral resources or mineral reserves and the historical mineral resources are superseded by the current mineral resource estimates presented in Section 14.3 of this Technical Report. The historical mineral resources described above are relevant only for historical completeness and are not being treated as current mineral resources or mineral reserves by Gold Standard. This estimate incorporated more data but is otherwise comparable to the 1991 Crown polygonal estimate discussed above. A Whittle pit was run for the 1996 mineral resource estimate using a gold price of $390/oz, a recovery of 67%, total operating costs of $5.75/ton, a 4% Royalty, 50˚ maximum pit slope and dilution estimated at 10%. Using these values, two potential pits were generated for the Main zone and North zone totaling only 2.99 million tonnes and averaging 0.026 oz Au/ton (0.89 g Au/t), which represented approximately 85,750 ounces of gold. Of that, 57,400 ounces was considered recoverable. A qualified person has not done sufficient work to classify the historical mineral resources as current mineral resources ore mineral reserves and historical mineral resources are superseded by the current mineral resource estimates presented in Section 14.3 of this Technical Report. The historical mineral resources described above are relevant only for historical completeness and are not being treated as current mineral resources or mineral reserves by Gold Standard. As with the previously discussed historical mineral resource estimates, this 1996 estimate incorporated limited density, QA/QC and recovery information and its geographic limitation to Section 22 in turn limited the applicability of the mineral resource estimate as it excluded a significant amount of drill data in the northern part of Section 27.

6.3.2 Dark Star Deposit Historical Estimates

Based upon the 1991 to 1993 drilling results, Crown and Cyprus estimated mineral resources in 1992 and 1994, prior to the 1997 to 1999 drill holes completed by Mirandor and Kinross. The historical mineral resource estimates discussed below should not be relied upon and they are superseded by the current mineral resources estimate presented in Section 14.2 of this Technical Report.

Calloway (1992) described the 1992 Crown estimate for the Dark Star deposit as follows:

> *"Crown Resources has delineated a geologic resource in the Dark Star discovery area of approximately 7.0 MT @ 0.022 opt Au, or 154,000 oz of contained gold. Mineralization remains open in three directions. Calculations of the Dark Star geological resource utilized nearest neighbor and ordinary kriging methods, with a 0.010 opt cutoff, minimal 15 ft benches, and a 13.5 ft^3/st density factor."*

There are no other details provided for the 1992 Crown estimate by Calloway (1992). The estimate is considered historical and should not be relied upon. The authors have not done sufficient work to classify these historical estimates as current mineral resources or mineral reserves, and Gold Standard is not treating these historical estimates as current estimates. These historical mineral resource estimates are superseded by the current mineral resource estimate described in Section 14.2 and are relevant only for historical completeness.

In 1994, a consultant on behalf of Crown constructed a polygonal mineral resource estimate for the Dark Star deposit (Table 6-4) using GEO-MODEL and PC-XPLOR modules of GEMCOM (Peek, 1994; McCusker and Drobeck, 2012). The estimated mineral resource was based upon a polygonal methodology using composited drill-hole intervals and cross sections at 100 ft intervals. Tonnages, grade, and total ounces were calculated using polygons of 50 ft width on either side of each cross-section. The 1994 estimate did not include any geostatistics on variability or capping, no geologic constraints, no down-hole surveys, no QA/QC data evaluation, and no mention of density measurements. Peek (1994) utilized an assumed tonnage factor of 13.50 ft^3/ton (density of 2.375 g/cm^3) for the estimate. No economic constraints other than a lower-grade cutoff were applied to the mineral resource estimate.

Table 6-4: 1994 Dark Star Historical Crown Mineral Resource Estimate

Mineral Resource (Reference)	Tons (x 10^6)	Tonnes (x 10^6)	Gold Grade (oz Au/ton)	Gold Grade (g Au/t)	Cut-off Grade (oz Au/ton)	Cut-off Grade (g Au/t)	Contained Au (oz)
Polygonal (Peek, 1994)	11.5	10.43	0.0168	0.576	0.010	0.343	193,709
	7.55	6.85	0.0201	0.689	0.013	0.446	151,481

Note: The authors have not done sufficient work to classify these historical estimates as current mineral resources or mineral reserves, and Gold Standard is not treating these historical estimates as current estimates. These historical mineral resource estimates are superseded by the current mineral resource estimate described in Section 14.2, are relevant only for historical completeness and should not be relied upon.

In December 1995 to January 1996, Cyprus personnel estimated a polygonal mineral resource estimate for the Dark Star deposit with data from ~81 drill holes, utilizing a lower-grade cutoff, a pit shell, internal dilution, and a stripping ratio of 1.5:1, in a manner that was consistent with industry standards at that time (DeMatties, 2003). Polygons were constructed on cross sections using drill-hole information and were classified as "proven" in areas where drill density was 100 ft and polygons were projected 50 ft on either side of a section. Polygons with drill-hole spacing between 100 ft and 200 ft were classified as "probable" and those with spacing >200 ft were classified as "inferred." The Dark Star mineral resource was estimated by summing all polygons with an average grade 0.001 oz Au/ton (0.34 g Au/t). A tonnage factor of 12.50 ft^3/ton (density of 2.563 g/cm^3) was used. Very few density measurements and little or no QA/QC data were incorporated (DeMatties, 2003).

The 1995-1996 Cyprus estimate for Dark Star is summarized in Table 6-5. It represents a global historical "geological" mineral resource as of January 1996 and does not include the drilling by Mirandor and Kinross in Section 24. Although the Dufresne and Nicholls (2016) review established a high quality for the data used in the 1995-1996 estimate, there is insufficient information available to properly assess all of the estimation parameters and the standards by which the estimate for Dark Star was categorized. The authors have not done sufficient work to classify these historical estimates as current mineral resources or mineral reserves, and Gold Standard is not treating these historical estimates as current estimates. The historical mineral resource estimate for Dark Star should not be relied upon, it is relevant only for historical completeness, and it is superseded by the current mineral resource estimate presented in Section 14.2 of this Technical Report.

Table 6-5: Dark Star Deposit 1995-1996 Cyprus Mineral Resource Estimate

Mineral Resource	Tons	Tonne	Gold Grade		Cut-off Grade		Contained
(Reference)	(x 10^6)	(x 10^6)	(opt) oz Au/ton	(g Au/t)	(opt) oz Au/ton	(g/t Au)/t	Au (oz)
Polygonal DeMatties 2003; Cyprus 1995-1996	7.72	7.00	0.020	0.690	0.01	0.34	151,365

6.3.3 POD (Railroad) Deposit Historical Mineral Resources 1985 - 2003

The first estimate of gold mineral resources at the POD deposit was made by Kuhl (1985) using the data from NICOR's drilling (Table 6-6). A rectangular-block polygonal estimate was used with the following parameters:

- Data projected half way to the adjoining drill hole or 100 ft;
- Inclusion of intercepts less than 0.030 oz Au/ton (1.03 g Au/t) if the outlying intervals brought the overall average to equal 0.030 oz Au/ton (1.03 g Au/t);
- Minimum 10 ft intercept in the drill hole;
- All calculations made using fire assay intervals;
- No stripping ratio calculated; and
- No metallurgical recovery information utilized.

Bartels (1999) re-estimated the gold mineral resource at the POD (Railroad) deposit (Table 6-6) with a cross-sectional method based on 58 holes on 27 cross sections spaced 100 ft apart using the following assumptions:

- Tonnages were calculated using a tonnage factor of 12.50 ft^3/ton (density of 2.563 g/cm^3);
- Assay values include silver credits at a 60:1 ratio;
- Compositing of assay values was done according to the following conventions:
- Intervals of low grade (<0.030 oz Au/ton, or <1.030 g Au/t) up to 15 ft thick, bound on both sides by >0.030 oz Au/ton (>1.030 g Au/t) values were included within the "ore" envelope only if the average of the low grade and the upper- and lower-bounding values were ≥0.030 oz Au/ton (≥1.030 g Au/t);
- No capping of high-grade assay values was done;
- Volumes were determined by projecting the contoured "ore" areas 50 ft on either side of the section plane;
- An average grade was assigned to each area by determining the weighted average grade of all drill intercepts within the "ore" envelope; and
- Average grade was assigned to the respective volume and contained ounces were calculated.

Masters (2003a) re-estimated the gold contained within the POD (a.k.a. Railroad) zone (Table 6-6) utilizing a cross-sectional polygonal method with 71 holes on 15 cross sections approximately spaced 100 ft apart using the following methodology and assumptions:

- Tonnages were calculated using a tonnage factor of 12.50 ft^3/ton (density of 2.563 g/cm^3);
- Mineralization was categorized as oxidized (cyanide soluble gold within the Webb siltstone) and refractory gold (primarily within carbonaceous, sulfidic, unoxidized Webb siltstone);
- The oxidized and refractory gold categories were sub-divided into grade shells of 0.001 oz Au/ton to 0.20 oz Au/ton and >0.20 oz Au/ton (0.34 g Au/t to 0.69 g Au/t and >0.69 g Au/t), and an additional category of mineralization for refractory gold at depths above 300 ft depth was also considered; and
- Each mineralization category was estimated separately for tons, ounces and grade.

Masters (2003b) also presented the first estimation for gold contained within the East Jasperoid zone (Table 6-6) located immediately to the east of the POD zone, located immediately to the east of the POD zone. Estimation was completed utilizing a cross-sectional method on four sections spaced 100 ft apart.

Table 6-6: POD Deposit Historical Mineral Resource Estimates 1985 - 2003

Resource Area	Tons	Tonnes	Contained Ounces Au	Average Au Grade		Cutoff Au Grade		Reference
				(opt) oz Au/ton	(g Au/t)	(opt) oz Au/ton	(g Au/t)	
POD	1,197,400	1,086,280	107,766	0.090	3.09	0.030	1.03	Kuhl, 1985
POD	1,400,000	1,270,080	112,000	0.080	2.74	0.020	0.69	Kuhl, 1985
POD	1,006,665	913,250	89,731	0.089	3.05	0.030	1.03	Bartels, 1999
POD	2,654,112	2,407,810	134,445	0.0506	1.73	0.010	0.34	Masters, 2003a
East Jasperoid	1,013,808	919,727	31,742	0.031	1.06	0.010	0.34	Masters, 2003b

Note: The historical mineral resource estimates summarized in Table 6-4 were performed prior to the implementation of the standards set forth in NI 43-101 and are relevant only for historical completeness. There is insufficient information available to properly assess the estimation parameters and the standards used. The authors have not done sufficient work to classify these as current mineral resources, Gold Standard is not treating them as current mineral resources and they have been superseded by the current resources presented in Section 13. These historical mineral resources should not be relied upon.

6.4 HISTORICAL MINE PRODUCTION

6.4.1 North Railroad

The North Railroad portion of the property covers the historic Railroad district. Ketner and Smith (1963) suggested that historic production records for the district are not very reliable for the period between 1869 and 1905. Only the total volumes of tons mined, and commodity produced were reported, if they were reported. They estimated the total value of production through 1956 to be worth $2 million using the value of the commodity produced for the year it was produced. Ketner and Smith (1963) reported 43,940 total tons of ore were mined with mineral production distributed as follows:

- Gold - 6,918 ounces
- Silver - 382,000 ounces
- Copper - 2,850,000 pounds

- Lead - 4,340,000 pounds
- Zinc - 372,000 pounds

6.4.2 South Railroad

There has been no mineral production reported for the South Railroad portion of the property.

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7 GEOLOGICAL SETTING AND MINERALIZATION

This section summarizes the geologic setting and mineralization of the Pinion-Railroad property, which includes the Dark Star, Pinion, Jasperoid Wash, and North Bullion area deposits. This section is based on the descriptions and information provided by Dufresne and Nicholls (2016), Hunsaker (2010; 2012a; 2012b), Koehler *et al.* (2014), Shaddrick (2012), and sources cited therein. The authors have reviewed this information and believe it accurately represents the geology and mineralization as currently understood.

References to Tomera Formation equivalent stratigraphy have been noted historically. However, recent work suggests these units in the Railroad-Pinion property may not be of equivalent age, so all usage of Tomera Formation equivalent in this Technical Report refer to units that are Pennsylvanian-Permian undifferentiated.

7.1 REGIONAL GEOLOGIC SETTING

The Railroad-Pinion property is located in the southern portion of the Carlin trend, a northwest-southeast alignment of sedimentary-rock hosted gold deposits and mineralization, as shown in Figure 7-1. The property is centered on the Railroad dome, or “window” in the Piñon Range (Mathewson, 2002) as shown in Figure 7-2. Such domes or “windows” consist of upright folds in horsts of Paleozoic rocks of the Roberts Mountains autochthon, exposed by erosion, that were favorable for the formation of Carlin-style gold deposits (Jackson and Koehler, 2014). In the case of the Railroad and other “windows” within the Carlin trend, pulses of Mesozoic and Cenozoic magmatism intruded the folds and related faults (Figure 7-2).

The Carlin trend was within the passive, western continental margin of North America during the early and middle Paleozoic time, which is the time of deposition of the oldest rocks observed in the area (Stewart, 1980). A westward-thickening wedge of sediments was deposited at and west of the continental margin, in which the eastern depositional facies tend to be coarser and carbonate-rich (shelf and slope deposits, carbonate platform deposits) while the western facies are primarily fine-grained siliciclastic sediments (deeper basin deposits). The Carlin trend is proximal to the shelf-slope break, although this break was not static over time.

In the Late Devonian through Middle Mississippian, east-west compression during the Antler Orogeny produced folds and thrust faults, the most significant manifestation of which is the Roberts Mountain Thrust. This regional, low-angle fault placed western facies siliciclastic rocks over eastern facies carbonate rocks across the region. In this Technical Report the western facies are referred to as allochthonous whereas the eastern facies are autochthonous. As a result of this tectonism, the Mississippian and Pennsylvanian overlap assemblage of clastic rocks was deposited across the region (Smith and Ketner, 1975). Late Paleozoic sedimentary rocks in the Piñon Range are interpreted as structurally interleaved allocthonous and autochthonous sequences (Longo *et al.*, 2002; Mathewson, 2001; Rayias, 1999; Smith and Ketner, 1975).

Multiple igneous intrusions occur along the Carlin trend. The oldest igneous rocks are reported to be Late Triassic in age (Teal and Jackson, 2002).

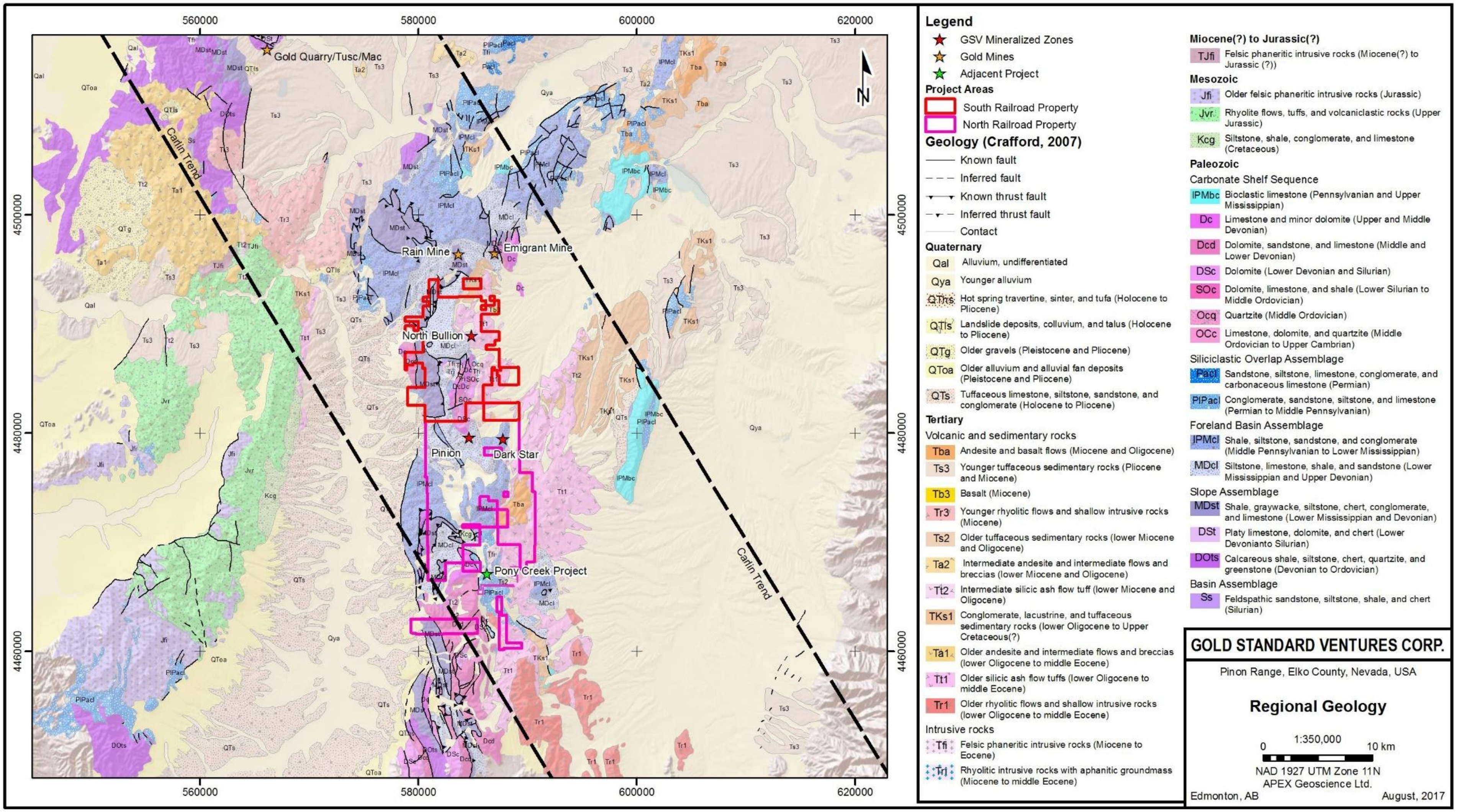

Figure 7-1: Regional Geology of the Railroad-Pinion Property

(from Dufresne and Nicholls, 2017a; after Crafford, 2007)

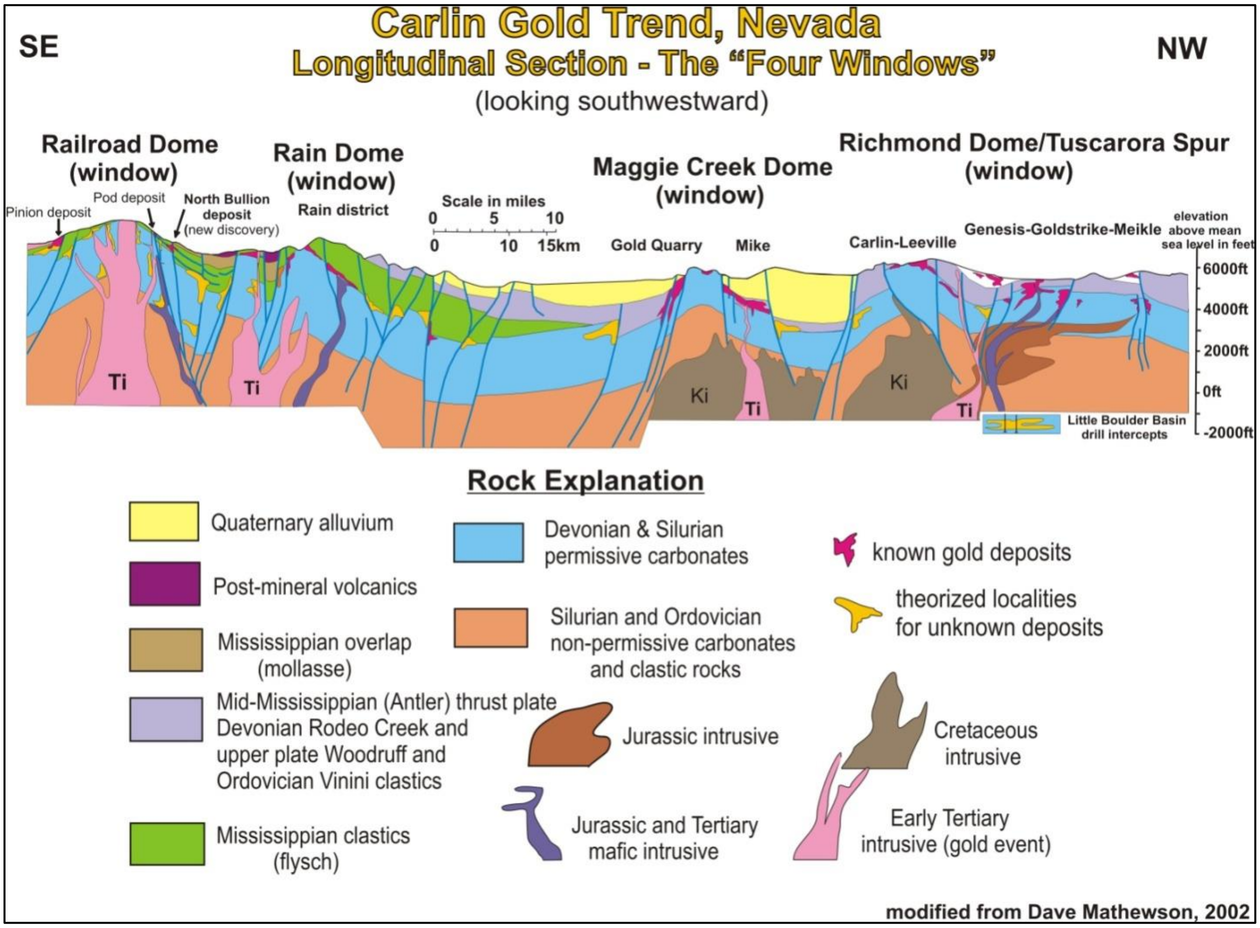

Figure 7-2: Long Section through the Carlin Trend

Other igneous rocks include: a Late Jurassic dioritic intrusion documented at the Goldstrike gold deposit (Bettles, 2002); intermediate to mafic dikes of Jurassic and Cretaceous age; the Cretaceous, quartz monzonite Richmond stock; the Eocene age Welches Canyon stock; and hydrothermally altered and locally gold-bearing felsic to mafic dikes of Eocene age (Ressel, 2000). The Eocene-age Bullion stock (Henry *et al.*, 2015) is situated between the North Bullion and Pinion gold deposits within the Railroad-Pinion property (Figure 7-1 and Figure 7-2).

Late Eocene and Miocene volcanic rocks were erupted over large areas of the region. These predominantly consist of ash-flow tuffs and lava flows, mainly of rhyolitic compositions, as well as volumetrically smaller amounts of andesitic and basaltic lavas. Sequences of lacustrine sedimentary and volcanic-sedimentary rocks, as young as Pliocene in age, interfinger with and overlie the Cenozoic volcanic cover rocks.

Major regional extension commenced in mid-Miocene time. The extension was generally east-west directed, has continued to the present, and is manifested in the Basin and Range topography. The extensional faulting varies from normal-displacement, block faulting to listric-style faulting with progressively greater extension. The significant consequence of extensional faulting has been the dismemberment and tilting of pre-existing rocks, and development of range-scale horsts and grabens.

7.2 LOCAL AND PROPERTY GEOLOGY

The property is within the central part of the Piñon Range, which is comprised of Ordovician through Permian marine sedimentary rocks (Smith and Ketner, 1975; Figure 7-3) that form a structural dome. At least one large-scale, asymmetric anticline is present, but younger horst and graben structure developed within a framework of overprinted high-angle faults is a prominent feature of the range. Tertiary sedimentary rocks deposited in shallow, freshwater lakes and overlying intermediate to felsic Tertiary volcanic rocks are present on the flanks of the range and within adjacent grabens (Figure 7-3).

Four prominent high-angle fault directions have been identified including west-northwest, north-south, northwest, and northeast-striking faults. The north-south-striking Bullion fault corridor separates the Tertiary volcanic rocks to the east from the Paleozoic sedimentary units in the range. Northwest- and west-northwest-striking faults occur across the project area and include the South and Main faults at Pinion and the Saddle fault at Dark Star. Some of the faults are low-angle. Drilling indicates that multiple episodes of low-angle fault displacements have juxtaposed Devonian carbonate rocks and Mississippian rocks, resulting in interleaved sections of the Devonian Devils Gate Limestone and Webb Formation, as well as Webb age-equivalent rocks of the Tripon Pass Formation (Hunsaker, 2012b).

A complex of Eocene igneous rocks, centered south of Bald Mountain, have intruded the Paleozoic sedimentary units in the core and east flank of the range (Figure 7-3). Twenty-four samples of intrusive and volcanic rocks from the project area have been studied by Dr. Christopher Henry of the Nevada Bureau of Mines and Geology. Petrography, chemical analyses, and $^{40}Ar/^{39}Ar$ and U-Pb zircon age dates have led to an interpretation that at least 10 distinct igneous rock types at the project were emplaced during at least four distinct episodes between 38.9 and 37.5 Ma, associated with the Indian Well volcanic field (Henry *et al.*, 2015).

The Railroad-Pinion area geology is summarized in two parts that correspond to the North Railroad portion of the property, and the South Railroad portion of the property.

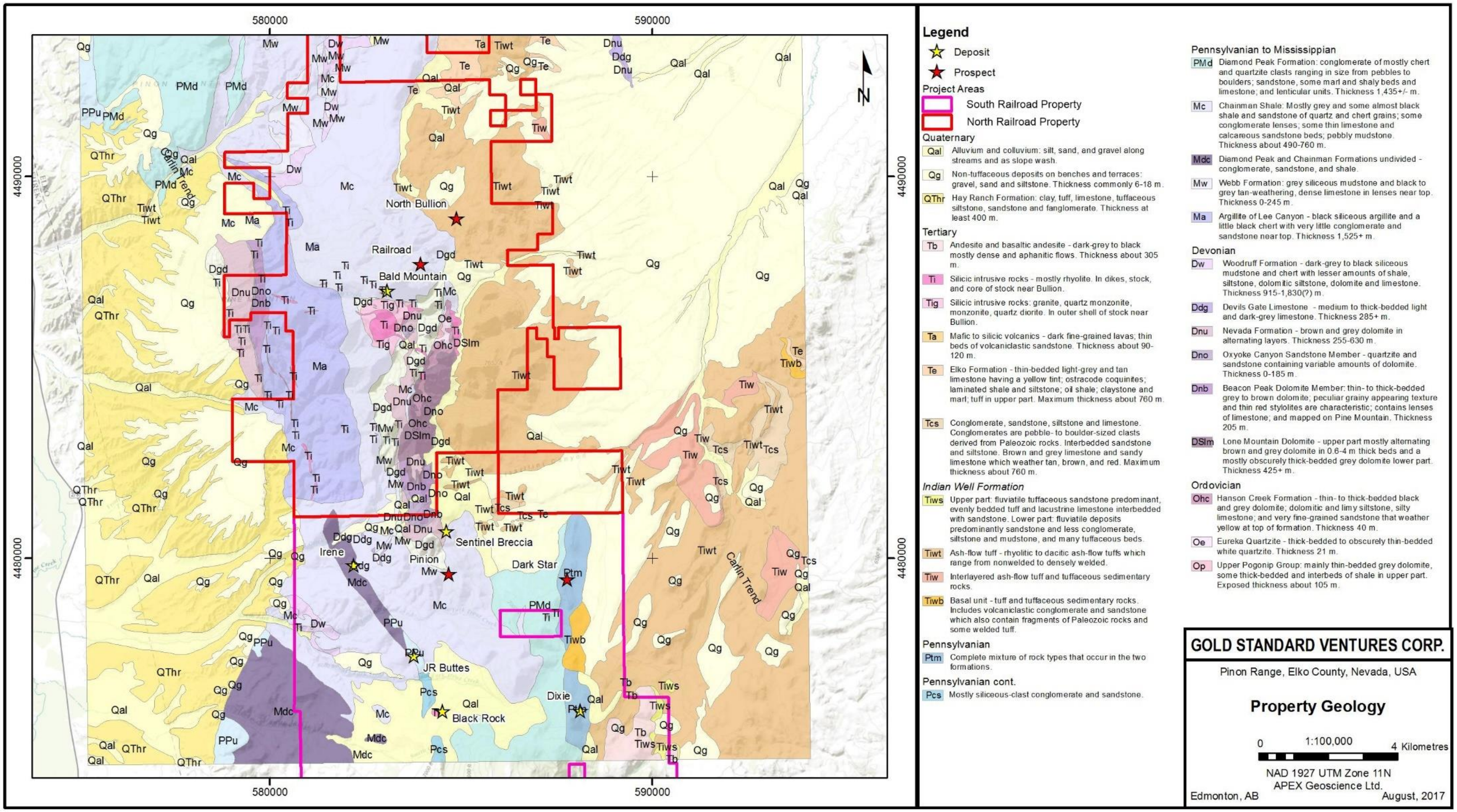

Figure 7-3: Gold Standard Property Geologic Map

(from Dufresne *et al*., 2017; modified after Smith and Ketner, 1978)

7.2.1 North Railroad Portion of the Property

7.2.1.1 North Bullion Area Geology

The North Bullion horst is bounded to the east and northwest by younger, generally flat lying, dacitic to rhyolitic tuffs of the Indian Well Formation (Figure 7-3; Henry *et al.*, 2015). The Indian Well Formation contains phenocrysts of quartz, sanidine, hornblende, and biotite within a pink to grey groundmass, and rests on top of an angular unconformity above the underlying, Eocene-age Elko Formation in the eastern hanging wall of the North Bullion fault zone ("NBFZ"). The Elko Formation is exposed within the eastern hanging wall of the NBFZ in the northern part of the property, as shown in Figure 7-3, and consists of thick- to thinly bedded mudstone, sandstone, chert pebble conglomerate, freshwater limestone, and tuffaceous sediments (Stewart, 1980; Smith and Ketner, 1976).

The North Bullion horst consists of thick bedded, fining upward, conglomerate, and mudstone of the Mississippian Chainman Formation which contains 3 ft to 30 ft (1 m to 7 m) thick dacite sills from 330 ft to 650 ft (100 m to 200 m) below the surface. Dacite dikes occur along steeply dipping faults within the NBFZ (Jackson *et al.*, 2015). In between the upper and lower Chainman Formation is a sequence of mixed carbonate and siliciclastic rocks, which are interpreted to belong to the Mississippian Tripon Pass Formation (Longo *et al.*, 2002; Matthewson, 2001; Oversby, 1973). Two limestones within the Tripon Pass Formation act as informal marker units. Limestone 1 is a dark-grey, laminated to thinly bedded micrite located at the top of the Tripon Pass Formation, and limestone 2 is a grey, medium- to thick-bedded calcisiltite to calcarenite located approximately 180 ft (55 m) below limestone1 (Figure 7-4). The Tripon Pass Formation hosts the upper gold zone of the North Bullion deposit and locally contains >0.175 oz Au/ton (>6 g Au/t). The Tripon Pass Formation is underlain by the variably bedded sandstone, conglomerate, and silty mudstones of the Mississippian Chainman Formation.

Underlying the Chainman Formation, in low-angle fault contact, is the Devonian Devils Gate Limestone (Devils Gate Limestone of Figure 7-3). It is composed of grey, thick-bedded calcarenite and minor micrite, between 200 to 500 ft (60 to 150 m) in thickness. Dissolution-collapse breccia developed at the top of the Devils Gate Limestone is host to high-grade gold within the lower zone at North Bullion (Jackson *et al.*, 2015). In the northern portion of the deposit, silty mudstone of the Mississippian Webb Formation and silty micrite of the Mississippian Tripon Pass Formation (Figure 7-4), are important hosts to gold, and are preserved along the low-angle fault contact between the Chainman Formation and the Devils Gate Limestone. Beneath the Devils Gate Limestone there is a transitional contact into the Sentinel Mountain Dolomite, which has an average thickness of 500 ft (150 m) and is in transitional contact with calcareous sandstone of the underlying Oxyoke Formation (Oxyoke Sandstone in Figure 7-4). The cross-bedded Oxyoke is approximately 400 ft (120 m) in thickness and consists of well-rounded quartz grains, which are either matrix- or grain-supported. There is tectonic and dissolution-collapse breccia that extends from the lower contact of Tripon Pass limestone to the top of the Devils Gate Limestone between the Massif and West Strand faults. The deepest drill holes at North Bullion bottomed in thin- to thick-bedded dolomite of the Devonian Beacon Peak Dolomite (Figure 7-4).

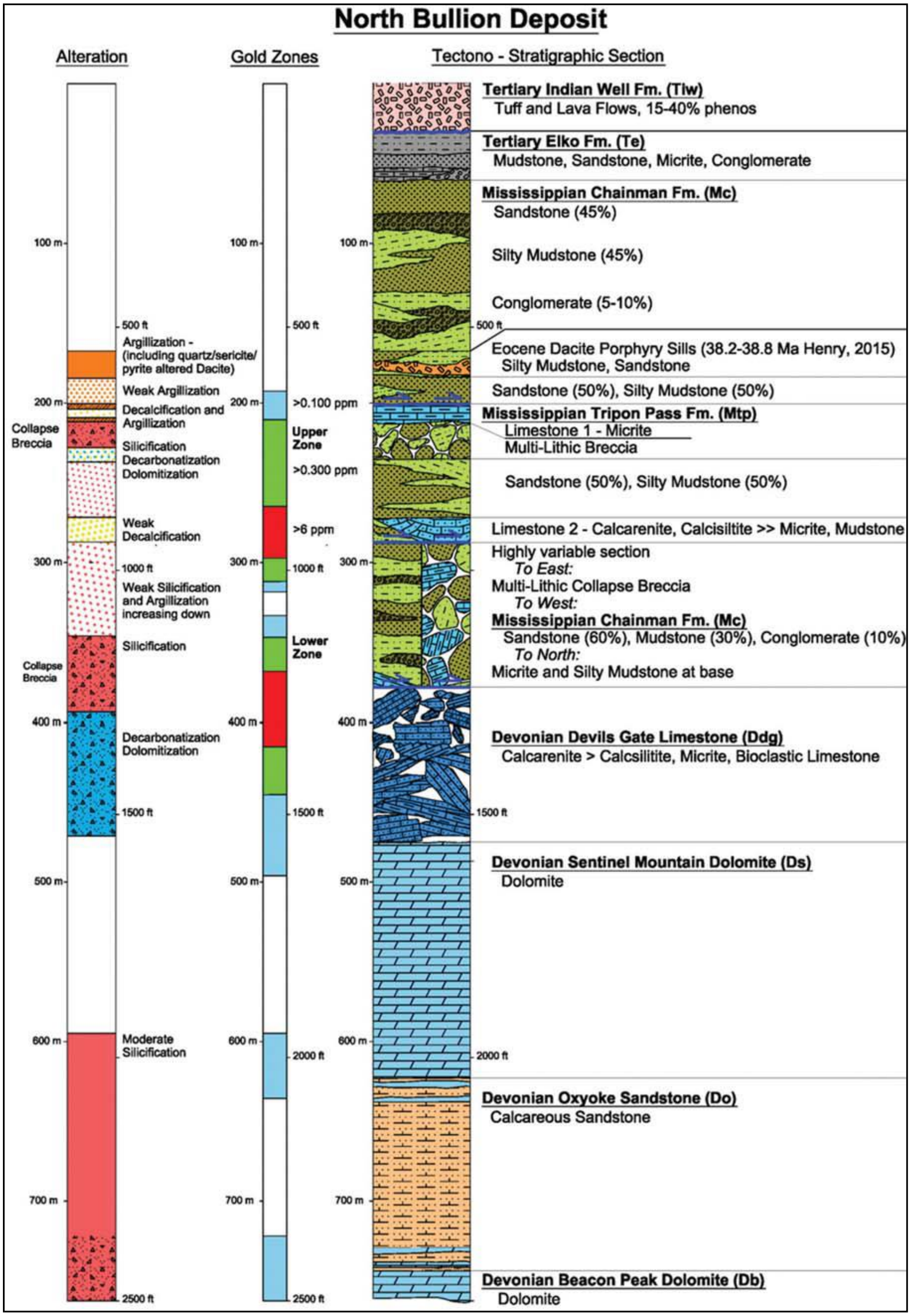

Figure 7-4: North Bullion Stratigraphic Column

(from Jackson et al., 2015)

Jackson *et al.* (2015) described the structural effect on geology at North Bullion as follows:

> *"North Bullion (gold deposit) occurs in a triangular shaped horst in the footwall of the major north-striking, steeply east-dipping, North Bullion Fault Zone (NBFZ). The western edge of the horst is bounded by a northeast-striking, northwest-dipping fault. The NBFZ is 300 m* [985 ft] *wide and apparent normal displacement across the NBFZ is greater than 600 m* [1,970 ft]*, as constrained by the deepest holes into the Indian Well Formation volcanic rocks that fill the Bullion graben to the east. Chainman sandstone occupies the center of the horst, and the variable strikes and dips at the surface indicate an open fold is centered on the horst. The western edge of the horst is bounded by a N50E striking, northwest-dipping fault. The triangular shape of the horst is well represented in structure contours on the top of the Devils Gate Limestone."*

> "*Intrusive relationships and tilting of units indicate the deposit formed during an Eocene event with synchronous intrusion, hydrothermal activity and extensional movement on graben-bounding faults. Dacite sills, dated at 38.8–38.2 Ma, intruded steeply dipping faults within the NBFZ and low angle, bedding parallel faults, capping the gold system. The margins of dacite dikes and sills are commonly sheared and some dacite occurs as clasts within mineralized dissolution-collapse breccia, indicating continued movement along faults and hydrothermal activity after emplacement of the dacite. In fault steps within the NBFZ, the Eocene Elko Formation has the same moderate eastward dip as the underlying Paleozoic rocks. The collapse breccia generally exhibits a flat-tabular textural fabric subparallel to today's surface. All of this evidence supports the Formation of North Bullion during a very dynamic, focused Eocene event with synchronous extension, intrusion and Carlin-style mineralization.*"

7.2.2 South Railroad Portion of the Property

7.2.2.1 Pinion Deposit Area Geology

The geological setting, stratigraphic units and the overall tectonic history of the Pinion area is the same as that described for the adjacent North Railroad area by Hunsaker (2010, 2012a, 2012bb), Shaddrick (2012), Koehler *et al.* (2014), Turner *et al.* (2015), Dufresne and Koehler (2016), and Dufresne and Nicholls (2018). The geology is illustrated in Figure 7-3. A stratigraphic column for the project area is presented in Figure 7-5.

The Pinion deposit area encompasses a sequence of Paleozoic sedimentary rocks exposed within large horst blocks in which the sedimentary rocks have been broadly folded into a south- to southeastward-plunging, asymmetric anticline. The axis of the Pinion anticline can be traced for approximately 2 mi (3.2 km), trends N20°W, and plunges approximately 25° to 30° to the south-southeast (DeMatties, 2003). The apparent dip of the western fold limb ranges from 10° to 35° and the steeper eastern limb dips 25º to 50º. Eastern assemblage formations including the Oxyoke, Beacon Peak, Sentinel Mountain, and Devils Gate formations form the core of the anticline. Siliceous clastic units of the Tripon Pass, Webb, Chainman, and Tonka formations form its limbs (Calloway, 1992a).

The contact between the Devils Gate and Tripon Pass (Figure 7-5) is characterized by a multi-lithic dissolution-collapse breccia ("mlbx") that ranges from 10 ft to 400 ft (3 m to 120 m) in thickness. The mlbx is characterized by multi-lithic clasts, barite, clay matrix with a silica overprint, and infrequent banded quartz veins. The breccia is thickest on the east limb of the fold and thins along the crest and along the west limb.

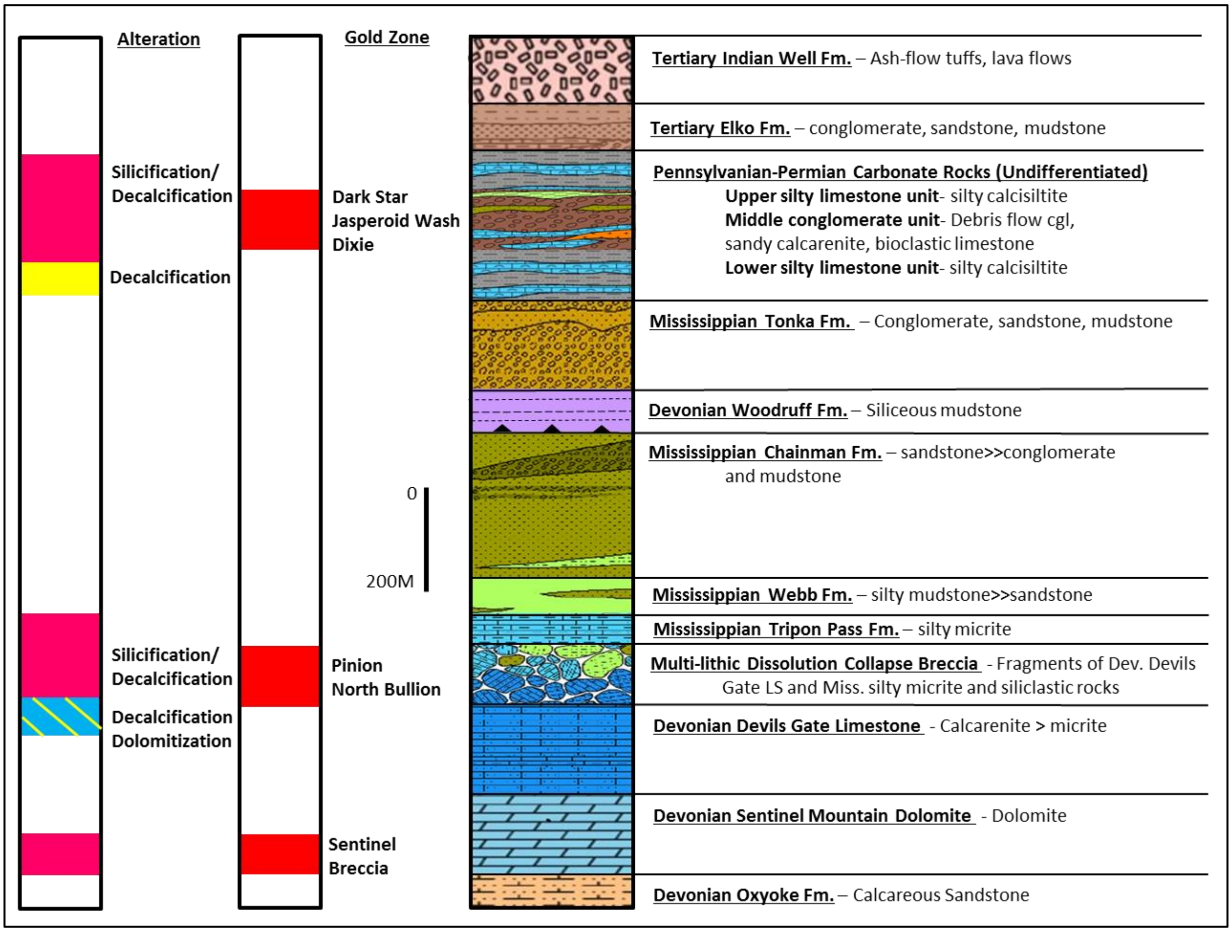

Figure 7-5: Stratigraphic Column for the Pinion, Dark Star, and Jasperoid Wash Deposit Areas

(from Gold Standard 2019; Undifferentiated Pennsylvanian-Permian units are those at Dark Star and Jasperoid Wash)

The Pinion deposit is contained within a northwest-trending horst. Faults on the northeast horst margin are linking structures to the more northerly striking, range-bounding Bullion fault corridor (Norby *et al.*, 2015) and include the locally named Bullion, Linkage, N10E, and Tonka faults. Older N50°W- to N60°W-striking faults (South and Main faults) transect the Pinion deposit and offset the anticline.

At depth, the Devils Gate, Tripon Pass, and Webb formations overlie Mississippian-aged Chainman Formation. This contact was defined by Norby *et al.* (2015) as gently west-dipping Pinion thrust fault between the overlying Devils Gate to Chainman sequence and the underlying Chainman sequence. On the east limb of the fold, additional localized thrust faults occur above the Pinion thrust fault, resulting in locally repeated sections of Chainman, Webb, and Tripon Pass.

Alteration associated with gold-silver mineralization is primarily silicification of the breccia. There are also zones of abundant disseminated and vein barite, with up to 75% barium determined from x-ray fluorescence analysis. Decalcification of the Tripon Pass and Devils Gate formations along the margins of the breccia have also been observed. Minor clay alteration can be seen along the Main, South, and Bullion faults. Elements associated with gold are silver, antimony, arsenic, barium, and mercury. A type of mineralization with more typically epithermal-like textures is also present at Pinion. Banded fine-grained to fine-cockscomb silica occurs throughout the deposit, locally with stibnite (or oxidized to stibiconite) and elevated silver to 70 ppm.

Gold and silver mineralization at the Pinion deposit is strongly controlled by the dissolution-collapse breccia at the contact between calcarenite of the Devils Gate Limestone and the overlying silty micrite of the Tripon Pass Formation (Norby *et al.*, 2015). Approximately 90% of the mineralization is hosted within the breccia and is defined locally as the Main zone. The Pinion deposit extends northwards, along the Bullion fault corridor, and is referred to as the North zone. The North zone appears to be a fault offset of the east limb of the Pinion anticline. Low-grade mineralization extends into the footwall of the Bullion fault and is hosted in Sentinel Mountain Dolomite.

7.2.2.2 Dark Star Geology

The Dark Star deposit is located east of the Pinion deposit (Figure 7-3) and occurs in a 1,300 ft- to 2,000 ft-wide (400 m- to 600 m-wide) structural block of Pennsylvanian-Permian rocks (*Harp et al.*, 2016). A generalized stratigraphic column for the Dark Star area is illustrated in Figure 7-5.

Dark Star lies along the north-south Dark Star fault corridor that has Mississippian Chainman Formation and unconformably overlying Tertiary Conglomerate to the west, and Eocene Indian Wells Formation to the east. These formations are fault bounded by the West fault and Dark Star fault, respectively. Pennsylvanian-Permian undifferentiated conglomerate and calcareous bioclastic units are interpreted to be a Tomera Formation equivalent, a localized unit that occurs at Dark Star and possibly Jasperoid Wash, comprise the horst between these faults. The Pennsylvanian-Permian undifferentiated section is informally broken down into the uppermost unit of siltstone (generally calcareous), a middle unit of calcareous conglomerate (with minor interbedded sandstone), and a lower unit of calcareous siltstone (Figure 7-5). These units are gently folded in a north-south-trending syncline-anticline pair between the West and Dark Star faults.

The Dark Star fault corridor is a prominent north-south-trending fault system consisting of the West, Ridgeline, IDK, East, and Dark Star faults. The corridor has a surface expression of greater than 7.5 mi (12 km) in length. All but the West fault are steeply east-dipping normal faults with 50 ft to 650 ft (15 m to 200 m) of offset. The West fault is a moderately west-dipping fault with displacement of the Chainman Formation over the Pennsylvanian-Permian rocks and may be a continuation or age equivalent to the Pinion thrust fault.

An older set of N°40W- to N60°W-striking faults, the Saddle and Outcrop faults, transect the Dark Star deposit, and appear to offset the mineralization. These appear to be contemporaneous with the N60°W-striking faults at Pinion. Surface mapping has indicated the presence of regional N55°E- to N60°E-striking faults north and south of the Dark Star deposit.

Alteration at Dark Star is dominated by decalcification and silicification of the Pennsylvanian-Permian rocks. Small areas of clay alteration associated with faults have been observed, along with localized barite veins and widespread disseminated barite (Harp *et al.*, 2016). Quartz veinlets, drusy-quartz lining fractures, and banded-quartz occur in the silicified rocks. Several stages of tectonic, collapse, and hydrothermal breccia are recognized throughout the mineralized zone. Alteration of the upper and lower siltstone units is characterized by decalcification, overprinted by argillic and weak silicic alteration.

7.2.2.3 Jasperoid Wash Geology

The Jasperoid Wash deposit is located south of the Pinion deposit in a structural block of Pennsylvanian-Permian rocks (Figure 7-3). These rocks are similar to those at the Dark Star deposit as illustrated in Figure 7-5.

The Jasperoid Wash deposit occurs along a linear, north-south-striking structural corridor which is bounded on its east and west sides by major faults. The west-bounding fault juxtaposes Mississippian Tonka Formation against the Pennsylvanian-Permian rocks to the east. A horst block of Pennsylvanian-Permian conglomerate and clastic units is between the two main faults. The Pennsylvanian-Permian rocks are informally assigned to an upper unit of silty limestone, a middle unit of calcareous sandstone and conglomerate, a lower unit of calcareous siltstone, and an underlying conglomerate composed of chert pebbles and a sandstone matrix. These rocks are similar to and may correlate with Tomera Formation equivalent units at Dark Star, but the stratigraphic position relative to known formations is not known at Jasperoid Wash.

At Jasperoid Wash, the middle sandstone and conglomerate unit crops out at the surface in small crags that are resistant to weathering. This unit is mostly composed of thick beds of debris-flow conglomerate containing clasts of chert and cherty bio-micrite in a silicified, sandy calcarenite to silty-micrite matrix. The lower calcareous siltstone unit is composed of varying thicknesses of interbedded calcisiltite, calcarenite, bioclastic limestone, calcareous sandstone, and minor beds of conglomerate. Outcrops of this unit tend to be less resistant to weathering and are smooth and low-lying.

Dikes of "quartz-eye" rhyolite and feldspar porphyry with a composition close to dacite are present within the Jasperoid Wash deposit and are inferred to be of Tertiary age. These intrusions occur within the structural corridor and at fault intersections. A third type of dike, composed of intensely silicified quartz-feldspar porphyry, crops out north of the deposit. At a fault intersection within the deposit, some outcrops consist of a multi-phased, hydrothermally altered breccia consisting of younger quartz-feldspar porphyry matrix and clasts of dacite and rhyolite. Also, strongly clay-altered and mineralized dacite porphyries with very fine-grained pyrite has been encountered in drilling.

Structurally, the Jasperoid Wash deposit is bounded to the west by the north-south-striking, 65°W-dipping Westport fault. This is interpreted to be a reactivated thrust fault and is similar to the West fault at Dark Star. The Eastport fault of the Jasperoid Wash structural corridor also strikes north-south, and dips 78°W. The Eastport fault truncates a syncline-anticline pair that also trends north within the structural corridor. There are also east-west-trending faults within the north-south fault corridor that bound a horst block and define the southern extent of the deposit.

Alteration of the middle conglomerate and lower siltstone units includes moderate to strong silicification, decalcification, and argillization. Quartz veinlets and drusy quartz on fractures occur with silicification. Small pods of unoxidized sulfide minerals are preserved within the sedimentary rocks where oxidizing fluids did not permeate the rock. Vugs formed by decalcification of limestone and dolostone are present. Hydrothermal alteration is mostly seen in the feldspar porphyry, calcisiltite, calcarenite, calcareous sandstone, and bioclastic limestone units, and is marked by strong clay development and/or disseminated sulfide grains with a sooty appearance that are mostly oxidized to limonite and hematite. Hydrothermal alteration of the feldspar porphyry dike is distinct and defined by disseminated sulfide grains with a sooty appearance. The lower siltstone unit is commonly decalcified and becomes more calcareous with depth.

7.3 MINERALIZATION

The Railroad-Pinion property includes demonstrated Carlin-type gold mineralization in at least four deposit areas: North Bullion, Pinion, Dark Star, and Jasperoid Wash. These deposits are similar in setting and style to that of other deposits in the region, including Rain and Emigrant (Koehler *et al.*, 2014; Norby *et al.*, 2015; Turner *et al.*, 2015; Dufresne and Koehler, 2016). Mineralization occurs mainly as finely disseminated, submicroscopic gold in largely stratiform bodies in Devonian, Mississippian, and Pennsylvanian-Permian rocks. The following subsections describe the mineralization in the North Bullion, Pinion, Dark Star, and Jasperoid Wash deposits and are modified from Dufresne and Nicholls (2016; 2017a; 2017b; and 2018).

7.3.1 North Bullion Deposits

The North Bullion deposits, which includes North Bullion, POD, Sweet Hollow and South Lodes zones, contains Carlin-type disseminated-gold mineralization that is largely not exposed at the surface. The bulk of the geological understanding and interpretation of the North Bullion deposits has come from core drilling that was guided by interpretations of gravity and CSAMT data. Gold mineralization is focused in the footwall of the NBFZ, a north-south-striking zone of normal faults with an overall down-to-the-east displacement. North-south-, northwest-, west-northwest-

, and northeast-striking faults appear to be important controls on mineralization. In general, gold-silver mineralization is localized in gently to moderately dipping, strongly sheared Webb and Tripon Pass formation rocks, and dissolution-collapse breccia developed above and within silty micrite of the Tripon Pass Formation and calcarenite of the Devils Gate Limestone (Figure 7-6) (Jackson and Koehler, 2014; Jackson *et al.*, 2015).

The upper limit of gold mineralization at the North Bullion deposit varies from 350 ft to 1300 ft (105 m to 400 m) in depth. The dip of the mineralized material steepens from 10° to 45° to the east as the eastern strand of the NBFZ is approached. Gold is associated with sooty-looking, very fine-grained sulfide minerals, silica, carbon, clay, barite, realgar, and orpiment in addition to elevated arsenic, mercury, antimony, and thallium. Gold grades >0.175 oz Au/ton (>6 g Au/t) have been intercepted.

The North Bullion deposit, as currently defined, is approximately 2,500 ft (750 m) in length, 2,000 ft (600 m) in width and as much as 1,650 ft (500 m) in vertical extent.

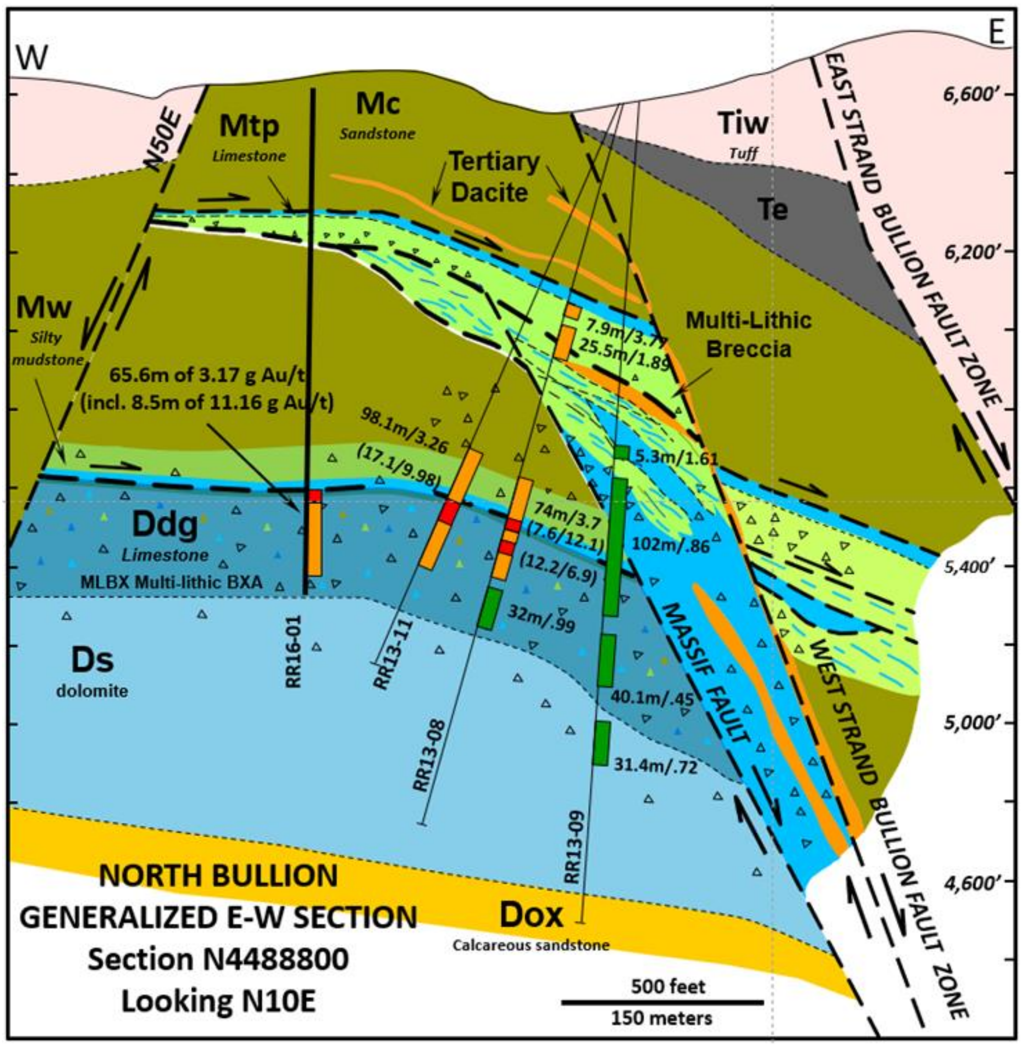

Figure 7-6: North Bullion Cross Section N 14727034 ft (N4488800 m)

(from Jackson *et al.*, 2015)

Mineralization at the nearby POD zone is restricted to a steeply dipping shear zone which trends west-northwest and is situated in rocks stratigraphically higher than the lower mineralization at North Bullion (Hunsaker, 2012b; Masters, 2003). Mineralization at POD is hosted by the upper siltstones of the Webb Formation. The core of the mineralized body contains carbon and fine-grained, disseminated pyrite, and accounts for approximately 15% of the mineralization. This is surrounded by strongly oxidized mineralization. Gold grains are in the range of 5 to 20 microns, and are associated with oxidized pyrite, stibnite, and arsenopyrite (Masters, 2003). Additionally, gold mineralization at POD is associated with silicified rock, including jasperoid, argillized rock, pyrite, barite, and some minor dolomite replacement of calcite (Hunsaker, 2012b).

As currently defined, the POD zone is approximately 2,100 ft (650 m) in length, 500 ft (150 m) in width, and as much as 650 ft (200 m) in vertical extent.

The Sweet Hollow zone is situated about 650 ft (200 m) southeast of the POD zone and about 2,000 ft (600 m) south of the North Bullion deposit. As currently defined, the Sweet Hollow zone is approximately 3,500 ft (1,050 m) in length, 800 ft (250 m) in width, and as much as 330 ft (100 m) in vertical extent.

7.3.2 Pinion Deposit

The Pinion gold deposit is located along the west-northwest-trending Pinion anticline and proximal to the Bullion fault. The Main zone trends approximately N50°W to N60°W, is approximately 3,300 ft long by 3,300 ft wide (1,000 m by 1,000 m), and varies in thickness between ~50 to 500 ft (~15 to 150 m) vertically. Mineralization at the Main zone has been intersected to a depth of 650 ft (200 m) below surface. Mineralization is hosted primarily along the crest of the Pinion anticline, but also along the east and west limbs. The multi-lithic dissolution-collapse breccia at the Devils Gate-Tripon Pass contact hosts the majority of mineralization, with minor amounts associated with decalcified limestone and dolostone above and below the breccia.

The North zone is approximately 3,600 ft (1,100) m long, along a roughly north-northwest trend, varies from 150 ft to 330 ft (45 m to 100 m) in width, and ranges from 115 ft to 440 ft (35 m to 135 m) in vertical thickness. Lateral continuity of mineralization is shown in a representative Gold Standard cross section (Figure 7-7). Mineralization at the North zone is hosted primarily in multi-lithic breccia and appears to be an offset of the east limb of the anticline. Low-grade mineralization has also been noted in the Sentinel Mountain Dolomite.

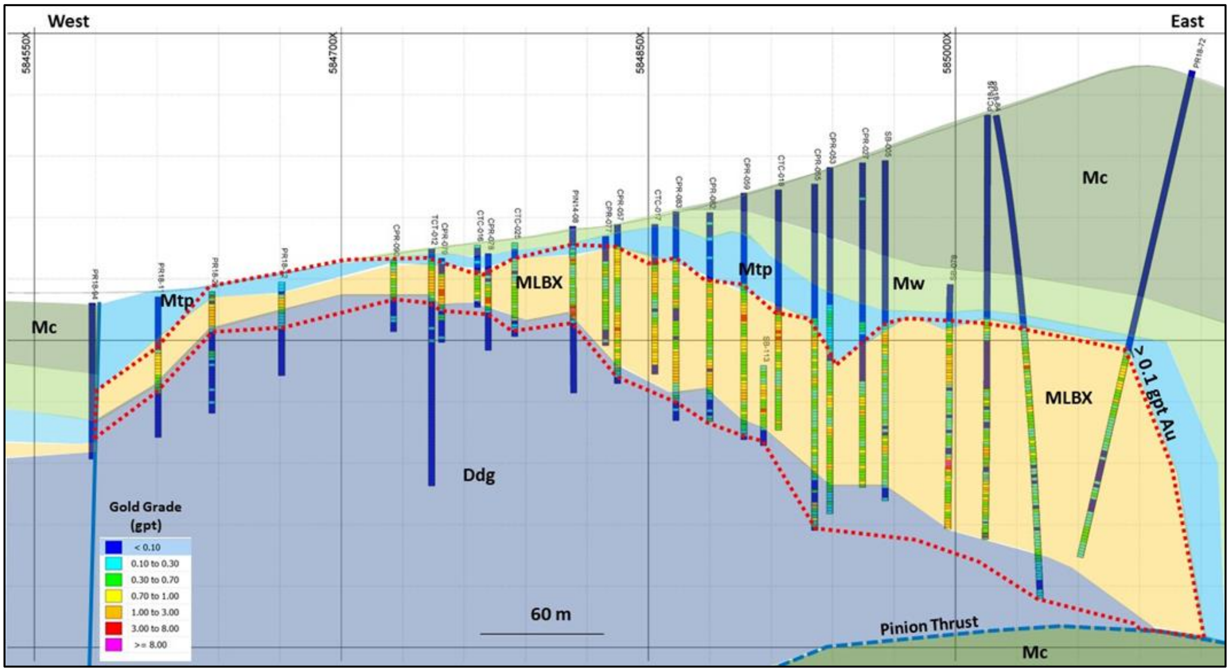

Figure 7-7: Pinion Deposit Geology, Section N14696129 ft (N4479380 m)

(from Gold Standard, 2018)

Mineralization at Pinion occurs mainly as submicroscopic disseminated gold in the largely stratiform, multi-lithic, dissolution-collapse breccia developed along the contact between silty micrite of the Tripon Pass Formation and calcarenite of the underlying Devils Gate Limestone (Figure 7-5). Important structural controls are west-northwest and north- to northeast-striking folds and faults. Gold deposition is thought to have been contemporaneous with breccia development and with quartz vein formation and silica ± barite replacement and infill of open spaces. Some free gold in 2 to 20 micron-size grains has been noted in 2018 mineral liberation studies (AMTEL, 2018). Barite was deposited as both massive and disseminated forms and is found most often in the multi-lithic, dissolution-collapse breccia. Barite appears to be paragenetically late, overprinting both the breccia and silica events.

7.3.3 Dark Star Deposit

The Dark Star deposit is hosted primarily within Pennsylvanian-Permian undifferentiated units possibly equivalent to the Tomera Formation, with minor amounts of gold mineralization found in the Chainman Formation. The deposit is centered along the north-south-striking Dark Star fault corridor and is elongate in the N5°E direction. As presently defined by drilling, the deposit consists of the Dark Star Main and Dark Star North zones, and has dimensions of approximately 4,600 ft (1,400 m) in length, up to 2,300 ft (700 m) in width, and to a depth of 1,500 ft (450 m) below surface. A representative geologic cross section is shown in Figure 7-8.

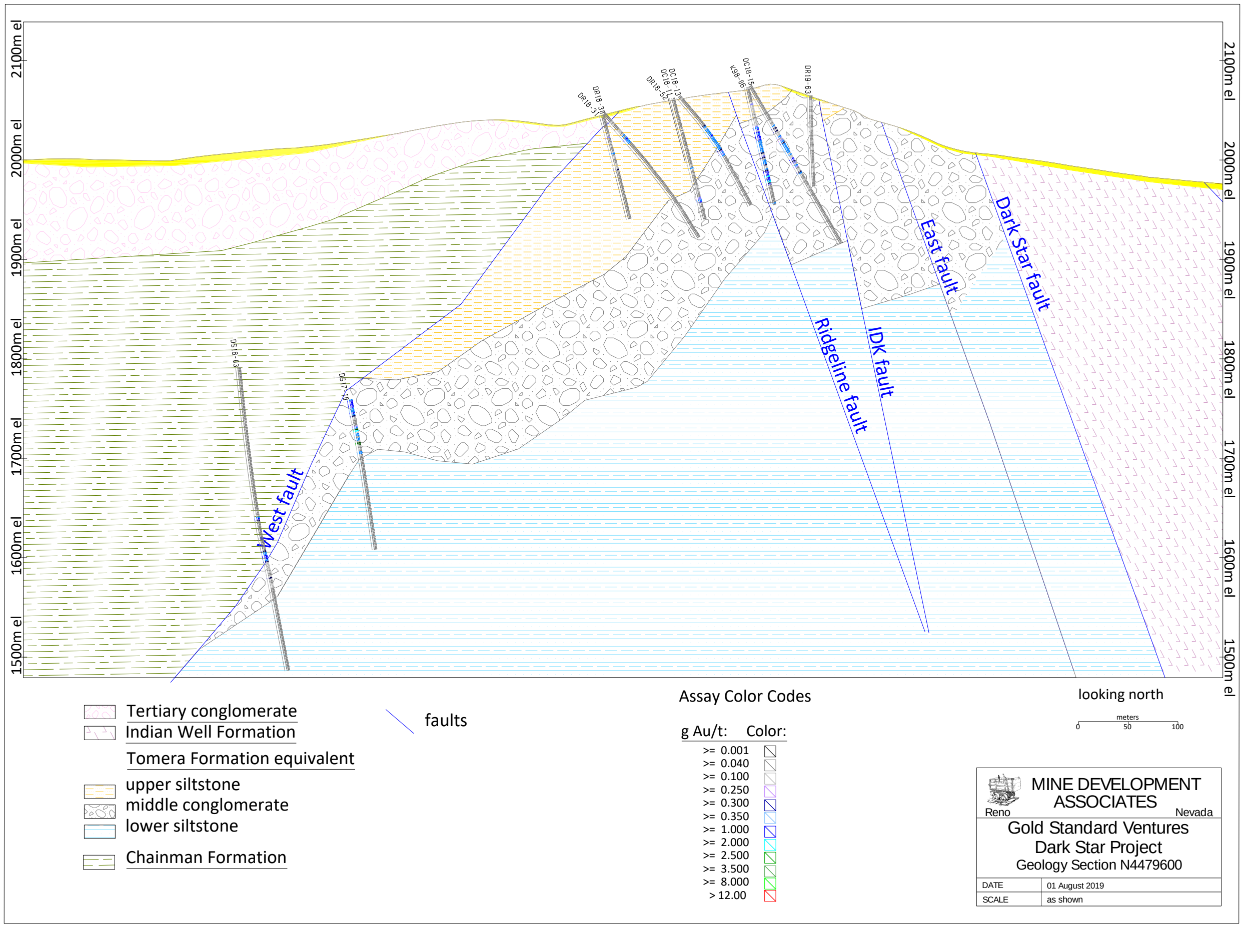

Figure 7-8: Dark Star Geologic Cross Section N14696850 ft (N4479600 m)

Gold mineralization at Dark Star is submicroscopic and disseminated within a north- to north-northeast-striking zone of silicification within the middle coarse conglomeratic and bioclastic limestone-bearing unit. This unit is between the upper and lower silty limestone and calcisiltite units (see stratigraphic column in Figure 7-5, Section 7.2.2.2, and geology cross sections in Figure 7-8). At Dark Star Main the mineralization dips steeply to the west near the surface to sub-horizontal at depth; at Dark Star North the mineralization dips steeply to the west.

Oxidation is pervasive at Dark Star Main to a depth of 1,500 ft (450 m) in the middle conglomeratic unit. At Dark Star North, oxidation is pervasive to a depth of 1,100 ft (330 m) in the middle conglomeratic and lower silty limestone and calcisiltite units. Oxidation products are primarily limonite with lesser hematite. However, thin zones of unoxidized sulfide minerals are present; pyrite is the principal sulfide mineral.

7.3.4 Jasperoid Wash Deposit

The Jasperoid Wash deposit has approximate extents of 4,600 ft (1,400 m) in a north direction and a width of about 3,600 ft (1,100 m). Drilling shows the deposit dips west gently to steeply at least 1,300 ft (400 m). Gold is disseminated within altered feldspar porphyry dikes and adjacent conglomeratic rocks, possibly the same units that host mineralization at Dark Star. The gold is inferred to be submicroscopic, though no petrographic studies have been done. Higher-gold grades are associated with drusy quartz in fractures, which have a varnish of limonite and/or hematite and with zones of very fine-grained disseminated sulfide minerals that have a sooty appearance in the argillized feldspar porphyry. A representative Gold Standard cross section is shown in Figure 7-9.

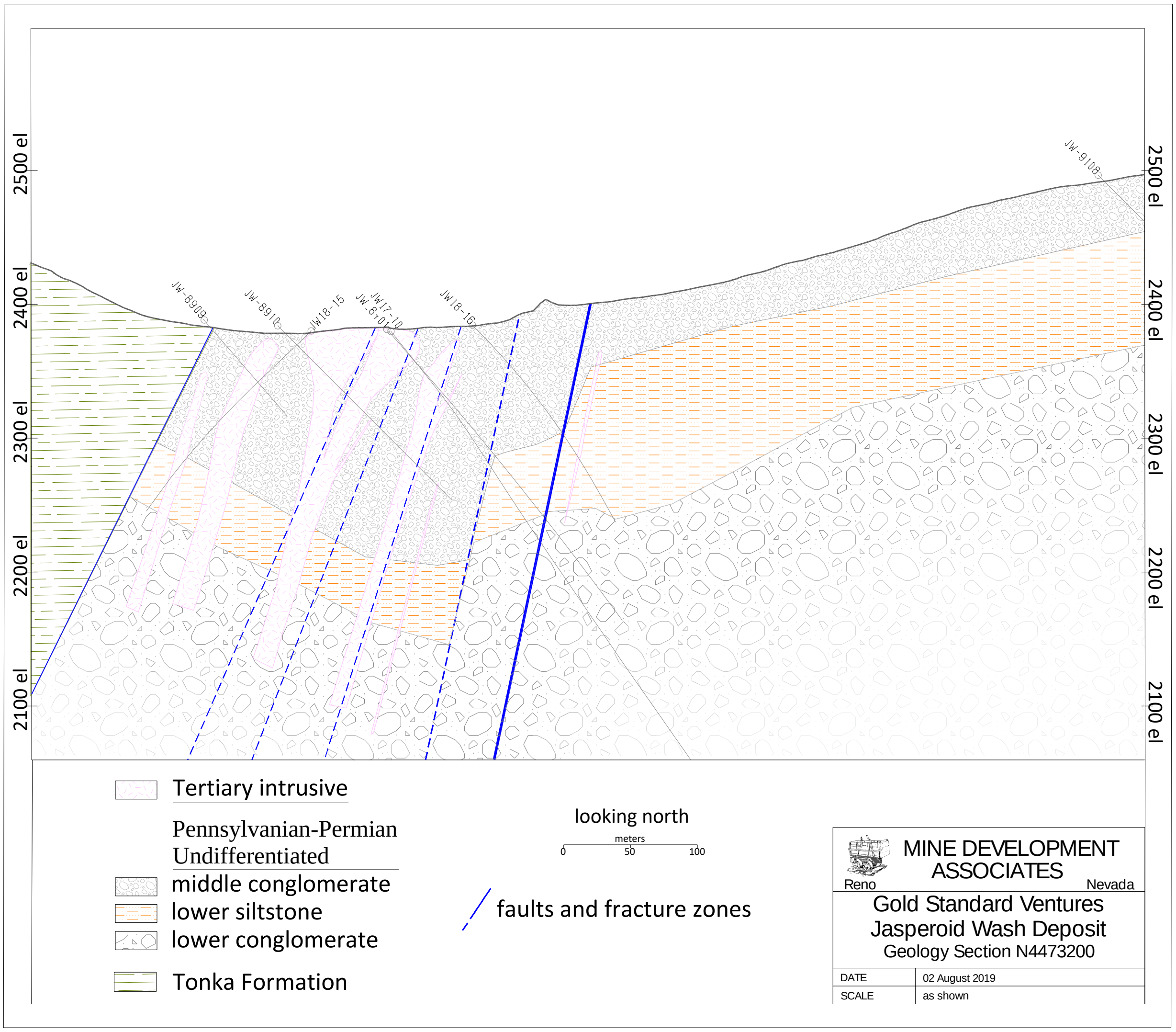

Figure 7-9: Jasperoid Wash Geologic Cross Section N14675853 ft (4473200N m)

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8 DEPOSIT TYPES

Gold deposits known and being explored for in the Railroad-Pinion property area are sedimentary-rock hosted, disseminated, Carlin-type gold deposits. These types of gold deposit were first recognized in the 1960s in northern Nevada, and were named for the town of Carlin, Nevada. Since then, over 100 geologically similar deposits, containing approximately 200 million ounces of gold, have been discovered in northern Nevada (Hofstra and Cline, 2000), making it one of the most significant gold regions in the world.

Carlin-type deposits are epithermal deposits with characteristics sufficiently different from typical epithermal deposits that they are considered a distinct deposit type. When first discovered, these deposits were often informally referred to as “no-see-um” gold deposits or “micron” gold deposits because the gold is rarely visible to the naked eye and cannot be recovered by panning.

These deposits are distinctive from typical epithermal deposits because they form replacement bodies with structural and stratigraphic controls, contain primary gold that is restricted to ionic substitution and sub-micron-sized grains in arsenian pyrite, and have alteration that is subtle but dominated by carbonate dissolution of calcareous host rocks (Cline, 2004). Gold did not precipitate in response to boiling or fluid cooling, but instead precipitated in response to sulfidation of iron in the host rock or in a second iron-bearing fluid (Muntean *et al.*, 2011). Host rocks for Carlin-type deposits in Nevada are primarily Paleozoic carbonate rocks. Other host rocks include calcsilicate hornfels, chert, argillite, and igneous dikes.

Most systems exhibit a main stage of alteration and mineralization characterized by acid dissolution and replacement of the calcareous host rock. If the host rock is composed of relatively pure carbonate without quartz silt or sand-grain support, dissolution of the carbonate can result in the formation of open space, leading to collapse and breccia formation. Main-stage decarbonatization of carbonate host rocks is typically accompanied by clay alteration (argillization) of silicate minerals, sulfidation of available reactive iron, and silicification of limestone. Alteration is characterized by an assemblage of quartz, illite, and dolomite with the edges of the system marked by an increase in calcite (Kuehn and Rose, 1992). In gold-enriched zones, dissolution of carbonates, and argillization of silicate minerals is accompanied by sulfidation of iron released by mineral alteration, resulting in precipitation of disseminated auriferous- and arsenian-pyrite, marcasite, or arsenopyrite. These iron sulfide minerals commonly occur as rims on preexisting pyrite. The most important consequence of the pyrite-forming sulfidation reaction is the coupled precipitation of gold with this pyrite (Hofstra and Cline, 2000). It is well-documented that most of the gold in Carlin-type deposits initially resides in arsenian pyrite, arsenian marcasite, and arsenopyrite (Hofstra and Cline, 2000), occurring as sub-micron inclusions of native gold or as structurally bound gold. Pervasive silica replacement (silicification) of the various host rocks is also common.

A distinctive suite of late-stage minerals is commonly present in open cavities and fractures. Textural relationships demonstrate that these minerals precipitated after the main-stage alteration and mineralization. In proximal zones, open cavities and fractures may be filled with orpiment and/or realgar, in places accompanied by quartz, barite, fluorite, pyrite, marcasite, cinnabar, barite, or thallium and antimony sulfides. More distal veins are dominantly calcite ± orpiment and realgar. The geochemistry of Carlin-type deposits is characterized by a distinctive suite of gold, arsenic, antimony, thallium, and mercury ± tungsten (Hofstra and Cline, 2000). These elements are frequently used as pathfinder elements for surface geochemical surveys and as vectors toward mineralization in drill-hole geochemical studies.

Carlin-type deposits vary greatly in size and contained gold. Areal footprints of district deposit clusters range from about 8 to 46 miles squared. Mineralization within a deposit can extend laterally more than 5,000 ft and over vertical intervals greater than 3300 ft. The larger deposits in Nevada occur within linear districts, or “trends” extending up to more than 12.5 mi and are often controlled by regional structures. Some of these structures probably resulted from reactivation of much older basement normal faults that originated during Proterozoic rifting of western North America (Lund, 2008).

These old faults are inferred to have served as conduits for deep-crustal hydrothermal fluids responsible for formation of Carlin deposits.

The varied forms of individual deposits reflect local zones of high porosity and permeability that result from favorable lithologic and structural features. Permeable features frequently associated with orebodies include high-angle faults, thrust faults, low-angle normal faults, hinge zones of anticlines, lithologic contacts, reactive carbonate units, debris-flow facies carbonate rocks, lithologic facies changes, breccia zones of all types, and contacts of sedimentary rock with metamorphic aureoles (Cline *et al.*, 2005).

Carlin-type deposits share many features in common, that include (Muntean *et al.*, 2011):

- Middle to late Eocene ages (42 and 36 Ma.) (Cline, 2004), a time that corresponds to a change from tectonic compression to extension and renewed felsic to intermediate magmatism;
- Deposits occur in linear clusters along old reactivated structures that are probably linked at depth to crustal-scale Proterozoic basement rift structures;
- Deposits are preferentially hosted in carbonate rocks within or adjacent to structures in the lower plate of a regional thrust fault;
- Deposits exhibit very similar paragenesis, characterized by decarbonatization, argillization, silicification, and sulfidation that results in the formation of gold-bearing arsenian pyrite, which initially hosts the vast majority of the gold in the deposits. This replacement mineralization was followed by open-space deposition of minor amounts of drusy quartz with pyrite, followed by orpiment, realgar, stibnite, and other sulfides. Oxidation often removes the initial sulfide formed in the deposit;
- Deposits have low concentrations of silver and base metals, and have an elemental signature of predominantly Au-Tl-As-Hg-Sb;
- Deposits were formed by non-boiling ore-forming fluids that ranged from 180°C to 240°C during mineralization, were of low to moderate salinity (mostly ≤6 wt% NaCl equivalent), and CO_2-bearing (<4 mol%); kaolinite and illite indicate that fluids were acidic;
- There is a lack of mineral or elemental zoning at the district scale that suggest minor temperature gradients. There are no coeval associated porphyry copper, skarn, or distal Au-Pb-Zn-Mn zones; and
- Evidence suggests deposit formation by largely fracture-controlled fluid flow from multiple upwelling zones with little evidence for significant lateral fluid flow or spaced convection cells.

A schematic regional deposit model cross-section is shown in Figure 8-1 from Muntean (2018).

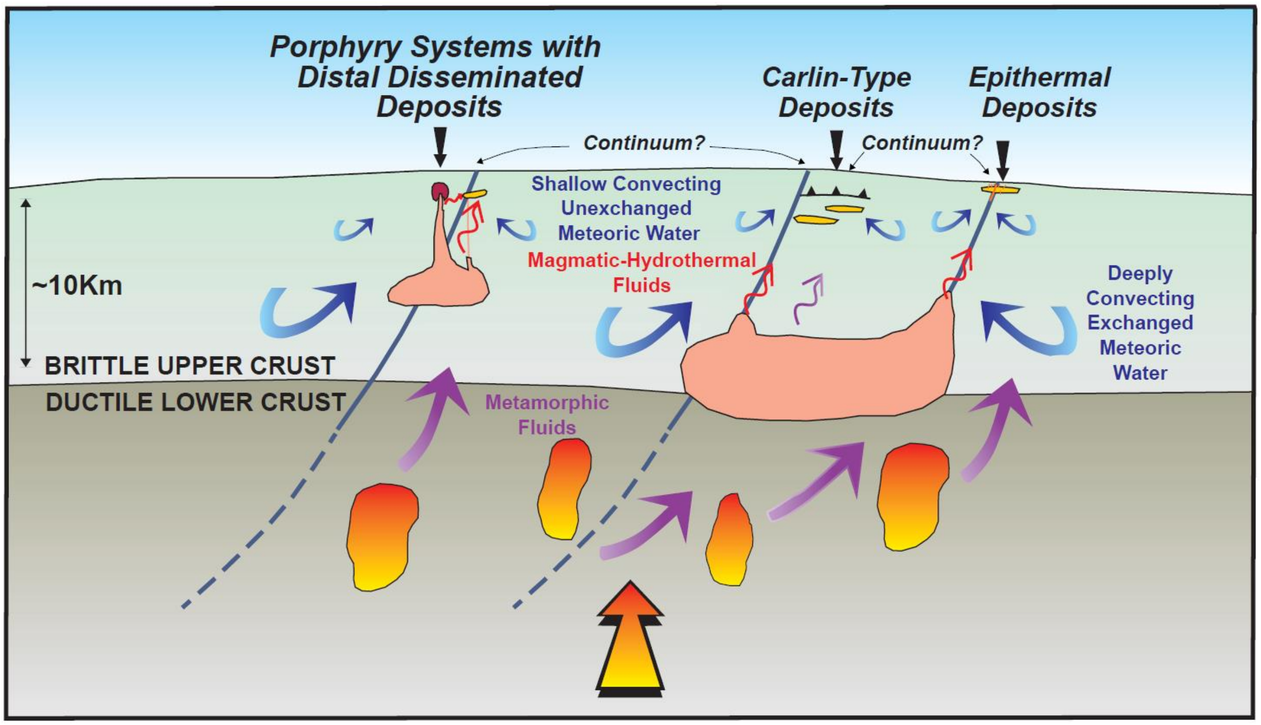

Figure 8-1: Regional-Scale Carlin-Type Deposit Model

(from Muntean and Cline, 2018)

These features strongly suggest Carlin-type deposits, which formed over a broad region of northern Nevada during a relatively narrow time interval, shared common underlying processes for the formation and transport of gold-bearing hydrothermal fluids and the deposition of gold.

Carlin systems can be large deposits with high concentrations of gold. Deposits frequently occur in clusters and can occur at depth with subtle or no surface evidence. It is notable that although the original Carlin deposit in Nevada was discovered in 1960, exploration continues, and discoveries continue to be made.

The Dark Star, Pinion, Jasperoid Wash, and North Bullion gold deposits present characteristics similar to other Carlin-type gold deposits of the Carlin trend. Specific geologic features in these deposits include:

- Deposits occur in relatively close proximity to a multi-phase Eocene igneous center with associated igneous stocks, dikes and sills; gold mineralization is of Eocene age;
- Deposits occur in a linear zone;
- Deposits are hosted in or adjacent to carbonate rock types;
- Deposits exhibit strong structural control, localized in areas with greater fault density and occur in either hanging wall or footwall settings of high-angle faults;
- Alteration is characterized by decarbonatization, dolomitization, argillization, silicification, barite, and sulfidation;
- Gold generally occurs initially as a chemical impurity or as micron-scale particles of arsenian pyrite. Later oxidation has generally removed most sulfides at Dark Star, Pinion, and Jasperiod Wash.

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9 EXPLORATION

The Railroad–Pinion property is being explored on an ongoing basis by Gold Standard using geological mapping, geochemical and geophysical surveying, and drilling. This section of the report is largely drawn from Dufresne and Nicholls (2016), Dufresne *et al.* (2017), Dufresne and Nicholls (2017a), Dufresne and Nicholls (2018) and Ibrado et al. (2020). The authors have reviewed this information and believe it accurately represents the exploration work done by Gold Standard.

Prior to 2015, exploration activities by Gold Standard were focused in the North Railroad portion of the property. Work completed in 2015 was largely focused on the Pinion area in the South Railroad portion of the property, after its acquisition in 2014. A thorough discussion of these work programs and their results and interpretations is available in previous Technical Reports by Hunsaker (2010, 2012a, 2012); Shaddrick (2012); Koehler *et al*. (2014); Turner *et al*. (2015); Dufresne and Koehler (2016); and Dufresne *et al*. (2017).

Exploration work by Gold Standard since 2010 has resulted in the identification of 17 prospect areas or zones of mineralization within the overall property position, including the Bald Mountain area and North Bullion deposits in the North Railroad-Pinion portion of the property, the Pinion, Dark Star, and Jasperoid Wash deposits, and other areas of the South Railroad portion of the property. Drilling conducted by Gold Standard is summarized in Section 10.

9.1 2009 – 2021 GEOPHYSICS

There is a significant and growing body of geophysical information for the Railroad-Pinion property that includes gravity, controlled-source audio magneto-telluric ("CSAMT"), and ground magnetic surveys. These surveys have been employed to aid in identifying geological structures, key lithologies, and zones of hydrothermal alteration related to mineralization. Additionally, the geophysical surveys have aided in drill-hole targeting and have assisted in the definition of multiple exploration targets.

A ground magnetic survey was completed over the Bullion stock area in 2014 (Figure 9-1). A total of 197 line-km was surveyed with total magnetic intensity recorded in continuous mode at 2-second intervals on lines 328 ft m apart. The lines were oriented east-west.

Gold Standard completed six gravity surveys from 2009 to 2015, collecting measurements from 3,991 stations covering a large portion of the property as shown in Figure 9-1. The gravity surveys were designed to delineate structures, particularly those in areas lacking bedrock exposures, and/or those areas under cover, and to identify rock types and alteration related to sedimentary-rock hosted and skarn-type mineralization (Wright, 2013). During 2017, gravity measurements at an additional 1,027 stations were taken, covering 8.88 mi^2 in the South Railroad portion of the property. The 2017 gravity survey was conducted by Magee Geophysical Services LLC and was interpreted by Wright Geophysics.

Seven CSAMT surveys were completed by Gold Standard from 2012 to 2016, covering the Bullion fault corridor, the North Bullion, Pinion, and Dark Star deposits, and the Dark Star fault corridor (Figure 9-1). A total of 52.8 line-mi of CSAMT data were collected during the seven CSAMT surveys. The 2016 CSAMT survey involved 13.2 line-mi focused on the Dark Star fault corridor, with nine east-west lines at variable spacing from 656 ft to 1,640 ft, that were oriented perpendicular to the main fault trend in the area.

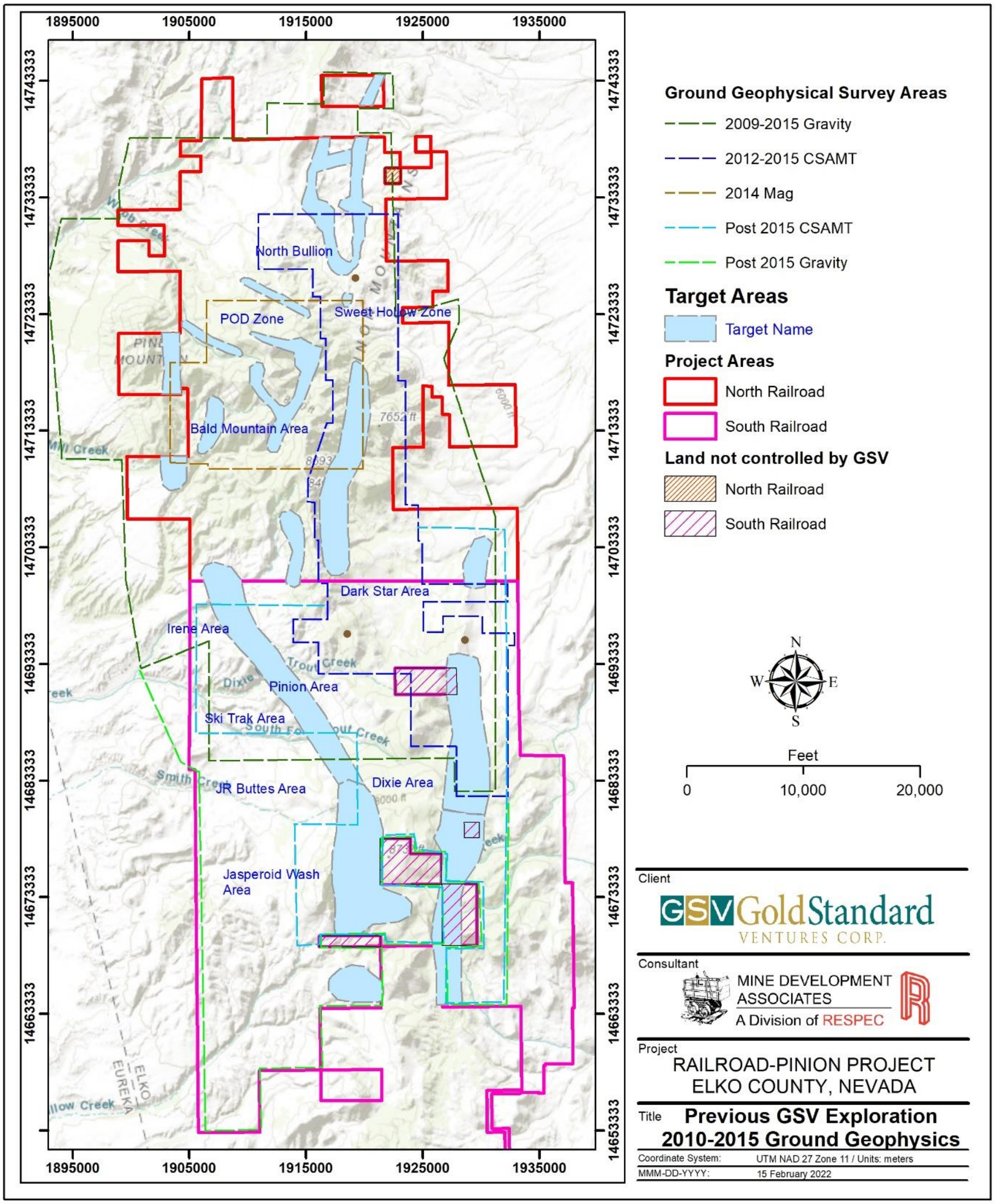

Figure 9-1: Ground-based Geophysical Surveys by Gold Standard 2009 to 2015

(from Dufresne *et al.* 2017)

During 2017, another 42.3 line-mi of CSAMT were surveyed with 21 lines across the Dark Star fault corridor, Ski Track and Bullion to East Pine Mountain areas. The data were acquired by Zonge International Inc. and interpreted by Wright Geophysics.

James Wright of Wright Geophysics designed, supervised, and interpreted the 2016 CSAMT survey. An interpretation of the results by Wright (2016a) is summarized as follows:

- A major north-south-oriented structural zone—the Dark Star fault corridor—exists along the east side of all 2016 sections, juxtaposing Tertiary rocks against older sedimentary rocks. The zone has two major normal faults bounding a predominantly Pennsylvania–Permian horst block. Both bounding faults have multiple parallel faults and lesser splays;
- A north-south-oriented horst of Pennsylvania–Permian clastic rocks beneath approximately 260 ft of Tertiary and Quaternary cover is bounded by two major faults and runs parallel to and 1,475 ft west of the Dark Star fault corridor;
- The above horst is terminated to the north by a north-northeast-trending fault and is divided to the south by a major cross-cutting west-northwest-trending fault. South of that the two horsts appear to merge to the south of this cross-cutting structure; and
- The Dark Star Main and Dark Star North deposits correlate with high resistivity from a depth of 0 to 82 ft to a depth of 650 to 1,310 ft, respectively. The near-surface high resistivity features may be related to alteration.

In 2016, Gold Standard purchased a portion of an airborne magnetic survey from EDCON-PRJ that covered the entire Piñon Range including the North Railroad and South Railroad portions of the property and their surroundings. The Bullion stock forms a strong and large magnetic high, and several of the major structures were extended by the airborne interpretation of Wright (2016b).

Seismic surveys were performed in 2017 and 2018 at Pinion, Dark Star, and North Bullion. In total, three east-west-oriented lines for 23.1 line-mi were surveyed. In 2019 three additional seismic lines, totaling 13 line-mi, were surveyed directly over and to the north of the North Bullion deposit. The seismic data were acquired by Bird Seismic Services and processed and interpreted by Columbia Geophysical, Sterling Seismic Services Ltd., and Wright Geophysics.

In 2021, a seismic survey of approximately three line-mi was conducted northwest of Dark Star. The survey was carried out by hydroGEOPHYSICS, Inc.

9.2 2010 – 2021 GEOCHEMISTRY

Historical data and subsequent work by Gold Standard has shown there is a positive correlation between anomalous gold and arsenic concentrations in soil samples, and near-surface gold mineralization confirmed with drilling. Gold Standard collected approximately 7,450 soil samples from 2010 to 2015. These were collected over grids in six areas (Figure 9-2) with lines 164 ft to 328 ft apart and samples taken at spacings of164 ft. During 2017 and 2018, a total of 7,823 soil samples were collected from the South Railroad portion of the property in the Ski Track, Dixie, and Jasperoid Wash areas, and near the southern limit of the property. Samples were taken at intervals of 164 ft along lines spaced 238 ft apart.

To expand the rock geochemistry database in areas that lacked historical sampling, Gold Standard collected approximately 3,500 rock samples throughout the Dark Star, Pinion, and North Bullion deposit areas from 2010 to 2015 (Figure 9-2). Samples were collected from outcrops, road cuts, and field traverses parallel with topography. The majority of these rock samples comprise simple “grab” samples, but chip, channel and scoop sampling techniques were employed to a lesser degree.

Gold Standard did not collect any rock, soil, or scoop samples in 2016. During 2017 and 2018, a total of 1,550 rock samples were collected from the Ski Track, Dixie, and Jasperoid Wash areas of the property. The geochemical exploration work described above identified eight drill targets, some of which have returned significant intercepts of gold, silver, copper, lead, and zinc.

During 2019 through 2021, a total of 22 soil samples and 497 rock samples were collected by Gold Standard in the Dark Star area. A total of 252 rock samples were collected at the LT area in 2020. At the South Dome area, 78 rock samples and 459 soil samples were collected in 2020. A total of 93 rock samples were collected in the Pinion area during 2020 and 2021.

The authors have not analyzed the sampling methods, quality, and representativity of surface sampling at the Railroad-Pinion property because drilling results form the basis for the mineral resource estimates described in Section 14. Drilling is described in Section 10.

9.3 2009 – 2021 GEOLOGIC MAPPING

During 2009 through 2016, Gold Standard geologists carried out Anaconda-style, layer-based geological mapping that covers a total of 58 mi^2 within and near the Railroad-Pinion property. The mapping was done at scales of 1:6,000 to 1:2,000. The cumulative results of that mapping, combined with published mapping by the U.S.G.S. and the Nevada Bureau of Mines and Geology, as well as certain mapping by historical operators, are shown in Figure 7-3. During 2016-2018, approximately 21 mi^2 were mapped in the Dark Star, Dixie, Jasperoid Wash, Ski Track, Elliot Dome, and east Pine Mountain areas. Additional mapping was conducted at a scale of 1:2,000 in the Ski Track and LT areas during 2018.

During 2019 through 2021, Gold Standard personnel conducted geological mapping in the LT, South Dome, Jasperoid Wash and central Railroad district areas.

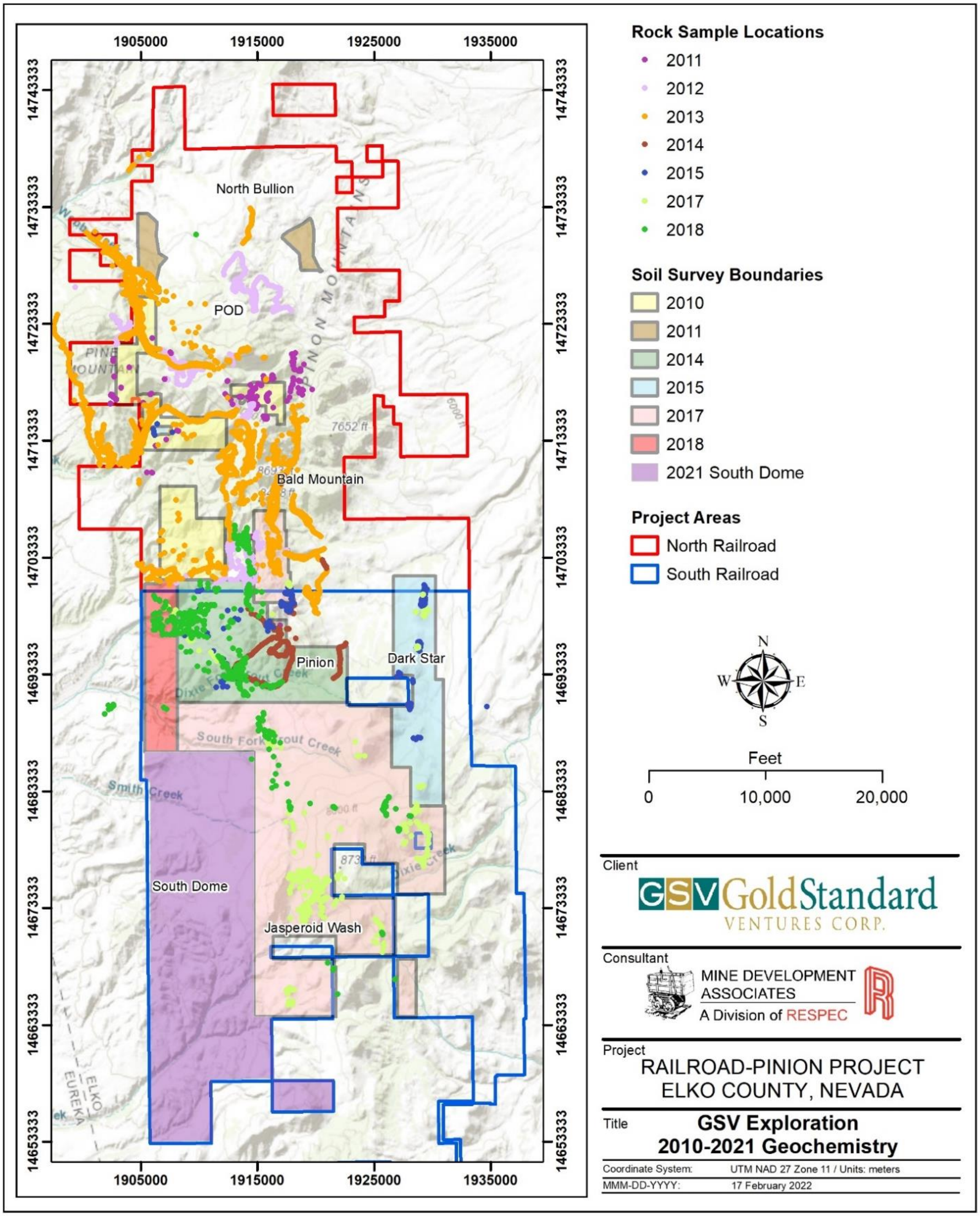

Figure 9-2: Rock and Soil Sample Locations 2010 - 2018

9.4 2014 – 2016 DARK STAR AND PINION PETROGRAPHY

Petrographic analysis systematically describes mineralogical and textural details of rock samples, commonly using thin-section optical microscopy. Consultant Mark McComb of McComb Petrographics performed a petrographic analysis on one sample of Pinion area drill core in 2014, and 14 samples of Dark Star area drill core in 2016. The 2016 samples were from drill hole DS15-13 (Dufresne *et al.,* 2017). McComb (2016) summarized his findings as follows:

"Rock types found in this suite of samples generally include silicified biomicrite, silicified silty to sandy biomicrite, silicified siltstone and sandstone, and decalcified siltstone and sandstone. Gold grades are the highest in samples that contain the most decalcified siltstone and sandstone and were logged as debris flow. Debris flow samples often contain clasts of silicified silty to sandy biomicrite in a decalcified siltstone/sandstone matrix. Decalcified siltstone/sandstone usually has wispy stylolaminated texture attesting to the removal of carbonate and generally comprises detrital quartz in a matrix of low birefringent clay that is often iron stained and contains extremely fine-grained iron oxides. Low birefringent clay appears to be kaolinite, where it is not highly iron stained. Gold mineralization is interpreted to occur in iron oxides, which are interpreted to be oxidized arsenian pyrite. Silica locked extremely fine-grained pyrite can still be observed locally. Mineralized debris flow samples are similar to what is described in the Roberts Mountain DSr3 unit in the northern Carlin Trend." (pp.1).

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10 DRILLING

The information presented in Section 10 is derived from multiple sources, as cited. The authors have reviewed this information and believe this summary accurately represents the drilling conducted at the Railroad-Pinion property.

10.1 SUMMARY

MDA/RESPEC received from Gold Standard on October 4, 2021, a summary of all drilling conducted within the property during 2018 through 2021. This data was used to update the property-wide drilling information summarized by Ibrado et. al. (2020). In total, there are records from a total of 1,453,656 ft drilled in 2,205 holes since drilling commenced in 1969 (Table 10-1). These totals exclude two holes for which MDA/RESPEC has collar locations, but no depths drilled, hole type, company or assays. Twenty-one different historical operators are known to have drilled 1,084 holes, for a total of 500,544 ft, from 1969 through 2008. As of September 21, 2021, Gold Standard has drilled 1,121 holes for a total of 953,112 ft (Table 10-1). This includes 16 holes for 12,140 ft drilled in the Pinion area after the June 2, 2021 effective date of the Pinion resource database; five holes for 1,220 ft drilled in the Dark Star area after the June 15, 2021 effective date of the Dark Star resource database; and 38 holes for 12,409 ft drilled in the North Bullion area after the August 21, 2020 effective date of the North Bullion resource database.

The drilling was done using Imperial units of measure. Figure 10-1 shows the distribution of all known drill collar locations in the property.

Approximately 81% of the holes have records to indicate they were drilled with RC methods. There is a total of 33,357 ft drilled in 88 historical holes for which MDA/RESPEC has no reliable information on the type of hole or drilling methods used. The authors believe the amount of RC drilling may be understated because the historical holes with no hole-type attribute were drilled in the late 1980s and 1990s when RC drilling was common.

Table 10-1: All Railroad-Pinion Drilling 1969 – 2021

Period	Rotary & RC Holes	Rotary & RC (ft)	Core Holes	Core (ft)	RC + Core Tail Holes	RC + Core Tail (ft)	Unknown Type Holes	Unknown Type (ft)	Total Holes	Total (ft)
Historical Drilling 1969 - 2008	938	432,591	58	34,595			88	33,357	1,084	500,544
Gold Standard 2010 - 2021	847	667,707	233	217,607	41	67,798			1,121	953,112
Totals	***1,785***	***1,100,298***	***291***	***252,202***	***41***	***67,798***	***88***	***33,357***	***2,205***	***1,453,656***

A summary of historical drilling by operator, area and year is presented in Table 10-2. Unless given in the report, the authors are not aware of information on the drilling contractors, rig makes, bit diameters, or specific drilling, logging, and sampling methods and procedures used during any of the historical drilling from 1969 through 2008.

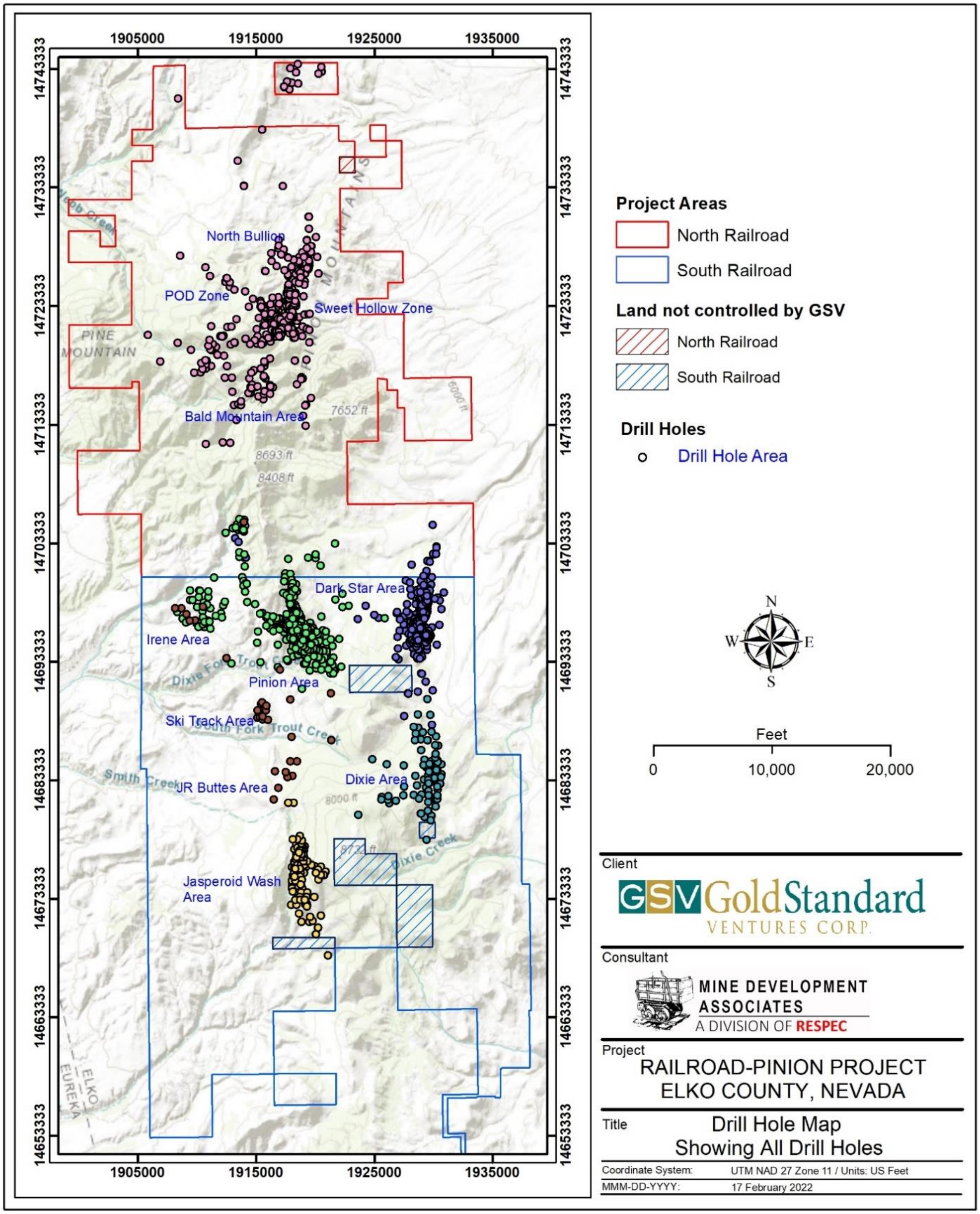

Figure 10-1: Railroad-Pinion Drill Hole Map (1969 – 2021)

Note: For more detailed depictions of drill holes and mineral resource outlines, see Figure 14-1, Figure 14-10, and Figure 14-22 in Mineral Resource Estimates, Section 14.

Table 10-2: Historical Drilling Summary

Year	Company	Area Drilled	Rotary Holes	Rotary Feet	RC Holes	RC Feet	Core Holes	Core Feet	Unknown Type Holes	Unknown Type Feet	Total Holes	Total Feet
1969-1970	American Selco	Bald Mountain					7	8,593	7	3,955	14	12,548
1972	Placer Amex	Bald Mountain			1	1,200					1	1,200
1974	El Paso-LLE	Bald Mountain, Pinion			1	835	4	2,030			5	2,864
1977-1980	AMAX	Bald Mountain					15	6,212			15	6,212
1980-1981	AMOCO	Pinion			31	9,505					31	9,505
1980-1981	Homestake	POD-N.Bullion, Bald Mountain			22	5,788					22	5,788
1981-1982	Newmont	Irene			6	1,250			23	6,617	29	7,867
1983	Freeport	Pinion			8	2,695					8	2,695
1983	NICOR	POD-N.Bullion, Bald Mountain			98	38,605					98	38,605
1984	Cyprus-AMAX	Dark Star	9	3,700							9	3,700
1985	Santa Fe Mining	Pinion			14	5,065					14	5,065
1985-1986	NICOR	POD-N.Bullion, Bald Mountain			12	6,170					12	6,170
1987-1989	Newmont	Irene, Pinion			65	37,122			11	1,835	76	38,957
1987-1989	Teck	Pinion			39	12,490					39	12,490
1987-1992	Westmont	POD-N.Bullion, Bald Mountain, Jasperoid Wash, Pinion, LT, Dark Star, JR Buttes			144	60,198	3	967	9	3,775	156	64,940
1988	Battle Mountain	Pinion							12	3,805	12	3,805
1988-1989	Freeport	Dixie			26	12,240					26	12,240
1990-1993	Crown Resources	Pinion, Dark Star, Dixie			205	82,046					205	82,046
1993	Unknown	Pinion							2	1,240	2	1,240
1994	Ramrod	POD-N.Bullion, LT			13	9,290					13	9,290
1994-1995	Cyprus	JR Buttes, Pinion			77	42,987					77	42,987
1995	Newmont	N of N.Bullion							1	1,395	1	1,395
1996	Royal Standard	Pinion					6	1,175			6	1,175

1996-1997	Mirandor	Bald Mountain, Pinion, Dark Star,POD-N.Bullion			53	25,375			4	930	57	26,305
1997-1999	Cameco	Dixie, Jasperoid Wash, Pinion, JR Buttes			36	27,996	8	9,863			44	37,859
1998-1999	Kinross	Dark Star, Pinion, POD-N.Bullion, Bald Mountain			68	45,415	2	1,080	12	8,660	82	55,155
2003	Royal Standard	Pinion			10	2,620	4	1,060	3	700	17	4,380
2005	Unknown	Pinion, POD-N.Bullion							4	445	4	445
2007-2008	Royal Standard	Pinion, Bald Mountain					9	3,617			9	3,617
	Grand Total		9	3,700	929	428,891	58	34,595	88	33,357	1,084	500,544.1

10.2 HISTORICAL NORTH RAILROAD DRILLING

10.2.1 1969-1974 American Selco, Placer Amex and El Paso Gas Company

American Selco drilled 7 core holes and 7 holes of unknown type, for a total of 12,548 ft, exploring for porphyry copper and molybdenum in the general Bald Mountain area in 1969-1970.

In 1972, Placer Amex drilled a single RC hole to a down-hole depth of 1,200 ft in the Bald Mountain area exploring for porphyry-type mineralization.

The El Paso Natural Gas Company and Louisiana Land and Cattle Company drilled one RC hole and four core holes for 2,865 ft in the Bald Mountain and Pinion areas in 1974.

10.2.2 1977-1980 AMAX

AMAX drilled 15 core holes in the Bald Mountain area in 1977-1980 for a total of 6,212 ft (Table 10-2). Drill hole AR-7 intersected 98 ft that averaged 0.11 oz Au/ton from 37 ft to 135 ft near the historic replacement and skarn mines.

10.2.3 1980-1981 Homestake

Homestake drilled 5,788 ft in 22 RC holes in 1980 and 1981 (Table 10-2). Four of these were drilled in the Bald Mountain area and 18 holes were drilled in the POD-North Bullion area. Homestake's drilling produced the first significant results in the North Bullion area when hole BDH05 returned 43 ft with an average of 0.046 oz Au/ton starting at a down-hole depth of 6.9 ft.

10.2.4 1983 and 1985-1986 NICOR

From 1983 through 1986, NICOR drilled a total of 110 RC holes for 44,775 ft. This included 21 RC holes in the Bald Mountain area for 6,655 ft. During this period, NICOR also drilled 99 RC holes for 38,120 ft in the North Bullion area and north of North Bullion. This drilling expanded the drill coverage at North Bullion and resulted in the first historical mineral resource estimate for the POD portion of the North Bullion deposits.

10.2.5 1987-1992 Westmont

Westmont drilled 58 RC holes for 21,708 ft in the POD-North Bullion area from 1987 through 1992. Three RC holes for 1,085 ft were drilled north of the North Bullion deposit area in 1987 and 1990. A total of 5,230 ft was drilled in 12 RC holes in the Bald Mountain area in 1987-1992.

10.2.6 1994 Ramrod

Ramrod Gold drilled 13 RC holes in the POD-North Bullion area in 1994 for a total of 9,290 ft.

10.2.7 1995 Newmont

One hole of unknown type was drilled by Newmont north of the deposits in 1995 for 1,395 ft.

10.2.8 1996-1997 Mirandor

During 1996 and 1997, Mirandor drilled 28 RC holes in the POD-North Bullion and north of North Bullion areas for a total of 13,640 ft. Fourteen RC holes were drilled in 1997 in the Bald Mountain area. Hole EMRR-9722 penetrated 70 ft that averaged 0.111 oz Au/ton from 15 ft to 85 ft, including 45 ft at a grade of 0.164 oz Au/ton from 35 ft to 70 ft, and

20 ft at 0.236 oz Au/ton from 55 ft to 75 ft. This hole was drilled near AMAX hole AR-7, adjacent to the historic Sylvania mine, which had historic production from replacement and/or skarn mineralization.

10.2.9 1998-1999 Kinross

Kinross drilled 37 RC holes and one core hole for 21,825 ft in the POD-North Bullion deposit area in 1998 and 1999. During this period, 27 RC holes were drilled in the Bald Mountain area for 20,750 ft. Hole K98-49 intersected 70 ft with a grade of 0.108 oz Au/ton at 855 ft to 925 ft, including 5 ft at 0.387 oz Au/ton from 880 ft. Hole K99-19 returned a significant interval well away from any previously targeted areas with 10 ft at 0.026 oz Au/ton from 610 ft and 10 ft at a grade of 0.018 oz Au/ton from 1,205 ft.

10.2.10 2005-2008 Royal Standard Minerals

In 2005, RSM drilled a total of 1,760 ft in four core holes and three holes of unknown type in the POD-North Bullion area. At the Bald Mountain area, RSM drilled three core holes in 2007 and one core in 2008 for 2,272 ft.

10.3 HISTORICAL SOUTH RAILROAD DRILLING

10.3.1 1980-1981 AMOCO Minerals

AMOCO drilled 31 RC holes for 9,505 ft in the Pinion area in 1980 and 1981.

10.3.2 1981-1982 Newmont

The Irene prospect was tested by Newmont in 1981 and 1982 when six RC holes and 21 holes of unknown type were drilled for 7,867 ft.

10.3.3 1983 Freeport

In 1983, Freeport drilled eight RC holes for 2,695 ft in the Pinion deposit area.

10.3.4 1984 Cyprus-AMAX

The Dark Star area was first tested by Cyprus-AMAX with nine rotary holes for 3,700 ft in 1984.

10.3.5 1985 Santa Fe Mining

Santa Fe Mining drilled 14 RC holes for 5,065 ft in the Pinion deposit in 1985.

10.3.6 1987-1989 Newmont

Newmont drilled four RC holes and 11 holes of unknown type for 4,500 ft in the Irene prospect during 1987 through 1989. During this same time period, Newmont drilled 61 RC holes in the Pinion deposit and vicinity.

10.3.7 1987-1989 Teck Resources

Teck drilled 39 RC holes for 12,490 ft in the Pinion deposit.

10.3.8 1988 Battle Mountain

A total of 12 holes of unknown type and 3,805 ft were drilled at the Pinion area by Battle Mountain Gold Corp. ("BMGC") or Battle Mountain Exploration Co. ("BMEC") in 1988.

10.3.9 1989-1992 Westmont

Westmont first drilled in the Jasperoid Wash area with 48 RC holes and two core holes for 22,311 ft in 1989 through 1992. The Pinion area was drilled by Westmont in 1989 with nine holes of unknown type for 3,775 ft. In 1991, Westmont drilled two RC holes at Pinion for 680 ft. Three RC holes for 785 ft were drilled at Dark Star by Westmont in 1991. Westmont tested the JR Buttes prospect in 1992 with 19 RC holes for 8,365 ft.

10.3.10 1988-1989 Freeport

The Dixie prospect was tested by Freeport with 26 RC holes for 12,240 ft drilled.

10.3.11 1990-1993 Crown Resources

In 1990, Crown began drilling in the Pinion deposit and by 1993 had drilled 40,345 ft in 130 RC holes. Crown also drilled 36,860 ft in 69 RC holes at the Dark Star deposit in 1991 through 1993. A total of 5,100 ft in seven RC holes were also drilled by Crown at the Dixie prospect in 1991, following up on the drilling done there by Freeport.

10.3.12 1994-1995 Cyprus Mining

During 1994 and 1995, Cyprus drilled at total of 40,817 ft in 73 RC holes in the Pinion deposit area. Cyprus also drilled three RC holes for a total of 1,525 ft at the JR Buttes prospect.

10.3.13 1997 Mirandor

Mirandor drilled a total of 7,230 ft in 11 RC holes at the Dark Star deposit in 1997. A total of 930 ft in four holes of unknown type were also drilled in the Pinion deposit area.

10.3.14 1997-1999 Cameco

Cameco's drilling during this period was focused on the Pinion deposit area with a total of 20 RC holes and eight core holes. A total of 8,810 ft in 11 RC holes were drilled by Cameco in the Dixie prospect in 1997 and 1998, and one RC hole for 725 ft was drilled in 1998 at JR Buttes. In 1997, Cameco also drilled 1,825 ft in four RC holes at the Jasperoid Wash area.

10.3.15 1998-1999 Kinross

Kinross focused their 1998 and 1999 drilling in the South Railroad portion of the property at Dark Star with one core hole, three RC holes and 11 holes of unknown type for a total of 11,085 ft. A total of 1,495 ft was also drilled in two RC holes in the Pinion deposit area.

10.3.16 2003 and 2007 Royal Standard Minerals

In 2003, RSM drilled a total of 2,620 ft in 10 RC holes in the Pinion deposit area. RSM subsequently drilled five core holes at the Pinion deposit area in 2007, for a total of 1,345 ft.

10.4 GOLD STANDARD DRILLING, NORTH RAILROAD AREA 2010 - 2020

Gold Standard's drilling in the North Railroad portion of the property commenced in 2010. As summarized in Table 10-3, a total of 261,542 ft has been drilled in 184 holes as of the effective date of the database of this Technical Report. Gold Standard's most recent drilling in the North Railroad portion of the property was conducted in 2020. Approximately 34% of the feet and 44% of the holes were drilled with RC methods. Diamond-core drilling accounts for 41% of the feet and 35% of the holes; the balance of the drilling was done using RC followed by core tails.

Gold Standard's RC holes were drilled wet; water was always injected. Face-return bits were only used when interchanges were flooded out. Tri-cone bits were only used when the hammer bits were ineffective due to too much water.

For core drilling, Gold Standard geologists completed paper or digital logs on the whole core. The logs captured and illustrated core recovery, sample intervals, lithologic data, hydrothermal alteration, mineralogy, and structural features. Structural features were measured with respect to the core axis. When available, structural features were measured on core oriented using a Reflex Act 2 orienting device. Photographs were taken of all drill core, labeled with drill hole footages and sample intervals. RC drill chips were also logged on paper or digital logs by Gold Standard geologists. The data from the paper drill logs were later captured in electronic spreadsheets for both core and RC drill holes.

Table 10-3: Summary of Gold Standard Drilling 2010 – 2021

Year	Area	RC* Holes	RC Feet	Core** Holes	Core** Feet	RC + Core Holes	RC + Core Feet	Total Holes	Total Feet
North Railroad									
2010	POD-N.Bullion	6	9,330.0	5	7,341.5	4	6,095.0	15	22,766
2011	N of N.Bullion	1	2,000.0		-		-	1	2,000
	POD-N.Bullion	5	5,556.5	5	9,504.9	7	13,333.0	17	28,394
	Bald Mountain		-	4	4,868.0		-	4	4,868
2012	N of N.Bullion	2	5,085.0	1	3,627.5		-	3	8,712
	POD-N.Bullion	4	5,985.0	25	43,528.4	2	4,583.0	31	54,096
	Bald Mountain		-	3	5,810.0		-	3	5,810
2013	POD-N.Bullion	5	7,575.0	15	26,910.9		-	20	34,486
	Bald Mountain	4	7,995.0	3	5,192.0		-	7	13,187
2014	Bald Mountain	5	6,220.0		-		-	5	6,220
2015	POD-N.Bullion		-	2	3,143.0	2	2,324.3	4	5,467
2016	Bald Mountain	9	16,440.0		-		-	9	16,440
	POD-N.Bullion	1	2,185.0		-	9	17,242.0	10	19,427
2017	Bald Mountain	4	5,315.0		-		-	4	5,315
	POD-N.Bullion	1	1,250.0			10	17,553.5	11	18,804
2019	Bullion	2	3,140.0					2	3,140
2020	Bullion	27	8,850.0	11	3,558.5			38	12,409
2010-2020	*N. Railroad Totals*	*76*	86,926.4	*74*	*113,484.7*	*34.0*	*61,130.7*	*184*	*261,542*
South Railroad									
2012	Pinion & Vicinity	6	9,930.0					6	9,930
2014	Pinion & Vicinity	53	41,365.0	4	1,584.0			57	42,949
2015	Pinion & Vicinity	24	30,870.0					24	30,870
	Dark Star	12	15,160.0	1	1,402.0			13	16,562
	Irene	1	1,985.0					1	1,985
2016	Pinion & Vicinity	20	24,888.0	5	1,564.8			25	26,453
	Dark Star	19	29,230.0	21	29,309.5			40	58,540
	Dixie	2	3,905.0					2	3,905
	Irene	2	4,450.0					2	4,450
2017	Pinion & Vicinity	16	6,290.0	3	1,380.0			19	7,670
	Dark Star	35	42,017.5	12	8,643.0			47	50,661
	Jasperoid Wash	10	11,670.0	2	2,592.0			12	14,262
	Dixie	17	25,237.0	1	1,462.0			18	26,699
2018	Pinion & Vicinity	106	39,375.0	31	11,892.0			137	51,267
	Dark Star	122	76,805.0	23	14,010.5	1	2,035.0	146	92,851
	Jasperoid Wash	46	30,670.0	3	2,923.0			49	33,593
	Dixie	27	40,181.0					27	40,181

	Ski Track	6	6,680.0					6	6,680
2019	Pinion & Vicinity	3	1,462.0	18	3,523.5			21	4,986
	Dark Star	90	44,340.0	5	2,086.0	1	3,412.0	96	49,838
	Jasperoid Wash	9	7,130.0	1	592.0			10	7,722
	Dixie	8	9,215.0					8	9,215
	Ski Track	2	1,970.0					2	1,970
2020	Pinion & Vicinity	71	47,105.0	22	16,174.0			93	63,279
	Dark Star	25	10,600.0	7	4,984.0			32	15,584
2021	Pinion & Vicinity	17	12,540.0					17	12,540
	Dark Star	22	5,710.0			5	1,220.0	27	6,930
2012-2021	*S. Railroad Totals*	*771*	*580,780*	*159*	*104,122*	*7*	*6,667*	*937*	*691,570*
	Grand Totals	***847***	***667,706.8***	***233***	***217,607.0***	***41***	***67,797.7***	***1,121***	***953,112***
* includes sonic holes; ** includes geotechnical holes									

10.4.1 North Bullion Deposits Drilling by Gold Standard

Drilling by Gold Standard in the North Bullion area commenced in 2010 and a total of 261,542 ft had been drilled in 184 holes through the end of 2020. No drilling was done in 2021. Drill collar locations in the North Bullion area are shown in Figure 10-2.

10.4.1.1 2010-2013 North Bullion Deposits Drilling

From 2010 through 2013, Gold Standard drilled 101 holes totalling 174,321 ft in the North Bullion area (Table 10-3; Figure 10-2; Hunsaker, 2012a, b; Shaddrick, 2012; Koehler *et al*., 2014). In 2010, Gold Standard utilized gravity data and geological models to identify an untested target that led to intercepts of 105 ft of 0.041 oz Au/ton and 143 ft of 0.035 oz Au/ton in hole RR10-8 at the North Bullion deposit (Jackson *et al*., 2015). This discovery of blind, sedimentary-rock hosted, Carlin-style gold mineralization leads to additional drilling conducted from 2010 to 2013 within the North Bullion deposit area and eventually to the estimated gold mineral resources presented in Section 14. The true thickness of mineralization in the POD deposit and North Bullion deposit, and its relationship to drill interval lengths, is discussed in Section 14 of this Technical Report.

Gold Standard's 2010 and 2013 RC drilling was conducted by Hard Rock Exploration Inc. ("Hardrock") and National Exploration Wells and Pumps ("National"), using a TH75 and 685 Schramm, respectively. Bit sizes were 5 ¼ in. to 6 ½ in. diameter bits. The rig was operated on one or two 12 hr shifts per day. RC samples were collected continuously over 5.0 ft intervals and split with a rotating wet splitter located beneath the cyclone. A drilling technician placed a few ounces of each 5.0 ft interval in plastic chip trays for logging.

Core drilling in 2010 to 2013 was done by Redcor Drilling Inc. with an LF-230 rig. Core sizes were PQ3, HQ3, and NQ3. No drilling was done in 2014.

10.4.1.2 2015 North Bullion Deposits Drilling

In 2015, Gold Standard drilled two core holes and two RC holes with core tail holes totalling 5,467 ft (Table 10-3; Figure 10-2; Turner *et al*., 2015; Dufresne and Koehler, 2016). The RC drilling was conducted by National using a 685 Schramm. Bit sizes were 5 ¼ in. to 6 ½ in. diameter bits. The rig was operated on one or two 12-hr shifts per day. RC samples were collected continuously over 5.0 ft intervals and split with a rotating wet splitter located beneath the cyclone. A drilling technician placed a few ounces of each 5.0 ft interval in plastic chip trays for logging.

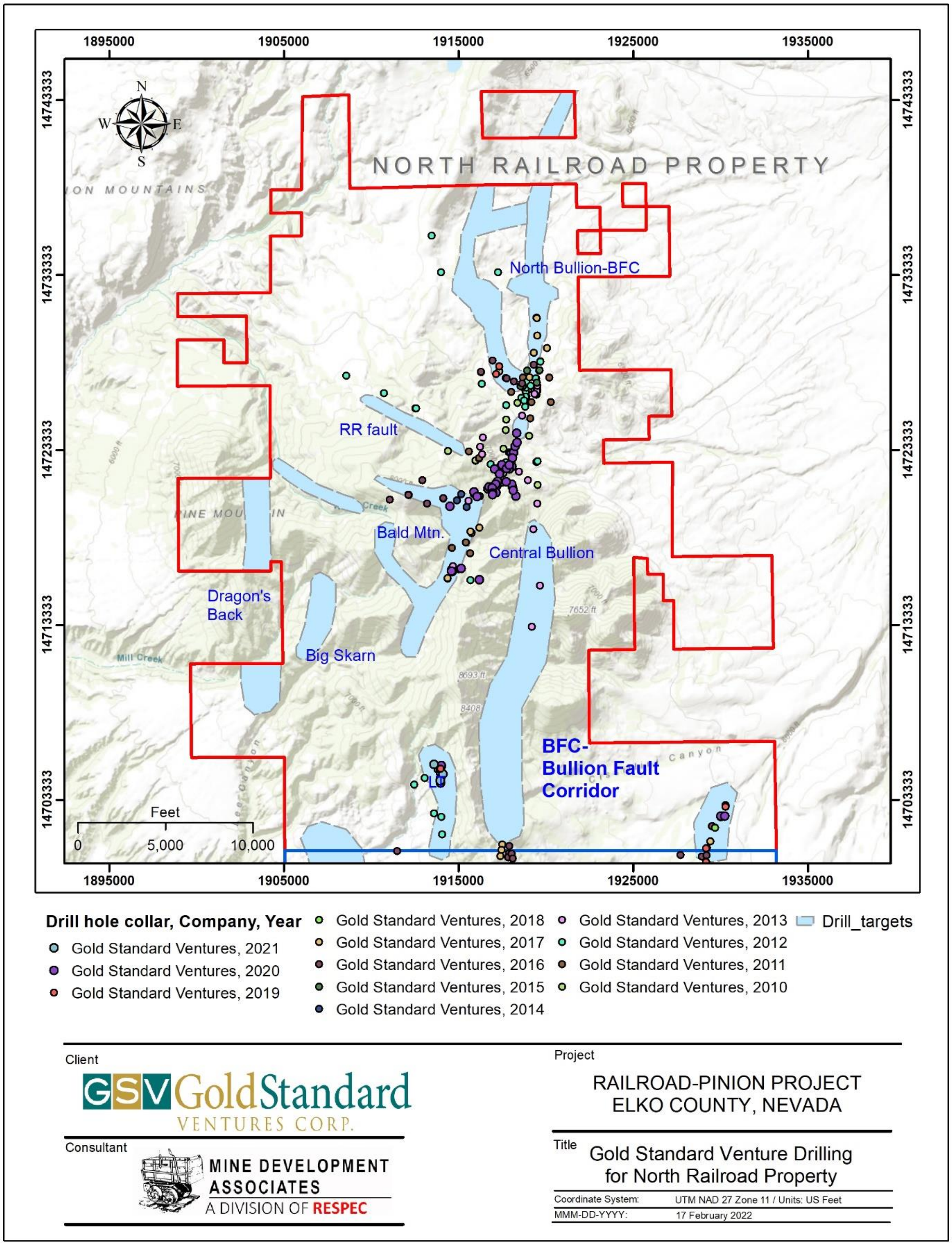

Figure 10-2: Map of North Railroad Property Drill Collar Locations

The 2015 core drilling was performed by Timberline Drilling ("Timberline") of Elko Nevada using an LF90 drill rig Core sizes were PQ3, HQ3, and NQ3. Core was also drilled by TonaTec Exploration LLC ("TonaTec") of Utah. The rig may have been a CS2000. Core sizes were PQ3, HQ3, and NQ3.

10.4.1.3 2016-2017 North Bullion Deposits Drilling

A total of 59,985 ft was drilled in 34 holes in 2016 and 2017 (Table 10-3; Figure 10-2). Most of the RC drilling was conducted by National using a 685 Schramm. Bit sizes were 5 ¼ in. to 6 ½ in. diameter bits. The rig was operated on one or two 12-hr shifts per day. RC samples were collected continuously over 5.0 ft intervals and split with a rotating wet splitter located beneath the cyclone. A drilling technician placed a few ounces of each 5.0 ft interval in plastic chip trays for logging.

Boart Longyear of Elko, Nevada was the contractor for four RC holes drilled in 2017. A track-mounted drill of unknown type was used; specific methods and procedures are not reported.

The 2015 core drilling was performed by Timberline of Elko Nevada using an LF90 drill rig. Core sizes were PQ3, HQ3, and NQ3. Core was also drilled by First Drilling ("First Drilling") of Elko Nevada. The rig was an LF90. Core sizes were PQ3, HQ3, and NQ3.

10.4.1.4 2019-2020 North Bullion Deposits Drilling

Gold Standard drilled a total of 15,549 ft in 40 RC holes at the North Bullion deposits during 2019 and 2020. National and Major Drilling Group International Inc. ("Major") of Salt Lake City, Utah, were the drilling contractors.

The results from drilling completed prior to August 21,2020 were used to estimate the current gold mineral resources presented in Section 14.5 of this Technical Report. A total of 38 holes for 12,409 ft were drilled after the August 21, 2020, effective date of the North Bullion database.

10.4.2 Bald Mountain Drilling by Gold Standard

A total of 51,850 ft was drilled by Gold Standard in 22 RC and 10 core holes in the Bald Mountain area from 2011 through 2017 (Table 10-3; Figure 10-2). Drilling contractors, rig types and diameters for the Bald Mountain area drilling are summarized in Table 10-4.

All 2011-2017 core drilling was done with two 12-hr shifts per day. The RC drills operated for one or two 12-hr shifts per day. RC samples were collected continuously over 5.0 ft intervals and split with a rotating wet splitter located beneath the cyclone.

Table 10-4: Bald Mountain Drilling Contractors and Methods

Year	RC Contractor	RC Drill Rig	RC Diameter	Core Contractor	Core Drill Rig	Core Diameter
2011 to 2013	NA	NA	NA	Redcor	LF-230	PQ3, HQ3, and NQ3
2014	Hardrock	TH75	5¼ in. to 6½ in.	NA	NA	NA
2016	National	685 Schramm	5¼ in. to 6½ in.	NA	NA	NA
2017	Boart Longyear	MPD 1500	5¼ in. to 6½ in.	NA	NA	NA

10.5 GOLD STANDARD DRILLING, SOUTH RAILROAD AREA 2012-2019

Drilling in the South Railroad portion of the property by Gold Standard commenced in 2012. As summarized in Table 10-3, a total of 691,750 ft was drilled in 937 holes (Figure 10-1). Approximately 84% of the feet and 82% of the holes were drilled with RC methods. Diamond-core drilling accounts for about 15% of the feet and 17% of the holes; the balance of the drilling was done using RC followed by core tails. Both angle and vertical drilling was done.

A Gold Standard representative checked each drill rig at least once per day during drilling to monitor sample collection. For core drilling, Gold Standard geologists completed paper or digital logs on the whole core. The logs captured and illustrated core recovery, sample intervals, lithologic data, hydrothermal alteration, mineralogy, and structural features. Structural features were measured with respect to the core axis. When available, structural features were measured on core oriented using a Reflex Act 2 orienting device. Photographs were taken of all drill core, labeled with drill hole footages and sample intervals. RC drill chips were also logged on paper or digital logs by Gold Standard geologists. The data from the paper drill logs were later captured in electronic spreadsheets for both core and RC drill holes.

Gold Standard's RC holes were drilled with water injection. Face-return bits were utilized when not impeded by excess water. Tri-cone bits were only used when the hammer bits were unable to function due to excessive water pressure.

10.5.1 Dark Star Area Drilling by Gold Standard

In 2015, Gold Standard began drilling in the Dark Star deposit area to extend historically known shallow oxidized gold mineralization and to test other exploration targets. In 2015 through 2021, Gold Standard drilled a total of 290,964.5 ft in 401 holes (Table 10-3). RC drilling accounts for about 82% of the holes and 77% of the feet drilled by Gold Standard. Collar locations for the Gold Standard drilling at Dark Star are shown in Figure 10-2 and in greater detail in Figure 14-1.

Drilling contractors, rig types and diameters for the Dark Star area drilling are summarized in Table 10-5. All 2015-2021 core drilling was done with two 12-hr shifts per day. The RC drills operated for one or two 12-hr shifts per day. RC samples were collected continuously over 5.0 ft intervals and split with a rotating wet splitter located beneath the cyclone.

Table 10-5: Gold Standard's Dark Star Drilling Contractors and Methods

Year	RC Contractor	RC Drill Rig	RC Diameter	Core Contractor	Core Drill Rig	Core Diameter
2015	National	T450GT, 685 Schramm	5¼ in. to 6½ in.	National	CT14	PQ3, HQ3, and NQ3
2016	National	685 Schramm	5¼ in. to 6½ in.	National; Timberline	CT14; LF90	PQ3, HQ3, and NQ3
2017	National; Boart Longyear	685 Schramm, T450GT; 685 Schramm, MPD1500	5¼ in. to 6½ in.	First Drilling; National	LF90; CT14	PQ3, HQ3, and NQ3
2018	National	685 Schramm, T450GT, EDM95; 685 Schramm, MPD1500	5¼ in. to 6½ in.	First Drilling; National; Boart Longyear	LF90; CT14; LF90	PQ3, HQ3, and NQ3
2019	National; Major	Schramm T450GT, Schramm 455GT EDM95	5¼ in. to 6½ in.	First Drilling	LF90	PQ3, HQ3
2020	National; Major	Schramm T450GT, Schramm 455GT EDM95	5¼ in. to 6½ in.	First Drilling; National; Major	LF90; EDM45K	PQ3, HQ3
2021	Major	Schramm T450GT	5¼ in. to 6½ in.	Major	LF90	SQ, PQ3

Highlights from the 2016 drill program at Dark Star and an updated mineral resource estimate were presented by Dufresne and Nicholls (2017a). In 2019, the mineral resource estimate was updated by Ibrado et. al. (2019). The current estimate of mineral resources for Dark Star is presented in Section 14.2 of this Technical Report. The true thickness of mineralization in the Dark Star deposit, and its relationship to drill interval lengths, is shown in Section 14.2 of this Technical Report.

10.5.2 Pinion Area Drilling by Gold Standard

Gold Standard's drilling in the Pinion deposit area (Figure 10-1) has totalled 249,943.3 ft in 399 holes drilled from 2012 through September 21, 2021 (Table 10-3). A total of 16 RC holes for 12,140 ft were drilled after the June 2, 2021 effective date of the Pinion resource database. The great majority of the drilling, approximately 86% of the feet drilled, was done with RC methods. Contractors, rig types, and hole diameters for the Pinion area drilling by Gold Standard are summarized in Table 10-6.

Following acquisition of the Pinion deposit area in 2014, in the South Railroad part of the property, Gold Standard focused their drilling on the expansion and infill drilling of various zones of what is now the Pinion gold deposit. The 2014 drilling (Table 10-3) produced significant gold intervals at the Pinion deposit indicating that gold mineralization associated with multi-lithic breccia and certain structures remained open along and across strike. Further drilling of 23 holes in 2015 also provided significant gold intercepts indicating the mineralized system was still open in a number of directions.

Table 10-6: Gold Standard Pinion Area Drilling Contractors and Methods

Year	RC Contractor	RC Drill Rig	RC Diameter	Core Contractor	Core Drill Rig	Core Diameter
2014	Hard Rock; Major	TH75; T450GT	5¼ in. to 6½ in.	Major	LF230	PQ3, HQ3, and NQ3
2015	Hard Rock; National	TH75; T450GT, 685 Schramm	5¼ in. to 6½ in.	NA	NA	NA
2016	National	685 Schramm	5¼ in. to 6½ in.	National; Timberline	CT14; LF90	PQ3, HQ3, and NQ3
2017	Boart Longyear	685 Schramm, MPD1500	5¼ in. to 6½ in.	National	CT14	PQ3, HQ3, and NQ3
2018	National; Boart Longyear	450 Schramm; 685 Schramm	5¼ in. to 6½ in.	First Drilling; Boart Longyear	LF90; LF90	PQ3, HQ3, and NQ3
2019	none	none	none	First Drilling	LF90	PQ3, HQ3
2020	National; Major	Schramm T450GT, Schramm T455GT EDM95	5¼ in. to 6½ in.	First Drilling; Major	LF100; CT20; LF90	PQ3, HQ3
2021	National; Major	Schramm T450GT, Schramm T130	5¼ in. to 14½ in.	none	none	none

In 2016, Gold Standard drilled a total of 25 holes in the Pinion deposit area for a total of 26,452 ft. This drilling was designed to extend known zones of mineralization, provide infill data for specific zones, and provide material for metallurgical testing. Several holes were drilled to test the Irene geological and geochemical target 1.2 miles west of the Pinion deposit (Figure 10-1) and at the Sentinel target to the north of the Pinion deposit.

The 2016 Pinion drilling resulted in several significant gold intersections, defined as averaging greater than the 0.004 oz Au/ton cut-off grade that was used previously for the 2016 estimate of Pinion gold mineral resources (Dufresne and Nicholls, 2016). Most significantly, the 2016 drilling identified a new stratigraphic target called the Sentinel zone, which is located at the north end of the Pinion deposit area and comprises gold hosted within the Sentinel Mountain dolomite and the top of the underlying Oxyoke sandstone, below the Devils Gate Limestone. The Sentinel gold mineralization is shallow, oxidized, and open to the north and west.

Gold Standard's 2014 through 2018 RC drilling was conducted on one or two 12-hr shifts per day. RC samples were collected continuously over 5.0 ft intervals and split with a rotating wet splitter located beneath the cyclone. The splitter reduced the samples to approximately 5.0 to 20 lb, which were collected in pre-numbered sample bags. A few ounces of each 5.0 ft interval were placed in chip trays for logging.

Results from the 2014 through 2021 Gold Standard drilling were used with data from historical drilling to estimate the current gold mineral resources presented in Section 14.3 of this Technical Report. The true thickness of mineralization in the Pinion deposit, and its relationship to drill interval lengths, is discussed in Section 14 of this Technical Report.

10.5.3 Jasperoid Wash Area Drilling by Gold Standard

Gold Standard's drilling at the Jasperoid Wash deposit area commenced in 2017. Since then, a total of 55,577 ft have been drilled in 71 holes (Table 10-3). RC drilling accounts for about 92% of the holes and 89% of the feet drilled by Gold Standard. Collar locations for the Gold Standard drilling at Jasperoid Wash are shown in Figure 10-1 (see Section 14.4 and Figure 14-22 for a detailed map).

The 2017 and 2018 RC drilling were conducted by National using a 450 Schramm, 685 Schramm, and an EDM 95. Major also drilled at Jasperoid Wash and used a 455 Schramm. Bit sizes were 5¼ in. to 6½ in. in diameter. The rig was operated on two 12-hr shifts per day. RC samples were collected continuously over 5.0 ft intervals and split with a rotating wet splitter located beneath the cyclone. A drilling technician placed a few ounces of each 5.0 ft interval in plastic chip trays for logging.

Core drilling in 2017 and 2018 was carried out by National and First Drilling using a CT14 and an LF90, respectively. Core sizes drilled were PQ3, HQ3, and NQ3. RC drilling in 2019 was done by Major and National.

The results of the Gold Standard drilling, together with historical drill data from Jasperoid Wash, have been used to estimate the current gold mineral resources presented in Section 14.4 of this Technical Report. The true thickness of mineralization in the Jasperoid Wash deposit, and its relationship to drill interval lengths, is shown in Section 14.4 of this Technical Report.

The 2018 mineral resources reported by Ibrado et. al. (2019) for Jasperoid Wash are superseded by the mineral resources estimated in Section 14 of this Technical Report.

10.5.4 Irene Area Drilling by Gold Standard

Three RC holes for a total of 6,435 ft were drilled at the Irene prospect about 1.2 miles west of the Pinion deposit in 2015 and 2016 (Table 10-3). Drilling done at Irene used drill rigs similar to those used for the Pinion drilling.

10.5.5 Dixie Area Drilling by Gold Standard

The Dixie prospect, including Arturus and Elliot Dome targets, located about 1.9 miles south of Dark Star, was drilled by Gold Standard in 2016, 2017, 2018, and 2019. A total of 80,000 ft was drilled in 51 RC holes, three core holes, and one RC pre-collar holes with a core tail (Table 10-3). This drilling was conducted by National using a 685 Schramm, 450 Schramm, and EDM 95, and Boart Longyear using a 685 Schramm or MPD1500. Major also drilled at Dixie in 2018 using a 455 and a 685 Schramm. Bit sizes were 5¼ in. to 6½ in. diameter. The rigs operated on two 12-hr shifts per day. RC samples were collected continuously over 5.0 ft intervals and split with a rotating wet splitter located beneath the cyclone. A drilling technician placed a few ounces of each 5.0 ft interval in plastic chip trays for logging.

Core drilling was conducted by National and First Drilling using a CT14 and LF90, respectively. Core sizes drilled were PQ3, HQ3, and NQ3.

10.5.6 Ski Track Drilling by Gold Standard

Eight RC holes were drilled in 2018 and 2019 at the Ski Track prospect by Major and National for a total of 8,650 ft. Major used a 685 Schramm. Bit sizes were 5¼ in. to 6½ in. in diameter. The rigs operated on two 12-hr shifts per day. RC samples were collected continuously over 5.0 ft intervals and split with a rotating wet splitter located beneath the cyclone. A drilling technician placed a few ounces of each 5.0 ft interval in plastic chip trays for logging.

10.6 DRILL-HOLE COLLAR SURVEYS

10.6.1 Historical Collar Surveys, North Railroad Portion of the Property

APEX stated that collar locations were rectified to a satellite orthophoto with one-meter contours (Dufresne and Nicholls, 2017b). Elevations for all the remaining holes were adjusted to a topographic surface created from the orthophoto.

10.6.2 Historical Collar Surveys, South Railroad Portion of the Property

Mr. Lindholm has no information on the methods used to survey the locations of the historical drill collar locations in the South Railroad portion of the property. Coordinates for historical drill holes at the Pinion, Dark Star, and Jasperoid Wash deposits were obtained from old records, resurveying in the field, and taken from historical maps. Much work was done by Gold Standard and APEX resolving collar location issues. However, those few that did contradict surrounding holes, or whose geology and grades were improbable, were eliminated from use in modeling and estimation.

10.6.3 Gold Standard Collar Surveys, North Railroad Portion of the Property

Gold Standard has performed differential Global Positioning System ("GPS") surveys of all collar locations for holes drilled from 2010 through 2021. The surveys were carried out by Apex Surveying LLC out of Spring Creek Nevada using a Trimble differential GPS. Where possible, the locations of historical drill collars were also surveyed. During their site visits, APEX located some historical and Gold Standard drill collars using a hand-held GPS, along with tracks representing drill roads and trails. Although unmarked in the field, several drill collars were ascertained due to their unique location, which were found to be consistent with historically recorded location information. Further work on refining the collar positions has been performed by Gold Standard personnel and reviewed by the author of this section of the report.

The most significant problem with the historical drill locations are collar elevations which initially had obvious errors. With near flat-lying mineralized zones it was imperative to obtain a reliable dataset of collar elevations that were internally consistent from one hole to the next. Once accurate real-world coordinates were obtained for the historical collars, elevations were obtained by projecting the collars to a digital elevation model that was generated by Pacific Geomatics from ortho-rectified satellite imagery with ~1 m elevation and horizontal resolution.

10.6.4 Gold Standard Collar Surveys, South Railroad Portion of the Property

As stated in Section 10.6.3, the collar locations for all Gold Standard holes drilled through 2021 were surveyed by differential GPS. After the holes were abandoned, the collars were marked by wooden lath with the hole name on a wire and aluminum tag placed in the cement collar plug. Apex Surveying, LLC, of Spring Creek, Nevada professionally surveyed the Gold Standard drill collars at the Pinion, Dark Star and Jasperoid Wash deposits using a "differential GPS" according to APEX.

10.7 DOWN-HOLE SURVEYS

10.7.1 Historical Down-Hole Surveys, North and South Railroad Portions of the Property

APEX reported that most of the deeper historical drill holes in the Railroad-Pinion property were downhole surveyed (Dufresne and Nicholls, 2017b). Survey equipment used is unknown. During 1999, at least a portion of the Kinross drill holes in various areas of the property were surveyed down-hole by Silver State Surveys of Elko, Nevada (Jones *et al.*, 1999), but the type of instrument and methods and procedures are not known.

10.7.2 Gold Standard Down-Hole Surveys, North and South Railroad Portions of the Property

Gold Standard contracted International Directional Services ("IDS"), who used Stockholm Precision Tools with a continuous-read, north-seeking gyro down-hole surveying tool named Memory North Seeking Gyroscopic Inclinometer. IDS has also used an Axis Champ Navigator, supplied by Axis Mine Tech. In 2017, Gold Standard contracted Minex, using a MEMS continuous-read, north-seeking gyro down-hole surveying tool. All holes longer than ~300 ft were down-hole surveyed for azimuth and dip.

10.8 SUMMARY STATEMENT

The authors believe that the drilling, sampling, and logging methods and procedures provided samples that are representative and of sufficient quality for use in the mineral resource estimations subject to the elimination of some drill holes and some samples, and to the downgrading of mineral resource classification when blocks were dominantly estimated by historical drilling (discussed in Section 14). The authors are aware of sampling or recovery factors that impact the reliability of the samples for use in a mineral resource estimate. Those samples were removed from use in estimation (discussed in Section 14).

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11 SAMPLE PREPARATION, ANALYSES AND SECURITY

The information presented in Section 11 is derived by MDA from Dufresne *et al.*, 2017, Dufresne and Nicholls (2017b), data received directly from Gold Standard, Ibrado et al. (2020), and other sources, as cited. The authors have reviewed this information and believe this summary accurately represents the methods, procedures and analyses used for the drilling samples on which the estimated mineral resources presented in Section 14 of this Technical Report are based.

Documentation of the methods and procedures used for historical surface and drilling sample collection, preparation, analyses, and sample security at the Railroad-Pinion property is incomplete and in many cases is not available. MDA recommends that Gold Standard compile and evaluate the information contained in records that are available.

Methods and procedures used for the security, preparation, and analysis of surface samples collected by historical operators and Gold Standard have not been evaluated for this Technical Report because the results have not been used in the estimation of the mineral resources presented in Section 14. While useful for identifying drilling targets and planning exploration drilling, the results and representativity of the Gold Standard surface sampling are not of material importance to the interpretations and conclusions of this Technical Report. The reader is referred to Koehler *et al*. (2014), Dufresne *et al*. (2014; 2015; 2017) and references cited in those reports for information on Gold Standard's soil- and rock-sample collection, security, preparation, and analyses.

11.1 HISTORICAL OPERATORS' DRILLING SAMPLES - NORTH RAILROAD PORTION OF THE PROPERTY

Historical drill logs and reports in the possession of Gold Standard have not been evaluated. MDA recommends that Gold Standard extract and compile information from available documents regarding logging methods, and where available, information on core diameters, RC-bit diameters, and sample splitting prior to shipment to the analytical laboratories.

The authors and Gold Standard are not aware of the methods and procedures used by American Selco, Placer Amex, El Paso, AMAX, Homestake, and NICOR for historical drill-sample collection, splitting, preparation, analyses, and sample security during drilling at Bald Mountain and North Bullion from 1969 through 1986.

Samples from the Westmont drilling in the North Bullion area in 1987 were analyzed for gold and silver by fire assay methods at Universal Laboratory, Inc. ("Universal"), in Elko, Nevada. It is not known if this laboratory was independent of Westmont, or if any certifications were held. Samples from Westmont's drilling at North Bullion in 1990 and 1992 were analyzed at Cone Geochemical Inc. ("Cone"), in Lakewood, Colorado. Gold was determined by fire-assay fusion of 30 g aliquots. Cone was independent of Westmont, but MDA is not aware if any certifications were held by Cone at that time. MDA is not aware of sample security measures taken or the details of transport from the drill sites to the laboratories.

Samples from Ramrod's drilling in the North Bullion area in 1994 were assayed at Cone and at Monitor Geochemical Laboratory Inc. ("Monitor), in Elko, Nevada. At Cone, gold was determined by fire-assay fusion of 25 g and 1.0 g aliquots with an atomic adsorption ("AA") finish. At Monitor, Ramrod's samples were analyzed for gold and silver by 30 g fire-assay fusion and some were analyzed by cyanide-leach with an AA finish. Some composited pulps representing 25 ft lengths were analyzed for arsenic, antimony and mercury by unspecified method(s). Monitor and Cone were independent of Ramrod. It is not known if any certifications were held by these laboratories at the time. MDA is not aware of sample-security measures taken or the details of transport from the drill sites to the laboratories.

In 1997, Mirandor's drill samples from north of North Bullion and the Bald Mountain areas were analyzed by Interteck Testing Services, a division of Bondar-Clegg & Company Ltd. ("Bondar-Clegg"), in North Vancouver, British Columbia. Gold was determined by fire-assay fusion of 30 g aliquots with an AA finish. Some samples were re-analyzed for gold by 30 g fire assay with a gravimetric finish. Silver was determined by AA and inductively-coupled plasma-emission spectrometry ("ICP). Some samples were analyzed for copper, lead, zinc, molybdenum, arsenic, and antimony by AA, and for mercury by cold-vapor AA ("CVAA"). Bondar-Clegg was independent of Mirandor. MDA is not aware if any certifications were held by Bondar-Clegg at that time. MDA is not aware of sample-security measures taken or the details of transport from the drill sites to the laboratory.

Samples from Kinross' drilling in 1998 and 1999 at North Bullion and Bald Mountain were analyzed at Chemex Labs, Inc. ("Chemex"), in Sparks, Nevada. Gold was determined by fire-assay fusion of 30 g aliquots with an AA finish. Some samples were re-analyzed for gold by 30 g fire assay with a gravimetric finish. Composited pulps representing 25 ft sample lengths were analyzed ICP for 35 minor, major, and trace elements, including silver. Chemex was independent of Kinross. MDA is not aware if any certifications were held by Chemex at that time. MDA is not aware of sample-security measures taken and the details of transport from the drill sites to the laboratory.

11.2 GOLD STANDARD'S DRILLING SAMPLES - NORTH RAILROAD PORTION OF THE PROPERTY

Commencing in 2010, drilling company employees collected Gold Standard's RC samples at the rig. Those samples were then picked up at the drill sites by representatives of ALS Minerals ("ALS") or Inspectorate America Corporation ("Inspectorate"), a division of Bureau Veritas Mineral Laboratories USA ("Bureau Veritas") and transported by truck to their respective laboratories in either Elko or Reno, Nevada (for ALS), or Elko (for Bureau Veritas). Excessively wet samples were kept at the drill sites for a few days to drain and dry prior to collection by the laboratory staff.

ALS and Bureau Veritas were, and continue to be, commercial laboratories independent of Gold Standard. ALS is accredited to the standard ISO/IEC 17025:2005 for specific analytical procedures, while most of their laboratories have attained ISO 9001:2008 certification. Bureau Veritas' laboratories in Sparks, Nevada is accredited to the standard ISO/IEC 17025:2017, RG- MINERAL:2017. The Bureau Veritas laboratory in Vancouver, British Columbia is accredited to the standard ISO/IEC 17025:2005 and ISO 9001:2008.

Core samples were transported daily from the drill sites to Gold Standard's logging and core-cutting facility in Elko by Gold Standard personnel. After logging and marking core-sample intervals by Gold Standard geologists, the core was photographed prior to being sawed lengthwise by contractor technicians. Whole HQ-size core was sawed in half. Whole PQ-size core was sawed in quarters. One half of the HQ core, and three quarters of the PQ core, were returned to the core boxes and the remainder was placed in pre-numbered sample bags that were closed with ties. Following insertion of quality assurance/quality control ("QA/QC") blanks and certified reference materials ("CRMs"), the core samples were transported by representatives of ALS or Bureau Veritas to their respective laboratories for preparation and analysis.

Samples from Gold Standard's RC and core drilling at North Bullion in 2010 through 2014, and at Bald Mountain in 2014, were prepared at the ALS laboratories in Elko and Reno, Nevada. The samples were dried and crushed in their entirety to 70% at less than 0.079 in. The crushed samples were riffle-split to obtain 8.82 oz subsamples that were pulverized to 85% less than 75 microns. The pulps were shipped by air freight by ALS to the ALS laboratory in North Vancouver, British Columbia, for analysis. Gold was determined by 30 g fire-assay fusion with an AA finish (method code Au-AA23). Samples assayed at ≥0.292 oz Au/ton were re-analyzed with a second 30 g aliquot by fire-assay fusion and gravimetric finish (method code Au-GRA21). Separate aliquots of 0.5 g were analyzed for silver and 34 major, minor and trace elements by ICP following an aqua regia digestion. In some cases, the ICP analyses were conducted on pulps from 5.0 ft drill samples. In other cases, ICP analyses were conducted on composited pulps representing 20 ft drill intervals. Samples that assayed >292 oz/t for silver or zinc by ICP were re-analyzed using AA following aqua regia digestion of 0.1 g aliquots.

A minority of the 2010 through 2012 drill samples were analyzed by SGS Canada Inc. ("SGS") of Vancouver, British Columbia. The assay certificates do not indicate how or where the samples were prepared for analysis. At the SGS laboratory in Burnaby, British Columbia, gold was determined by 30 g fire-assay fusion with an AA finish and separate aliquots were analyzed by ICP for 35 major, minor and trace elements. SGS was a commercial laboratory independent of Gold Standard. MDA is not aware of certifications held by SGS at that time.

In 2013, pulps from previously prepared samples from North Bullion were analyzed by Bureau Veritas in Sparks, Nevada. Gold was determined by 30 g fire-assay fusion with an AA finish. Some of the samples were analyzed using a 30 g aliquot by fire-assay fusion and gravimetric finish. In 2014, some of the Bald Mountain drill sample pulps were re-analyzed at Bureau Veritas' laboratory in Vancouver, British Columbia for copper by cyanide-H_2SO_4 leach. Other pulps were analyzed for 45 major, minor and trace elements by a combination of ICP and mass spectrometry ("ICP-MS") after 4-acid digestion.

Samples from the 2015, 2016. and 2017 drilling at North Bullion and Bald Mountain were analyzed at ALS and Bureau Veritas. At ALS the methods and procedures of preparation were the same as those used in 2010 through 2014. Gold was determined using ALS method code Au-AA23 and Au-GRA21 principally in the ALS laboratory in North Vancouver. Most gold assays on 2017 North Bullion samples were performed in the ALS laboratory in Reno with the same methods (Au-AA23; Au-GRA21). Separate aliquots of 0.5 g were analyzed for silver and 34 major, minor and trace elements by ICP following an aqua regia digestion in the North Vancouver laboratory. In some cases, these were composited pulps representing 20 ft drill intervals.

A significant portion of the samples from the 2016 North Bullion drilling, and the majority of the 2017 North Bullion samples, were prepared and analyzed by Bureau Veritas. These samples were prepared in the Bureau Veritas laboratory in Elko. After crushing, a 8.0 oz riffle-split subsample was obtained from each drill sample. These subsamples were pulverized to 200-mesh size and the pulps were shipped to the Bureau Veritas laboratory in Sparks, Nevada. Gold was determined by fire-assay fusion of 30 g aliquots with an AA finish. The pulps were shipped via air freight by Bureau Veritas to their analytical laboratory in Vancouver where they were analyzed for 45 major, minor and trace elements by ICP-MS after four-acid digestion.

Samples from Gold Standard's 2019 North Bullion drilling were analyzed at Bureau Veritas. At total of 40 major, minor and trace elements, including gold, were analyzed by ICP following an aqua regia digestion. The 2020 North Bullion drilling samples were analyzed at ALS for gold using a 30 g aliquot by fire-assay fusion followed by an AA finish.

11.3 HISTORICAL OPERATORS - SOUTH RAILROAD PORTION OF THE PROPERTY

AMOCO and Cyprus' drilling samples from the Pinion area in 1980 and 1981 were mainly analyzed at Barringer Resources, Inc. ("Barringer") in Sparks, Nevada. Gold and silver were determined by fire-assay fusion of 30 g aliquots. Some samples were also analyzed for arsenic and mercury, but no other information is available. In 1980, some of AMOCO's samples were analyzed for silver and gold at Monitor, but the methods of analysis are not available. Barringer and Monitor were independent of AMOCO and Cyprus. MDA is not aware of any certifications that may have been held by these laboratories at that time.

In 1981, Newmont's drilling samples from the Irene area were analyzed at Monitor in Elko. Gold and silver were determined by fire-assay fusion, but MDA has no other information on the methods and procedures used. Newmont's 1982 drilling samples from the Pinion area were analyzed at Skyline Labs Inc. ("Skyline"), in Tucson, Arizona. Gold was determined by fire-assay fusion, but no other information is available. Skyline and Monitor were independent of Newmont, but MDA is not aware of any certifications that may have been held by these laboratories at that time.

Santa Fe's samples from their 1985 drilling in the Pinion area were analyzed by Monitor in Elko. Gold was determined by fire-assay fusion of 30 g aliquots, but no other information is available. Monitor was independent of Santa Fe, but MDA is not aware of any certifications that may have been held by Monitor at that time.

Samples from Teck Resource's drilling in the Pinion area in 1987 and 1989 were analyzed by Chemex in Sparks, Nevada. Gold was determined by fire-assay fusion with an AA finish. Some samples were analyzed for silver using AA after an aqua regia digestion. In 1988, Teck's samples from Pinion were analyzed at American Assay Laboratories ("AAL") in Sparks. Gold was determined by fire-assay fusion of 30 g aliquots with an AA finish. Silver was determined by AA following aqua regia digestion. Some samples were analyzed for gold by fire-assay fusion of 60 g aliquots. Chemex and AAL were independent of Teck, but MDA is not aware of certifications held by these laboratories at that time.

Newmont's 1987 and 1988 drilling samples from the Pinion area, and some of their 1989 Pinion samples, were analyzed at Geochemical Services, Inc. ("GSI"). MDA is not aware of the location(s) of the GSI laboratory. Gold was determined by fire-assay fusion of 30 g aliquots with both gravimetric and AA finish. Samples were also analyzed for silver, arsenic and antimony by ICP. In 1989, Newmont also sent drilling samples from the Pinion area to be analyzed at Bondar-Clegg in Sparks. Following crushing, a subsample was pulverized to -150 mesh. Gold was determined by fire-assay fusion of 30 g aliquots with and AA finish. Silver, arsenic, antimony, molybdenum, and thallium were analyzed by direct-current plasma emission ("DCP") and mercury was determined by CVAA. Bondar-Clegg and GSI were independent of Newmont, but MDA is not aware of certifications held by these laboratories at that time.

In 1989, Westmont's drilling samples from the Pinion area were analyzed at Universal in Elko, Nevada. Gold and silver were analyzed by fire-assay fusion, but MDA has no further information on the methods and procedures used. Westmont's 1991 and 1992 drill samples from the JR Buttes, Jasperoid Wash, and Black Rock areas were analyzed by Cone in Lakewood, Colorado. Gold was determined by fire-assay fusion of 30 g aliquots with a gravimetric finish. Silver, arsenic, antimony, and mercury were determined by AA. Universal and Cone were independent of Westmont, but MDA is not aware of certifications held by these laboratories at that time.

Crown Resources' samples from their 1991 drilling at Pinion, Dixie, and Dark Star were in part analyzed for gold at AAL in Sparks using fire-assay fusion of 30 g aliquots. Arsenic and antimony were also analyzed, but MDA has no information on the methods and procedures used. Some of the samples from Crown's drilling at Dark Star in 1991 were analyzed at Activation Laboratories Ltd ("ActLabs"). Composited pulps from prior assays were analyzed for gold, silver and 34 other elements. MDA is not aware of the location of the ActLabs laboratory or the methods and procedures used for the analyses. Samples from Crown's drilling at the Dark Star and Pinion areas in 1993 were analyzed for gold at AAL in Sparks using fire-assay fusion of 30 g aliquots. AAL and ActLabs were independent of Crown, but MDA is not aware of certifications held by these laboratories at that time.

In 1995, samples from the Cyprus drilling in the Pinion area were analyzed at Chemex in Sparks. Gold was determined by fire-assay fusion of 30 g aliquots with an AA finish. Some 1.524 m samples and composited pulps of up to 50 ft lengths were analyzed for silver, arsenic, antimony, mercury, and barium by AA following digestion in aqua regia. Chemex was independent of Cyprus, but MDA is not aware of certifications held by Chemex at that time.

RSM's 1996 drill samples from the Pinion area were analyzed at Chemex in Sparks. Gold was determined by fire-assay fusion of 30 g aliquots with an AA finish. Silver was determined by AA following digestion in aqua regia. In 2014, pulps from some of these 1996 RSM Pinion area samples were re-analyzed by ALS in North Vancouver, British Columbia. At ALS, gold was determined by fire-assay fusion of 30 g aliquots with an AA finish. Separate aliquots of 30 g were analyzed for silver and 34 major, minor and trace elements by ICP following an aqua regia digestion. Portions of remaining drill core from RSM's 1996 drilling at Pinion were also analyzed at ALS in 2014. These samples were crushed in their entirety to 70% at less than 0.079 in. The crushed samples were riffle-split to obtain 8.0 oz subsamples that were pulverized to 85% at less than 75 microns. Gold was determined by 30 g fire-assay fusion with an AA finish. Separate aliquots of 0.5 g were analyzed for silver and 34 major, minor and trace elements by ICP following an aqua regia digestion. Chemex was independent of RSM, but MDA is not aware of certifications held by Chemex at that time.

In 1997, Mirandor's drilling samples from the Pinion and Dark Star areas were analyzed at Intertek Testing Services ("ITS") in North Vancouver, British Columbia. At that time, ITS was a division of Bondar-Clegg. Gold was determined by fire-assay fusion of 30 g aliquots with an AA finish. Some samples were analyzed for gold by fire-assay fusion of 30 g aliquots with a gravimetric finish. Arsenic, antimony, and barium were determined in some of the samples by AA. Mercury was determined by CVAA. ITS and Bondar-Clegg were independent of Mirandor, but MDA is not aware of certifications held by ITS or Bondar-Clegg at that time.

Cameco's 1997 drill samples from the Pinion and Dixie areas were analyzed at Chemex and AAL, both in Sparks. At both laboratories, gold was determined by fire-assay fusion of 30 g aliquots. At Chemex these fire assays were finished with AA. Copies of the AAL assay records do not indicate the type of finish. The samples assayed at AAL were also analyzed for silver and 29 major, minor and trace elements by ICP following aqua regia digestion of 0.5 g aliquots. In 1999, Cameco's drill samples from the Pinion area were analyzed for gold at AAL by fire-assay fusion of 30 g aliquots. Chemex and AAL were independent of Cameco, but MDA is not aware of certifications held by Chemex or AAL at that time.

In 1998 and 1999, the Kinross drill samples from Dark Star and Pinion were analyzed at Chemex in Sparks. Gold was determined by fire-assay fusion of 30 g aliquots with an AA finish. Composited pulps representing 25 ft drill intervals were analyzed for 34 major, minor and trace elements by ICP. Chemex was independent of Kinross, but MDA is not aware of certifications held by Chemex at that time.

RSM's 2003 drill samples from the Pinion area were analyzed by ALS Chemex in North Vancouver, British Columbia. The samples were prepared in the ALS Chemex laboratory in Elko, Nevada, where they were crushed in their entirety to 70% at less than 0.079 in. The crushed samples were riffle-split to obtain 8 oz subsamples that were pulverized to 85% at less than 75 microns. Gold was determined by 30 g fire-assay fusion with an AA finish. In 2007, RSM's drill samples from the Pinion area were also analyzed by ALS Chemex. MDA is not aware of how or where these samples were prepared, but silver plus 34 major, minor and trace elements were assayed by ICP following aqua regia digestion of 0.5 g aliquots. Pulps from the 2007 RSM drilling at Pinion were re-analyzed in 2014 at ALS in North Vancouver for gold by 30 g fire-assay fusion with an AA finish.

11.4 GOLD STANDARD - SOUTH RAILROAD PORTION OF THE PROPERTY

MDA has not reviewed and evaluated the methods and procedures used for the collection and analysis of surface samples by Gold Standard as these samples were not used to prepare the mineral resource estimates and mineral reserve estimates presented in later sections of this Technical Report. While useful for purposes of exploration, the surface soil and rock samples of Gold Standard are not material to the interpretations and conclusions of this Technical Report.

Commencing in 2012, Gold Standard's RC samples stored by the drill rig were collected at the drill sites by representatives of ALS or Bureau Veritas and transported via truck to their respective laboratories in Elko, Nevada. Excessively wet samples were kept at the drill sites for a few days to drain and dry prior to collection by the laboratory staff.

Core samples were transported daily from the drill sites to Gold Standard's logging and core cutting facility in Elko by Gold Standard personnel. After logging and marking core-sample intervals by Gold Standard geologists, the core was photographed prior to being sawed lengthwise by contractor technicians. Whole HQ-size core was sawed in half. Whole PQ-size core was sawed in quarters. One half of the HQ core, and three quarters of the PQ core, were returned to the core boxes and the remainder was placed in pre-numbered sample bags that were closed with ties. Following insertion of QA/QC blanks and CRM, the core samples were transported by representatives of ALS or Bureau Veritas to their respective laboratories for preparation and analysis.

11.4.1 Pinion Deposit Area Drill Samples

Samples from Gold Standard's drilling in 2012, 2014, 2015, 2016, and 2017 were analyzed by ALS. The samples were prepared at the ALS laboratory in Elko, Nevada. The samples were dried and crushed in their entirety to 70% at less than 0.079 in. The crushed samples were riffle-split to obtain 8.0 oz subsamples that were pulverized to 85% at less than 75 microns. The pulps were shipped via air freight by ALS to the ALS laboratory in North Vancouver, British Columbia, for analysis. Gold was determined by 30 g fire-assay fusion with an AA finish (method code Au-AA23). Samples assayed at ≥0.292 oz/ton were re-analyzed with a second 30 g aliquot by fire-assay fusion and gravimetric finish (method code Au-GRA21). Separate aliquots of 0.5 g were analyzed for silver and 34 major, minor and trace elements by ICP following an aqua regia digestion. In some cases, the ICP analyses were conducted on pulps from 5.0 ft drill samples. In other cases, ICP analyses were conducted on composited pulps representing 20 ft drill intervals. Some samples in 2014 were analyzed for silver by fire-assay fusion of 30 g aliquots with a gravimetric finish. In 2014, some samples were also assayed for 48 major, minor and trace elements by ICP-MS after four-acid digestions. During 2017, samples were analyzed for gold by cyanide leach with an AA finish.

In 2018, Pinion area drill samples were analyzed at Bureau Veritas and AAL. At the Bureau Veritas laboratory in Sparks, Nevada, samples were crushed in their entirety and riffle-split to obtain 8.0 oz subsamples. These subsamples were pulverized to 200-mesh size. Gold was determined by 30 g fire-assay fusion with an AA finish. Some samples were analyzed for gold by cyanide leach with an AA finish. The pulps were shipped to the Bureau Veritas laboratory in Vancouver, British Columbia. Carbon, CO_2 and sulfur were determined by induction-furnace infrared absorption and thermal conductivity ("LECO") analyses of 0.1 g aliquots. Gold, silver and 35 major, minor and trace elements were assayed by ICP following aqua regia digestion of 0.5 g aliquots. Additional silver assays were completed in 2019 at Bureau Veritas using drill-sample pulps from previous analyses. Silver was determined by AA following four-acid digestion of 1.0 g aliquots.

At AAL in Sparks, Nevada, composited pulps of 2018 Pinion area drill samples were analyzed for gold by 30 g fire-assay fusion with an AA finish, and in some cases, with a gravimetric finish. Some of the samples were analyzed for gold by cyanide leach and an AA finish. Gold, silver and 49 major, minor and trace elements were determined in some samples by ICP-MS following digestion in aqua regia.

AAL also analyzed selected, previously assayed drill-sample pulps for elemental barium using an energy-dispersive, x-ray fluorescence ("XRF-ED") procedure. Pressed-powder pellets made from 2.0 g aliquots of sample pulps were used for the XRF-ED analyses, which were performed in 2018 and 2019. Other selected sample pulps were analyzed for barium using XRF-ED with 2.0 g pressed-powder pellets. Some of these were also analyzed for barite using wave-length dispersive x-ray fluorescence ("XRF-WD") following lithium metaborate fusion of 0.5 g aliquots. Other sample pulps were analyzed for elemental barium by NITON hand-held XRF on both loose-powder aliquots. These were also analyzed by x-ray diffraction ("XRD") for barite, witherite and calcite, as well as sulfur and carbon by induction-furnace infrared (LECO).

Gold Standard also performed assays of elemental barium together with 39 major, minor and trace elements using hand-held NITON XRF analyzers. These assays were done in 2018 in Elko, Nevada by independent contractor Rangefront Geological using selected drill-sample pulps in loose powder form.

In 2019, the Pinion drilling samples were analyzed at Bureau Veritas. Gold was determined by ICP following an aqua regia digestion and by cyanide leach followed by an AA finish. Silver was analyzed by AA following a 4-acid digestion and by ICP following an aqua regia digestion. Thirty-seven major, minor and trace elements were analyzed by ICP following an aqua regia digestion. Carbon species, sulfur species and CO_2 were determined by LECO methods.

The 2020 drilling samples from Pinion were analyzed at Paragon Geochemical ("Paragon"). Paragon is an independent commercial analytical laboratory in Sparks, Nevada with ISO/IEC 17025 certification. Thirty-four major, minor and trace elements were analyzed by ICP following an aqua regia digestion. Some of the samples were analyzed by ICP following a 4-acid digestion. Silver was analyzed by AA and by ICP following a 4-acid digestion. Gold was determined using a 30 g fire-assay fusion with an ICP finish. Gold was also analyzed by cyanide leach of a 30 g aliquot with an AA finish.

In 2021, Pinion drilling samples were analyzed at AAL, Bureau Veritas and Paragon. The same methods of analysis used at each of these three laboratories in prior years were also used for the 2021 drilling samples. Gold Standard obtained XRF barium assays in-house using NITON and Olympus units, and through AAL and Paragon Laboratories.

11.4.2 Dark Star Deposit Area Drill Samples

Gold Standard's 2015 drilling samples from the Dark Star area were mostly analyzed by Bureau Veritas after preparation in the Bureau Veritas laboratory in Elko, Nevada. The samples were crushed in their entirety and riffle-split to obtain 8.0 oz subsample. These subsamples were pulverized to 200-mesh size. Gold was determined by 30 g fire-assay fusion with an AA finish in Bureau Veritas' laboratory in Sparks, Nevada. Composited pulps were analyzed in Bureau Veritas' laboratory in Vancouver, British Columbia, for gold, silver and 35 major, minor and trace elements by ICP-MS following aqua regia digestion of 0.5 g aliquots. Some of the 2015 pulps were re-analyzed by ALS in in North Vancouver, British Columbia, for gold by 30 g fire-assay fusion with an AA finish.

The 2016 and 2017 drilling samples from the Dark Star area were analyzed in part by Bureau Veritas and in part by ALS, with sample preparation in their respective laboratories in Elko, Nevada, using the same procedures that were used for the Pinion area samples as summarized in Section 11.4.1. The ALS assays were carried out in their Reno and North Vancouver laboratories where gold was determined by 30 g fire-assay fusion with an AA finish. Samples with ≥0.292 oz Au/ton were re-analyzed with a second 30 g aliquot by fire-assay fusion and gravimetric finish. Silver and 34 major, minor, and trace elements were assayed by ICP following aqua regia digestion of 0.5 g aliquots.

The Bureau Veritas assays of the 2016 and 2017 Dark Star drilling samples were performed in Bureau Veritas' laboratories in Sparks, Nevada, and Vancouver, British Columbia. Gold was determined by fire-assay fusion of 30 g aliquots with an AA finish and in some cases with a gravimetric finish. Some samples were analyzed for gold by cyanide leach and an AA finish, and some samples were analyzed for gold with a screen-fire assay procedure. Gold, silver, and 35 major, minor, and trace elements were assayed in the Vancouver laboratory by ICP-MS following aqua regia digestion of 0.5 g aliquots.

The 2018 and 2019 drilling samples from the Dark Star area were prepared in either Bureau Veritas' Elko or Sparks, Nevada, laboratories and analyzed in their Sparks and Vancouver laboratories. Gold and multi-element assays were carried out with the same methods and procedures used for the 2016-2017 samples. In addition, some samples were analyzed for carbon species, sulfur species and CO_2 by LECO methods.

Bureau Veritas was the principal laboratory for the analysis of the 2020 and 2021 Dark Star drilling samples. Silver was analyzed by AA following a 4-acid digestion, as well as by ICP following an aqua regia digestion. Gold was determined using a 30 g fire-assay fusion with an AA finish. Gold was also analyzed using a 30 g cyanide leach with an AA finish. Thirty-seven major, minor and trace elements, including gold and silver, were analyzed by ICP following an aqua regia digestion. Carbon species, sulfur species and CO_2 were determined with LECO methods.

ALS analyzed some of the 2020 Dark Star samples for gold using a 30 g fire-assay fusion with an AA finish, as well as a 30 g cyanide leach with an AA finish. Samples that assayed ≥0.292 oz Au/ton were re-analyzed with a second 30 g aliquot by fire-assay fusion and gravimetric finish.

AAL analyzed gold in some of the 2021 Dark Star drilling samples using a 30 g cyanide leach with an AA finish. Samples were also analyzed for gold using a 30 g fire-assay fusion followed by an ICP finish. Samples that assayed ≥0.292 oz Au/ton were re-analyzed with a second 30 g aliquot by fire-assay fusion and gravimetric finish.

11.4.3 Jasperoid Wash Area Drill Samples

The 2017 drilling samples from the Jasperoid Wash area were analyzed in part by Bureau Veritas and in part by ALS following preparation at their respective laboratories in Elko, Nevada. Gold and multi-element analyses were performed at their respective laboratories in Sparks, Nevada, Vancouver and North Vancouver, British Columbia, using the same methods and procedures used for the 2016-2018 Dark Star samples as summarized in Section 11.4.2.

All of the 2018 drill samples from Jasperoid Wash were prepared and analyzed by Bureau Veritas in Sparks, Nevada and Vancouver, British Columbia, using the same methods and procedures used for the 2016-2019 Dark Star samples as summarized in Section 11.4.2.

The 2019 drill samples from Jasperoid Wash were analyzed at Bureau Veritas. Thirty-seven major, minor and trace element, including gold and silver, were analyzed by ICP following an aqua regia digestion. Gold was also analyzed by cyanide leach. Carbon species, sulfur species and CO2 were determined with LECO methods. In 2020, some of the earlier Jasperoid Wash drilling samples were analyzed for silver using AA following a 4-acid digestion.

11.4.4 Dixie Area Drill Samples

Gold Standard's 2017 and 2018 drilling samples from the Dixie area were prepared by Bureau Veritas in Sparks, Nevada and Elko, Nevada. Analyses were conducted in the Bureau Veritas Sparks and Vancouver laboratories. Gold was determined by fire-assay fusion of 30 g aliquots with an AA finish. Some samples were analyzed for gold by cyanide leach and an AA finish. Gold, silver and 35 major, minor and trace elements were assayed in the Vancouver laboratory by ICP-MS following aqua regia digestion of 0.5 g aliquots. Composited pulps from the 2018 drilling were analyzed for carbon species, sulfur species and CO_2 by LECO methods in the Vancouver laboratory.

11.4.5 Ski Track Area Drill Samples

Most RC samples from Gold Standard's 2018 drilling at the Ski Track area were prepared by Bureau Veritas in Sparks, Nevada and Elko, Nevada. Analyses were conducted in the Bureau Veritas Sparks and Vancouver laboratories. Gold was determined by fire-assay fusion of 30 g aliquots with an AA finish. Some samples were analyzed for gold by cyanide leach and an AA finish. Gold, silver, and 35 major, minor and trace elements were assayed in the Vancouver laboratory by ICP-MS following aqua regia digestion of 0.5 g aliquots. Composited pulps from the 2018 drilling were analyzed for carbon species, sulfur species, and CO_2 by LECO methods in the Vancouver laboratory.

11.5 AUTHOR'S OPINION

The sample collection, security, transportation, preparation, and analytical procedures are judged by the authors to be acceptable and to have produced data suitable for use in the estimation of the mineral resources reported in Section 14, subject to those exclusions or modifications discussed in Section 14. The authors consider the procedures utilized by Gold Standard and the assay laboratories to be appropriate for use as described.

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12 DATA VERIFICATION

Data verification, as defined in NI 43-101, is the process of confirming that data have been generated with proper procedures, have been accurately transcribed from the original sources and are suitable to be used. Additional confirmation of the drill data's reliability is based on the authors' evaluations of the Dark Star, Pinion, Jasperoid Wash, and North Bullion area QA/QC procedures and results, as described below, and in general working with the data. No separate evaluations of QA/QC procedures and results were done on data from drilling outside the mineral resource areas.

Prior to MDA's involvement, as part of the data verification process, APEX visited the Railroad-Pinion property in May 2013, April 2014, and October 2014. Mr. Michael B. Dufresne, P.Geo. conducted several additional site visits from May 31 to June 4, 2015, August 30 to September 2, 2015, and most recently June 7 to 9, 2017. During all site visits, the project geology was reviewed, which included: a) a field tour of the deposit area; b) visual inspection of core holes; and c) discussion with Gold Standard personnel of the current geologic interpretations. Drill site and mineralization verification procedures were conducted, and core drilling and sampling procedures were appraised.

Mr. Dyer and Mr. Ristorcelli visited the Pinion and Dark Star deposit sites on November 18, 2016. This site visit included reviews of core, examination of drill-hole cross sections with the geologic model, and investigations of representative exposures in road cuts and outcrops. Mr. Ristorcelli also visited the Gold Standard office in Elko, Nevada on June 21, 2018. Mr. Lindholm and Mr. Mijal, Senior Geologists with MDA, visited the Dark Star and Jasperoid Wash sites, respectively, on September 18 and 19, 2018. Their work included review of core, checking collar locations, and visiting the site to inspect the geology. On July 14 through July 16, Mr. Lindholm visited the project office in Elko, as well as the North Bullion, Sweet Hollow, POD and Pinion deposit areas. Mr. Lindholm verified drill collar locations at the North Bullion, Sweet Hollow and POD deposits, and observed the drilling and sample handling methods and procedures being used at two core drills and one RC drill that were in operation at Pinion. The site visit also included reviews of drill core, examination of drill-hole cross sections and discussions of the geologic model with Gold Standard personnel.

12.1 DARK STAR AND PINION DATABASE AUDITS

12.1.1 Audit of Pinion and Dark Star Historical and Gold Standard 2014-2018 Drill-Hole Data

Beginning in March 2018, MDA conducted verification of Gold Standard's Dark Star and Pinion drilling databases. The databases consisted of Excel spreadsheets, exported by Gold Standard from Micromine's GeoBank secure database software, with collar, survey, assay, and geologic information. MDA imported the data into a SQL database (GeoSequel) and used the built-in data validation routines to evaluate. Collar, survey, assay, geologic and geotechnical data were imported into GeoSequel directly from the spreadsheets provided by Gold Standard for both Dark Star and Pinion (see Section 12.2 for Jasperoid Wash and Section 12.3 for North Bullion). The following validation tests were conducted:

- Collars: identify collars with missing depths, collars with missing coordinates, switched or duplicated coordinates, drill holes without assay intervals or intervals without assays, drill holes without collar survey information, drill holes without geology, and drill holes with illogical geotechnical information (core holes only);
- Surveys: identify survey depths greater than total depth, survey points missing azimuth or dip values, surveys where azimuth readings above or below 0° to 360°, surveys with positive or flat dip angles (< ~ -45°), or outside -90° to +90°; and
- Assays: identify illogical or incorrect 'from' and 'to' intervals; excessively large or small assay or geologic intervals, assay, geologic or geotechnical intervals that are greater than collar total depth, gaps and overlaps in assay, geologic or geotechnical intervals.

Errors found during these tests were iteratively corrected in the database by Gold Standard staff, or by MDA with input from Gold Standard.

The next step was to verify the assay data by comparison to the original assay certificates. Because Gold Standard provided electronic copies of certificates for their own drilling, and electronic copies of historical certificates for the pre-Gold Standard holes were incomplete, MDA split the assay validation into two parts. About 58.9% of Pinion drilling assays were backed by certificates, and 73.5% of the Dark Star assay data could be tracked back to scanned copies of physical certificates.

The digital data were verified against any physical data that Gold Standard possessed. Collar information and collar coordinate data were largely validated in their entirety, while the assay data was validated using a representative subset of the data. Collar data were found to be reasonably accurate.

Down-hole survey data from original sources were available for the Gold Standard core holes and some of the historical drill holes, and were loaded into GeoSequel for comparison. Eight core holes were evaluated for improbable rates of change of azimuth and dip in down-hole surveys; however, none could be shown to be incorrect and were left in the database.

The first portion of the assay verification was comparing the databases to a random sampling of 10% of the certificate-backed assays. For the Pinion database, thirty certificates with 3,120 sample intervals were randomly selected and checked against the database. The database entries largely compared well, with only three significant errors, all of which were in the silver values. For the Dark Star database, MDA randomly selected fourteen certificates with 2,391 sample intervals and compared these to the database. These database entries also compared well, with no significant errors. Insignificant discrepancies for both deposits were found, including below detection assays entered as half the detection limit that were rounded, inconsistent rounding of converted data (*i.e.,* ounces per ton to grams per tonne), and data in original reported units not maintained in the database.

The second portion of the assay verification involved a random selection of 10% of the drill holes for the two deposits and checking the database entries against all available information in the Gold Standard files. For the Pinion property, this involved 35 drill holes with 2,756 sample intervals. For the Dark Star property, 11 holes with 887 sample intervals were compared. No significant assay errors were found.

For both deposits, MDA found omitted assay values for Ag, As, and other geochemical analyses, and numerous inconsistencies with rounding. These were not restored or modified, but various other insignificant errors in the gold data were corrected.

In May of 2019, MDA received a database containing 47,550 silver values for the Pinion project. Using digital certificates supplied by Gold Standard, evaluation of 24,523 silver records (51.6%) produced an error rate of less than 0.01%. Of these, all were due to rounding, were insignificant, and were corrected in the database used for modeling. Of the remaining records, MDA randomly selected a group of certificates, most of which were supplied by Gold Standard as pdf files, to manually audit. Over five percent of the remaining records were audited with an error rate of 1.1%, of which only a small number were significant and corrected. Most of the discrepancies were due rounding or removal of the detection limit negative sign.

Additional data evaluation was accomplished during cross sectional modeling. Suspect data included samples with no gold detected within mineralized intervals, assay values where no sample was indicated, and potential down-hole contamination. Most of these sample assays were considered to be unreliable, and therefore were removed from use in estimation. MDA also found significant discrepancies between some TCX-series holes (drilled by Amoco) and more recent surrounding drill holes. As a result, all TCX holes were not used in domain modeling or estimation.

All the above issues were discussed with Gold Standard, who applied corrections in their respective databases. MDA noted that subsequent databases received from Gold Standard contained the modifications as discussed, and that a few additional minor corrections were made.

For non-analytical field data, Gold Standard has instituted protocols to ensure data integrity. For example, during surface geochemical sampling (rock grab and soil sampling), samplers are required to enter sample locations and descriptive information into computers daily and locations are checked to eliminate data input errors. For non-analytical drill hole information, Gold Standard employs a similar protocol of continuous data checking to ensure accurate recording into the project drilling database, which includes all geological and geotechnical information from both core and RC chip logging. The procedures employed are considered reasonable and adequate with respect to insuring data integrity.

12.1.2 Dark Star GPS Collar Checks

During the Dark Star site visit in September 2018, Gold Standard, with MDA present, took GPS measurements of seven drill collars on six drill pads in the field to spot-check coordinates in Gold Standard's collar tables (see Table 12-1). A Garmin - Rino 530 non-differential GPS was used to measure coordinates at the drill collars. The Garmin website indicates the unit is accurate to within 3 m to 5 m (9.8 ft to 16.4 ft). Only one easting exceeded the maximum range of accuracy of the GPS, and that was by less than three feet; all other readings were within acceptable limits.

Table 12-1: MDA Verification GPS Checks of Dark Star Drill Collars (NAD27 UTM 11N feet)

	MDA GPS Location			Surveyed Location			Difference (GPS - Survey)		
Drill Hole	East	North	Elev.	East	North	Elev.	East	North	Elev.
DR18-71	1,929,133.3	14,699,179.9	6,781.5	1,929,131.0	14,699,170.4	6,783.8	2.3	9.5	-2.3
DS17-37	1,929,336.7	14,698,474.5	6,722.4	1,929,342.9	14,698,482.4	6,720.5	-6.2	-7.9	2.0
DR18-68	1,929,179.2	14,697,628.1	6,610.9	1,929,178.9	14,697,621.5	6,602.3	0.3	6.6	8.5
DC18-15	1,928,867.5	14,696,840.7	6,797.9	1,928,872.1	14,696,838.4	6,801.8	-4.6	2.3	-3.9
DR18-58	1,928,418.1	14,696,414.2	6,817.6	1,928,437.1	14,696,403.0	6,815.3	-19.0	11.2	2.3
DR18-95	1,928,687.1	14,696,036.9	6,916.0	1,928,689.7	14,696,034.9	6,925.2	-2.6	2.0	-9.2
DR18-96	1,928,674.0	14,695,931.9	6,922.6	1,928,675.3	14,695,928.6	6,927.8	-1.3	3.3	-5.2

12.1.3 2019 Audit of Dark Star and Pinion Carbon, CO_2 and Sulfur Data

Gold Standard provided MDA with assay tables containing 7,081 records of analyses and calculated values for carbon and sulfur species from Dark Star in the chemical forms listed in Table 12-2. Most of the analyses were performed by Bureau Veritas in Vancouver, British Columbia. A smaller number were analyzed by AAL in Sparks, Nevada.

Table 12-2: Dark Star Carbon and Sulfur Records Checked and Analytical Procedures

Laboratory	No. of Records	C Total % Method	CO_2 % Method	C InOrganic % Method	C Organic % Method	S Total % Method	S Sulfide % Method
Bureau Veritas	7,062	TC003	TC006	calculated	calculated	TC003	TC009
AAL	19	ELTRA C	n/a	calculated	ELTRA C	ELTRA C	n/a

Note: n/a indicates "not applicable" as in not analyzed and not calculated; TC003 and TC006 are Bureau Veritas method codes for LECO analyses. ELTRA C is AAL method code for LECO-type analyses. On the Bureau Veritas certificates, the TC00x codes on the data listings and cover pages are not the same. The codes listed in the table above are from the cover pages.

The assay tables for Pinion contained 4,050 records of analyses and calculated values for carbon and sulfur species as summarized in Table 12-3. Most of the analyses were performed by Bureau Veritas in Vancouver, British Columbia. A smaller number were analyzed by AAL if Sparks, Nevada.

Table 12-3: Pinion Carbon and Sulfur Records Checked and Analytical Procedures

Laboratory	No. of Records	C Total % method	CO_2 % method	C InOrganic % method	C Organic % method	S Total % method	S Sulfide % method
Bureau Veritas	3,941	TC003	TC006	calculated	calculated	TC003	TC009
AAL	93	ELTRA C	n/a	calculated	ELTRA C	ELTRA C	ELTRA C
AAL	16	ELTRA C	n/a	calculated	ELTRA C	ELTRA C	ELTRA C

Note: n/a indicates "not applicable" as in not analyzed and not calculated; TC003, TC006 and TC009 are Bureau Veritas method codes for LECO analyses. ELTRA C is AAL method code for LECO-type analyses. On the Bureau Veritas certificates, the TC00x codes on the data listings and cover pages are not the same. The codes listed in the table above are from the cover pages.

MDA compared the measured values in the assay tables from Gold Standard to copies of the laboratory certificates. Gold Standard's calculated values were checked using equations as follows:

- When C Inorganic was not directly assayed
  - C Inorganic = CO_2 Percent / 3.666
    or
  - C Inorganic = C Total – C Organic
- C Organic = C Total – C Inorganic

MDA determined that all measured values from the assay tables matched those in the laboratory certificates, and all the calculations were performed correctly. The only errors found were 36 assay intervals from Dark Star hole DS18-07 for which the starting and/or ending depths had been entered incorrectly. MDA corrected these in consultation with Gold Standard.

12.1.4 Audit of Pinion 2019-2020 Drill-Hole Data

An audit of all 2019-2020 Pinion drilling data was completed by MDA staff in April of 2021. Since all data was available digitally in original certificate form, the audit process for the newer Gold Standard data was identical to the March 2018 Pinion audit. Gold Standard supplied collar coordinate survey data in the original APEX Survey files, and down hole survey data was supplied as both the original IDS Survey .csv and .pdf files. Only two assay labs were used in the 2019-20 drill programs, Bureau Veritas and Paragon Geochemical. All Bureau Veritas certificates were downloaded directly from the laboratory website, and all Paragon Geochemical certificates were supplied in both .pdf and .csv file formats by Gold Standard personnel.

Data from Gold Standard prior to 2019 was compared to MDA's previously audited database as an extra check to confirm that no changes had been made since the audit. Except for five historical holes included in the Gold Standard Pinion database that were previously in the Dark Star database (EMRR_9701 to EMRR_9704, and hole K99C_1), the holes in the Pinion database were the same. There were 76 holes with differences in collar coordinates in either the northing and/or easting, of which 16 also had discrepancies in elevation. Fourteen of these differences were minor (within 0.1 feet), however, the remainder were considerable, and were ultimately resolved in conjunction with Gold Standard. The PFS down-hole surveys in the database received from Gold Standard matched those in MDA's database. Similarly, the PFS assay data sent by Gold Standard is unchanged, although there are discrepancies in rounding that resulted from conversion from metric to Imperial units, as described below.

Depending on the operator and drill campaign, assay data was analyzed in g Au/t or oz Au/ton. Commonly, measured values in Gold Standard's Pinion and Dark Star databases had been converted to one unit, and converted back to the original unit. Discrepancies due to inconsistently applied conversion factors and rounding were consequently created in the database. MDA evaluated assay procedures in order to determine the original analytical units for respective data sets, and assays in the database were changed where required to honor the most original data. In summary, Gold Standard holes were initially assayed in g Au/t and were restored and converted to oz Au/ton (oz Au/ton = g Au/ton / 34.285714). Historical samples were originally assayed in oz Au/ton and were restored. Consistent conversion factors were applied when needed.

All new digital data was imported into a SQL database (GeoSequel) and compared to the database from Gold Standard through a series of comparison queries. New collar surveys from certificates matched exactly the coordinates in the Gold Standard collar file. The azimuths and dips of 19 of the new holes were switched, and the planned orientation data was used at the top of eight holes, producing radical deviations with down-hole survey measurements. Slight discrepancies were noted in nine down-hole survey records. All errors and discrepancies in collar and survey data were modified in agreement with Gold Standard. There were 38 errors noted in the gold data that apparently occurred during conversion from to oz Au/ton from g Au/t, which were corrected. Similarly, conversion errors were found in the silver assays and corrected. After all validations were completed, and necessary corrections applied, 105 new drill holes from the 2019-20 campaign were added to the MDA database.

12.2 JASPEROID WASH DATABASE AUDIT

The drilling database for Jasperoid Wash contains 10,147 assay intervals in 97 drill holes. Documentation was available for the for the 40 holes drilled by Gold Standard, although 14 of the holes did not have assay data. MDA compared the database against digital certificates supplied by Gold Standard, and found no significant issues or discrepancies.

Since no original assay certificates were available, data for the 43 historical holes was verified using secondary sources, which primarily consisted of written reports, database printouts and previous database compilations. MDA compared the older drill data in the database received from Gold Standard to two Westmont annual, a Cameco assay compilation, and an assay compilation in a digital text file (PHOLASAY.txt) of unknown origin which contained the JW-8910, JW-8911, and JW-9001 to JW-9014. Only one minor typographical error, as well as insignificant issues due to rounding, were found and corrected. The verification demonstrated the database properly reflects the secondary data sources; however, the historical drill-hole data cannot be fully verified without comparison to original certificates.

The drill-hole survey data for the 2017 and 2018 Gold Standard holes were verified against original down-hole survey instrument files obtained from Gold Standard. No discrepancies were found between the compiled data set and the source survey data.

12.3 NORTH BULLION DEPOSITS DATABASE AUDIT

12.3.1 APEX Data Verification

APEX produced the initial resource estimates for the North Bullion deposits, and performed extensive verification of Gold Standard's pre-2017 North Bullion-Bald Mountain database (Dufresne, 2017b). Historical drill-hole collar locations were verified on site during site visits, during site visits. APEX also verified down-hole survey data for Gold Standard's 128 holes completed between 2010 and 2017, but noted that no supporting documentation was available for historical drilling. Similarly, original lab certificates were available and used to verify assay data for 135 Gold Standard holes and 140 historical drill holes. The drill-hole database that presumably resulted from APEX's verification efforts, in addition to data for holes drilled since 2017, was provided by Gold Standard, and was verified by MDA in its entirety.

12.3.2 MDA Data Verification

MDA conducted verification of Gold Standard's North Bullion drilling database starting in June of 2020. The database received from Gold Standard consisted of Excel spreadsheets exported from Micomine's GeoBank secure database software, and contained collar, survey, assay and geologic information. Collar, survey, assays, geologic logging and geotechnical data were imported into a SQL database (GeoSequel) directly from the spreadsheets. Logic tests were conducted on the data as described for Pinion and Dark Star in Section 12.1.1. Errors found during these tests were iteratively corrected by MDA with in conjunction with Gold Standard.

The digital database was verified against any physical documentation that Gold Standard possessed. Collar coordinate data were largely validated in their entirety found to be accurate. Down-hole survey data from original sources were available for all Gold Standard core holes and 42 holes drilled by Kinross. In all, down-hole surveys for 176 holes were evaluated for abrupt and radical changes in azimuth and dip, during which only one survey record was determined to be improbable and was modified by MDA and Gold Standard.

Based on availability of original lab certificates, the assay data was verified in two groups. Since certificates were accessible for all Gold Standard drilling from 2010 to present, which represents 28% of drill holes and 57% of assay intervals, a full audit of the assay database was possible. Original certificates were downloaded directly from the analytical laboratories, and the comparison to Gold Standard's database revealed no errors or discrepancies.

Since about 43% of the assay intervals were obtained from historical drilling sources and were not generally available in digital form, a 20% randomized manual audit of these data was performed. Of the 368 historical drill holes with 33692 assay intervals, 6738 intervals in 78 holes were randomly selected for verification. Values in the database were checked against the paper copies of certificates for both gold and silver. The resulting error rate was well under 1%, and the minor issues detected were corrected by MDA and Gold Standard. The issues found included transcriptional errors, and some missing data that was added into the database. Analytical procedures and their respective detection limits by operator and drill campaigns were evaluated in order to validate and properly apply values below detection limits. In general, positive values of half detection limit for the gold and silver were assigned.

Collar coordinates for historical drill holes were checked in a general sense against topography and identifiable drill sites on images. Paper copies of down-hole survey data were manually compared with the database. Only minor discrepancies in collar and down-hole survey data were found, and were corrected in conjunction with Gold Standard. Geologic logging was verified during the modeling process on section. Conflicts were noted, particularly due to inconsistent logging of formations, but were interpreted with the help of Gold Standard staff to produce a reasonably consistent geologic model.

Depending on the operator and drill campaign, assay data was analyzed in g Au/t or oz Au/ton. Commonly, measured values in Gold Standard's North Bullion database had been converted to one unit, and converted back to the original unit. Discrepancies due to inconsistently applied conversion factors and rounding were consequently created in the database. MDA evaluated assay procedures in order to determine the original analytical units for respective data sets, and assays in the database were changed where required to honor the most original data. In summary, Gold Standard holes were initially assayed in g Au/t and were restored and converted to oz Au/ton (oz Au/ton = g Au/ton / 34.285714). Historical samples were originally assayed in oz Au/ton and were restored. Consistent conversion factors were applied when needed.

12.3.3 North Bullion GPS Collar Checks

During the North Bullion site visit in July 2020, Gold Standard, with MDA present, took GPS measurements on five drill-hole collars (first five rows in Table 12-4) and five drill pads with indirect evidence of drill holes in the field to spot-check coordinates in Gold Standard's collar tables. A Garmin - Rino 530 non-differential GPS was used to measure coordinates at the drill collars. The Garmin website indicates the unit is accurate to within 3 m to 5 m (9.8 ft to 16.4 ft). Seven northings and/or eastings exceeded the maximum range of accuracy of the GPS. However, the actual drill-hole location was not apparent on the pads for all but two of the northings, and these exceeded the maximum accuracy by six feet or less. All other readings were within acceptable limits.

Table 12-4: MDA Verification GPS Checks of North Bullion Drill Collars (NAD27 UTM 11N feet)

		MDA GPS Location			Gold Standard Collar Location			Difference (GPS vs Survey)		
Area	**Indicated or Nearest Drill Hole**	**Easting**	**Northing**	**Elev.**	**Easting**	**Northing**	**Elev.**	**Easting**	**Northing**	**Elev.**
North Bullion	RR13-15	1,918,539.5	14,726,971.9	6,584.6	1,918,552.6	14,726,985.0	6,570.0	13.1	13.1	-14.6
North Bullion	RR17-03	1,919,038.2	14,727,513.2	6,519.0	1,919,053.8	14,727,495.2	6,462.4	15.6	-18.0	-56.6
North Bullion	RR13-02	1,919,490.9	14,726,693.0	6,538.7	1,919,494.2	14,726,715.0	6,531.1	3.3	22.0	-7.6
North Bullion	RR13-04				1,919,490.6	14,726,681.2	6,533.9	-0.3	-11.8	-4.8
Sweet Hollow	RRB17-01	1,917,479.8	14,721,479.7	6,879.9	1,917,493.8	14,721,467.3	6,871.8	14.0	-12.4	-8.1
Sweet Hollow	RR12-21	1,917,988.3	14,722,690.4	6,870.1	1,918,033.4	14,722,633.2	6,880.8	45.1	-57.2	10.7
Sweet Hollow	RR10-01	1,917,588.0	14,721,939.1	6,991.5	1,917,568.3	14,721,991.6	6,996.0	-19.7	52.5	4.6
POD	NR-030	1,916,347.9	14,722,509.9	7,244.1	1,916,336.4	14,722,525.1	7,233.0	-11.5	15.2	-11.1
POD	BDH-14	1,916,866.2	14,722,290.1	7,076.8	1,916,854.2	14,722,281.5	7,087.0	-12.0	-8.6	10.2
POD	NR-032	1,916,964.7	14,722,342.6	7,086.6	1,916,924.4	14,722,329.6	7,086.0	-40.2	-13.0	-0.6

12.4 GOLD STANDARD QA/QC PROCEDURES

No QA/QC data was available or evaluated for historical drilling programs in the South Railroad portion of the property. The analytical portion of the QA/QC program employed by Gold Standard aimed to provide a means by which the accuracy and precision of the assaying that was performed on the drilling samples (core and RC chip) can be assessed to ensure the highest possible data quality. In order to achieve this goal, Gold Standard personnel inserted samples of certified reference materials ("CRM", also known as standards), which are commercially available pulverized materials certified to contain a known concentration of an element (or elements) - in this case gold. The Gold Standard protocol was to use several CRMs of varying gold concentration during a drilling campaign and randomly insert one CRM sample pulp into the stream of actual drill samples at a rate of approximately one in 10. These were alternately inserted with a blank material with gold below detectable limits. The analytical QA/QC measures employed by Gold Standard are sufficient to properly monitor analytical accuracy and precision, and possible in-lab contamination.

CRMs used in mineral exploration are usually powders comprised of rock-forming minerals, including the metal of interest in known concentrations. They are analyzed along with batches of samples, and the resulting analyses are evaluated using criteria for passing or failing. CRMs are usually obtained from commercial suppliers. The suppliers provide specifications including the average of many analyses by multiple labs, and the standard deviation of the analyses. In the years 2014 through 2020 Gold Standard has used CRMs obtained from Minerals Exploration & Environmental Geochemistry, Inc. ("MEG") of Reno, Nevada.

A typical criterion for accepting the analyses of CRMs in the mineral industry is that they should fall within a range determined by the average or expected value ± three standard deviations. Gold Standard uses a stricter criterion, the expected value ± two standard deviations. In the evaluation described here, MDA has used the expected value ± three standard deviations.

Blanks are samples known or thought to contain little or no gold. They are inserted into the sample stream and the results are monitored to be sure that the lab does not report significant gold values when little or no gold should be present (*i.e.,* contamination). Coarse blanks generally test for contamination during sample preparation, where it predominantly occurs, whereas pulp blanks test for contamination during the analytical phase, which is much less common. The type of blank material is generally not known for historical data.

12.5 DARK STAR DRILL PROGRAM QA/QC

MDA has QA/QC data for the years 1997 and 2015 through 2019, and a very small amount of data for 1991. The types of QA/QC data vary from year to year, but in general there is a substantial suite of QA/QC data available to support the assays used in the Dark Star mineral resource estimate. Table 12-5 summarizes the quantities of each type of data by year.

Table 12-5: Summary Counts of Dark Star QA/QC Analyses

QA/QC Type	1991	1997	2015	2016	2017	2018	2019
Standard							
Number in Use		14	6	5*	5	5	3
Number of Analyses		285	150	708*	310	594	201
Number of Failures		2	1	2	3	3	0
Field Duplicate		56**			322	714	301
Coarse (Preparation) Duplicate		105	58	185			
Pulp Duplicate or Replicate		248	59	198			
External Check	133		443	1,376	175		
Pulp Blank		300	148	1107	170	364	153
Coarse Blank				205	111	158	10

*Notes: * A single analysis of a sixth standard is not included in the counts for 2016.*
*** A description of the 1997 duplicates is not available to MDA, so it is only an assumption that they are field duplicates.*

The QA/QC data summarized in Table 12-5 are comprised of some QA/QC samples that were part of the project operators' QA/QC programs, and some that were part of the internal QA/QC protocols of the laboratories that were used.

The QA/QC data available to MDA, including "historical" data inherited from the former project operators of 1997, are adequate to support the use of the Dark Star assay database in a mineral resource estimate. Current QA/QC protocols are adequate to support on-going exploration. MDA has not seen any coarse duplicate data for 2017, 2018, and 2019. Data for coarse duplicates may be available from the laboratories for those years, and if so, MDA suggests that they be acquired and compiled by Gold Standard. Coarse duplicates would be a useful addition to future QA/QC protocols.

During the 2018 and 2019 drilling, Gold Standard has submitted only pulp blanks with samples from RC drilling and only coarse marble blanks with samples of drill core. It would be ideal to submit both types of blanks with both types of samples. If only one type of blank is used, coarse blanks are the best choice.

The following sections contain brief summaries of the QA/QC results by year(s).

12.5.1 Dark Star Drill Program QA/QC 1991

Very little QA/QC data are available for any holes drilled prior to 1997. However, for 1991 there is a comparison between assays of composited intervals by AAL, which was apparently the original laboratory used, MBA Lab and Actlabs, each using a different analytical method. The composites were made from material drawn from 10 of the 63 holes known to have been drilled that year. AAL and MBA used variations of the atomic absorption analytical method, and their results compare well. Actlabs used the instrumental neutron activation method, a very different analytical method, and obtained results biased significantly high relative to the other two labs (Figure 12-1 and Figure 12-2). Thus, for a small subset of the 1991 drill holes there is some validation of the assay results, based on the AAL vs. MBA comparison. The analyses in the assay table used for estimation are those of AAL.

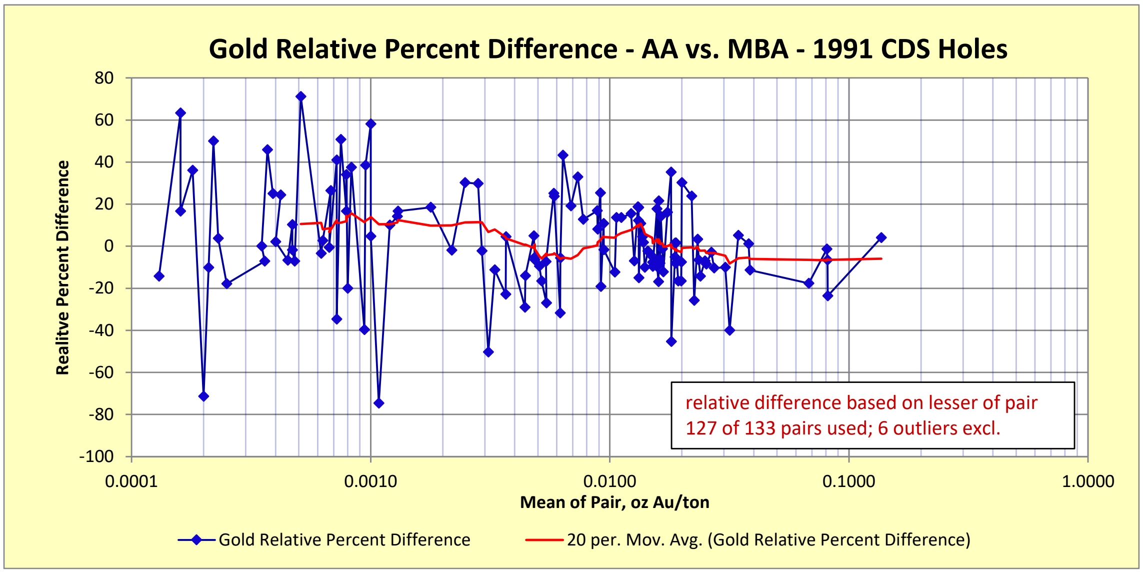


Figure 12-1: Dark Star Assay Comparison - AAL vs. MBA - 1991 CDS Holes

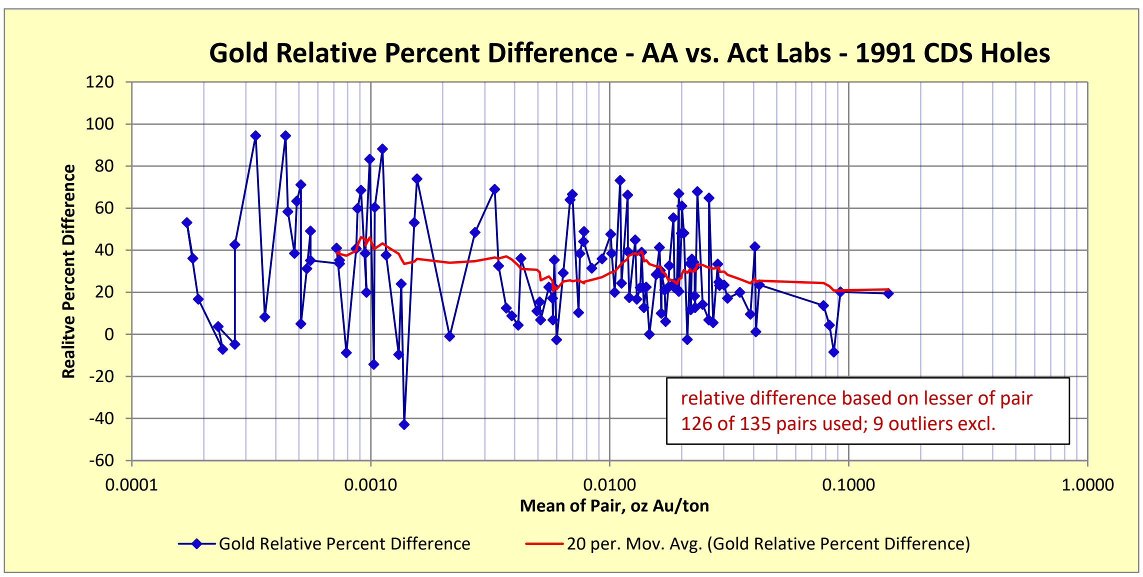


Figure 12-2: Dark Star Assay Comparison - AAL vs Actlabs - 1991 CDS Holes

12.5.2 Dark Star Drill Program QA/QC 1997

12.5.2.1 Standards

In total, 300 CRMs were analyzed with drill samples in 1997, although much of the data came from the laboratory's internal QA/QC. Only two failures were noted, and they are not from holes that are included in the Dark Star mineral resource estimate. Results for CRM analyses are summarized in Table 12-6, and the two failed analyses are detailed in Table 12-7.

Table 12-6: Summary of Dark Star Results Obtained for Certified Reference Materials, 1997

Standard ID	Grades in oz Au/ton				Count	Dates Used		Failure Counts		Bias pct	Comment
	Target	Average	Maximum	Minimum		First	Last	High	Low		
C1	n/a	0.0563	0.0611	0.0486	18	29-Aug-97	13-Nov-97	0	0	n/a	target value not known
C2	n/a	0.0449	0.0534	0.0344	29	29-Aug-97	13-Nov-97	0	0	n/a	target value not known
C3	n/a	0.0223	0.0265	0.0193	13	29-Aug-97	07-Nov-97	0	0	n/a	target value not known; too few samples to chart
C4	n/a	0.0209	0.0224	0.0193	2	16-Sep-97	14-Nov-97	0	0	n/a	target value not known
Gannet_192	0.0056	0.0055	0.0076	0.0048	49	29-Aug-97	13-Nov-97	1	0	-2.08	target value known, spec. limits not known
Gannet_394	0.0115	0.0114	0.0127	0.0104	31	29-Aug-97	07-Nov-97	0	0	-1.27	target value known, spec. limits not known
Gannet_415	0.0121	0.0133	0.0138	0.0127	3	14-Nov-97	13-Nov-97	0	0	9.88	target value known, spec. limits not known; too few samples to chart
Gannet_1585	0.0462	0.0454	0.0498	0.0398	48	29-Aug-97	13-Nov-97	0	0	-1.70	target value known, spec. limits not known
Gannet_1050	0.0306	0.0303	0.0346	0.0275	48	29-Aug-97	13-Nov-97	1	0	-1.14	target value known, spec. limits not known
Gannet_2450	0.0715	0.0701	0.0756	0.0660	45	29-Aug-97	13-Nov-97	0	0	-1.24	target value known, spec. limits not known
Gannet_9900	0.2887	0.2812	0.3001	0.2642	8	3-Oct-97	14-Nov-97	0	0	-1.84	target value known, spec. limits not known
Gannet_13800	0.4025	0.4099	0.4197	0.4002	2	26-Oct-97	9-Nov-97	0	0	1.85	target value known, spec. limits not known; too few samples to chart
BCC_Gold_STD_90-1	0.1843	0.1952	0.2135	0.1654	3	25-Sep-97	21-Oct-97	0	0	5.9	target value known, spec. limits not known; too few samples to chart
FA_Synthetic	n/a	0.0429	0.0429	0.0429	1	10-Oct-97	10-Oct-97	0	0	n/a	target value not known; too few samples to chart
Count or Sum	14				300			2	0		
Percent					100			0.7	0		

Table 12-7: List of Dark Star Failed Certified Reference Materials, 1997

		Values in oz Au/ton				
Standard ID	**Drill Hole ID**	**Target for Std**	**Fail Type High/Low**	**Fail Limit**	**Failed Value**	**Comment**
Gannet_192	EMRR-9714	0.0056	High	0.0076	0.0076	This drill hole is not in MDA's data set.
Gannet_1050	EMRR-9713	0.0306	High	0.0338	0.0346	This drill hole is not in MDA's data set.

Available records do not include specifications for the CRMs used by Mirandor. The expected values for the ten CRMs used by Intertek are known, but the expected standard deviations are not. MDA used standard deviations derived from the gold assays set to evaluate the data.

12.5.2.2 Field Duplicates

The 1997 assay certificates available to MDA include results for 56 samples with a suffix "D." It is assumed that these are field duplicates, but specific information is lacking. Based on relative differences, at grades below about 0.001 oz Au/ton, the "D" duplicates are on average biased 26% high relative to the presumed original samples. At higher grades, the high bias of the duplicates averages only about 3.8%, within the range of biases that MDA typically finds in such data sets.

12.5.2.3 Preparation Duplicates

The 1997 assay certificates contain results for 105 samples described as "Prep Duplicate". MDA interprets that these samples are preparation or coarse crush duplicates. MDA's evaluation of these samples revealed no significant issues.

12.5.2.4 Pulp Duplicates

The 1997 assay certificates contain results for 58 pulp duplicates analyzed using a gravimetric finish and 190 pulp duplicates analyzed using an atomic absorption finish. MDA's evaluation of these assays showed the results to be acceptable.

12.5.2.5 Comment on Grade Ranges

Two subsets of gold grade ranges were recognized and evaluated for each of the "D" duplicates, preparation duplicates and pulp duplicates that were analyzed using an AA finish in 1997. The subsets were selected based on visual inspection of relative difference graphs. Notably, the division between lower- and higher-grade subsets are in the range 0.0010 to 0.0012 oz Au/ton. It appears that the relative precision of the analytical method was substantially better at grades higher than approximately 0.0012 oz Au/ton than at lower grades. This result is generally expected, and any likely mining cutoff would be at higher grades where the analyses are more precise.

12.5.2.6 Mirandor "B" Blanks

In 1997, Mirandor inserted blanks into the sample stream at intervals of approximately 250 ft, for 62 insertions. MDA does not know the nature of this blank material. The results indicate there are no issues with respect to contamination, although the type of blank material is not known.

12.5.2.7 Intertek Analytical Blanks

The Intertek assay certificates from 1997 contain results for 238 analyses of material that Intertek labelled "Analytical Blank." MDA reviewed these assays and found no high values that would indicate contamination.

12.5.3 Dark Star Drill Program QA/QC 2015

12.5.3.1 Dark Star CRMs

Gold Standard used Bureau Veritas as its primary laboratory in 2015. In total, 150 CRMs were analyzed with drill samples sent to Bureau Veritas, with only one failure recorded. The single failure is not material to the mineral resource estimate. Results for CRM analyses are summarized in Table 12-8, and the failed analysis is detailed in Table 12-9.

Table 12-8: Summary of Dark Star Results Obtained for Certified Reference Materials, 2015

Standard ID	Grades in oz Au/ton				Count	Dates Used		Failure Counts		Bias pct
	Target	Average	Maximum	Minimum		First	Last	High	Low	
MEG-Au.10.02	0.0010	0.0010	0.0016	0.0007	31	Jun-15	Nov-15	1	0	-2.86
MEG-Au.10.04	0.0023	0.0023	0.0028	0.0018	24	Jun-15	Nov-15	0	0	0
MEG-Au.11.29	0.1076	0.1080	0.1215	0.1014	16	Jun-15	Nov-15	0	0	0.35
MEG-Au.13.02	0.0218	0.0220	0.0237	0.0203	31	Jun-15	Nov-15	0	0	0.94
MEG-S107007X	0.0445	0.0455	0.0486	0.0430	27	Jun-15	Nov-15	0	0	2.23
MEG-Au.11.17	0.0785	0.0794	0.0885	0.0732	21	Jun-15	Oct-15	0	0	1.11
Count or Sum	6				150			1	0	
Percent					100			0.67	0	

Table 12-9: List of Dark Star Failed Certified Reference Materials, 2015

		Values in oz Au/ton				
Standard ID	Drill Hole ID	Target for Std	Fail Type High/Low	Fail Limit	Failed Value	Comment
MEG-Au.10.02	EMRR-9714	0.0010	High	0.0014	0.0016	

In 2017, "A comprehensive assay check (umpire) program was completed by ALS on original sample pulps from the Gold Standard's 2015 and 2016 drilling at the Dark Star deposit which had reported values at or above the 0.0041 oz Au/ton cut-off grad". Gold Standard elected to use the assays from ALS for the 2015 and 2016 samples. Consequently, most of the assays in MDA's database for the 2015 drill holes are the original Bureau Veritas assays, however, the majority of the assays at or above 0.0041 oz Au/ton are those from ALS. There are 376 such assays, out of a total of 3,426 from the 2015 drill holes. MDA's review of standards for 2015 applies only to the Bureau Veritas assays. MDA has no QA/QC data for the 2015 assays from ALS, so there is no QA/QC data applying to most of the mineral resource-grade samples from 2015.

12.5.3.2 Bureau Veritas (Inspectorate) Duplicates

One of two Excel files provided to MDA with QA/QC data for 2015 contains a compilation of analytical results for Bureau Veritas' internal-preparation and pulp duplicates, which are from holes DS15-06 through DS15-12. There is no other duplicate data available for other holes drilled in 2015. MDA evaluated the results for these duplicates and found the inherent variability in the assays to be within expected limits. However, there was a negative bias in pulp duplicates with respect to the original analyses. The average difference of pulp duplicates at grades exceeding 0.0012 oz Au/ton relative to the originals is lower by 5.5%.

12.5.3.3 ALS vs. Bureau Veritas Checks

In 2017, Gold Standard obtained re-analyses of pulps from the 2015 samples at ALS, for comparison with the original Bureau Veritas assays. MDA evaluated these as check assays, as shown in Figure 12-3. In all, there are 443 sample pairs. ALS' analyses are biased higher on average by about 4.7% relative to Bureau Veritas.

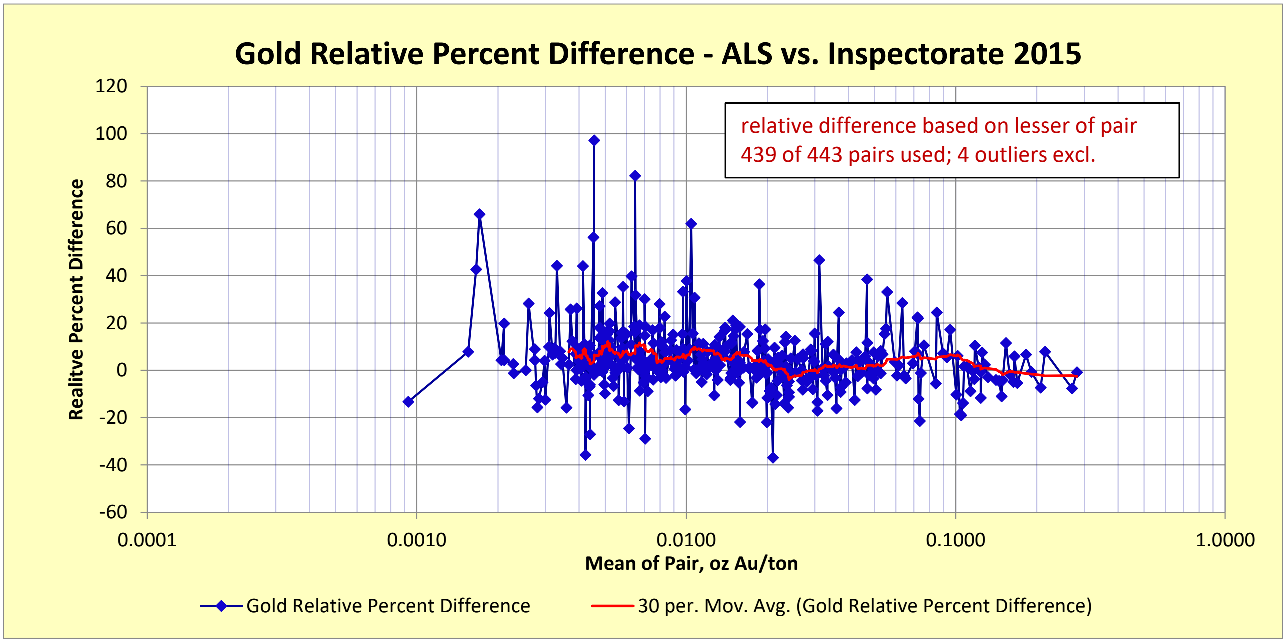


Figure 12-3: Dark Star Check Assays – ALS Assay vs. Bureau Veritas (Inspectorate), 2015

12.5.3.4 Blanks

In 2015, Gold Standard used pulp blanks obtained from a vendor of standard reference materials. No issues with respect to contamination were indicated by the 148 analyses of the blank material.

12.5.3.5 Assay Substitution

The QA/QC data available for 2015 support the original assays for that year performed by Bureau Veritas, although there were no QA/QC data associated with the ALS assays. The ALS assays compare reasonably well to the Bureau Veritas check assays, albeit with a high bias of 4%. Check assays by ALS were substituted for some of the original Bureau Veritas assays.

12.5.4 Dark Star Drill Program QA/QC 2016

12.5.4.1 CRMs

In total, 709 CRMs were analyzed with drill samples in 2016. Two failures occurred, but are not material with respect to the mineral resource estimate. Results for CRM analyses are summarized in Table 12-10, and the two failed analyses are given in Table 12-11.

Table 12-10: Summary of Dark Star Results Obtained for Certified Reference Materials, 2016

Laboratory	Standard ID	Grades in oz Au/ton				Count	Dates Used		Failure Counts		Bias pct
		Target	Average	Maximum	Minimum		First	Last	High	Low	
Inspectorate	MEG-Au.10.02	0.0010	0.0010	0.0012	0.0008	156			0	0	0
ALS	MEG-Au.10.02	0.0010	0.0010	0.0012	0.0009	11			0	0	2.86
Inspectorate	MEG-Au.10.04	0.0023	0.0023	0.0027	0.0017	142			0	2	0
ALS	MEG-Au.10.04	0.0023	0.0024	0.0024	0.0023	8			0	0	5.13
Inspectorate	MEG-Au.13.02	0.0218	0.0218	0.0234	0.0204	141			0	0	0.40
ALS	MEG-Au.13.02	0.0218	0.0221	0.0224	0.0216	6			0	0	1.74
Inspectorate	MEG-S107007X	0.0445	0.0454	0.0493	0.0402	114			0	0	2.03
ALS	MEG-S107007X	0.0445	0.0438	0.0452	0.0430	7			0	0	-1.51
Inspectorate	MEG-Au.11.17	0.0785	0.0809	0.0880	0.0742	110			0	0	2.97
ALS	MEG-Au.11.17	0.0785	0.0824	0.0855	0.0790	13			0	0	4.86
Inspectorate	MEG-Au.11.29	0.1076	0.1206	0.1206	0.1206	1			0	0	12.09
ALS	MEG-Au.11.29	0.1076	n/a	n/a	n/a	0			0	0	n/a
Inspectorate						664					
ALS						45					
Count or Sum	6					709			0	2	
Percent						100			0	0.028	

Table 12-11: List of Dark Star Failed Certified Reference Materials, 2016

			Values in oz Au/ton			
Standard ID	Laboratory	Drill Hole ID	Target for Std	Fail Type High/Low	Fail Limit	Failed Value
MEG-Au.10.04	Inspectorate	DS16-08 651A	0.0023	low	0.0017	0.0017
MEG-Au.10.04	Inspectorate	DS16-38 1650A	0.0023	low	0.0017	0.0017

In addition to the analyses of CRMs by Bureau Veritas (Inspectorate), a small number of CRM analyses were also done by ALS in 2016. It is noteworthy that there was an overall high bias in the ALS data relative to the expected values for four of five CRMs, whereas the magnitude of bias associated with Bureau Veritas assays was considerably smaller. Bureau Veritas' assays were, on average, more accurate with respect to the expected values for the CRMs. Also, in 2016 some ALS check assays have been substituted for the original Bureau Veritas assays, but no CRMs were submitted with these samples.

12.5.4.2 Bureau Veritas Duplicates

MDA was provided with a compilation of Bureau Veritas' internal preparation duplicate and replicate data, comprised of 185 preparation duplicate pairs and 198 pulp duplicate or replicate pairs. MDA's evaluation of these revealed no significant issues.

12.5.4.3 ALS vs. Bureau Veritas Checks on Pulps

In 2017, Gold Standard obtained re-analyses of the 2016 samples at ALS, for comparison with the original Bureau Veritas assays. MDA evaluated these as check assays, as shown in Figure 12-4. There are 1,376 sample pairs. ALS' analyses are biased on average about 3.8% high relative to Bureau Veritas.

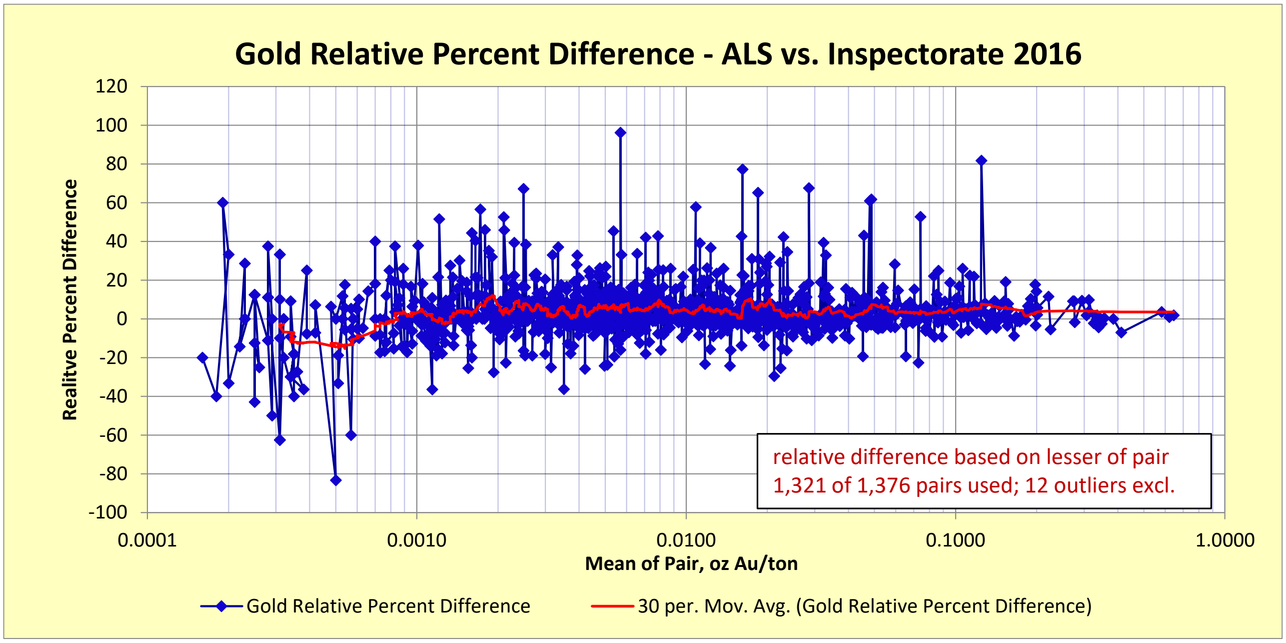


Figure 12-4: Dark Star Check Assays - ALS Assay vs. Bureau Veritas (Inspectorate) 2016

12.5.4.4 Gold Standard Pulp Blanks

In 2016, Gold Standard used a commercial pulp blank obtained from a vendor of CRMs, obtaining 572 analyses. No issues with respect to contamination were revealed by these analyses.

12.5.4.5 Bureau Veritas Pulp Blanks

The data package for 2016 contains 535 analyses of a pulp blank used by Bureau Veritas as part of their internal QA/QC program. MDA evaluated these and found no values that would suggest contamination issues.

12.5.4.6 Bureau Veritas Coarse Blanks

Gold Standard compiled results from 205 coarse blanks analyzed by Bureau Veritas as part of their internal QA/QC protocol. The location within the analytical sequence of the blanks is not known, so the data are less useful for testing for contamination. Despite a lack of sequential context, the analyses revealed no contamination issues.

12.5.4.7 Assay Substitution

The QA/QC data available for 2016 support the original assays for that year performed by Bureau Veritas, although there were no QA/QC data associated with the ALS assays. The ALS assays compare reasonably well to the Bureau Veritas check assays, albeit with a high bias of about 4%. Check assays by ALS were substituted for some of the original Bureau Veritas assays.

12.5.5 Dark Star Drill Program QA/QC 2017

12.5.5.1 CRMs

Of 310 CRMs analyzed in 2017, 180 were done at ALS and the remaining 130 were done at Bureau Veritas. Both ALS and Bureau Veritas analyses of the lowest-grade CRM, which has an expected value of 0.0023 oz Au/ton, were biased high by more than 6%, and three of ALS's analyses were high-side failures. Because the expected value and the highest grade of the failures are below a potential mining cutoff grade, the failures and the high bias associated with the lowest grade standard does not adversely affect confidence in the mineral resource estimate. Results for CRM analyses are summarized in Table 12-12, and the three failed analyses are detailed in Table 12-13.

Table 12-12: Summary of Dark Star Results Obtained for Certified Reference Materials, 2017

Laboratory	Standard ID	Grades in oz Au/ton				Count	Dates Used		Failure Counts		Bias pct
		Target	Average	Maximum	Minimum		First	Last	High	Low	
ALS	MEG-Au.10.04	0.0023	0.0024	0.0029	0.0021	135	16-Jul-17	27-Oct-17	3	0	6.41
Inspectorate	MEG-Au.10.04	0.0023	0.0024	0.0028	0.0021	64	8-Aug-17	2-Nov-17	0	0	7.69
ALS	MEG-Au.13.02	0.0218	0.0219	0.0223	0.0216	8	2-Aug-17	10-Jan-18	0	0	0.67
Inspectorate	MEG-Au.13.02	0.0218	0.0218	0.0224	0.0211	6	12-Jan-18	27-Feb-18	0	0	0.4
ALS	MEG-Au.12.11	0.0427	0.0443	0.0446	0.0436	3	30-Jul-17	30-Jul-17	0	0	3.62
Inspectorate	MEG-Au.12.11	0.0427	0.0428	0.0450	0.0393	11	19-Jan-18	27-Feb-18	0	0	0.27
ALS	MEG-Au.12.21	0.0042	0.0040	0.0043	0.0037	34	30-Dec-17	15-Jan-18	0	0	-3.5
Inspectorate	MEG-Au.12.21	0.0042	0.0041	0.0045	0.0035	44	27-Nov-17	27-Feb-18	0	0	-2.8
Inspectorate	MEG-Au.11.19	0.0035	0.0035	0.0036	0.0033	5	27-Feb-18	27-Feb-18	0	0	0
Totals or Averages											
ALS	4					180			3	0	1.80
Inspectorate	5					130			0	0	1.11
All	9					310			3	0	
Percent						100			0.97	0	

Table 12-13: List of Dark Star Failed Certified Reference Materials, 2017

Standard ID	Laboratory	Sample ID	Values in oz Au/ton				Comment
			Target for Std	Fail Type High/Low	Fail Limit	Failed Value	
MEG-Au.10.04	ALS	DS17-15 2045-2050-A2	0.0023	high	0.0028	0.0029	no follow-up
MEG-Au.10.04	ALS	DS17-15 1045-1050-A2	0.0023	high	0.0028	0.0028	no follow-up
MEG-Au.10.04	ALS	DS17-15 1245-1250-A2	0.0023	high	0.0028	0.0029	no follow-up

For three of four CRMs that were used, Bureau Veritas' assays are more precise on average to the expected values than ALS'. The opposite was the case for the 2016 analyses of CRMs, when ALS CRM assays were biased low compared to Bureau Veritas.

12.5.5.2 Gold Standard Duplicates

Evaluation of the charts of 322 field duplicates analyzed in the 2017 data set reveal no significant issues.

12.5.5.3 External Checks of 2017 Assays in 2018

In April and August 2018, Gold Standard submitted select pulps from three holes drilled in 2017 to outside labs as check assays. Pulps from one hole originally assayed by ALS was sent to Bureau Veritas (Inspectorate), and pulps from the other two holes originally assayed by Bureau Veritas were sent to ALS. In total, 175 check assay pairs were evaluated.

At grades up to about 0.0875 oz Au/ton, both sets of lab results compare well with little bias. Between about 0.0875 oz Au/ton and 0.2917 oz Au/ton, which is near the upper limit for ALS' Au-AA23 analytical method, ALS is biased low by about 6.8% relative to Bureau Veritas based on relative differences of 14 sample pairs. Conversely, at grades above 0.2917 oz Au/ton, for which both labs used a gravimetric finish, ALS is biased on average about 4.6% high relative to Bureau Veritas, based on relative differences of five sample pairs. Although the demonstrated biases were low, no conclusive determinations can be made due to the small number of sample pairs.

12.5.5.4 Gold Standard Pulp Blanks

In 2017, Gold Standard inserted 170 pulp blanks, obtained from a supplier of CRMs, into the sample stream. The analyses of these revealed no significant issues with respect to contamination.

12.5.5.5 Gold Standard Coarse Blanks

Gold Standard inserted 111 samples of a coarse marble blank into the sample stream in 2017. In blanks from three holes analyzed in October and November 2017, there is a significant correlation between analyses of blanks that reported detectable gold and high gold values in preceding samples. Some contamination during sample preparation is suggested, however, the highest gold assay of a marble blank is 0.0006 oz Au/ton, which is well below potential mining cutoff grades. The occurrence of low levels of detectable gold in coarse blanks following relatively high-grade samples is not unusual and does not necessarily signal a significant issue. However, continued monitoring of coarse blank assays is warranted, and should be brought to the attention of the assaying lab if higher blank grades are received.

12.5.6 Dark Star Drill Program QA/QC 2018

12.5.6.1 CRMs

Five certified CRMs were used, and 594 CRM samples were analyzed in 2018. Three total failures occurred, two high and one low. The below detection value of the latter suggests an incorrectly-labeled pulp blank rather than a failure, although this cannot be determined conclusively. Results for CRM analyses are summarized in Table 12-14, and the three failed analyses are detailed in Table 12-15.

Table 12-14: Summary of Dark Star Results Obtained for Certified Reference Materials, 2018

Laboratory	Standard ID	Grades in oz Au/ton				Count	Dates Used		Failure Counts		Bias pct
		Target	Average	Maximum	Minimum		First	Last	High	Low	
Inspectorate	MEG-Au.11.19	0.0035	0.0034	0.0041	0.0027	76	14-Mar-18	16-Apr-18	0	0	-4.17
AAL	MEG-Au.11.19	0.0035	0.0029	0.0031	0.0001	16	24-Apr-18	30-Apr-18	0	1	-17.5
Inspectorate	MEG-Au.17.06	0.0029	0.0030	0.0036	0.0024	376	26-Jun-18	14-Feb-19	1	0	4.08
Inspectorate	MEG-Au.13.02	0.0218	0.0219	0.0230	0.0212	10	17-Aug-18	06-Sep-18	0	0	0.54
Inspectorate	MEG-Au.12.11	0.0427	0.0433	0.0465	0.0396	66	17-Aug-18	14-Feb-19	0	0	1.43
Inspectorate	MEG-Au.17.07	0.0055	0.0059	0.0066	0.0054	50	06-Sep-18	14-Feb-19	1	0	6.91
Totals or Averages											
Inspectorate	5					578			2	0	0.47
AAL	1					16			0	1	-17.5

All	6					594			2	1	
Percent						100			0.34	0.17	

Table 12-15: List of Dark Star Failed Certified Reference Materials, 2018

			Values in oz Au/ton				
Standard ID	**Lab**	**Sample ID**	**Target for Std**	**Fail Type**	**Fail Limit**	**Failed Value**	**Comment**
MEG-Au.11.19	AAL	DR18-25 545-550 A9	0.0035	low	0.0024	<0.0001	blank?
MEG-Au.17.06	Insp.	DS18-02 1845-1850-L1	0.0029	high	0.0035	0.0036	insufficient sample
MEG-Au.17.07	Insp.	DC18-04 490-495-A12	0.0055	high	0.0064	0.0066	deemed OK by Gold Standard*

*Note: * Failure occurs in an unmineralized geotechnical drill hole outside the gold model.*

Most of the analyses in 2018 were performed by Bureau Veritas (Inspectorate), but there are sixteen CRM analyses associated with AAL assays with an expected value of 0.0035 oz Au/ton. The average of AAL's analyses of this CRM is biased 17.5% low, the magnitude of which is considered high. Only one of the AAL analyses is a failure, which represents a 6.3% failure rate for the lab. Although this sample is suspected to be a mis-labeled blank, the failure and low bias merits investigation.

Insufficient sample material may have contributed to one of the two high failures that occurred in Bureau Veritas' analyses of CRMs in 2018. Both failed analyses were 0.0001 oz Au/ton above the upper failure limit, so each barely qualify as failures. Gold Standard did not initiate any corrective action for any standard failure.

12.5.6.2 Gold Standard Duplicates

The 714 field duplicates evaluated in the 2018 data set reveal no significant issues.

12.5.6.3 Gold Standard Pulp Blanks

During the 2018 drill program, Gold Standard inserted pulp blanks into the RC sample stream, however, none were submitted with samples from core drilling. Most of the 364 blank analyses were within acceptable limits. Gold Standard re-analyzed part of the sample batch associated with one pulp blank gold assay of 0.0008 opt Au. It is not known if the re-analyzes replaced the original assays.

12.5.6.4 Gold Standard Coarse Blanks

The 158 analyses of coarse marble blanks in 2018 indicate possible contamination during sample preparation between mid-July and mid-October. There was a correlation between detectable gold in the coarse blanks and the preceding relatively high-grade samples, similar to that which occurred in the 2017. The same conclusion applies in 2018, in that contamination during sample preparation is suggested, however, the blank assay values well below potential mining cutoff grades. The occurrence of low levels of detectable gold in coarse blanks following relatively high-grade samples is not unusual and does not necessarily signal a significant issue. However, continued monitoring of coarse blank assays is warranted, and should be brought to the attention of the assaying lab if higher blank grades are received.

12.5.6.5 Twin-Hole Analysis

Gold Standard drilled one core hole twin (DC18-09) of a RC drill hole (DR18-44). The holes were collared 18.7 ft apart and intersected a significant amount of low- and high-grade mineralization. Core intervals were composited to 10 ft to match the RC intervals to facilitate a more direct comparison of the data. The higher-grade intercepts are wider in the core hole, although the relative positions of mineralization are similar in the two holes. Average gold grade is higher in the core hole at 0.0569 oz Au/ton, compared to 0.0437 oz Au/ton in the RC hole (Figure 12-5). The core hole roughly confirms the data in the RC hole, but conclusions from a single pair of holes cannot be extrapolated to the overall drill campaign. The single twin-hole comparison does suggest that grade of mineralization can vary greatly over short distances within the Dark Star deposit.

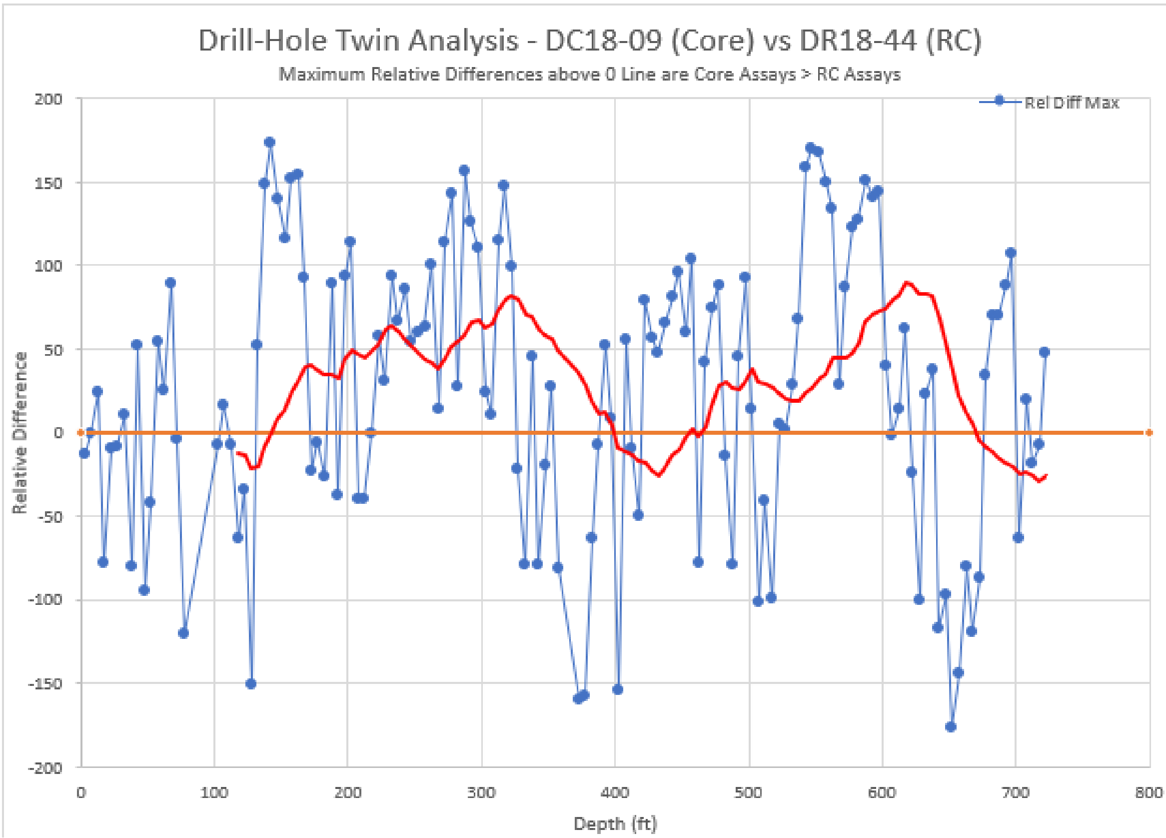


Figure 12-5: Scatter Plot of Twin-Hole Analysis – DC18-09 (core) vs DR18-44 (RC)

12.5.7 Dark Star Drill Program QA/QC 2019

12.5.7.1 CRMs

Three certified CRMs were used, and 701 CRM samples were analyzed in 2019 by Bureau Veritas (Inspectorate). No failures occurred. Results for one CRM were on average biased close to 6% above the expected value. The bias associated with the same standard in 2018 was similar. Although the results for the CRM are within acceptable limits, MDA recommends investigating the bias by performing pulp check analyses of the CRM at another laboratory, if any of the CRM material is still available. Results for CRM analyses are summarized in Table 12-16.

Table 12-16: Summary of Dark Star Results Obtained for Standards, 2019

Laboratory	Standard ID	Grades in oz Au/ton				Count	Dates Used		Failure Counts		Bias pct
		Target	Average	Maximum	Minimum		First	Last	High	Low	
Inspectorate	MEG-Au.17.06	0.0029	0.0029	0.0033	0.0026	92	08-Feb-19	24-Apr-19	0	0	2.04
Inspectorate	MEG-Au.12.11	0.0427	0.0436	0.0460	0.0404	66	08-Feb-19	24-Apr-19	0	0	2.12
Inspectorate	MEG-Au.17.07	0.0055	0.0058	0.0063	0.0053	43	08-Feb-19	24-Apr-19	0	0	5.85
Totals or Averages											
All	3					201			0	0	
Percent						100			0	0	

12.5.7.2 Duplicates

Variability between original samples and field duplicates in 2019 was reasonable. The results reflect the natural heterogeneity inherent in gold deposits.

12.5.7.3 2019 Pulp Blanks

The results for the pulp blanks analysed during the first quarter of 2019 were acceptable. No significant issue with respect to contamination were revealed.

12.5.7.4 2019 Coarse Blanks

Ten analyses of coarse blanks were analysed in a shipment of samples from one core hole. The results did not indicate contamination during sample preparation.

12.6 GOLD STANDARD'S PINION DRILL PROGRAM QA/QC

The lack of QA/QC before 2014 has impacted the mineral resource classification as described in Section 14.3.

During the period 2014 through 2016, Gold Standard's QA/QC program involved the use of pulp blanks and CRMs. No coarse blanks or duplicates were collected or analyzed during those years. In 2017 and 2018, Gold Standard's QA/QC program was similar to the previous program, but with the addition of coarse blanks and RC rig (field) duplicates. MDA's evaluation of Gold Standard's QA/QC data revealed the following issues:

- In the latter half of 2014, six of 52 analyses of one CRM with a target grade of about 0.0583 oz Au/ton were high failures, yielding a failure rate of about 12%;
- In April 2018, seven sequential analyses of a CRM with a target grade of 0.0035 oz Au/ton were biased low by an average of about 18.5%;
- Among samples from hole PIN15-14, ten of the blanks assayed gold in the range 0.0009 to 0.0024 oz Au/ton. Gold Standard obtained re-analyses of 14 mineralized samples analyzed in the same batch as the blanks in question. In a 55 ft interval, the re-run assays averaged 0.0102 oz Au/ton, whereas the original assays averaged 0.0120 oz Au/ton. The original assays were replaced by the second analyses in the project database;
- There are some indications in the data that referee samples are occasionally mis-labeled. This is, however, unprovable; and

- The data provided to MDA, particularly prior to 2016, do not contain consistent records of actions that may have been taken to investigate QA/QC failures. The example of PIN15-14 shows that Gold Standard does monitor and take action on some QA/QC failures, but records of these activities were not readily apparent in the data sets provided to MDA.

The issues identified by MDA are not of a sufficient magnitude to preclude the use of Gold Standard's gold assays in a mineral resource estimate. The overall effect on the model and estimate is not substantially material. However, the lack of QA/QC from before 2014, which represents a significant portion of the total drilling, and the minimal QA/QC samples prior to 2016 are considered in mineral resource classification.

MDA strongly suggests that, in the future, Gold Standard's QA/QC program include the use of coarse blanks to monitor the consistency of the laboratory's sample preparation procedures and possible contamination during preparation.

12.6.1 Pinion Drill Program QA/QC CRMs

12.6.1.1 CRMs - 2014 - 2015

For drilling during 2014 and 2015, Gold Standard supplied MDA with the analyses of 773 CRMs. MDA prepared control charts to evaluate the combined 2014 and 2015 data for each of the eight CRMs used during the campaign. The results are summarized in Table 12-17. Details of the 11 failures are listed in Table 12-18.

Table 12-17: Summary of Results for CRM Assays, 2014 – 2015

CRM ID	Grades in oz Au/ton				Count	Dates Used		Failure Counts		Bias pct
	Target	Average	Maximum	Minimum		First	Last	High	Low	
MEG-Au.10.02	0.0010	0.0010	0.0023	0.0006	180	Apr 2014	Dec 2015	1	**1**	-2.86
MEG-Au.10.04	0.0023	0.0023	0.0026	0.0019	123	Apr 2014	Dec 2015	0	0	1.28
MEG-Au.11.19	0.0035	0.0034	0.0040	0.0028	20	Apr 2014	July 2014	0	0	-2.50
MEG-Au.11.29	0.1076	0.1088	0.1304	0.0925	86	Apr 2014	Dec 2015	0	0	1.11
MEG-Au.13.02	0.0218	0.0221	0.0241	0.0198	164	July 2014	Dec 2015	0	0	1.74
MEG-S107007X	0.0445	0.0448	0.0484	0.0346	112	Apr 2014	Dec 2015	0	**3**	0.58
MEG-Au.11.34	0.0617	0.0671	0.1578	0.0537	52	July 2014	Dec 2014	**6**	0	-0.94
MEG-Au.11.17	0.0785	0.0816	0.0872	0.0767	36	June 2015	Dec 2015	0	0	3.90
Sum					**773**			**7**	**4**	
Percent					**100**			**0.91**	**0.52**	

Table 12-18: List of Failed CRM Analyses, 2014 – 2015

CRM ID	Sample ID	Cert. Grade oz Au/ton	Fail Type High/Low	Fail Limit oz Au/ton	Failed Value oz Au/ton	Comment
MEG-Au.10.02	PIN14-20 650A	0.0010	Low	0.0007	0.0006	
MEG-Au.10.02	PIN14-44 100B	0.0010	High	0.0014	0.0023	mis-identification?
MEG-S107007X	PIN14-06 302A	0.0445	Low	0.0386	0.0382	
MEG-S107007X	PIN14-09 350A	0.0445	Low	0.0386	0.0382	
MEG-S107007X	PIN14-11 150A	0.0445	Low	0.0386	0.0346	
MEG-Au.11.34	PIN14-11 450A	0.0617	High	0.0767	0.0831	

CRM ID	Sample ID	Cert. Grade oz Au/ton	Fail Type High/Low	Fail Limit oz Au/ton	Failed Value oz Au/ton	Comment
MEG-Au.11.34	PIN14-18 250A	0.0617	High	0.0767	0.0965	
MEG-Au.11.34	PIN14-34 250A	0.0617	High	0.0767	0.0811	
MEG-Au.11.34	PIN14-38 250A	0.0617	High	0.0767	0.1578	mis-identification?
MEG-Au.11.34	PIN14-52 250A	0.0617	High	0.0767	0.1557	mis-identification?
MEG-Au.11.34	PIN14-56 250A	0.0617	High	0.0767	0.1047	

Six high failures occurred for one CRM, MEG-Au.11.34, which represents a nearly 12% failure rate. The control chart for this CRM is shown in Figure 12-6, and explanations for the control charts is in Table 12-19. Some of the more extreme high failures listed in Table 12-17 could be mis-labeled standards rather than actual failures, although this cannot be confirmed.

Table 12-19: Explanations for Control Charts

Mean and Standard Deviations Obtained from Certificate for CRM		
USL	Upper Specification Limit	Target + 3 Std Dev
Target	Expected Value	
LSL	Lower Specification Limit	Target - 3 Std Dev
Mean and Standard Deviations Calculated Using Assays of CRMs		
UCL	Upper Control Limit	Avg + 3 Std Dev
Avg	Mean Value	
LCL	Lower Control Limit	Avg - 3 Std Dev

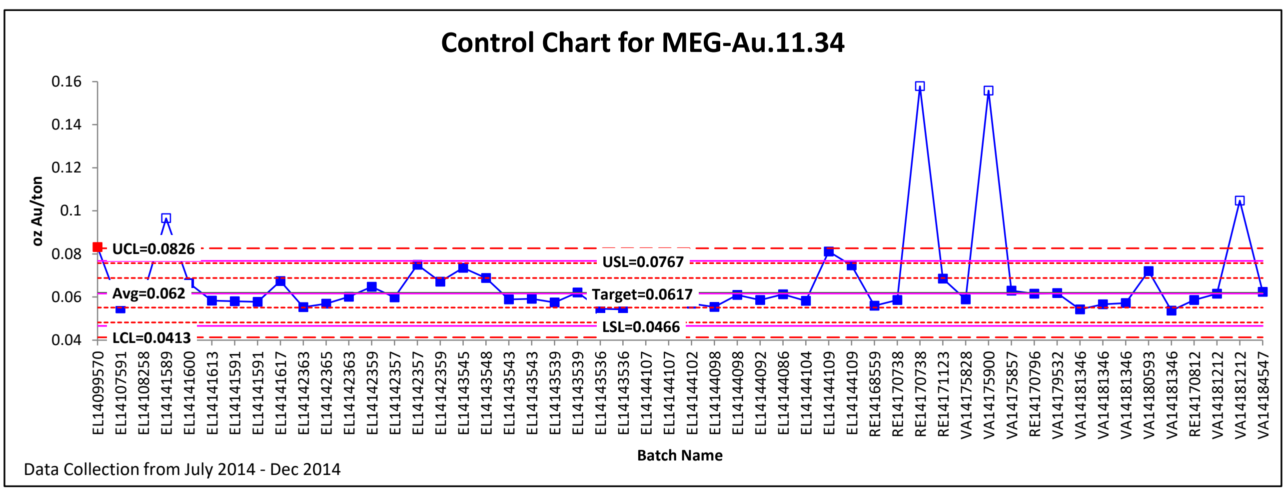


Figure 12-6: Control Chart for MEG-Au.11.34

Note: data points shown as hollow squares were not used in calculating the average and bias listed in Table 12-17.

Another control chart, for MEG-S107007X, is shown in Figure 12-7. The first ten analyses highlighted in red, three of which are analytical failures, are biased conspicuously low. Possible causes for these low analyses include mis-labeled CRMs or, for that period in 2014, the laboratory was producing analyses that were significantly low, after which the instruments were adjusted. However, the latter is unlikely because similar consistently low bias was not apparent in other CRMs analyzed during the same time period. Regardless of the cause, the analyses were failures, and confidence is lower for the assays associated with the respective sample batches.

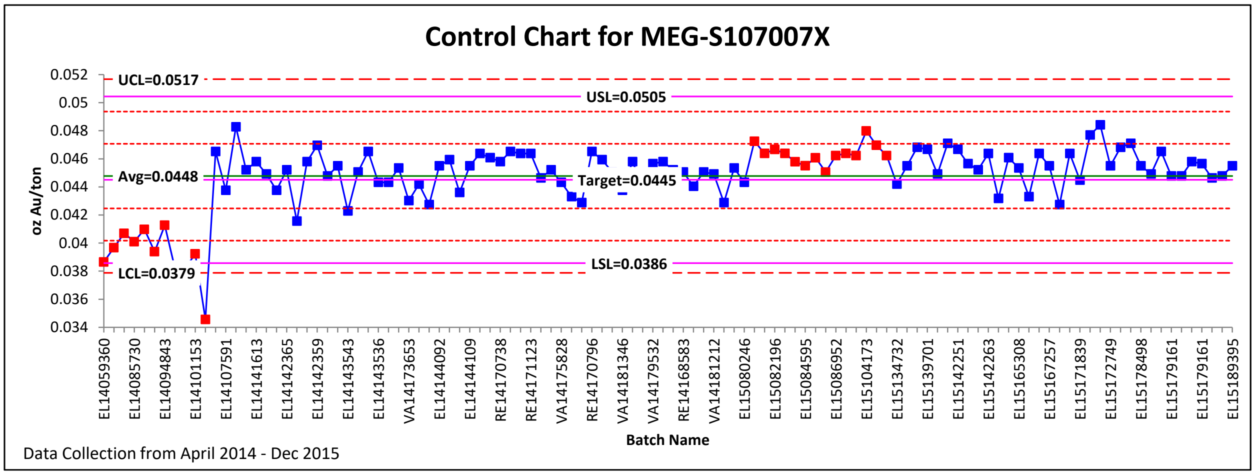


Figure 12-7: Control Chart for MEG-S107007X

12.6.1.2 CRMs - 2016, 2017 and 2018

Gold Standard provided MDA with sets of control charts for CRMs used during the 2016, 2017, and 2018 drilling campaigns. The results are summarized in Table 12-20, Table 12-21 and Table 12-22.

No failures were identified in the data for CRMs in 2016 and 2017. Three high failures occurred in 2018, as indicated in Table 12-22 and listed in Table 12-23. One is precisely at the failure limit and was accepted by Gold Standard and MDA. The other two high failures do not relate to any samples that were used in the gold model and mineral resource.

The magnitude of bias given in Table 12-20 and Table 12-21 are within the range that is expected for gold assays. However, the low bias for a portion of the data for CRM MEG-Au.11.19 in 2018 shown in Table 12-22 is excessive. Thirteen assays of MEG-Au.11.19 that were analyzed first are on average biased 2.3% low, within a reasonable range expected. However, the seven latest analyses of the CRM are biased 18.5% low, well outside the expected range (Figure 12-8). Possible explanations include an abrupt change in the physical character of the CRM or a change in some aspect of the laboratory’s analytical instrumentation or process. Although none of the seven low-biased analyses is technically a failure using the usual criteria of expected value ± three standard deviations, the demonstrated bias could indicate a systematic analytical issue that would reduce confidence in associated assays. The excessive low bias analyses of MEG-Au.11.19 occurred from April 10 through April 29, 2018. Another set of CRM samples with a similar order of magnitude gold grade, MEG-Au.17.06, was analyzed during the period April 11 through June 13, 2018, and show a slight positive bias, suggesting the laboratory was not producing analyses with a consistent strong low bias during the time period. Ultimately, the cause for the strong low bias is not known.

12.6.1.3 Grade Ranges of CRMs Used in 2018

Although the number of CRMs in use has varied over the years, generally with fewer CRMs in use as time progressed, Gold Standard has typically used one or more low-grade CRMs, one or more mid-grade CRMs, and one or more high-grade CRMs, in order to represent the grades of mineralized samples encountered at Pinion. In 2018, except for a short period in mid-April, Gold Standard used only two low-grade CRMs, both with certified grades below a potential mining cutoff (Figure 12-9). The low-grade CRMs are useful in that they test the analytical method used for most of the mineral resource-grade samples. However, a single analytical method can yield results with a range of accuracies and precisions over time. Use of CRMs over a range of grades that are representative of mineralized grades in the deposit would provide greater confidence in the associated assays.

Table 12-20: Summary of Results Pinion for CRM Assays, 2016

CRM ID	Grades in oz Au/ton				Count	Dates Used		Failure Counts		Bias pct
	Target	Average	Maximum	Minimum		First	Last	High	Low	
MEG-Au.10.02	0.0010	0.0010	0.0011	0.0008	73	June 2016	Jan 2017	0	0	-2.86
MEG-Au.10.04	0.0023	0.0023	0.0026	0.0020	68	June 2016	Jan 2017	0	0	2.32
MEG-Au.11.29	0.1076	0.1081	0.1202	0.1027	15	June 2016	July 2016	0	0	0.52
MEG-Au.13.02	0.0218	0.0221	0.0228	0.0213	25	June 2016	Jan 2017	0	0	1.73
MEG-S107007X	0.0445	0.0445	0.0475	0.0414	39	June 2016	Oct 2016	0	0	0
MEG-Au.11.17	0.0785	0.0813	0.0875	0.0709	43	June 2016	Jan 2017	0	0	3.44
Sum					**263**			**0**	**0**	
Percent					**100**			**0**	**0**	

Table 12-21: Summary of Results for Pinion CRM Assays, 2017

CRM ID	Grades in oz Au/ton				Count	Dates Used		Failure Counts		Bias pct
	Target	Average	Maximum	Minimum		First	Last	High	Low	
MEG-Au.10.02	0.0010	0.0010	0.0012	0.0002	11	Nov 2017	Nov 2017	0	1	-2.86
MEG-Au.10.04	0.0023	0.0024	0.0025	0.0022	8	Nov 2017	Nov 2017	0	0	3.85
MEG-Au.12.21	0.0042	0.0040	0.0044	0.0036	31	Nov 2017	Dec 2017	0	0	-4.90
Sum					**50**			**0**	**1**	
Percent					**100**			**0**	**2**	

Table 12-22: Summary of Results for Pinion CRMs, 2018

CRM ID	Grades in oz Au/ton				Count	Dates Used		Failure Counts		Bias pct
	Target	Average	Maximum	Minimum		First	Last	High	Low	
MEG-Au.17.06	0.0029	0.0029	0.0037	0.0024	258	11 Apr 2018	6 Jul 2018	3	0	2.32
MEG-Au.11.19	0.0035	0.0034	0.0040	0.0028	13	29 Mar 2018	9 Apr 2018	0	0	-2.31
MEG-Au.11.19	0.0035	0.0029	0.0030	0.0027	7	10 April 2018	29 Apr 2018	0	0	**-18.45**
MEG-Au.11.29	0.1076	0.1123	0.1268	0.0989	16	5 April 2018	20 Apr 2018	0	0	5.41
Sum					**294**			**0**	**0**	
Percent					**100**			**0**	**0**	

Table 12-23: List of Failed Pinion CRM Assays, 2018

CRM ID	Sample ID	Target for Std oz Au/ton	Fail Type High/Low	Fail Limit oz Au/ton	Failed Value oz Au/ton	Comment
MEG-Au.17.06	PR18-78 245-250-L1	0.0029	High	0.0035	0.0035	accepted by Gold Standard
MEG-Au.17.06	PR18-89 45-50-L1	0.0029	High	0.0035	0.0037	accepted by Gold Standard; does not affect any mineral resource blocks
MEG-Au.17.06	PC18-03 32-34.5-L1	0.0029	High	0.0035	0.0036	samples re-run by Gold Standard; related assays not used in mineral resource estimate

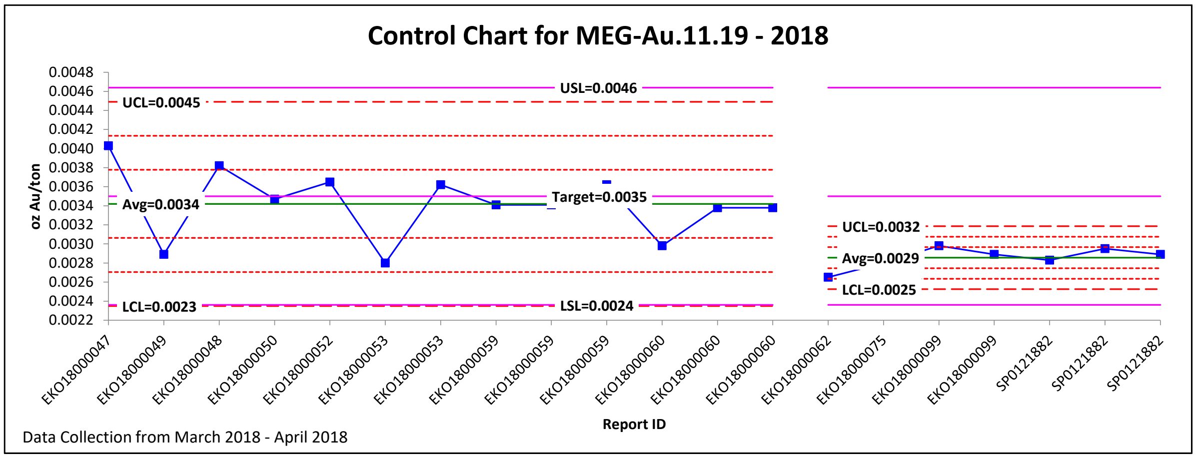


Figure 12-8: Control Chart for MEG-Au.11.19 – 2018

Note: Average, UCL and LCL are determined from analyses of the CRM as explained in Table 12-19.

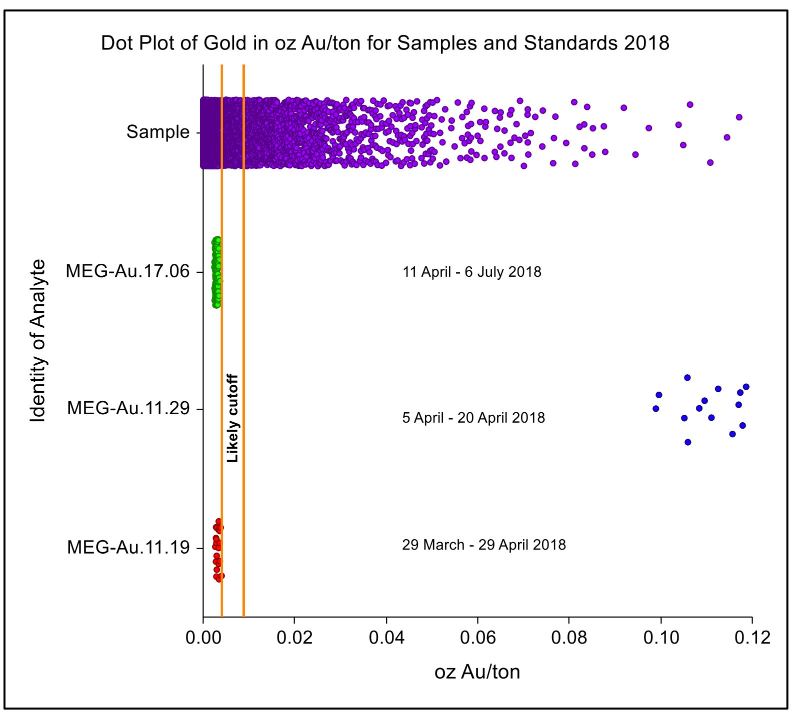


Figure 12-9: Grade and Date Ranges of 2018 Pinion CRMs

12.6.1.4 CRMs for Drill Sample Silver Analyses in 2019

In 2019, drill-sample pulps from 5.0 ft intervals of holes drilled by Gold Standard were submitted for silver assays, which were done from March to April of 2019. These intervals were previously analyzed for gold at either ALS or Bureau Veritas, however, silver analyses were performed on 20 to 30 ft composites, which was not sufficiently precise for silver modeling. Gold Standard inserted 765 silver CRMs, using three different CRMs certified for silver, into the pulp sample stream. MDA evaluated the CRM results using a variation of Shewhart-type charts prepared by Gold Standard. The properties of the three CRMs as well as the results of the 765 analyses of standards for silver are summarized in Table 12-24. The failures are listed in Table 12-25.

Table 12-24: Summary of 2019 Analyses of Silver CRMs

Standard ID	Grades in oz Ag/ton				Count	Dates Used		Failure Counts		Bias pct
	Target	Average	Maximum	Minimum		First	Last	High	Low	
MEG-LWA-34	0.0554	0.0379	0.0875	0.0146	331	20-Mar-19	10-Apr-19	0	33*	-31.6
MEG-Au.11.29	0.3908	0.4025	0.5833	0.0583	336	20-Mar-19	15-Apr-19	7	1	3.0
MEG-Au.13.03	0.1312	0.1400	0.1750	0.0583	98	18-Apr-19	27-Apr-19	0	1	6.7
Totals										
counts					**765**			**7**	**2***	
percentages					**100**			**0.9**	**0.3**	

*Note: * the 33 failures of MEG-LWA-34 are not included in the calculation of the failure rate.*
MEG-LWA-34 and MEG-Au.11.29 were used with samples from holes drilled in 2014 through 2018.
MEG-Au.13.03 was used with samples from holes drilled in 2014 through 2016.

Table 12-25: List of Failed Silver CRM Assays

Standard ID	Sample ID	Target for Std (oz Ag/ton)	Fail Type	Fail Limit (oz Ag/ton)	Failed Value (oz Ag/ton)	Comment
MEG-LWA-34	33 samples	0.0554	low	0.0204	<0.0292	below detection limit; not material
MEG-Au.11.29	PR18-52 245-250-S2	0.3908	high	0.4696	0.5833	
MEG-Au.11.29	PR18-01 245-250-S2	0.3908	high	0.4696	0.4958	
MEG-Au.11.29	PR18-80 245-250-S2	0.3908	high	0.4696	0.5833	
MEG-Au.11.29	PIN16-19 245-250-S2	0.3908	high	0.4696	0.5833	
MEG-Au.11.29	PIN15-09 1845-1850-S2	0.3908	high	0.4696	0.5250	
MEG-Au.11.29	PIN15-19 245-250-S2	0.3908	high	0.4696	0.5833	
MEG-Au.11.29	PIN14-07 645-650-S2	0.3908	high	0.4696	0.5542	
MEG-Au.11.29	PR18-74 645-650-S2	0.3908	low	0.3121	0.0583	sample mix-up?
MEG-Au.13.03	PIN14-27 45-50-S3	0.1312	low	0.0787	0.0583	

MEG-LWA-34 is a low-grade standard with an expected value of approximately 0.0292 oz Ag/ton, which is near the lower detection limit of the analytical method. The 33 low failures are not material given the low precision of the analytical method, and are not included in calculation of the failure rate presented in Table 12-24.

MDA evaluated the seven high failures of MEG-Au.11.29 in context with adjacent silver assays in the same drill holes and location relative to mineral domains. The failures are not considered to be material with respect to the silver modeling and estimation.

The QA/QC data includes another 17 silver analyses of a CRM certified for gold but not for silver. The certificate characterizing the CRM notes an expected silver value of 0.0020 oz Ag/ton. The 17 analyses, reported in ppb silver and converted to oz Ag/ton, are within the range 0.0004 to 0.0009 oz Ag/ton. Given the low silver grades and that the standard is not certified for silver, significant conclusions should not be drawn from these results.

Gold Standard did not re-analyze any of the samples in analytical batches associated with the failed silver standard analyses.

12.6.2 Pinion Drill Program QA/QC Field Duplicates

In 2017 and 2018, Gold Standard collected field duplicates at approximately 100 ft intervals, which is two or three duplicates per hole for the generally shallow drilling. Duplicates were obtained by collecting two samples simultaneously from a rotating wet splitter. Gold Standard did not collect duplicate samples in prior years.

MDA prepared three types of charts for the duplicates:

- A scatterplot, showing an RMA regression;
- A quantile/quantile plot; and
- Several relative difference plots (see explanation, below).

MDA used a relative difference expressed as a percentage for each duplicate pair calculated as follows:

Equation 1 $$100\ x\ \frac{(Duplicate - Original)}{Lesser\ of\ (Duplicate, Original)}$$

Table 12-26 summarizes the results for the field duplicates. The average of the relative difference listed in Table 12-26 is based on Equation 1 above and is an indication of the bias between the duplicates and the originals. The “Abs Rel Pct Diff” is the average of the absolute relative differences and gives an indication of the degree of variability between the duplicates and originals.

Table 12-26: Summary of Results for Pinion Field Duplicates

Type	Period	Corr. Coeff.*	Counts			RMA Regression	Averages as Percent	
			All	Used	Outliers	(y = dup, x = orig)	Rel Pct Diff	Abs Rel Pct Dif
Field Dup	2017 - 2018	0.95	331	277	2	y = 1.059x - 0.010	-4.8	27.6

MDA also performed an alternative calculation as part of the evaluation of duplicates using the following:

Equation 2 $$100\ x\ \frac{(Duplicate - Original)}{Mean\ of\ (Duplicate, Original)}$$

These results are not listed in Table 12-26. The disparity in Table 12-26 between the total number of pairs (“All”) and the number of pairs used (“Used”) exists because pairs in which one or both analyses are below the analytical detection limit were not included in calculations. Two outlier pairs were also excluded because the differences were excessive and would skew the statistics of the data set. Therefore, the average reported in the table is for all grades above the detection limit and excluding outliers. Note that reporting single averages for the entire set of duplicates masks differences that occur in different grade ranges. See the chart in Figure 12-10 for a more meaningful depiction of the relative difference data.

As indicated by the relative difference shown in Table 12-26, and shown in more detail by the moving average line (in red) in Figure 12-10, there is a tendency for the field duplicate samples to have slightly lower grades than the originals (when duplicate grades are greater than original sample grades, relative differences are positive). Figure 12-10 shows the bias of the duplicate grades greater than original sample grades to be most pronounced at mean grades below about 0.0058 oz Au/ton. Bias is almost absent at higher grades.

There is no information on which to base any opinion as to the cause of the low bias in the duplicates at lower grades. MDA suggests that Gold Standard review procedures used for sampling, sample preparation, and analysis to determine if a cause can be identified and take corrective action if necessary.

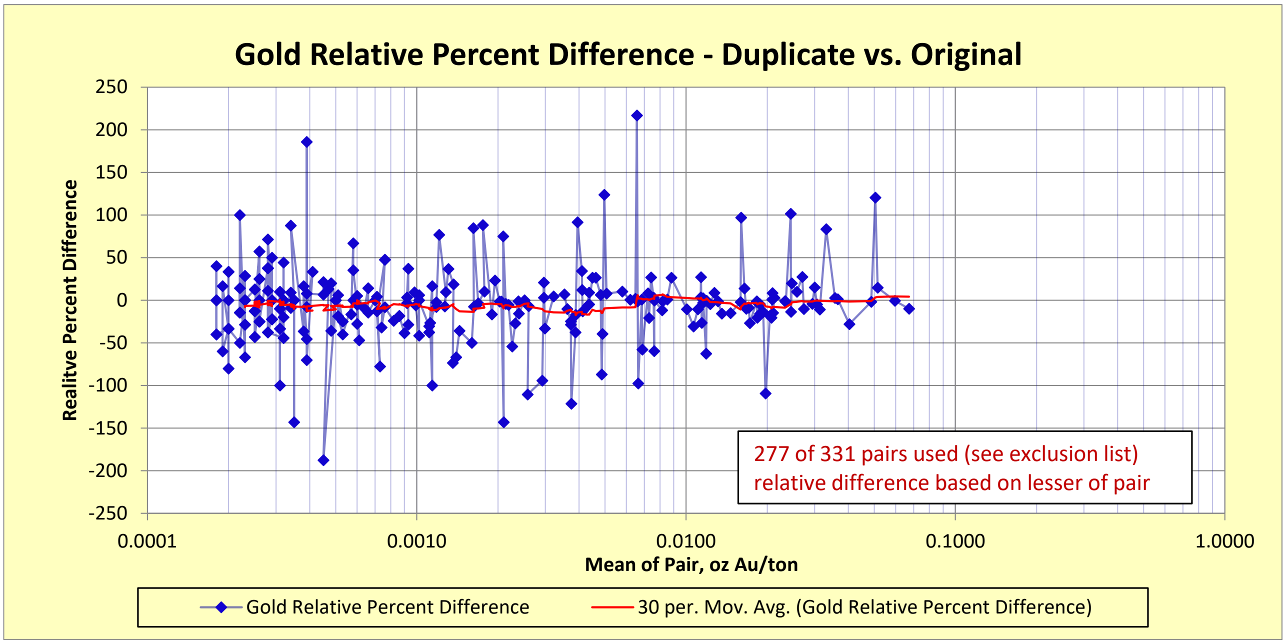


Figure 12-10: Gold Relative Percent Difference – Pinion Duplicate vs. Original

The 2019 silver assays of pulps from earlier Gold Standard drill-hole samples included 309 samples with the suffix "dup." MDA matched these to the original sample assays and evaluated the resulting duplicate pairs. A summary of the evaluation is given in Table 12-27.

The silver duplicate assay data includes 202 pairs for which both analyses were below the lower detection limit of the analytical method, and 12 additional pairs for which one of the analyses is below. These 214 pairs were not used in calculation of statistics in Table 12-27, so that only 95 pairs containing detectable silver were used in the evaluation. The results indicated in Table 12-27 do not indicate excessive variability.

Table 12-27: Summary of Results for Duplicates in Silver Re-Assays

Type	Comment	Corr. Coeff.	Ag Grade Averages (oz Au/ton)		Counts			RMA Regression (y = dup, x = orig)	Averages as Percent	
			Mean of Pair	Dup – Original	All	Used	Outliers		Rel Pct Diff	Abs Rel Pct Dif
Field Dup	all available excluding outliers	0.93	0.178	-0.006	309	95	0	y = 0.987x – 0.219	-3.2	30.3

Notes: The differences between the numbers of duplicate pairs available ("All") and those "Used" occurs because pairs in which one or both analyses fell below the method detection limit were excluded.
Mop indicates mean of pair
Relative differences shown in the last two columns of Table 12-27 are averages of those calculated using Equation 1. A negative relative difference indicates that, on average, the duplicate analyses were lower than the originals.

12.6.3 External Check Assays for Pinion Drilling

In April and August 2018, Gold Standard selected pulps from two holes drilled in 2017 that were originally assayed by ALS and sent them to Bureau Veritas for check assays. In total, 95 usable original and check assay pairs were produced. MDA evaluated these using the same suite of charts and statistics used to evaluate the other types of duplicates described herein. Differences were calculated so that when an ALS assay was higher than the Bureau Veritas assay, the difference is positive, and vice-versa.

The results of MDA's evaluation are summarized in Table 12-28, and the relative differences by mean grade are illustrated in Figure 12-11. Thirteen pairs having a mean grade less than 0.0010 oz Au/ton were excluded from the comparison because at the lowest grades, small differences are magnified and statistics are skewed.

Table 12-28: Summary of Results for 2018 Re-Assays of 2017 Pinion Samples

Type	Comment			Corr. Coeff.	Grade Averages (oz Au/ton)	
					Mean of Pair	Dup – Original
Check	all available excluding Au < 0.0010			0.999	0.0313	-0.0001
Check	subrange 0.0012 ≤ mop < 0.0058			0.986	0.0029	0.0002
Check	subrange mop > 0.0058 opt			0.999	0.0430	-0.0003
Type	Counts			RMA Regression	Averages as Percent	
	All	Used	Outliers	(y = ALS, x = bv)	Rel Pct Diff	Abs Rel Pct Dif
Check	95	82	-	y = 0.976x + 0.021	1.4	4.4
Check	24	24	-	y = 1.136x – 0.007	4.7	7.2
Check	58	58	-	y = 0.971x + 0.034	0.0	3.3

Notes: The differences between the number of duplicate pairs available ("All") and those "Used" occurs because very low-grade pairs were excluded from statistical calculations, as were outliers. "mop" indicates mean of pair.
Pairs in which one or both assays are below detection limit are not used in statistical calculations.
Relative differences in these tables are those calculated using Equation 1.

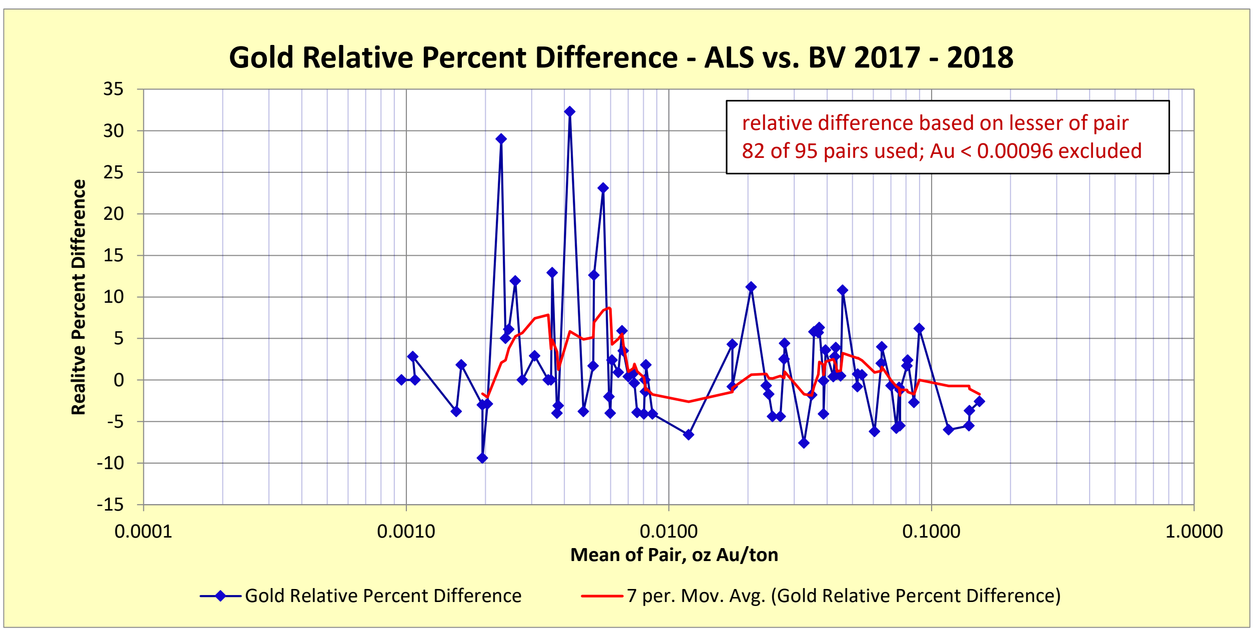


Figure 12-11: Gold Relative Percent Difference – ALS vs. Bureau Veritas, 2017 Pulps

Two grade subranges each have distinct characteristic statistics. For sample pairs with mean grades between 0.0010 oz Au/ton and 0.0058 oz Au/ton, ALS was on average biased higher than Bureau Veritas with an average relative difference of +4.7%. For pairs with mean grades greater than 0.0058 oz Au/ton, a subrange comprising about 60% of the pairs, there was effectively no overall bias, although the bias varies high or low by a few percentage points within that range (Figure 12-11).

In summary, the check assays done in 2018 on 2017 assay pulps revealed no issues respect to excessive variability or bias.

12.6.4 Pinion Drill Program QA/QC Blanks

12.6.4.1 Pulp Blanks – 2014 to 2016

In the period 2014–2018, Gold Standard used certified pulp blanks obtained from a supplier of CRMs. Pulp blanks test for contamination during the analytical process in the laboratory, but not the sample preparation process where the large majority of contamination occurs.

There were 422 pulp blanks analyzed in 2014. The blanks were inserted into the sample stream every 100 feet. Five blanks in drill hole PIN14-44, were marked in the database as "labelled wrong," and were disregarded in the current evaluation. Among the remaining 417 blank analyses, six were reported to have detectable gold. The maximum value of 0.0005 oz Au/ton detected in the pulp blanks is considered negligible, and does not qualify as a failure.

Figure 12-12 depicts the gold analyses of the blanks as well as the assay of the preceding drill samples. There is no meaningful evidence that the grades of the preceding samples are reflected in the pulp blank grades. Therefore, there is no evidence of sample contamination during the analytical process. As previously noted, pulp blanks are not useful for checking for contamination in the sample preparation process.

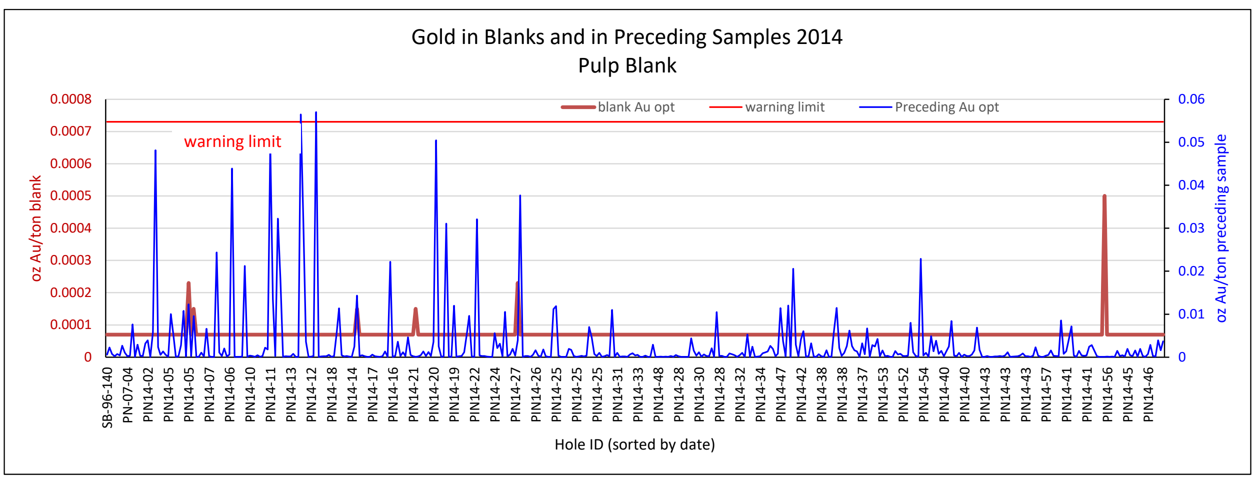


Figure 12-12: Gold in Blanks and Preceding Samples - 2014

In 2015, Gold Standard used a pulp blank to test for contamination in drilling at Pinion. In total, 296 analyses of the blank were assayed at downhole intervals of 100 feet. A chart of the blank analyses plotted with assays of the preceding samples (although not directly assessed, pulps are assumed to be prepared and analyzed in sequence), is presented in Figure 12-13.

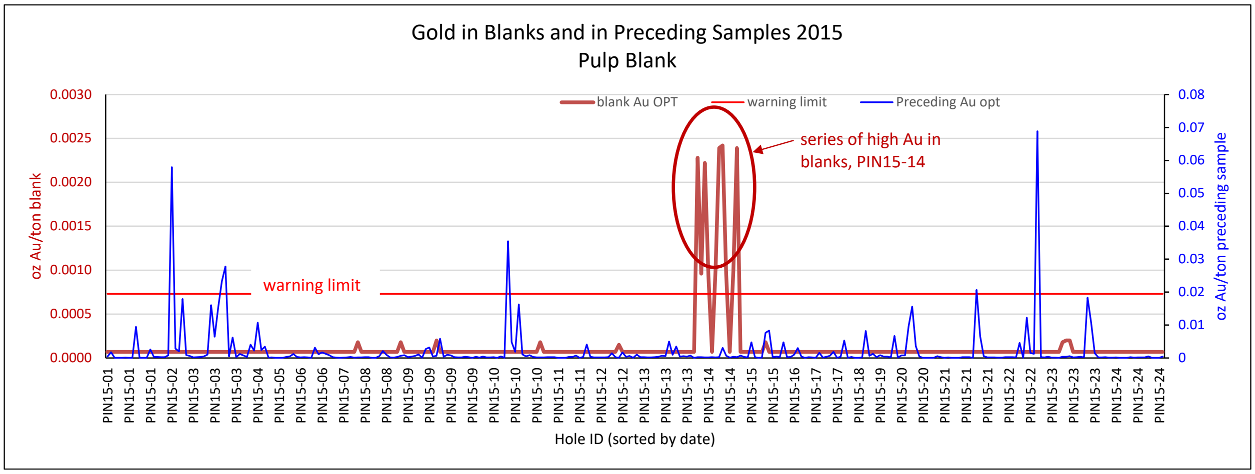


Figure 12-13: Gold in Blanks and in Preceding Samples - 2015

Nineteen of the 296 analyses of pulp blanks in 2015 reported some detectable gold. In nine of these cases, the values were low at 0.0001 to 0.0002 oz Au/ton, and were not considered to be failures. However, ten of the analyses which were with samples from drill hole PIN15-14, reported gold in the range 0.0009 to 0.0024 oz Au/ton. These are highlighted on Figure 12-13, but do not seem to correlate with gold-rich samples. Gold Standard obtained re-analyses of fourteen mineralized samples from the same batch as the blanks in question. Table 12-29 summarizes a comparison between the original gold analyses and the re-run assays. The table shows that the re-run assays for the interval from 710 to 765 ft are on average lower than the original assays. The re-run assays were substituted for original assays In the Pinion database.

Table 12-29: Comparison of Original Assays and Re-Runs in Part of PIN15-14

From-To in feet	Length in feet	Average grade original (Au-AA23?)	Average grade re-runs (Au-AA23)
710 – 765	55 ft	0.0121 oz Au/ton	0.0102 oz Au/ton
800 – 815	15 ft	0.0029 oz Au/ton	0.0029 oz Au/ton

During the 2016 drilling campaign Gold Standard used a pulp blank having a certified value of "<0.003 ppm Au" (0.0029 oz Au/ton). In all, 255 pulp blanks were inserted into the analytical stream every 100 feet. Only in one sample was a detectable gold value of 0.0002 oz Au/ton reported, which does not qualify as a failure. The analyses of pulp blanks in the 2016 campaign, therefore, revealed no evidence of contamination, although the potential for contamination during sample preparation was not tested.

12.6.4.2 Coarse and Pulp Blanks - 2017 and 2018

In 2017 and 2018, Gold Standard used both coarse and pulp blanks. The certified pulp blank was obtained from a commercial supplier (MEG-Blank.14.03), and the coarse blank is described as "Gold Standard marble". Coarse blanks undergo the full sample preparation and analytical process and can show if any contamination takes place in the sample preparation process. Both blank types are expected to have no detectable gold, which for the analytical method used for gold is 0.0001 oz Au/ton.

MDA prepared charts for both of these blank types separately. The charts are shown in Figure 12-14 and Figure 12-15. In the case of the pulp blanks in Figure 12-14, only four of 159 analyses reported gold exceeding the detection limit, and the highest grade reported was 0.0003 oz Au/ton, which does not qualify as a failure. There is no evidence that the analyses of the pulp blanks are affected by gold contained in the preceding samples.

Eleven of the 58 analyses of coarse blanks were reported to contain detectable gold, with the highest reported grade being 0.0003 oz Au/ton. Figure 12-15 shows that blanks following relatively high-grade samples are more likely to have gold analyses exceeding the detection limit. The correlation coefficient between the blanks and the preceding samples is a statistically significant 0.5. This suggests low-level contamination of samples from preceding high-grade samples through the crushing and grinding process in the laboratory. The degree of contamination is not significant, as none of the analyses that returned detectable gold qualify as failures, and the negligible magnitude of demonstrated contamination does not reduce confidence in gold analyses used for a mineral resource estimate.

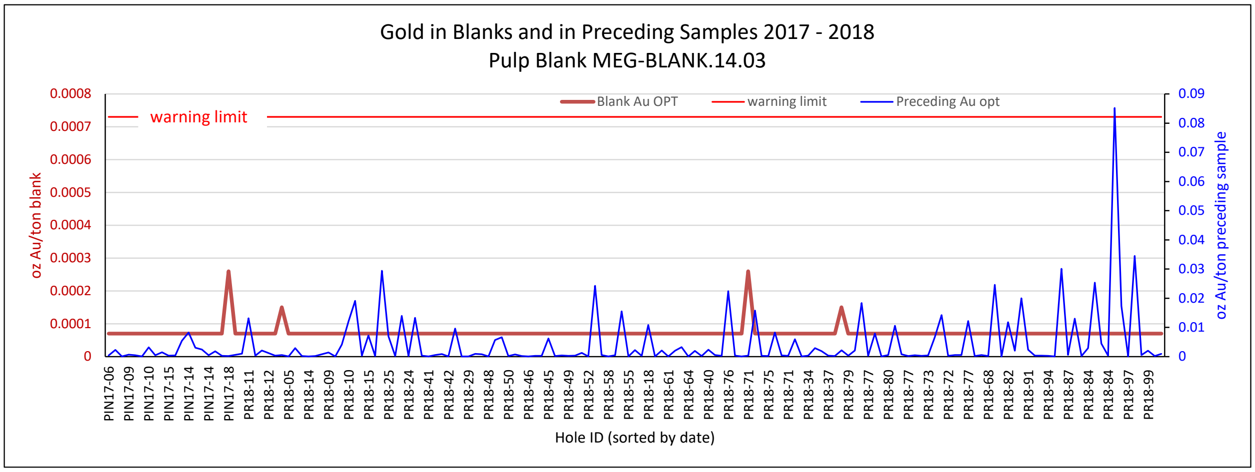


Figure 12-14: Gold in Pulp Blanks and in Preceding Samples - 2017 – 2018

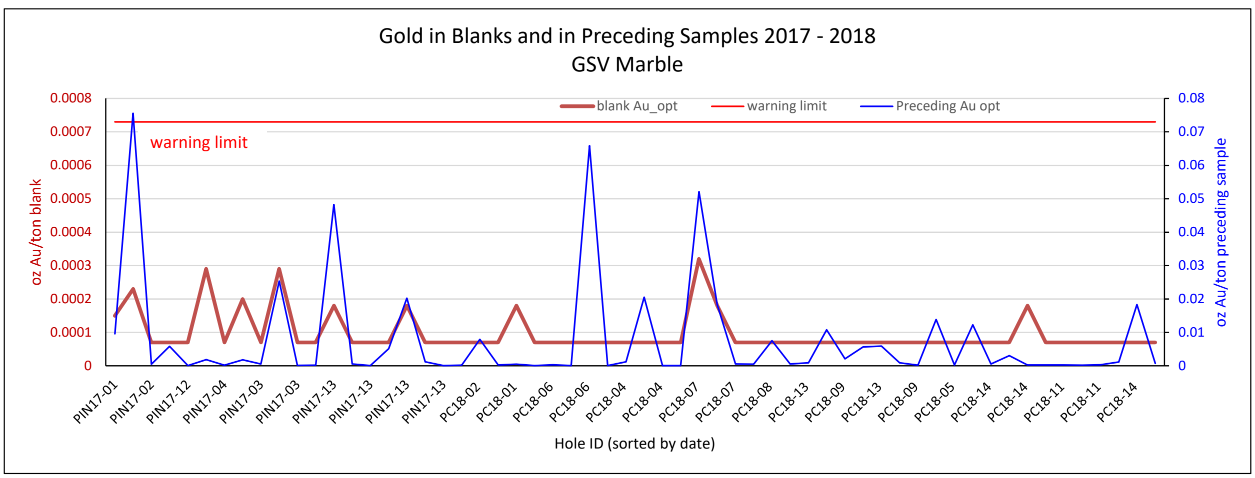


Figure 12-15: Gold in Coarse Blanks and in Preceding Samples - 2017 – 2018

12.6.4.3 Blanks - Silver Analyses

Pulp Blanks

The QA/QC data for silver include 646 analyses of pulp blanks, analysed with batches of samples from the 2014 through 2018 drill campaigns. The results are summarized in Table 12-30, and do not suggest there is systematic contamination during the analytical process.

Table 12-30: Results of Silver Analyses of Pulp Blanks

Analytical Result	Count of Analyses
below detection limit of 0.0292 oz Ag/ton	632
at detection limit of 0.0292 oz Ag/ton	13
0.0583 oz Ag/ton	1

Coarse Blanks

Data for 15 silver analyses of coarse blanks are included in the QA/QC package that MDA received from Gold Standard. One was from a series of samples in a 2014 drill hole, which was analysed using Bureau Veritas' method MA401 with a detection limit of 0.0292 oz Ag/ton and returned a result below the detection limit.

The other 14 coarse blanks were submitted with 2018 core holes. The analytical method used was Bureau Veritas' AQ250, having a detection limit of 0.0001 oz Ag/ton. All samples returned results above the lower detection limit in the range 0.0001 to 0.0008 oz Ag/ton. The warning limit for these is 0.0005 oz Ag/ton, however, the assays above this limit indicate the magnitude of contamination during sample preparation is negligible. There was no statistically meaningful correlation between results for the blank and preceding sample analyses.

12.6.5 Twin Holes

In 2018, four core holes were drilled into the Pinion deposit to obtain material for metallurgical testing. These four holes were twins of previously drilled RC holes. A comparison of length and grade of the intersected mineralization was made between these four sets of twin holes. For the 564 ft of drilling in the mineralized zones, the grade was 21% higher in the core holes (Table 12-31). A histogram of the two sets of data shows more low-grade samples in the four RC holes (Figure 12-16).

Table 12-31: Summary of Pinion Twin Hole Results

	RC Holes	Diff.	Core Holes	Units
Count	185		120	
Length	564	0%	566	ft
Grade	0.014	21%	0.017	oz Au/ton
Metal	8.1	21%	9.8	ft *x* (oz Au/ton)

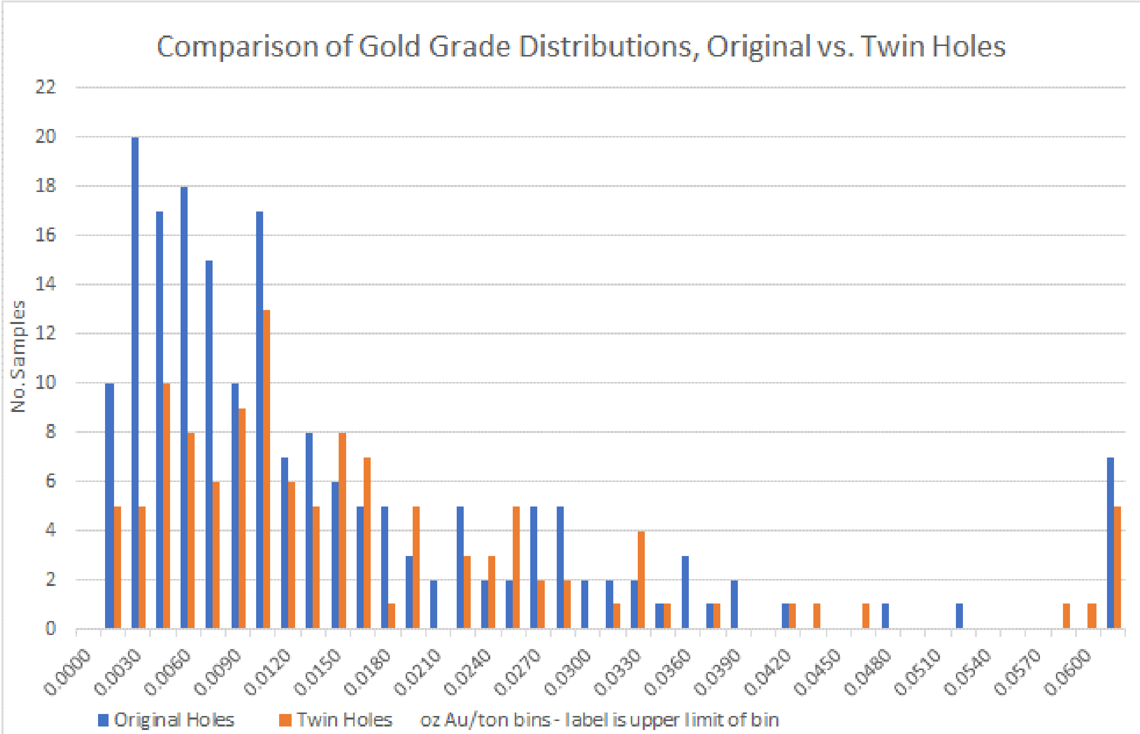


Figure 12-16: Histogram of 2018 Twin Drill-Hole Samples

12.6.6 Pinion Drill Program QA/QC on Barite

Because metallurgical investigation potentially indicated that the quantity of barite affects gold recovery, Gold Standard began a program to obtain barium analyses. Consequently, the quality of the barium analyses used to model barium domains in the Pinion deposit was assessed.

Initial barium analyses by ICP methods with two-acid digestion have been shown to be incorrect at grades above ~0.1% to ~0.2%. Subsequent barium analyses were done at AAL on existing pulps using a pressed-powder XRF-ED analysis (method Ba ED-XRF E5 with a lower detection limit of 0.003% Ba). There were 938 barium assays performed at AAL using this method. In addition, 21,747 loose-powder NITON XRF measurements of barium were done on drill-sample pulps by independent contractor Rangefront Geological.

A total of 4,235 duplicate readings of barium content by the NITON XRF instrument were also taken by independent contractor Rangefront Geological. MDA compared 4,091 of these duplicate loose-powder NITON XRF readings to determine variability of results. Seventeen pairs were determined to be extreme outliers and removed from the calculations. No significant biases were noted, and reproducibility was shown to be just over 10%.

For comparison to the Gold Standard loose-powder NITON XRF data, only 32 sample pulps were analyzed at AAL by a) ICP following a two-acid digestion, by b) ICP following a five-acid digestion, c) loose-powder NITON-XRF, d) pressed-powder XRF-ED, and e) XRF-WD (lithium metaborate fusion). The two-acid ICP analyses were 95% lower than the loose-powder NITON-XRF measurements, and the five-acid ICP analyses were 91% lower. The pressed-powder XRF-ED and XRF-WD analyses were 86% and 87% higher than the corresponding loose-powder NITON-XRF measurements, respectively. While 32 samples are not a statistically significant data set, the results do indicate good correlation with the XRF-ED analyses with a slope to the regression line of 0.55. The XRF-ED analyses are being applied in the metallurgical test work (see Section 13.1).

12.6.7 Pinion Drill Program QA/QC - 2019-2020

12.6.7.1 CRMs

Five CRMs were used during the 2019 and 2020 drill campaigns, and a total of 469 CRM analyses were obtained. With an insertion rate of about 1.2% for standards, 1.8% for blanks, and 0.8% for duplicates, a total insertion rate of 3.8% was maintained throughout the two drill campaigns. The laboratories used were Bureau Veritas, from January 2019 to October 2020, and Paragon Geochemical, from September 2020 to December 2020, with little overlap. For this reason, all standards were plotted across labs. A summary of the results of CRM analyses is shown in Table 12-32. There were 11 failures in the gold standards (Table 12-33). It is not known if any action was taken as a result of these failures.

Table 12-32: Summary of Pinion Results for Certified Reference Materials, Gold, 2019-2020

CRM ID	Grades in oz Au/ton				Count	Dates Used		Failure Counts		Bias pct
	Target	Average	Max	Min		First	Last	High	Low	
MEG-Au.12.11	0.0427	0.0434	0.0462	0.0400	18	12-Dec-18	10-Dec-19	0	0	1.60
MEG-Au.17.05	0.0015	0.0015	0.0020	0.0010	130	18-Feb-20	1-Mar-21	1	4	0.0
MEG-Au.17.06	0.0028	0.0030	0.0034	0.0027	22	12-Dec-18	10-Dec-20	1	0	7.10
MEG-Au.17.07	0.0055	0.0057	0.0067	0.0048	167	12-Dec-18	1-Mar-21	2	0	3.60
MEG-Au.19.11	0.0368	0.0370	0.0398	0.0347	132	9-Jul-20	1-Mar-21	3	0	0.50
TOTALS										
5					469			7	4	

Table 12-33: List of Pinion Failed Certified Reference Material Assays, Gold, 2019-2020

			Values in opt Au			
CRM ID	Laboratory	Sample ID	Target	Fail Type High/Low	Fail Limit	Failed Value
MEG Au.17.05	Paragon	PC20-10 107-112-A11	0.00152	low	0.00117	0.0011
MEG Au.17.05	Bureau Veritas	PR20-31 245-250-A11	0.00152	low	0.00117	0.0010
MEG Au.17.05	Paragon	PR20-54 45-50-A11	0.00152	low	0.00117	0.0008
MEG-Au.17.06	Bureau Veritas	PC19-12 367-372-L1	0.00283	high	0.00344	0.0034
MEG-Au.17.07	Bureau Veritas	PC18-29 218-223-A12	0.00548	high	0.00645	0.0065
MEG-Au.17.07	Bureau Veritas	PC19-07 37-42-A12	0.00548	high	0.00645	0.0067
MEG-Au.19.11	Paragon	LT20-10 245-250-A13	0.03684	high	0.03938	0.0397
MEG-Au.19.11	Bureau Veritas	PR20-22 445-450-A13	0.03684	high	0.03938	0.0398
MEG-Au.19.11	Bureau Veritas	PR20-24 45-50-A13	0.03684	high	0.03938	0.0397
MEG-Au.19.11	Paragon	PR20-58 445-450-A13	0.03684	High	0.03938	0.0398

Silver analyses were pulp re-runs from the 2014 to 2018 drilling, and were done for silver modeling on uncomposited intervals. Two certified reference materials were used for the 2019 to 2020 drill program. A summary of these standard analyses is shown in Table 12-34. Descriptions of the seven failures for MEG-Au.11.29 are given in Table 12-35.

Table 12-34: Summary of Pinion Results for Certified Reference Materials, Silver, 2019-20

Standard ID	Grades in oz Ag/ton				Count	Dates Used		Failure Counts		Bias pct
	Target	Average	Max	Min		First	Last	High	Low	
MEG-Au.11.29	0.3908	0.4016	0.5833	0.0583	240	27-Apr-18	18-Apr-19	7	0	2.8
MEG-Au.13.03	0.1313	0.1410	0.175	0.0583	96	4-Apr-19	5-May-19	0	0	7.4
TOTALS										
2					336			7	0	

Table 12-35: List of Pinion Failed Certified Reference Material Assays, Silver, 2019-20

			Values in oz Ag/ton			
Standard ID	**Laboratory**	**Sample ID**	**Target**	**Fail Type High/Low**	**Fail Limit**	**Failed Value**
MEG-Au.11.29	Bureau Veritas	PIN14-07 645-650-S2	0.39083	high	0.46958	0.5542
MEG-Au.11.29	Bureau Veritas	PIN15-09 1845-1850-S2	0.39083	high	0.46958	0.5250
MEG-Au.11.29	Bureau Veritas	PIN15-19 245-250-S2	0.39083	high	0.46958	0.5833
MEG-Au.11.29	Bureau Veritas	PIN16-19 245-250-S2	0.39083	high	0.46958	0.5833
MEG-Au.11.29	Bureau Veritas	PR18-01 245-250-S2	0.39083	high	0.46958	0.4958
MEG-Au.11.29	Bureau Veritas	PR18-52 245-250-S2	0.39083	high	0.46958	0.5833
MEG-Au.11.29	Bureau Veritas	PR18-80 245-250-S2	0.39083	high	0.46958	0.5833

Gold cyanide shaker-test analyses were performed on selected samples throughout the 2019-20 drilling programs. Both Bureau Veritas and Paragon Geochemical provided the analyses. Since no certified gold cyanide CRMs were obtained (and may not exist), the data was evaluated using means and standard deviations derived from the analyses. This provides a measure of the consistency of the assaying, not the accuracy relative to a certified CRM grade. Results of the evaluated gold cyanide data from CRMs is presented in Table 12-36. As expected with the applied methodology, only three samples exceeded the Mean +/- 3 Standard Deviations limits. The three failures, two from Paragon and one from Bureau Veritas, are listed in Table 12-37 .

Table 12-36: Summary of Pinion Results for Certified Reference Materials, Au_{CN}, 2019-2020

Standard ID	AuCN Grades in oz Au/ton			Count	Dates Used		Failure Counts	
	Average	Max	Min		First	Last	High	Low
MEG-Au.12.11	0.034	0.0403	0.0283	18	19-Dec-18	10-Dec-19	0	0
MEG-Au.17.06	0.0024	0.0032	0.0012	12	24-Dec-18	10-Dec-19	0	0
MEG-Au.17.07	0.0024	0.0056	0.0009	149	19-Dec-18	01-Mar-21	2	0
MEG-Au.19.11	0.0357	0.0403	0.0143	117	9-Jul-20	01-Mar-21	0	1
TOTALS								
4				296			2	1

Table 12-37: List of Pinion Failed Certified Reference Materials, Au_{CN}, 2019-2020

			AuCN Values in oz Au/ton			
Standard ID	Laboratory	Sample ID	Average	Fail Type High/Low	Fail Limit	Failed Value
MEG-Au.17.07	Paragon	LT20-03 45-50-A12	0.00548	high	0.00516	0.00530
MEG-Au.17.07	Paragon	LT20-05 45-50-A12	0.00548	high	0.00516	0.00560
MEG-Au.19.11	Bureau Veritas	PC20-03 408.1-410-A13	0.03684	low	0.0357	0.0143

12.6.7.2 Gold Duplicates

In both 2019 and 2020, Gold Standard collected field duplicates at intervals of 100 feet, which resulted in an average of about six duplicates per hole. A total of 713 field duplicates were taken, the results of which are summarized in Table 12-38. All original and duplicate samples in 2019 and 2020 were analyzed by the same lab. After excluding two outlier pairs where the absolute relative percent difference was great than 2000 percent, the regression line nearly coincides with the y=x line (Figure 12-17).

Table 12-38: Summary of Results for Pinion Au Field Duplicates (2019-20)

Type	Period	Counts			RMA Regression	Averages as Percent	
		All	Used	Outliers	(y = dup, x = orig)	Rel Pct Diff	Abs Rel Pct Diff
Field Dup	2019 - 2020	713	711	2	y = 0.989x - 0.0002	-2.05	21.8

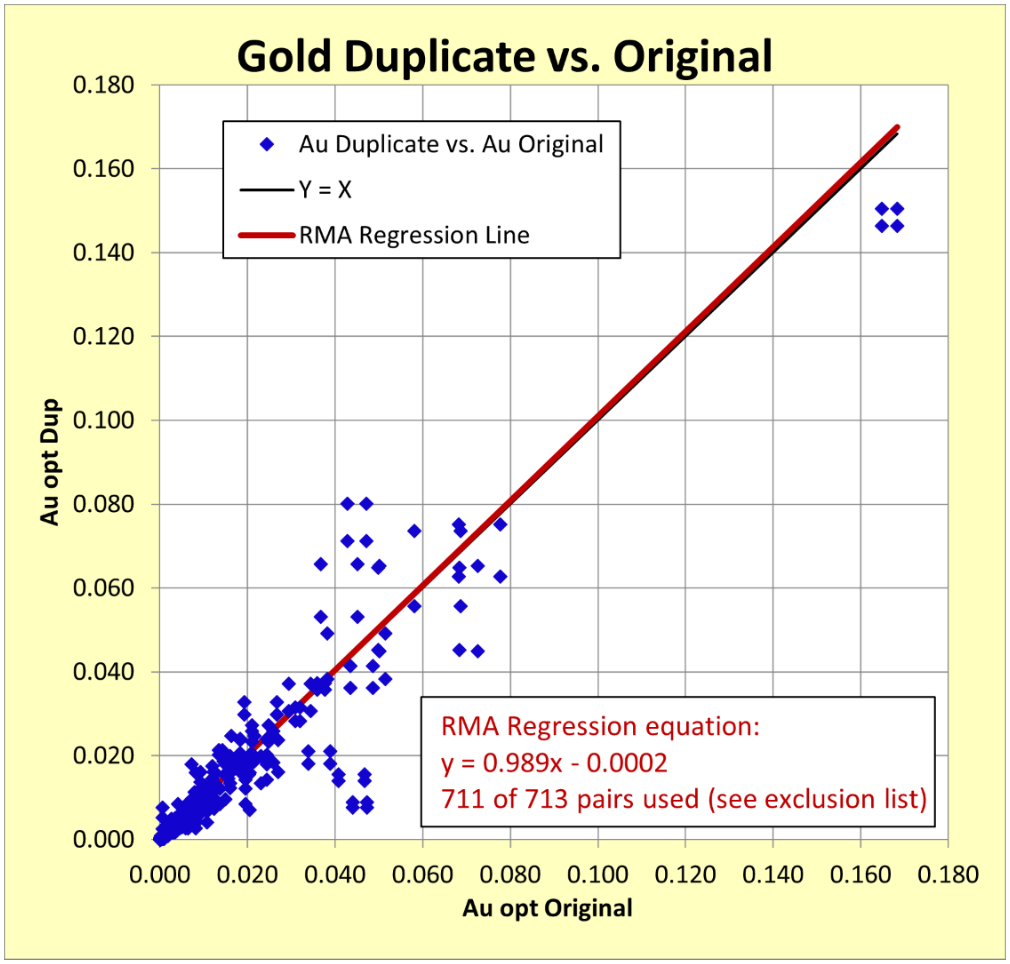


Figure 12-17: Gold Duplicate vs. Original

The relative percent difference chart shows more variability at the lower grades, and a negative bias (original assay grade > duplicate assay grade) at higher grades for both labs (Figure 12-18). No excessive variability or bias was indicated by the evaluation.

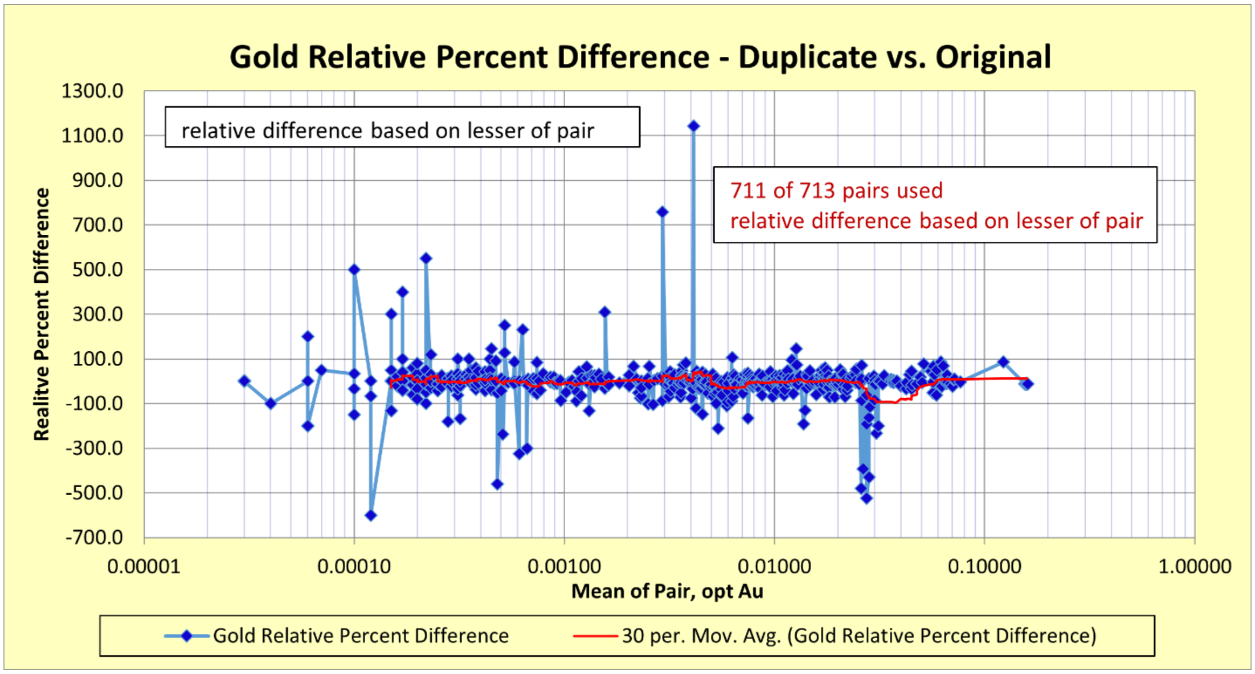


Figure 12-18: Relative Percent Difference for Gold - Duplicate vs. Original

12.6.7.3 Silver Duplicates

Pulps for field duplicates were assayed at Bureau Veritas for silver during the silver re-assay program. In total, 444 duplicates analyses were obtained. MDA's evaluation of these duplicates revealed no issues that would suggest excessive variability or bias. Table 12-39 summarizes the results for these duplicate analyses.

Table 12-39: Summary of Results for Pinion Ag Field Duplicates (2019-20)

Type	Period	Counts			RMA Regression	Averages as Percent	
		All	Used	Outliers	(y = dup, x = orig)	Rel Pct Diff	Abs Rel Pct Diff
Field Dup	2019 - 2020	444	444	0	y = 0.8671x + 0.0062	-1.48	7.63

12.6.7.4 Gold Pulp Blanks

During the 2019 to 2020 drill campaign, three certified pulp blanks from MEG were used. As previously noted, pulp blanks test for contamination during analysis, not during crushing and pulverization of the samples. The detection limits for gold are <0.000029 oz Au/ton at Bureau Veritas and 0.000146 oz Au/ton at Paragon Geochemical. Of the 214 Gold blanks analyzed, only one value was above the warning limit (5 times the detection limit). Therefore, no systematic analytical contamination was indicated. The pulp blank analyses are depicted in Figure 12-19, Figure 12-20 and Figure 12-21.

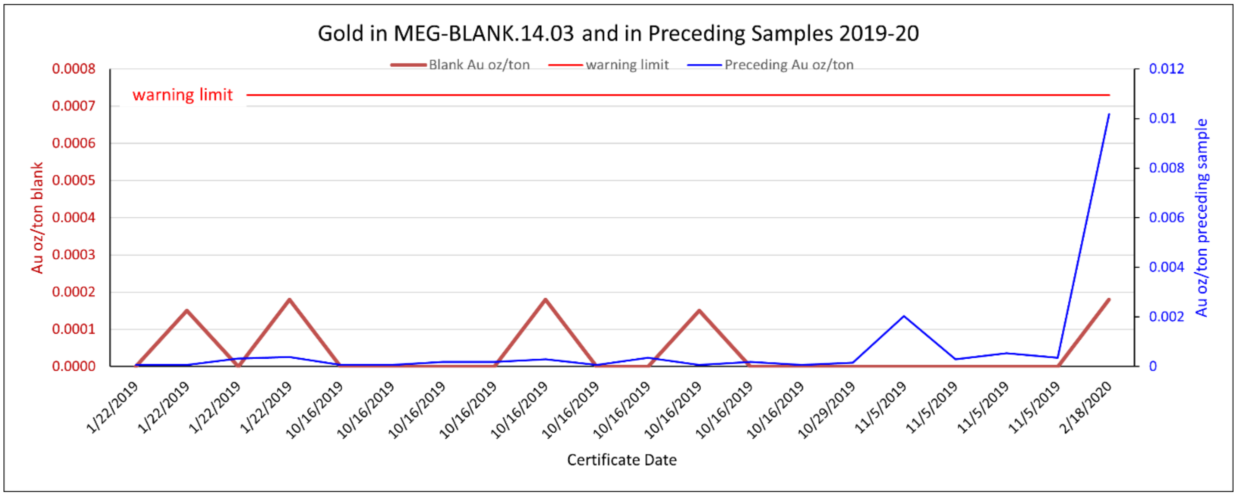


Figure 12-19: Gold Analyses of Pulp Blank MEG-BLANK.14.03 and Preceding Samples 2019-20

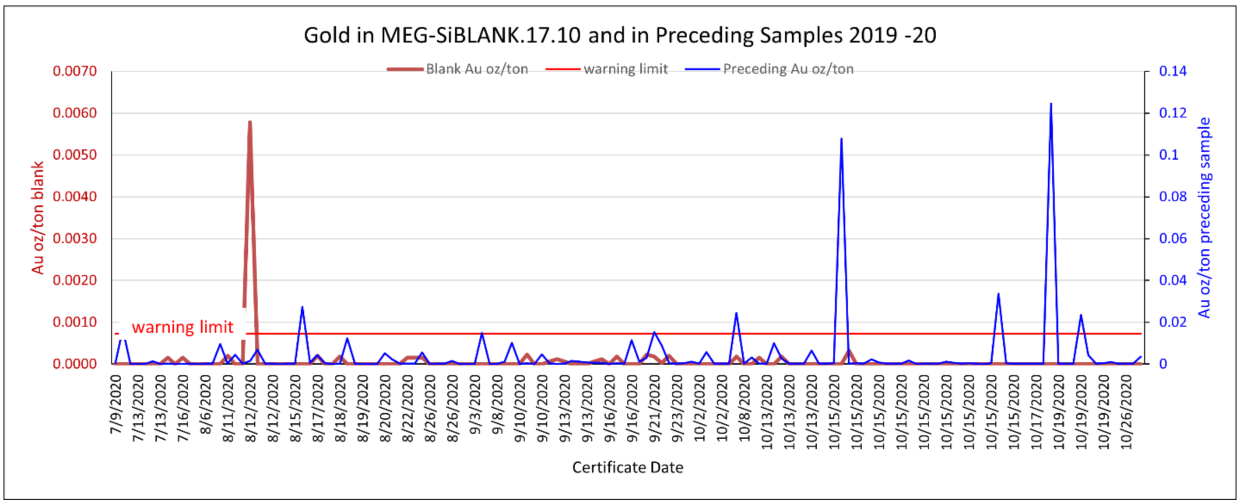


Figure 12-20: Gold Analyses of Pulp Blank MEG-SiBlank.17.10 and Preceding Samples 2020

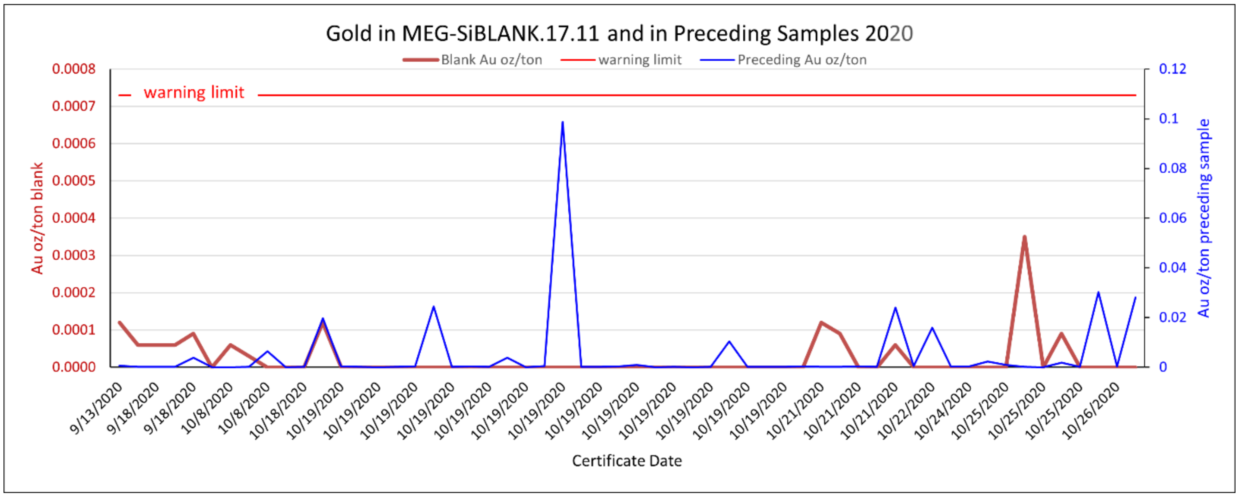


Figure 12-21: Gold Analyses of Pulp Blank MEG-SiBlank.17.11 and Preceding Samples 2020

12.6.7.5 Silver Pulp Blanks

There were 15 analyses of 668 total silver pulp blanks that returned anomalous detectable silver. The certified pulp blank from MEG is MEG-SiBlank.17.10, and results are shown graphically in Figure 12-22. The detection limit for the associated silver pulp re-runs is unusually high at 0.0292 oz Ag/ton, so the warning limit of 5 times the detection limit is correspondingly high. The consequence is that none of these detectable silver assays in pulp blanks are considered failures. However, the silver grade of the 15 pulps is still well below levels of concern with respect to the modeled silver grades. If there is some minor contamination indicated by the detectible pulp blank assays, the magnitude is very low and would not materially affect the silver resource estimate. The anomalous silver values are detailed in Table 12-40.

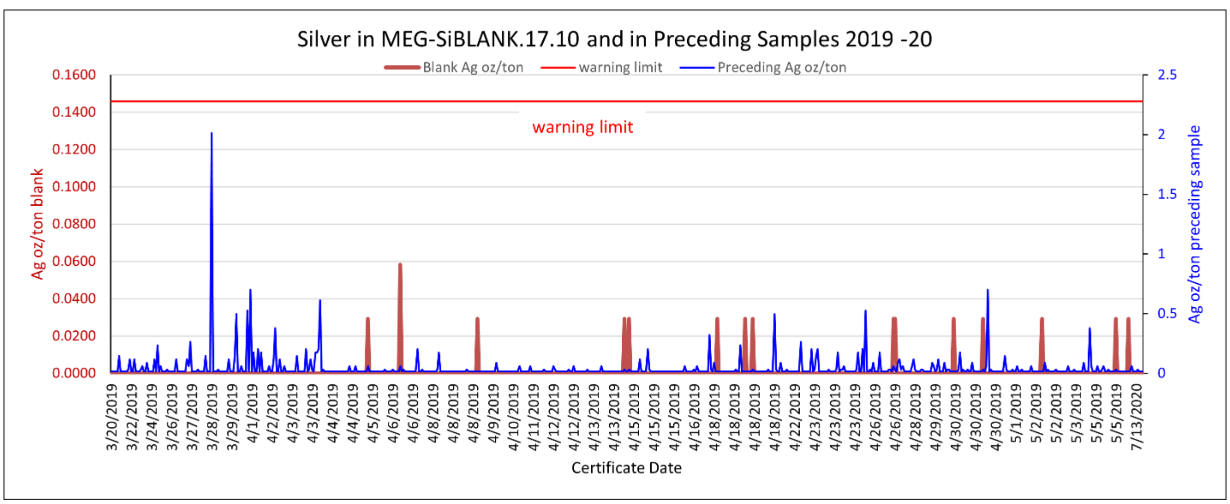


Figure 12-22: Silver Analyses of Pulp Blank MEG-SiBlank.17.10 and Preceding Samples 2019-20

Table 12-40: Anomalous Blank Sample Assays for Silver CRM MEG-SiBlank.17.10

Certificate	Method	Preceding		Blank CRM (MEG-SiBlank.17.10)	
		Sample	Value (oz Ag/ton)	Sample	Value (oz Ag/ton)
EKO19000099	AA	PIN17-18 145-150	0.05833	PIN17-18 145-150-B3	0.02917
EKO19000104	AA	PIN16-03 745-750	0.05833	PIN16-03 745-750-B3	0.05833
EKO19000125	AA	PIN16-22 145-150	0.01458	PIN16-22 145-150-B3	0.02917
EKO19000129	AA	PIN15-02 145-150	0.02917	PIN15-02 145-150-B3	0.02917
EKO19000129	AA	PIN15-02 745-750	0.02917	PIN15-02 745-750-B3	0.02917
EKO19000166	AA	PIN14-03 145-150	0.01458	PIN14-03 145-150-B3	0.02917
EKO19000154	AA	PIN15-23 545-550	0.01458	PIN15-23 545-550-B3	0.02917
EKO19000156	AA	PIN15-24 145-150	0.02917	PIN15-24 145-150-B3	0.02917
EKO19000203	AA	PIN14-40 545-550	0.05833	PIN14-40 545-550-B3	0.02917
EKO19000203	AA	PIN14-40 745-750	0.02917	PIN14-40 745-750-B3	0.02917
EKO19000209	AA	PIN14-46 545-550	0.01458	PIN14-46 545-550-B3	0.02917
EKO19000206	AA	PIN14-43 145-150	0.02917	PIN14-43 145-150-B3	0.02917
EKO19000191	AA	PIN14-28 145-150	0.01458	PIN14-28 145-150-B3	0.02917
EKO19000216	AA	PIN14-53 145-150	0.02917	PIN14-53 145-150-B3	0.02917
EKO19000218	AA	PIN14-55 490-495	0.01458	PIN14-55 145-150-B3	0.02917

12.6.7.6 Gold Coarse Blanks

The gold coarse blank material used by Gold Standard was identified as “GSV Marble Blank”. Little or no detectable gold was returned for the 114 samples analyzed. There was no apparent relationship with detectable gold and preceding sample grade, as shown in Figure 12-23. No systematic contamination during sample preparation is indicated by the coarse blank results.

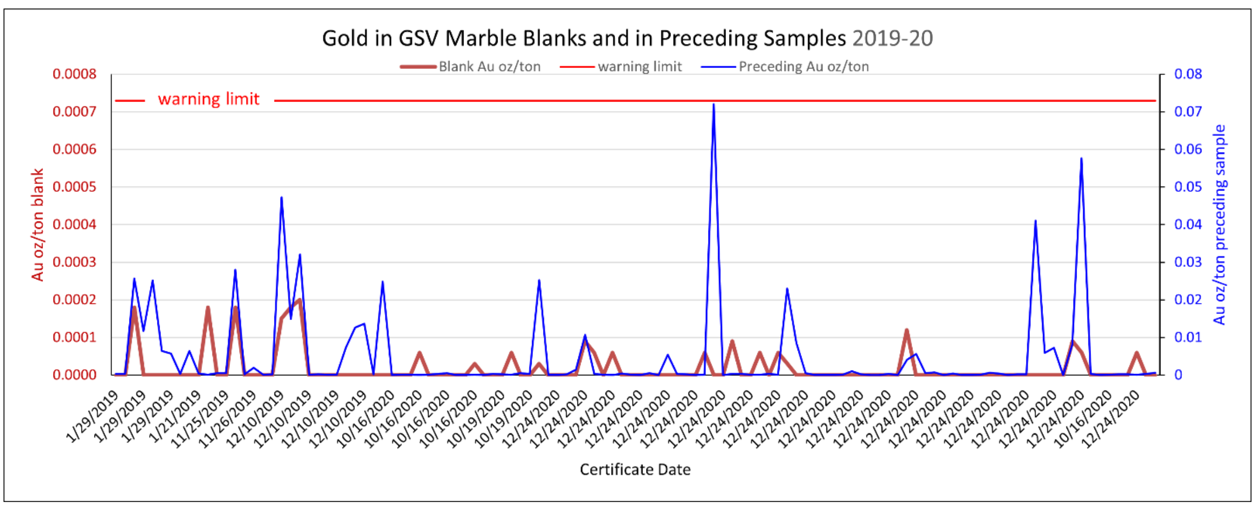


Figure 12-23: Results of Coarse Blank Analyses of Gold

12.7 JASPEROID WASH DRILL PROGRAM QA/QC

The only QA/QC data available for Jasperoid Wash was from Gold Standard's drilling campaigns in 2017 and 2018. Table 12-41 summarizes the quantities and results of QA/QC for the Jasperoid Wash drill samples.

Table 12-41: Summary Counts of Jasperoid Wash QA/QC Analyses

QA/QC Type	2017	2018
Number CRMs in Use	2	1
Number of CRM Analyses	93	93
Number of CRM Failures	1	1
Field Duplicates	113	153
Pulp Blanks	66	75
Coarse Blanks	-	10

The analysis of the QA/QC data from Jasperoid Wash for 2017 and 2018 did not reveal significant issues that would preclude use of the associated assays in a mineral resource estimate, or that would reduce the confidence in those assays. The primary issues and recommendations for future drilling programs are as follows:

- In 2017 and 2018, although three CRMs were used, only one was in use at Jasperoid Wash at any given time. The expected values for all three CRMs were either below or very close to a potential mining cutoff grade. For future drilling, it is recommended to use more than one CRM simultaneously, and to use CRMs with a range of expected values that represent grades of economic importance;
- In addition to field duplicates, the following additional types of duplicates, replicates or check assays are useful, and should be collected, analyzed and evaluated in future drill programs:
  - Preparation duplicates, also called coarse crush duplicates, are useful for monitoring for variability in the laboratory's sample-preparation circuit;
  - Analytical duplicates, sometimes called replicates, which are second splits from the original pulp; and
  - Check assays done at a different lab than the original assays.
- Only pulp blanks were used at Jasperoid Wash in 2017. In 2018, pulp blanks and coarse blanks were both used, but the latter were submitted with samples from only one drill hole. Both types of blank analyses are useful, but coarse blanks are more important, in that they are used to test for potential contamination issues in the sample preparation process. Pulp blanks only test for contamination during analysis of the prepared sample.

12.8 NORTH BULLION DEPOSITS DRILL PROGRAM QA/QC

All QA/QC data for North Railroad drilling, including exploration and within the four deposit areas collectively called the North Bullion deposits, were evaluated together. Approximately 43% of the historical drill holes at North Bullion have paper lab reports/certificates that have been utilized in part to validate the assay database. A number of these lab reports/certificates contain obvious QA/QC data. However, none were in digital format and in many cases are of unknown origin and quality, and therefore were not evaluated for the historical drilling programs. These data should be compiled and evaluated where possible.

Gold Standard incorporated a substantial number of blanks, CRMs and duplicates with assays for exploration and deposit drilling between 2010 and 2020 at the North Bullion deposit. There has been much less umpire assaying/sampling conducted with North Bullion, Sweet Hollow, POD and South Lodes mineral resource drilling, primarily because the majority of the drilling is pre-Gold Standard. For all drilling campaigns, it is not known if failed assay batches associated with QA/QC failures were re-assayed and replaced in the database used for mineral resource estimation.

12.8.1 North Bullion Drill Program QA/QC CRMs (Standards)

MDA reviewed the results obtained from the analyses of CRMs inserted by Gold Standard for the period 2010 through 2020 in their entirety, rather than by subsets of the data by deposit, campaign or year. During the period, 22 different CRMs were in use, and all were obtained from MEG. Most individual CRMs were in use for periods of one to four years, but some were used as early as 2010 and as late as 2020. The target or expected grades for the CRMs range from a low of 0.0011 oz Au/ton to a high of 0.1065 oz Au/ton. The certified values of the CRMs are expressed in units of ppm Au, but MDA has converted them to oz Au/ton in order to be consistent with units used throughout this technical report. Full sets of charts and statistics have been prepared using both grade units and compared, to ensure that no inadvertent errors were introduced during the conversion.

Ideally, the CRMs used should adequately represent the grade ranges in the deposit. Laboratories may perform differently at higher grades than at lower grades despite the application of the same analytical method. Low grade, mid-grade and high-grade gold mineral domains were modeled at North Bullion. The expected or target grades of the CRMs were summarized with respect to these mineral domains. Comparisons are illustrated in Figure 12-24 and Figure 12-25.

In Figure 12-24 the number of analyses of each CRM are indicated, sorted by expected grade and colored by mineral domain. The expected grades of the CRMs are well-distributed across the three mineral domains, whereas the numbers of analyses are more unevenly distributed. The largest number of the analyses of CRMs fall into the low-grade domain, the next largest number in the high-grade domain, and the fewest in the mid-grade domain. The lesser number of CRMs in the mid-grade domain is due to the relatively narrow grade range of the domain within which there are fewer CRM expected grades.

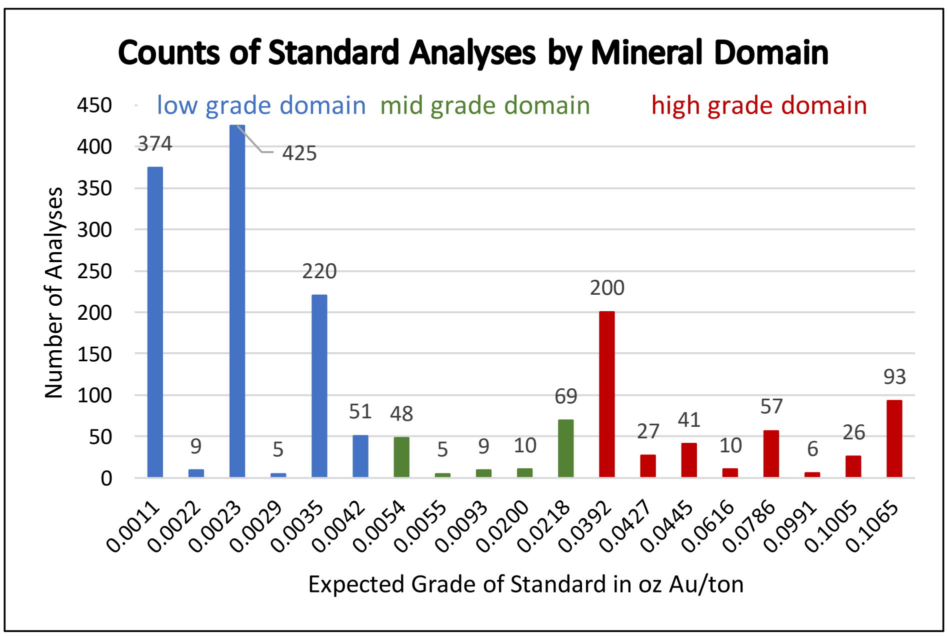


Figure 12-24: Counts of CRM Analyses by Mineral Domain

In Figure 12-25, the CRMs are plotted by time and expected grade and colored by mineral domain. Over the full-time span of the Gold Standard drilling, there is a good distribution of CRMs, but during some periods of time, one or more of the grade ranges were not represented by CRMs. For example:

- in campaigns before April 2012, high-grade CRMs were absent.
- between April 2012 and December 2013, mid-grade CRMs were not in use.
- during the 2017 campaign, only low-grade CRMs were in use.

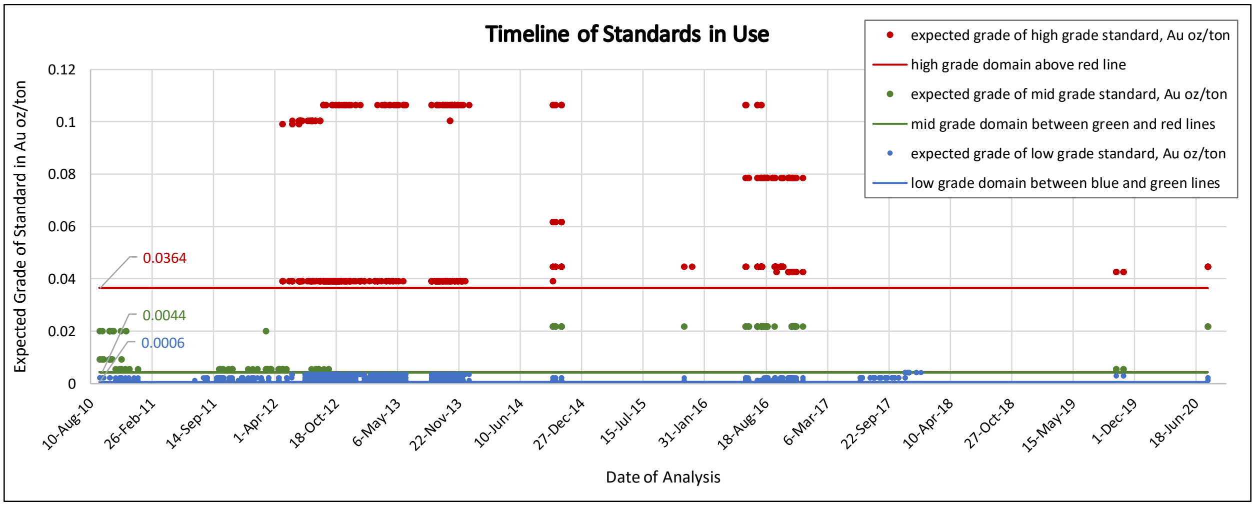


Figure 12-25: Timeline of CRMs in Use

Control charts were prepared for each of the 22 CRMs, using Excel™ with the add-in "SPC ('Statistical Process Control') for Excel™". Only one control chart is presented in this report, to illustrate the method, which is given for MEG-Au.11.19, a CRM that was used in 2012 and 2013, in Figure 12-26. Notes below the figure explain the lines and colors on the chart.

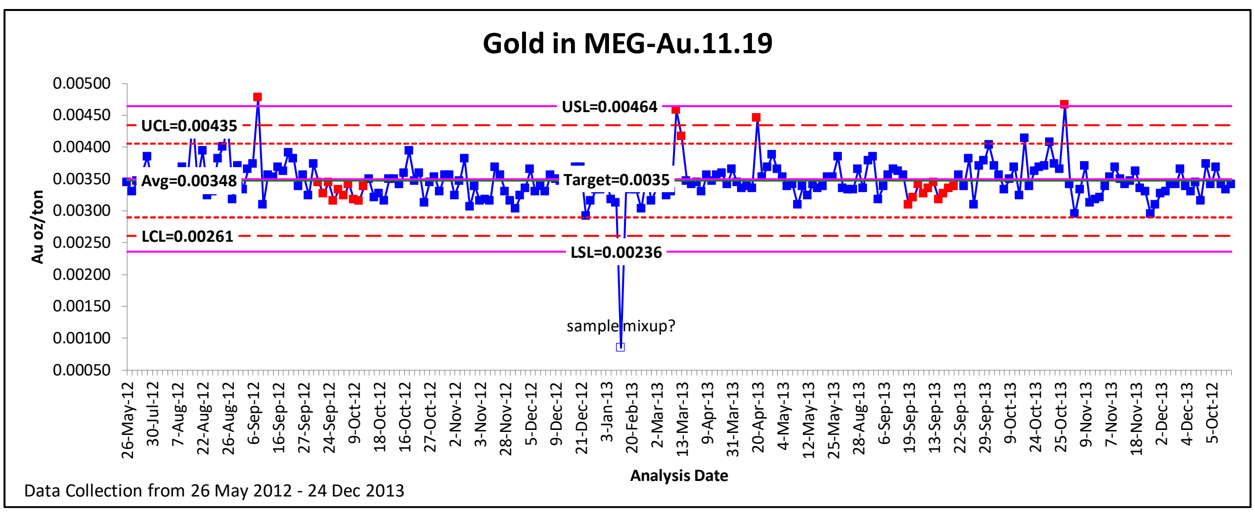


Figure 12-26: Gold in MEG-Au.11.19

Notes:

Explanations for Figure 12-26:

Items Obtained from Certificate for CRM

USL	Upper Specification Limit	Target + 3 Std Dev
Target	Expected Value	
LSL	Lower Specification Limit	Target - 3 Std Dev

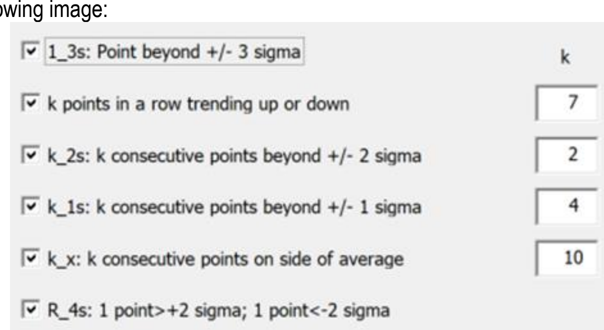
MDA considers analyses at or above/below the USL/LSL to be "failures".

Items Calculated using Gold CRM Data

UCL	Upper Control Limit	Avg + 3 Std Dev
Avg	Mean Value	
LCL	Lower Control Limit	Avg - 3 Std Dev

MDA does not use the UCL and LCL to designate "failures", but notes that a large number of analyses plotting outside these limits, even if within specification limits, could indicate excessive variability in the assaying.

The bright red data points in the control chart are colored by the software used according to the rules listed in the following image:



MDA does not apply the rules derived by Statistical Process Control in industrial settings to designate failures, but only to highlight aspects of a laboratory's performance.

Using MDA's criterion for designating failures, analyses falling at or above/below the upper/lower specification limits (magenta lines on Figure 12-26), there are three failures evident, two high and one low. MDA speculates but cannot prove that the low failure may be due to a mis-labeled CRM. The software has highlighted two periods, one in September-October 2012 and the other in September 2013, during which the laboratory was consistently reporting below average results for this CRM. The overall average value obtained for analyses of this CRM almost exactly matched the expected or target value, and the dispersion of results was less than that described in the specifications for the CRM. Overall, the performance of the laboratory on analyses of this CRM was acceptable, with a 1.4% failure rate.

Control charts like in Figure 12-26 were created to evaluate all the CRMs in the analytical data set for North Bullion. The results of these analyses are summarized in Table 12-42. The last column in Table 12-42 shows the biases obtained from the analyses of each CRM, which are calculated as:

[1]**Equation 1** $$100\ x\,\frac{average\ obtained - target\ value}{target\ value}$$

A group of analyses of a CRM by any lab will almost always show some bias relative to the target value. With the exception of the 10.5% low bias obtained for MEG-S107022X, the biases listed in Table 12-42 are within a range that is typical for analyses of CRMs, and do not indicate excessive assay variability. Given that there are only nine analyses of MEG-S107022X, the large, calculated bias is not yet considered to indicate a potential issue at the lab. However, if a low bias persists in future analyses of this CRM, it should be investigated. In general, the stronger biases tend to be

[1] The reported biases are based on the grades originally reported in ppm Au.

associated with CRMs having relatively few analyses, whereas those with large numbers of analyses tend to have smaller biases, suggesting that statistical support is a factor in the calculated biases.

Two CRMs, MEG-Au.10.04 and MEG-S107007X, are listed twice in Table 12-42, once with the suffix "EL" and once with the suffix "EKO", which were analyzed at ALS and Bureau Veritas or its antecedents, respectively. Most of Gold Standard's samples have been analyzed by ALS, but a significant number were analyzed by Bureau Veritas. When a given CRM has a significant number of analyses from both laboratories, it is an opportunity to evaluate and compare the performance of each laboratory. CRM statistical tests[2] were used to determine if the two labs produced results that were meaningfully different. The results were found to be meaningfully different only for MEG-Au.10.04 and MEG-S107007X, and are listed separately in Table 12-42.

Eleven high and seven low failures are indicated in Table 12-42, for a total calculated failure rate of about 1%. Details of the failures are listed in Table 12-43. No information as to actions that Gold Standard may have taken in response to these failures is available. In the comments in Table 12-43, MDA speculates that some of the failures may be due to mis-labeled CRM numbers, although this possibility cannot be investigated.

The results obtained for the CRM analyses employed by Gold Standard do not indicate any systemic analytical or sample-handling issues that would preclude the use of the associated sample analyses in a resource estimate.

[2] "t" tests for small data sets and "z" tests for larger ones. These are standard statistical tests used to determine if the means of two data sets are meaningfully different.

Table 12-42: Summary of Results Obtained for CRMs

CRM ID	Grades (oz Au/ton)				Count	Dates		Failure Counts		Bias pct
	Target	Average	Maximum	Minimum		Start	End	High	Low	
MEG-Au.09.01	0.0200	0.0190	0.0211	0.0178	10	8-Sep-10	4-Mar-12	0	0	-5.0
MEG-Au.09.02	0.00537	0.00513	0.00583	0.00449	48	31-Oct-10	24-Sep-12	0	0	-4.4
MEG-Au.09.04	0.0991	0.1045	0.1234	0.0963	6	26-Apr-12	18-Jun-12	1	0	5.5
MEG-Au.10.02	0.00105	0.00102	0.00130	0.00080	374	31-Oct-10	27-Jul-20	0	0	-2.8
MEG-Au.10.04 EL	0.0023	0.0024	0.0035	0.0006	370	31-Oct-10	27-Jul-20	2	1	2.5
MEG-Au.10.04 EKO	0.0023	0.0023	0.0026	0.0020	55	12-Aug-16	23-Oct-17	0	0	0.0
MEG-Au.11.15	0.1005	0.1070	0.1270	0.0870	26	29-May-12	24-Oct-13	4	1	6.2
MEG-Au.11.17	0.0786	0.0812	0.0880	0.0739	57	12-Jun-16	16-Dec-16	0	0	3.4
MEG-Au.11.19	0.0035	0.0035	0.0048	0.0009	220	26-May-12	24-Dec-13	2	1	-0.8
MEG-Au.11.29	0.1065	0.1100	0.1340	0.0750	93	6-Sep-12	3-Aug-16	0	1	3.3
MEG-Au.11.34	0.0616	0.0636	0.1943	0.0564	10	24-Sep-14	21-Oct-14	2	0	3.2
MEG-Au.12.11	0.0427	0.0445	0.0468	0.0418	27	22-Sep-16	26-Oct-19	0	0	4.1
MEG-Au.12.21	0.0042	0.0040	0.0043	0.0037	51	14-Nov-17	4-Jan-18	0	0	-4.9
MEG-Au.13.02	0.0218	0.0221	0.0232	0.0210	69	24-Sep-14	27-Jul-20	0	0	1.7
MEG-Au.17.06	0.0029	0.0030	0.0032	0.0027	5	2-Oct-19	26-Oct-19	0	0	4.1
MEG-Au.17.07	0.0055	0.0058	0.0059	0.0057	5	2-Oct-19	26-Oct-19	0	0	5.9
MEG-S107005X	0.0392	0.0396	0.0454	0.0004	200	26-Apr-12	24-Sep-14	0	2	1.2
MEG-S107007X EL	0.0445	0.0457	0.0468	0.0369	29	24-Sep-14	27-Jul-20	0	1	2.6
MEG-S107007X EKO	0.0445	0.0465	0.0494	0.0449	12	22-Jul-16	5-Aug-16	0	0	4.5
MEG-S107020X	0.0093	0.0091	0.0096	0.0084	9	8-Sep-10	19-Nov-10	0	0	-2.8
MEG-S107022X	0.0022	0.0020	0.0023	0.0018	9	8-Sep-10	16-Nov-10	0	0	-10.5
Sum or Count					**1,685**			**11**	**7**	
Percent					**100**			**0.65**	**0.42**	

Table 12-43: List of Failed Analyses of CRMs

CRM ID	Sample ID	Target for Std	Fail Type High/Low	Fail Limit	Failed Value	Comment
MEG-Au.09.04	RR12-05 1524A	0.0991	high	0.1169	0.1234	
MEG-Au.10.04	RR11-13 1645A	0.0023	high	0.0029	0.0035	mix-up with MEG-Au.11.19 ?
MEG-Au.10.04	RR12-19 1808A	0.0023	low	0.0017	0.0006	
MEG-Au.10.04	RR17-02 1090-1100-A2	0.0023	high	0.0029	0.003	rounding issue?
MEG-Au.11.15	RR12-05 1072A	0.1005	high	0.112	0.127	
MEG-Au.11.15	RR12-04 1332A	0.1005	low	0.089	0.087	
MEG-Au.11.15	RR12-08 1015A	0.1005	high	0.112	0.118	
MEG-Au.11.15	RR12-09 1187A	0.1005	high	0.112	0.113	
MEG-Au.11.15	RR12-08 1845A	0.1005	high	0.112	0.116	
MEG-Au.11.19	RR12-10 694A	0.0035	high	0.00464	0.00478	
MEG-Au.11.19	RR12-30 1092A	0.0035	low	0.00236	0.00085	sample mix-up?
MEG-Au.11.19	RRB13-03 116A	0.0035	high	0.00464	0.00467	
MEG-Au.11.29	RR13-01 1840A	0.1065	low	0.0786	0.075	mix-up with MEG-Au.11.17?
MEG-Au.11.34	RRB14-01 850A	0.0616	high	0.0767	0.0992	mix-up with MEG-Au.11.15?
MEG-Au.11.34	RRB14-01 250A	0.0616	high	0.0767	0.1943	sample mix-up?
MEG-S107005X	RR12-07 936.5A	0.0392	low	0.03173	0.02806	
MEG-S107005X	RR10-15 1698A	0.0392	low	0.03173	0.00044	sample mix-up?
MEG-S107007X	RR16-05 700A	0.0445	low	0.03857	0.0369	mix-up with MEG-S107005X?

12.8.2 North Bullion Drill Program QA/QC Field and Laboratory Duplicates

Gold Standard routinely collects field duplicates and has provided MDA with analytical results for the various campaigns in the period 2010 – 2019. MDA does not have a comparable data set for any other types of duplicates from Gold Standard covering a similar time span. However, assay certificates from Bureau Veritas contain data for the laboratory's internal QA/QC, including preparation duplicates (also called coarse crush duplicates) and pulp duplicates. The internal lab QA/QC data associated with assays performed by Bureau Veritas in 2016, 2017 and a few in 2019 has been compiled and evaluated by MDA.

For each of the three sets of duplicates, three types of charts were prepared:

- A scatterplot, showing a reduced major axis ("RMA") regression,
- A quantile/quantile ("QQ") plot, and
- Several relative difference plots (see explanation below, and for Figure 12-27 and Figure 12-28).

Relative difference is expressed as a percentage for each duplicate pair calculated as follows:

Equation 2 $$100\ x\ \frac{(Duplicate - Original)}{Lesser\ of\ (Duplicate, Original)}$$

An alternative calculation, which MDA also uses but does not include in Table 12-44, is:

Equation 3 $$100\ x\ \frac{(Duplicate - Original)}{Mean\ of\ (Duplicate, Original)}$$

Figure 12-27 and Figure 12-28 are examples of relative difference plots based on Equation 2, which depict gold in preparation duplicates. The above equations produce negative values that plot below the "0" line on the charts when the original assay is greater than the duplicate assay. In Figure 12-27 all data are used, and a number of pairs with extreme relative differences (outliers) are evident. The underlying statistics for the relationships between original and duplicate samples can be skewed by a few such outliers, obscuring underlying relationships prevailing in most of the data. For the statistics presented in this discussion, the most extreme outliers apparent on plots such as Figure 12-27 were removed. Figure 12-28 is a plot of the same data, but with ten outliers removed. The statistics presented in Table 12-44 are based on data sets with outliers removed.

Although outlier assays are removed for calculating statistics, they are important to consider. Duplicate sample pairs of analyses are expected to be similar, but in the case of outliers, the assays are radically different. Efforts should be made to understand the causes for outliers, particularly when a large number occur, which could indicate extreme and undesirable assay variability produced by the lab, or an inherent nugget effect in the deposit.

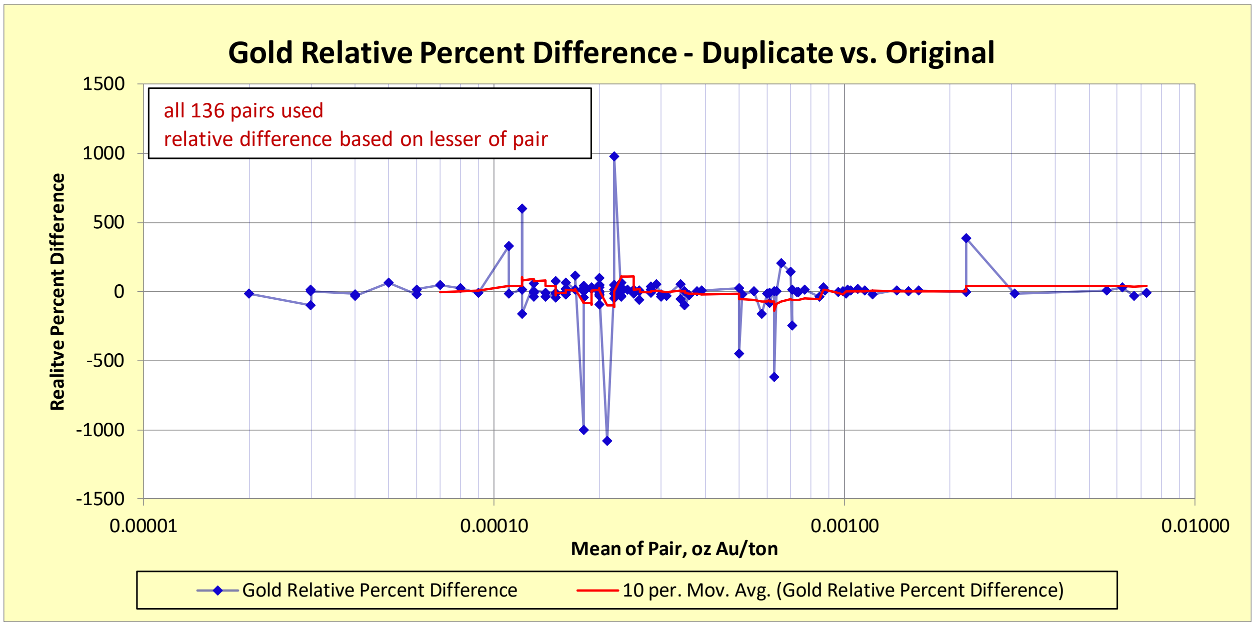


Figure 12-27 Relative Percent Difference - Gold in Preparation Duplicates

(showing all data)

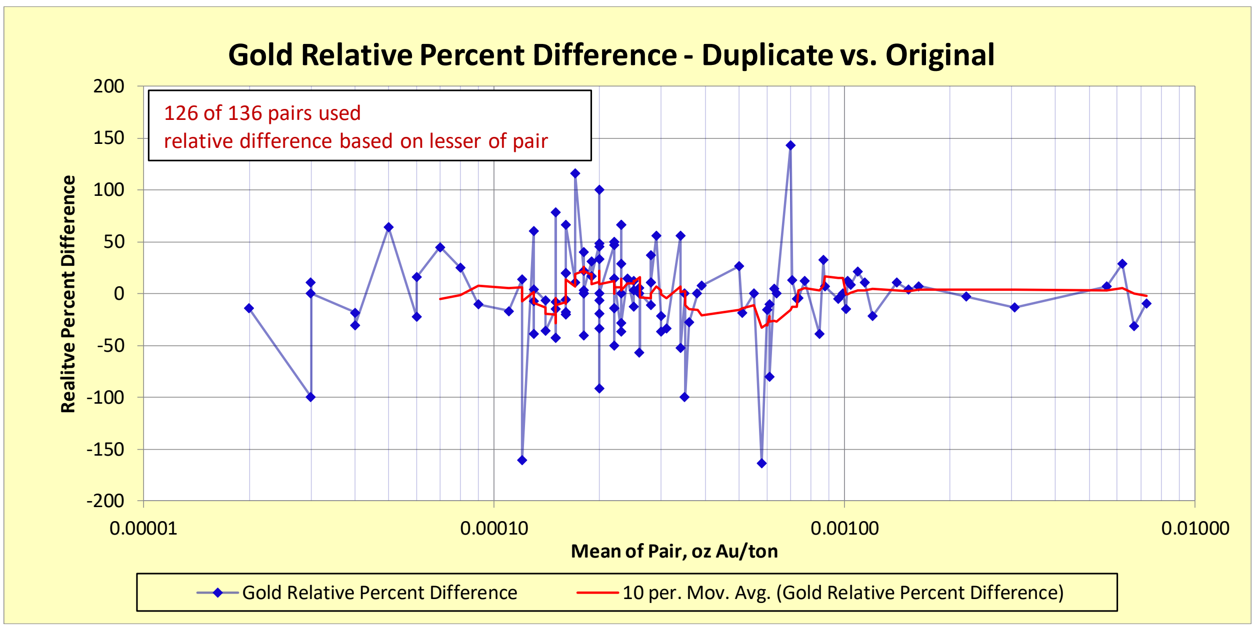


Figure 12-28 Relative Percent Difference - Gold in Preparation Duplicates

(outliers removed from data)

Table 12-44 summarizes the results for the field, preparation and pulp duplicate analyses. The averages of the relative differences listed in Table 12-44 are based on Equation 2 and provide indications of the biases between duplicate and the original assays. The “Abs Rel Pct Diff” is the average of the absolute relative differences and gives an indication of the degree of variability between duplicates and originals.

The field duplicates and the preparation duplicates show similar variability, as expressed by the absolute relative differences. The pulp duplicates show the least variability, as is expected.

The field duplicates exhibit a bias compared to the original field samples of +5%, as expressed by the relative differences. The cause for the overall bias is not known. Smaller positive biases are present in the preparation and pulp duplicates.

In Table 12-44 there are three rows for each of the preparation and pulp duplicates. In each case the first row is for the complete data set, followed by rows for lower-grade and higher-grade subsets. In the case of the preparation duplicates, Figure 12-28 shows that for grades up to about 0.0007 oz Au/ton, the variability appears to be significantly greater than at higher grades. A similar difference between lower and higher grades is evident on the equivalent plot (not shown) for the pulp duplicates. As expected, the lower grade subsets show greater variability than at higher-grades, as expressed by the absolute relative differences.

In addition to the relative differences, there are two other methods for expressing the relationship between the original and duplicate samples. These are RMA regression equations and Pearson correlation coefficients, which are also given in Table 12-44. A paired-sample t-Test was also run for each data set, and can be used to qualify differences in the means. Results of the t-Tests are not given in Table 12-44, but in all cases indicate that the original and duplicate assay sets likely belong to similar populations.

The magnitude of variability and bias noted in the duplicate data are typical for exploration data sets associated with gold deposits. Results do not preclude the use of Gold Standard's assay data for the North Bullion gold resource estimate.

Table 12-44: Summary of Results for Duplicates

Type of Duplicate	Period		Counts			RMA Regression	Grade Avgs. oz Au/ton		Averages as Percent		Correlation
	Start Date	End Date	All	Used	Outliers	(y = dup, x = orig)	Originals	Duplicates	Rel Pct Diff	Abs Rel Pct Dif	Coefficients
Field Dup	8-Sep-10	26-Oct-19	369	355	14	y = 1.043x - 0.002	0.00502	0.00516	5.0	26.9	0.97
Preparation Dup	22-Jul-16	26-Oct-19	136	126	10	y = 0.951x + 0.001	0.00058	0.00058	0.5	28.6	0.95
Preparation Dup < 0.0007	22-Jul-16	26-Oct-19	136	102	10	y = 0.833x + 0.001	0.00023	0.00023	0.3	32.1	0.78
Preparation Dup ≥ 0.0007	22-Jul-16	26-Oct-19	136	24	10	y = 0.946x + 0.004	0.00207	0.00207	1.2	13.4	0.97
Pulp Dup	22-Jul-16	26-Oct-19	179	169	10	y = 1.02x + 0	0.00347	0.00353	2.0	16.9	0.79
Pulp Dup < 0.0007	22-Jul-16	26-Oct-19	179	122	10	y = 1x + 0	0.00029	0.00029	2.1	20.4	0.93
Pulp Dup ≥ 0.0007	22-Jul-16	26-Oct-19	179	47	10	y = 1.02x + 0	0.0117	0.0119	1.7	8.0	1.00

12.8.3 North Bullion Drill Program QA/QC Blanks

Blanks are samples known to contain negligible quantities of elements of interest and are used to monitor a laboratory to ensure that it is not issuing higher assays than it should. MDA has data for analyses of blanks at North Bullion starting in 2010. Since then, eight different blanks have been used for various periods of time; six commercial pulp blanks supplied by MEG, a blank consisting of unmineralized marble, and one whose nature is unknown. The results are summarized in Table 12-45. Explanations for some of the items listed are in the notes that follow the table.

Table 12-45 Summary of Results for Blanks

Blank ID	Type	Counts		Maximum	Dates of Analyses	
		All	Above Warn	oz Au/ton	Start	End
Gold Standard Marble	coarse	51	0	0.00061	24-Jul-17	4-Jan-18
MEG-BLANK.11.02	pulp	246	3	0.00114	3-Dec-10	14-Nov-12
MEG-BLANK.12.01	pulp	431	1	0.00125	4-Jan-12	9-Nov-13
MEG-BLANK.12.03	pulp	186	0	0.00047	9-Oct-13	21-Oct-14
MEG-BLANK.14.01	pulp	251	1	0.00166	12-Aug-11	27-Jul-20
MEG-BLANK.14.02	pulp	83	21	0.02205	6-Oct-16	14-Nov-16
MEG-BLANK.14.03	pulp	129	0	0.00023	24-Nov-16	26-Oct-19
Unknown Blank	unknown	189	3	0.02333	8-Sep-10	5-Dec-12
	Sum	1,566	29			
	Percent	100	1.9			

Notes: "Type" indicates coarse blank or pulp blank. Coarse blanks undergo the full sample preparation and analytical process. Pulp blanks are essentially CRMs with no grade that undergo only the analytical process. Coarse blanks are more informative because contamination that might occur in crushing, grinding and pulverizing circuits is tested.
"Above Warn" indicates the number of the blanks for which analyses above a warning limit were obtained.
For this review, the warning limit is five times the detection limit of the assay methods used by the laboratories.
"Maximum" is the highest-grade assay obtained for the blank.

The results summarized in Table 12-45 indicate the laboratory performance on blank material is generally acceptable with one exception. More than a quarter of the results for MEG-BLANK.14.02 are above the warning limit, and more significantly, above 0.02 oz Au/ton. Because the high gold assays are consistent as a group, MDA suspects that a CRM has been mis-labeled as the blank, although this cannot be verified. It can be noted that for CRM samples analyzed during the same time period, there is no evidence to suggest that analytical errors of a similarly large magnitude occurred.

Analytical data for blanks are presented using "run charts", which are similar to control charts for CRMs, but do not have statistically derived control limits. A run chart for each of the eight blanks listed in Table 12-45 was prepared, an example of which is shown in Figure 12-29.

In Figure 12-29 two lines representing data are plotted. The thicker dark red line is the blank assays, and the thinner blue line represents assays of samples that immediately precede the blanks in the sample stream. Plotting the two sets of assays together provides a visual impression of the correlation between contamination and preceding high-grade samples, if it exists. In Figure 12-29 there are two cases in which the correlation appears to be established, which might indicate contamination. However, in most of the data plotted on the figure, there is no obvious relationship between the grades of blanks and those of preceding samples, suggesting that if such contamination occurred, it was not systemic and did not affect the majority of analyses in this particular blank.

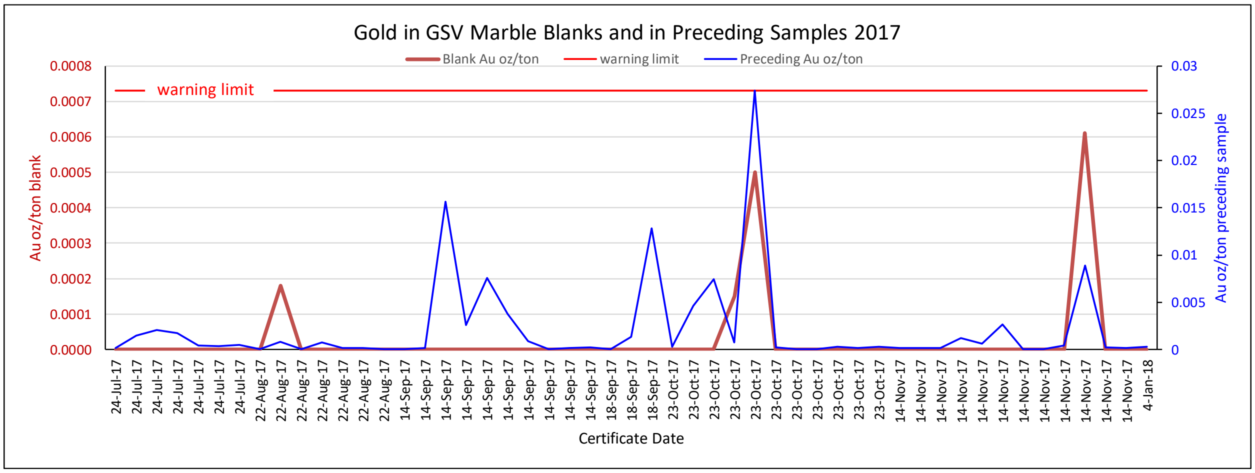


Figure 12-29: Gold in Gold Standard Marble Blanks and in Preceding Samples

Results for the Gold Standard marble blank, the only coarse blank in the data set, are given in Figure 12-29. It was in use for only a few months in the latter part of 2017. All the other analyzed blanks of known type are pulps, which are not useful for testing for contamination in the grinding, crushing and pulverizing circuits of the labs. Pulp blanks do serve to test for false high values in the analytical processes.

With the exception of the relatively high-grade analyses associated with MEG-BLANK.14.02, the results returned for the blanks are acceptable, and do not indicate systematic contamination issues. About 0.5% of the analyses of the other seven blanks returned results above the warning limit, and of those, only one analysis of an unknown blank type, was extremely high. The grade of this single high-grade failure is similar to the high values returned for MEG-BLANK.14.02, suggesting it is also a mis-labeled CRM.

12.9 SUMMARY STATEMENT ON DATA VERIFICATION

Based on the results of the data verification and QA/QC evaluations, it is Mr. Lindholm's opinion that the Dark Star, Pinion, and Jasperoid Wash analytical data are adequate for the purposes used in this Technical Report, subject to those samples removed and issues described above. The issues described above have been considered in assigning levels of confidence and the classification of the mineral resources estimated in Section 14.

Data for QA/QC programs applied to drilling campaigns prior to the first work by Gold Standard in 2014 is sparse or absent for Pinion and the North Bullion deposit on the North Bullion property. Available QA/QC data for Jasperoid Wash is limited to 2017 and 2018, and very limited overall for the Sweet Hollow, POD and South Lodes deposits at North Bullion. However, relatively significant quantities of QA/QC data from 1991 and 1997 was evaluated for historical drilling at Dark Star. As a result, confidence in historical data is lower than for Gold Standard drill-hole data, and has been accounted for by reducing resource classification when estimated grades in the block model rely primarily on historical assays.

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13 MINERAL PROCESSING AND METALLURGICAL TESTING

The current study of the South Railroad portion of the Railroad-Pinion property focuses on two main sources of ore: The Pinion and Dark Star deposits. Prior to acquisition of the property by GSV, numerous bottle roll and column leach tests were performed on these deposits using RC cuttings, diamond drill hole samples, and trench samples. A summary of these early tests is presented in Table 13-1.

Column leach tests on Pinion samples attained gold recoveries as high as 69% (trench samples, -¼" crush). In general, bottle roll tests achieved higher maximum gold recoveries: 80.6% for Pinion and 82.2% for Dark Star.

Bottle roll and column leach recoveries for Pinion trench samples were inversely proportional to logarithm of particle size, as shown in Figure 13-1.

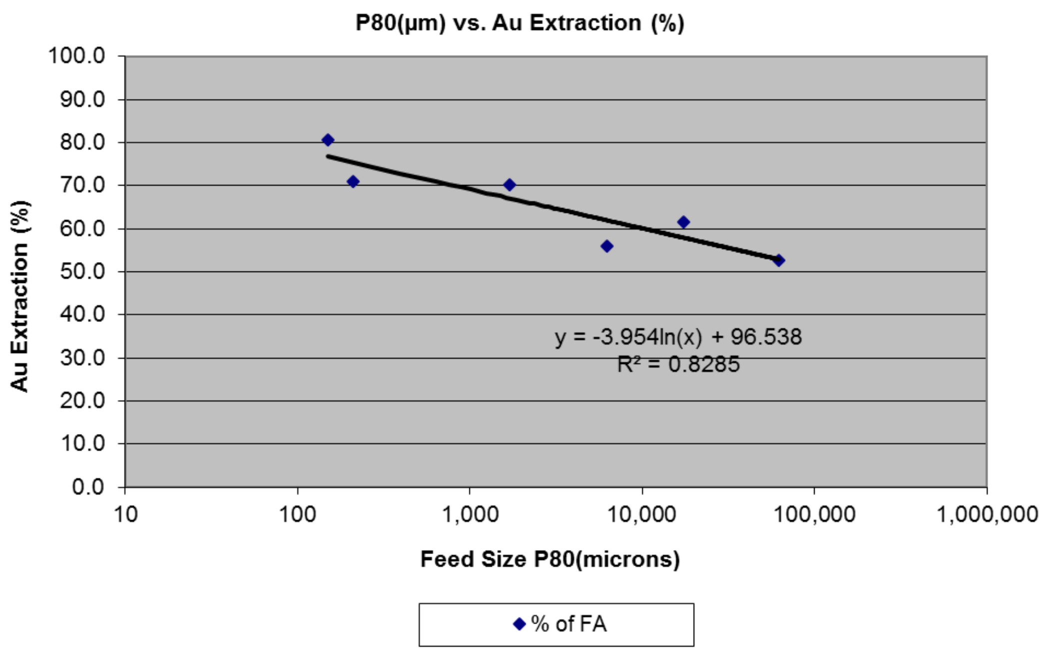


Figure 13-1: Plot of Column P_{80} (microns) vs. Gold Extraction (%)

Table 13-1: Summary of Metallurgical Tests Prior to Gold Standard Ventures Tests.

Company	Lab and Test		Sample	Time h	P_{80} (P_{100}) mm	Au Rec %	Ag Rec %	Calc Heads		NaCN lb/t	Lime lb/t	Comments
								oz/t Au	oz/t Ag			
PINION 1994-1995												
Cyprus	McClelland	BR	35 Composite of RC cuttings		1.68	66.10%						Rapid reaction, low CN, moderate lime
					0.21	60.6 - 68						
					0.074	3.8% Incr						Fine grind had little effect
		COL	880 kg bulk surface samples		(-2" & -3/4")	52.8 - 61.5						
		BR	880 kg bulk surface samples		(-1/2"-100 mesh)	55.9- 80.6						
PINION 2004												
RSM	KCA	BR	5 trench samples	72	0.075	78%	54%	0.048	0.670	0.63	4	
		COL	5 trench samples		0.53 " (-1.5")	57%	31%	0.046	0.29	1.35	2	
					0.35" (-0.5")	59%	33%	0.049	0.42	1.08	2	
					0.04 (-0.25)	69%	62%	0.048	0.37	1.88	2	
DARK STAR 1991												
Crown	McClelland	BR	158 RC cuttings (1.52 m drill intervals), 8 comps	96	59.8% -10 mesh	82.2		0.011-0.043		0.27	10.5	most of Au leached after 24 h

13.1 2015 – 2016 GOLD STANDARD PINION DEPOSIT CYANIDE BOTTLE-ROLL LEACH

Gold Standard commissioned three related bottle-roll test programs at KCA on a large number of samples extracted from composites made from Pinion drill intervals. The results were documented in three separate reports as follows: KCA (2016a), KCA (2016b), and KCA (2016c).

KCA (2016c) documented test results for 90 RC variability composites and KCA (2016b) reported results for 10 of the original 90 composites that were selected for re-run cyanide bottle-roll leach testing due to insufficient leach time. KCA (2016a) reported results on an additional 12 RC variability composites. Composites consisted of mostly oxide materials with some transition and sulfide samples.

13.1.1 2015 – 2016 Pinion Head Assays

Head assays and geo-metallurgical characterization were obtained for all 90 composites using a combination of three separate laboratories: KCA, ALS, and FL Schmidt (Simmons, 2019, Appendices 1,2, and 3), with the following results:

- Gold grade ranged from 0.19 to 4.41 ppm and averaged 0.81 ppm;
- Silver grade ranged from 0.62 to 72.3 ppm and averaged 6.9 ppm;
- Organic carbon (not preg-robbing) ranged from 0.02 to 3.68% and averaged 0.18%;
- Sulfide sulfur ranged from <0.01 to 4.18% (in the sulfide sample) and averaged 0.19%;
- Preg-robbing analysis ranged from -1.70 to 35.2% and averaged 2.2%, which is considered non-preg robbing;
- Copper values by ICP were very low, ranging from 5 to 39 ppm;
- Cyanide solubility of gold ranged from 7.4 to 100% and averaged 78.3%;
- Concentrations of the deleterious elements by ICP were: <5 ppm selenium, mercury ranged from 0.02 to 7.7 ppm, and arsenic was low at 47 to 1,360 ppm and averaged 280 ppm;
- Concentrations of the primary cyanide consumers were low and suggest minimum potential for affecting cyanide-consumption rates. Copper averaged 17 ppm, nickel averaged 22 ppm, and zinc averaged 67 ppm; and
- Silica content ranged from 28.1 to 96.7% by whole-rock analysis and averaged 81.4%.

13.1.2 2015 – 2016 Pinion Bottle-Roll Test Results

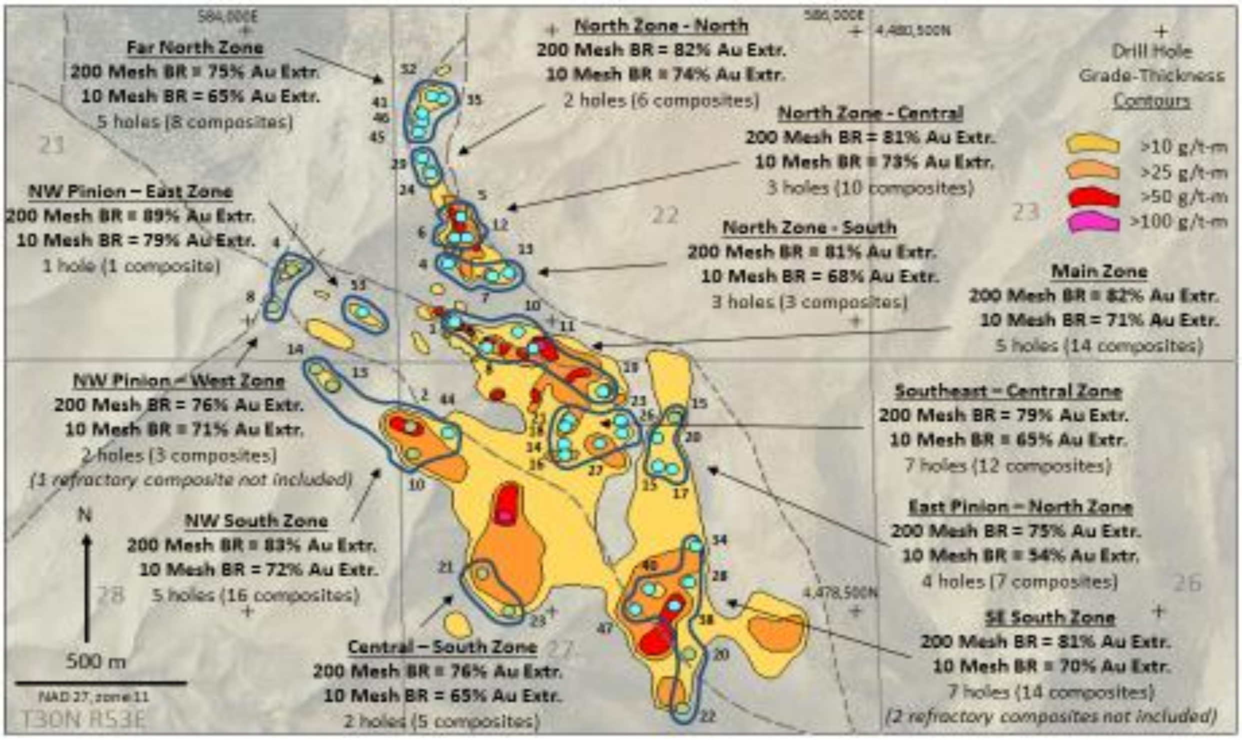
Bottle-roll leach cyanidation testing was conducted on 102 drill-core composites to evaluate the general leachability character of the Pinion geologic mineral resource. By design, these composites are not constrained by any pit shapes and therefore many of the composites may be located outside of any future economic pit limit. Bottle-roll testing was conducted at two targeted particle sizes: 80% passing 1,700 µm (10 mesh) and 80% passing 75 µm (200 mesh). Initially, retention times were 48-hrs for the 75 µm samples and 96-hrs for the 1,700 µm samples. Gold extraction results revealed that a significant number of samples were not completely leached in the allotted time frames.

Obvious under-leached samples were selected for re-leaching. The 75 µm samples were re-leached for 96 hours and the 1,700 µm samples were re-leached for 144 hours. All subsequent bottle-roll testing in a later program, KCA (2016a), were conducted at the longer retention times.

The 1,700 µm bottle-roll testing followed a standard procedure that is described in detail by the final KCA reports (KCA 2016a). The 75 µm bottle-roll procedure was the same as for the 1,700 µm bottle rolls, except the retention time was reduced to 96 hours. Results for the 1,700 µm bottle-roll test and 75 µm bottle-roll procedure are shown in Appendix 4 and 5 from the Metallurgy Report (Simmons, 2019).

For metallurgical testing, the Pinion mineral resource was divided into 12 zones. These are the Far North Zone (“FNZ”), North Zone North (“NZ-N”), North Zone Central (“NZ-C”), North Zone South (“NZ-S”), Main Zone (“MZ”), South East

Central Zone ("SE-CZ"), East Pinion North Zone ("EP-NZ"), SE South Zone ("SE-SZ"), Central South Zone ("C-SZ"), NW South Zone ("NW-SZ"), NW Pinion West Zone ("NWP-WZ"), and the NW Pinion and East Zone ("NWP-EZ"). The zones from which each of the 102 composited sample material originated are shown in Figure 13-2 and listed in Metallurgical Report (Simmons, 2019, Appendices 4 and 5).



(bottle-roll cyanide-leach average gold recoveries, 200 and 10 mesh tests; composites from 2014 and 2015 Gold Standard drill holes at the Pinion deposit)

Figure 13-2: Pinion Zone Location Map for 2015 – 2016 Metallurgical Composites

Direct agitated cyanidation (bottle roll) tests were conducted on each of the 102 drill-core composites at particle size 80% passing 1.7 mm (10 mesh) and 75 µm (200 mesh), to determine gold extraction, extraction rate, reagent consumption, and sensitivity to feed size. The following is a summary of the findings from the bottle-roll test results:

13.1.2.1 10-Mesh Bottle-Roll Results 2015 - 2016

Gold head grades for the composites ranged from 0.15 to 4.65 ppm Au (average = 0.74 ppm Au). Gold extraction results ranged between 0.0 and 86.2% (average = 65.0%). Three of the composites were sulfide (74852L, 74852M, and 74863I), and after removing them from the data set, the remaining transition and oxide composites ranged from 40.7 to 86.2% gold extraction (average = 66.7%).

Silver head grades for the composites ranged from 0.53 to 67.97 ppm Ag (average = 6.70 ppm Ag). Silver extraction results ranged from 3.1 to 69.4% (average = 24.3%). Three of the composites were sulfide (74852L = 10.5%, 74852M = 8.9%, and 74853I = 12.3%), and after removing them from the data set, the remaining transition and oxide composites averaged 24.7% silver extraction.

Cyanide consumption averaged 0.48 kg/t and lime consumption averaged 1.66 kg/t, with the three sulfide composites excluded from the averages.

13.1.2.2 200-Mesh Bottle-Roll Results

Gold head grades for the composites ranged from 0.16 to 4.19 ppm Au (average = 0.75 ppm Au). Gold extraction results ranged from 0.0 to 94.0% (average = 76.1%). Three of the composites were sulfide (74852L, 74852M, and 74863I), and after removing them from the data set, the remaining transition and oxide composites had gold extractions from 44.3 to 94.0% (average = 77.9%).

Silver head grades for the composites ranged from 0.55 to 53.3 ppm Ag (average = 6.37 ppm Ag). Silver extraction results ranged between 13.0 and 83.0% (average = 46.8%). Three of the composites were sulfide (74852L = 23.5%, 74852M = 20.0%, and 74853I = 24.5%), and after removing them from the data set, the remaining transition and oxide composites averaged 47.5% silver extraction.

Cyanide consumption averaged 3.15 kg/t and lime consumption averaged 1.18 kg/t, with the three-sulfide composited excluded from the averages.

13.2 2016 - 2017 GOLD STANDARD PINION DEPOSIT METALLURGICAL TESTING

In 2016 - 2017, a total of 33 composites were made from intervals selected from 10 core holes, on two cross-sections, located in the Pinion North and NW Pinion Main zones. The drill hole locations for the 2016 – 2017 composites are shown in Figure 13-3. These composites were used for column-leach, bottle-roll, and load permeability testing at KCA in Reno, Nevada, and results are documented in a final report by KCA (2017a).

Fourteen of the 33 composites were selected and shipped to Hazen Research, Inc. ("HRI") in Golden, Colorado, for SMC testing (SMC Test®) and Ai testing. Comminution and abrasion final test results were reported in KCA (2017a) and in a separate letter report from HRI (Stepperud, 2017a).

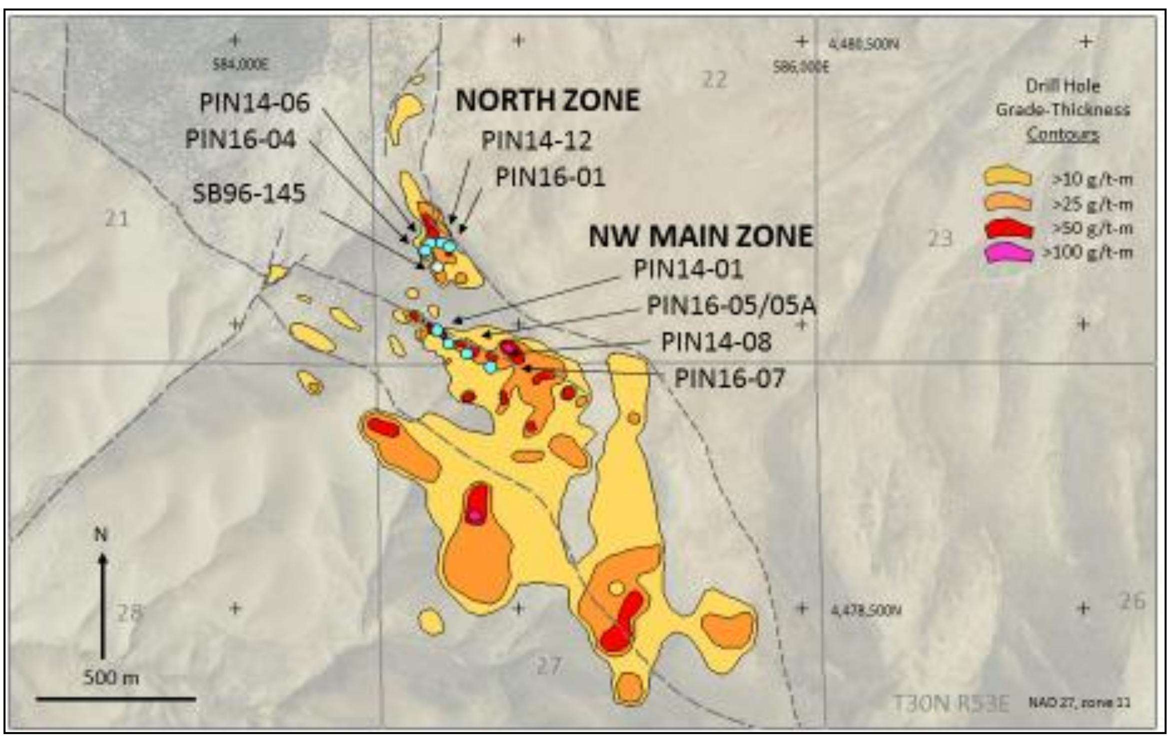


Figure 13-3: 2016 – 2017 Pinion Metallurgical Core Hole Locations

(from Gold Standard 2017)

13.2.1 2017 Pinion Head Assays

Head assays and geo-metallurgical characterization were conducted on all composites using a combination of three separate laboratories: KCA, ALS, and UBC.

Head assays are tabulated for gold, silver, copper, cyanide gold solubility, carbon and sulfur species, and preg-robb analysis (Simmons, 2019, Appendix 6). ICP multi-element analyses and whole-rock analyses are shown in Appendix 7 and 8, respectively, in Metallurgical Report (Simmons, 2019). Gold cyanide-solubility (“Au_{CN}”) assays presented are the average of two ALS assay procedures: AuAA13 and AuAA13s. The results for the 2016 – 2017 drill core composites are summarized below:

- Gold grades ranged from 0.23 to 1.82 ppm and averaged 0.76 ppm;
- Silver grades ranged from 3.3 to 38.7 ppm and averaged 10.4 ppm;
- Organic carbon ranged from 0.04 to 0.218% and averaged 0.10%;
- Sulfide sulfur ranged from <0.01 to 0.11% and averaged 0.03%;
- Preg-robb analyses ranged from -6.20 to 18.2% and averaged 2.8% (considered non-preg robbing);
- Copper values were very low, ranging from 1.5 to 74.8 ppm and averaged 6.1 ppm;
- Gold cyanide solubility ranged from 70.2 to 94.4% and averaged 84.2%;
- Concentrations of the deleterious elements were: selenium averaged 7 ppm, mercury ranged from 0.3 to 10.1 ppm with an average of 3.6 ppm, and arsenic levels were low ranging from 63 to 815 ppm with an average of 277 ppm;
- Concentrations of the primary cyanide consumers were low and suggest minimum potential for affecting cyanide consumption rates. Copper averaged 22 ppm, nickel averaged 46 ppm, and zinc averaged 139 ppm;
- Whole-rock silica content ranged from 25.7 to 89.1% and averaged 66.6%.

13.2.2 2016 – 2017 Bottle Roll and Column Leach Testing (KCA)

Twenty-four of the 33 drill core composites were subjected to bottle-roll leach testing at target P_{80} sizes of 75 µm and 1,700 µm, and to column-leach testing at either 12.5 mm or 25.0 mm crush sizes. The remaining nine composites were only bottle-roll leached at target P_{80} sizes of 75 µm and 1,700 µm. The testing program is summarized in Table 13-2. The main objective of these tests was to evaluate the laboratory-scale leachability character of the Pinion mineral resource in terms of gold extraction, extraction rate, reagent consumption, and sensitivity to feed size.

Table 13-2: Summary of Nominal Feed P_{80} for Column and Bottle-Roll Leach Tests

Pinion North Zone				Pinion NW Main Zone			
Columns		Bottle Rolls		Columns		Bottle Rolls	
12.5 mm	25 mm	75 µm	1,700 µm	12.5 mm	25 mm	75 µm	1,700 µm
13	**1**	**20**	**20**	**9**	**3**	**13**	**13**

The bottle-roll testing used a standard procedure that is described in the final laboratory report (KCA 2017), using 144 hours of retention time for 1,700 µm tests, and 96 hours for 75 µm tests.

Column-leach tests were conducted utilizing material crushed to target P_{80}’s and placed in columns of 10 and 15 cm diameters. During testing the material was leached for 60, 90 or 121 days with a dilute NaCN solution. After leaching, each column was washed for four days with water. A portion of the leached and washed material (“tailings”) from each column was assayed for “tail screen” analyses by size fraction.

Tailings material from 12 columns was utilized for compacted permeability test work. Additionally, tailings material from seven columns was submitted to Western Environmental Testing Laboratory ("WETLAB") in Sparks, Nevada, for acid-base accounting ("ABA") and meteoric-water mobility tests ("MWMT").

Geologic information for selected metallurgical composites, together with feed sizes, retention times, reagent consumptions, and gold and silver extraction balances can be found in the Metallurgical Report (Simmons, 2019, Appendix 9). The geologic information provided is part of the geo-metallurgical characterization of the Pinion mineral resource.

The following is offered as a summary of the findings from the 2016 – 2017 column and bottle-roll test results:

13.2.2.1 2017 Bottle-Roll Tests on 1,700 µm Composite Samples

Gold head grades for the composites ranged from 0.064 to 1.78 ppm Au, with an average of 0.74 ppm Au. From this material the gold extraction ranged from 49.0 to 86.0%, with an average extraction rate of 68.4%.

Silver head grades for the composites ranged from 3.4 to 40.4 ppm Ag, with an average of 10.4 ppm Ag. Silver extraction from this material ranged from 5.0 to 85.0%, with an average extraction rate of 26.9%.

Cyanide consumption averaged 0.18 kg/t and lime consumption averaged 0.78 kg/t.

13.2.2.2 2017 Bottle-Roll Tests on 75 µm Composite Samples

Gold head grades for the composites ranged from 0.13 to 1.85 ppm Au, with an average of 0.78 ppm Au. Gold extraction from this material ranged from 66.0 to 90.0%, with an average of 81.3%.

Silver head grades for the composites ranged from 3.49 to 103.1 ppm Ag, with an average of 13.7 ppm Ag. Silver extraction from this material ranged from 16.0 to 95.0%, with an average of 49.0%.

Cyanide consumption averaged 0.88 kg/t and lime consumption averaged 0.60 kg/t.

13.2.2.3 2017 Column-Leach Tests on Composite Samples

Column-leach test extraction results were calculated based upon loaded carbon assays and tails assays. Gold head grades for the twenty-two 12.5 mm column composites ranged from 0.26 to 1.88 ppm Au (Average = 0.76 ppm Au). Gold extraction results ranged between 55.8 and 90.4%, with an average of 70.0%.

Silver head grades for the twenty-two 12.5 mm column composites ranged from 1.44 to 41.6 ppm Ag, with an average of 9.54 ppm Ag. Silver extraction results ranged between 5.4 and 47.3%, with an average of 22.7%.

Cyanide consumption averaged 0.96 kg/t and lime consumption averaged 0.59 kg/t.

Gold head grades for the four 25.0 mm columns ranged from 0.44 to 0.90 ppm Au, with an average of 0.67 ppm Au. Gold extraction results ranged from 51.5 to 69.5%, with an average of 56.4%.

Silver head grades for the four 25.0 mm column composites ranged from 6.0 to 11.9 ppm Ag, with an average of 8.3 ppm Ag. Silver extraction results ranged between 9.7 and 44.8%, with an average of 22.6%.

Cyanide consumption averaged 1.0 kg/t and lime consumption averaged 0.56 kg/t.

KCA advises that commercial-scale, operational cyanide consumption typically runs in the range of 25 to 33% of laboratory consumption.

Gold extraction plotted by days under leach for the column-leach tests are shown graphically in Figure 13-4.

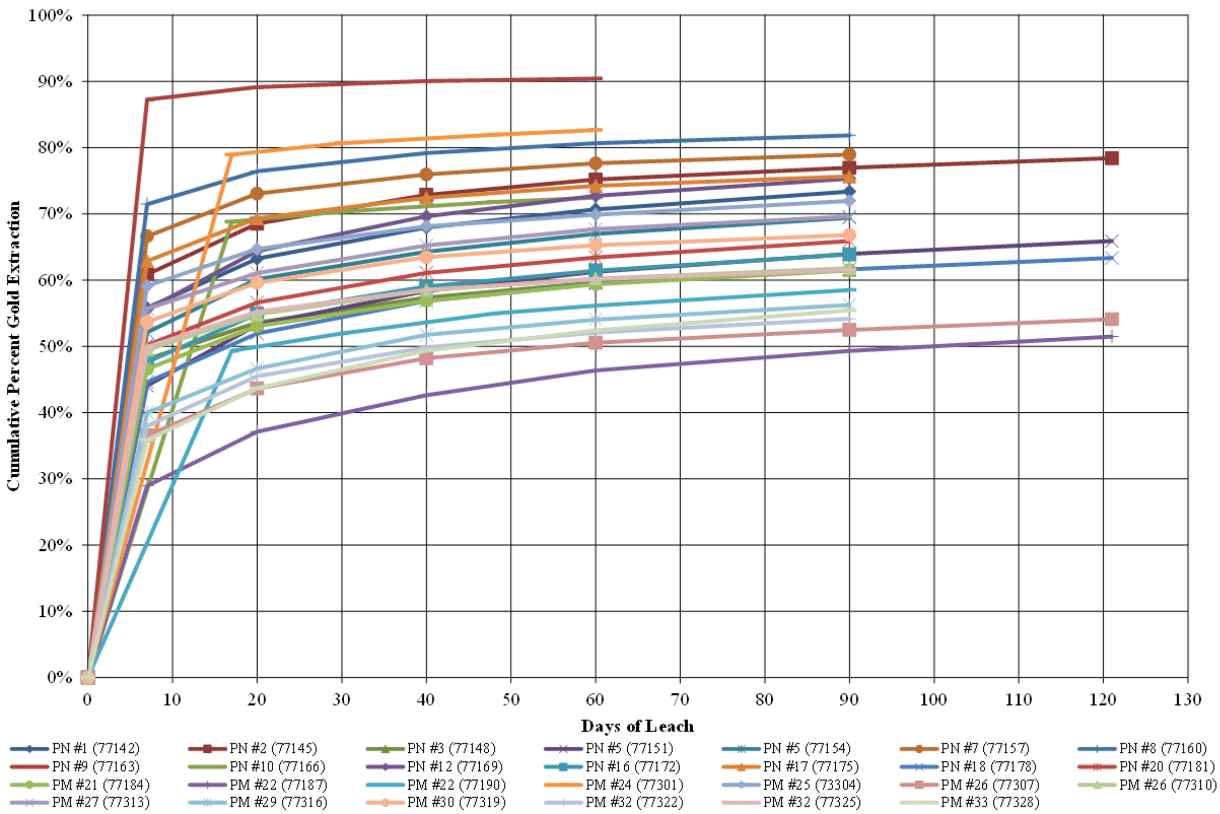


Figure 13-4: 2016 – 2017 Gold Extraction vs. Days Under Leach for Column-Leach Tests

13.2.3 2017 Pinion Comminution Characterization at HRI

Fourteen drill core samples were selected for comminution test work. These samples were limited to where sufficient material was available from the 2016 – 2017 metallurgical composites and represented major material types. They were subjected to the modified SMC Test at HRI to generate data for SAG mill comminution parameters, crushing index ("M_{ic}") by JKTech, and Ai testing. A final letter report was issued by HRI (Stepperud, 2017a).

13.2.3.1 2017 SMC Test Results

The 2017 HRI SMC Test® results for the 14 samples are given in the Metallurgical Report (Simmons, 2019, Appendix 10). This table includes the average rock density, A x b (a measure of resistance to impact breakage) and drop-weight index ("DW_i") values that are the direct result of the SMC Test® procedure. The values determined for the M_{ia}, M_{ih}, and M_{ic} parameters and the definitions of these abbreviations developed by SMCT are also presented in this table.

The DW_i ranged from 2.13 to 8.02 kWh/m^3, indicating soft to medium-hard material, and is tabulated along with other parameters of the SMC evaluation in the Metallurgical Report (Simmons, 2019, Appendix 10). In summary:

The Pinion samples A x b and DW_i values can be categorized as soft to moderate in comparison to the SMC worldwide database values. Although the Pinion oxide mineral resource material is not envisioned to require a milling circuit, the SAG comminution parameters are a primary component (output) of the SMC test, which also provides crushing parameters that can be used to design conventional crushing circuits.

13.2.3.2 2017 Pinion Bond Abrasion Index (Ai) Tests

Bond Abrasion index tests were performed at HRI on 14 composite samples. The Metallurgical Report (Simmons, 2019, Appendix 11) lists the Ai values for the 14 composites that were tested. Ai values ranged from a low of 0.4591 g to a high of 1.5548 g, indicating moderate to very high abrasiveness of the materials tested. The silica content of the Pinion mineral resource is the inferred rock component that contributes to the corresponding high Ai test results.

13.2.3.3 2017 Pinion Comminution Test Summary

The Pinion comminution samples tested can be considered amenable to conventional, multi-stage crushing and screening circuit design. M_{ic}, the SMC crusher component value, with an average of 5.9 kWh/t, would be ranked in the lower mid-range of the SMC worldwide database.

The Ai values (average = 0.9725 g) are modest to very high (see Simmons, 2019, Appendix 11) and represent the potential for high rates of wear on crusher liners, screen panels and conveyor drop boxes. The high Ai values of this material will likely translate into high wear rates on all ground-engaging equipment used for mining, including dozer tracks and blades, blast-hole drills, shovel and loader buckets, bucket teeth, and haul truck tires and bed liners.

13.2.4 2017 Pinion Load Permeability Test Work on Column Tailings

A portion of tailings material from each column-leach test was utilized for load permeability test work. The purpose of the load permeability test work was to examine the permeability of the crushed material under compaction loading equivalent to heap heights of 25 m, 50 m, 75 m, and 100 m.

The test cell utilized for modeling the permeability of stacked material at various heap heights, was a steel column or cell. Staged axial (vertical) loading of the test material was utilized to simulate the incrementally increased pressure obtained when loading the heap. Drainage layers were installed at the top and at the base of the column. External load was applied to the charge of material in the column utilizing a perforated steel plate that moved freely within the walls of the column.

A brief version of the guidelines that KCA utilizes when reviewing the results from this type of test are as follows:

1. A slump of over 10% is generally an indication of failure.
2. A measured flow of 10 times the heap design flow (10 to 12 li/h/m^2) is considered a pass for a bed of agglomerate material. However, lower flows are not necessarily a failure if there are enough consistently passing tests.
3. "Pellet breakdown" within the column of about 15% is marginally acceptable and anything higher is a failure. However, in general, a higher range may be allowable due to the subjective nature of the test, being based on visual observation. The tests only apply to materials agglomerated with cement.
4. Solution color and clarity is typically an indicator of agglomerate failure and fines migration. This information is utilized in coordination with both slump as well as pellet breakdown to determine if the test column passes.

All twelve column residues that were tested passed using KCA's criteria. The results of the load permeability test work are summarized in the Metallurgical Report (Simmons, 2019, Appendix 12).

13.3 2018 GOLD STANDARD PINION DEPOSIT HIGH PRESSURE GRINDING ROLL (HPGR) TESTING

Gold Standard commissioned KCA to perform bottle roll, conventional-crush column-leach and HPGR-crush column-leach testing on a drill core composite sample from the Pinion Main zone, here termed the "HPGR composite." Test results were documented in KCA (2018a).

13.3.1 2018 Head Assays Pinion Main Zone HPGR Composite

The HPGR composite sample was comprised of intervals from two PQ-diameter core holes: PIN17-12, 42.7 m to 53.8 m and PIN17-13, 114.3 m to 159.1 m. Head assays are presented in Table 13-3. The sulfide sulfur ($S^{=}$) head assay of 0.02% demonstrates the oxide character of this sample. The presence of C(org) (0.11%) and the preg-robb assay of 9.5% indicate that this composite may be mildly preg-robbing.

Table 13-3: Pinion Main Zone HPGR Composite Head Assays

KCA Sample No.	Description	Au & Ag Assays				Sulfur and Carbon Species					Preg-robb, %
		Au ppm	Ag ppm	Au_{CN} %	Ag_{CN} %	C(tot) %	C(org) %	$S_{(tot)}$ %	S= %	SO4 %	
Pinion HPGR Composite Sample											
78508C	Pin 17-12 140' to 176.5' and Pin 17-13 375' to 522'	0.736	4.53	80.2	73.5	0.19	0.11	3.07	0.02	3.05	9.5%

13.3.2 2018 Pinion Main Zone HPGR Bottle-Roll and Column-Leach Testing

The Pinion Main zone HPGR composite was also subjected to bottle-roll leach testing at target P_{80} sizes of 38 µm, 75 µm and 1,700 µm. Conventional column-leach testing was conducted at target P_{80} of 12.5 mm and HPGR column-leach testing was done on sub-samples subjected to low, medium, and high HPGR press forces. The main objective of these bottle-roll and column-leach tests was to evaluate the differences in gold extraction, comparing conventional-crush laboratory column-leach results to those from material crushed using HPGR.

13.3.2.1 2018 Bottle-Roll Tests, Pinion Main Zone HPGR Composite Sample

Bottle-roll leach testing was performed on 500 g or 1,000 g portions of head material comminuted to a P_{80} target size of 1,700 microns (1.70 mm), 75 microns (0.075 mm), and 38 microns (0.038 mm). Bottle-roll testing, wet screening and assay methods were performed utilizing the same procedures as outlined in Section 13.2.2. Bottle-roll cyanide-leach test results are shown in Table 13-4.

Table 13-4: 2018 Pinion Main Zone HPGR-Crushed Bottle-Roll Results

KCA Sample No.	Test No	Comp ID	GSV Geology				Feed Size		Leach Time (hrs)	Au Balance		Ag Balance		Reagents	
			Zone	Subunit	Rock Type 1	Vein 1	Target P_{80} (µm)	Screen P_{80} (µm)		Au Ext %	Calc Hd Au (ppm)	Ag Ext %	Calc Hd Ag (ppm)	Na CN kg/t	Lime kg/t
78508C	78525 A	**HPGR Comp**	Pinion Main	**CGL**	**car**	**qzv**	1,700	1,860	144	**53.8**	0.630	**32.5**	4.640	0.11	0.50
78508C	78526 A	**HPGR Comp**	Pinion Main	**CGL**	**car**	**qzv**	75	69	72	**72.5**	0.803	**58.3**	4.940	0.50	0.50
78508C	78526 B	**HPGR Comp**	Pinion Main	**CGL**	**car**	**qzv**	38	40	72	**69.8**	0.758	**59.9**	4.810	0.27	0.50

The reported bottle-roll cyanide-leach gold extractions are low for an oxide sample. This is an indication of refractoriness due to factors other than sulfide sulfur or C(org) contents.

13.3.2.2 Column-Leach Tests on Pinion Main Zone HPGR Composite

Column-leach tests were performed on four samples of the HPGR composite that were prepared in the following manner:

1 – Conventional crush to target P_{80} = 12.5 mm;

2 – HPGR crushed at low press force (2.20 N/mm^2) setting, P_{80} = 7,000 µm;

3 – HPGR crushed at medium press force (3.35 N/mm^2) setting, P_{80} = 6,500 µm;

4 – HPGR crushed at high press force (4.30 N/mm^2) setting, P_{80} = 5,000 µm

The column-leach tests were conducted for 65 days with a dilute sodium cyanide solution utilizing the same procedures as outlined in Section 13.2.2. The results are summarized in Table 13-5.

Table 13-5: 2018 Pinion Main Zone HPGR-Crushed Column Leach Test Results

KCA	Test No	Comp ID	GSV Geology				Feed Size		Leach Time (days)	Au Balance		Ag Balance		Reagents	
			Zone	Subunit	Rock Type 1	Vein 1	Target P_{80} (µm)	Screen P_{80} (µm)		Au Ext, %	Calc Hd Au (ppm)	Ag Ext %	Calc Hd Ag (ppm)	NaCN kg/t	Lime kg/t
78509B	78516	HPGR - Low	Pinion Main	CGL	car	gzv	N/A	7,000	65	**53.3**	0.846	**37.4**	4.6	0.54	1.01
78510B	78519	HPGR - Med	Pinion Main	CGL	car	gzv	N/A	6,500	65	**65.5**	0.722	**39.9**	4.56	0.57	1.01
78511B	78522	HPGR - High	Pinion Main	CGL	car	gzv	N/A	5,000	65	**64**	0.708	**42.8**	4.07	0.61	1.01
78508C	78513	Conventional Crush	Pinion Main	CGL	car	gzv	12,500	12,200	65	**43.8**	0.864	**21.6**	3.99	0.54	1.02

The column-test extractions in Table 13-5 are based upon pregnant solution carbon assays using the calculated head (carbon assays + tails assays), which ranged from 0.71 g Au/t to 0.85 g Au/t. Gold extractions ranged from 44% (conventional crush) to 66% (HPGR medium pressure). Sodium cyanide consumption ranged from 0.54 to 0.61 kg/t and hydrated lime consumption ranged from 1.01 to 1.02 kg/t.

Graphical comparisons for gold and silver extraction between conventionally crushed and HPGR-crushed sample charges are shown in Figure 13-5 and Figure 13-6.

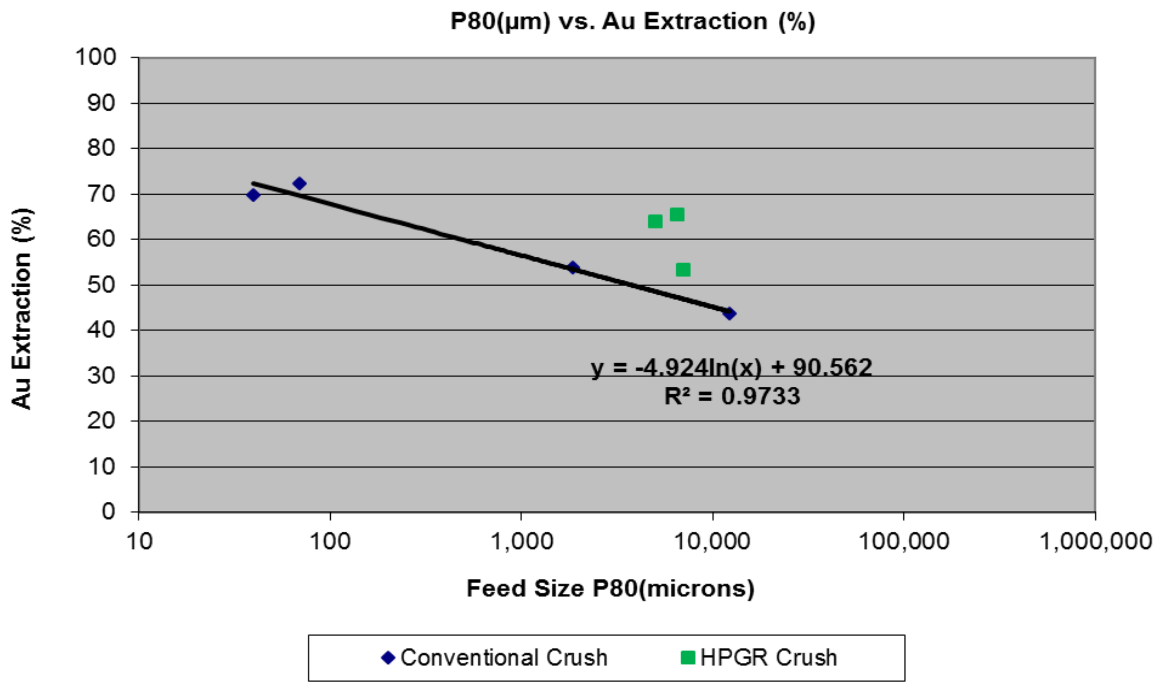


Figure 13-5: Conventional Crush vs. HPGR Gold Extraction Comparison

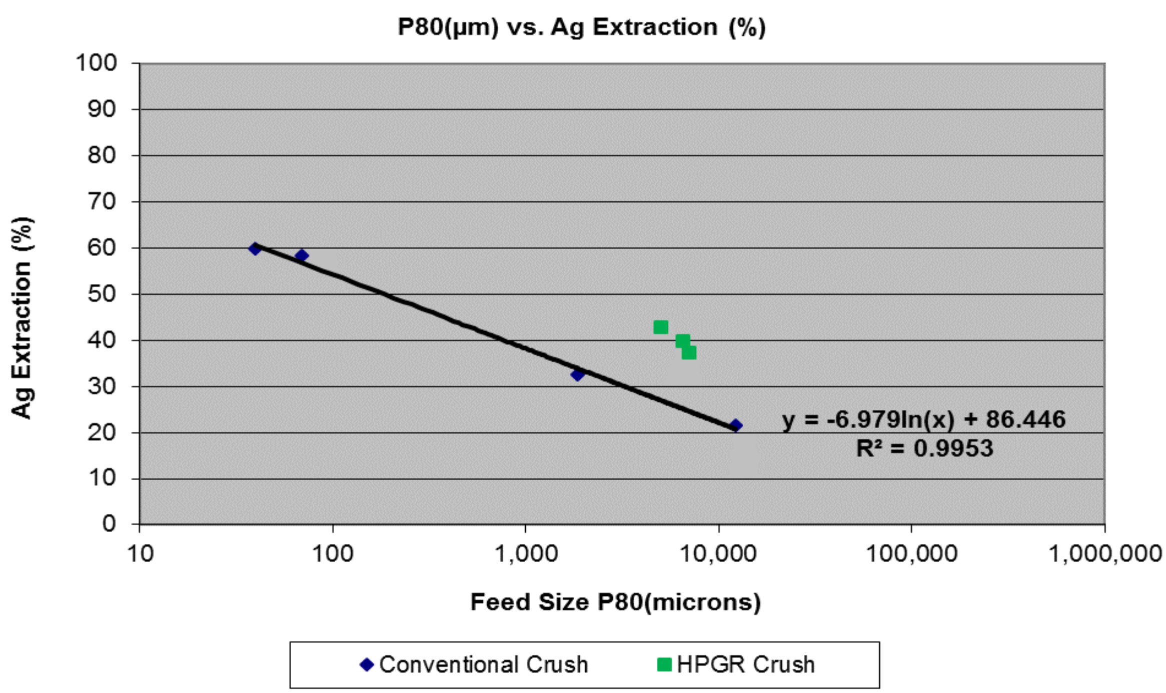


Figure 13-6: Conventional Crush vs. HPGR Silver Extraction Comparison

The data demonstrate that the HPGR-crushed column charges, at medium and high press force, provide a significant gold extraction advantage over the conventionally crushed sample. While it is relatively simple to design a flowsheet to produce any specific P_{80} particle size from conventional crushing, it is not for HPGR comminution. The P_{80}'s shown in Figure 13-5 and Figure 13-6 represent a close approximation to the product size that would be produced in a commercial HPGR comminution circuit.

13.3.3 2018 Pinion Main Zone HPGR Agglomeration and Load Permeability Testing

Preliminary agglomeration testing was performed on the low, medium, and high press-force HPGR-comminuted samples before being loaded into columns. All charges passed the KCA agglomeration criteria except the medium press-force sample at "0" kg/t cement addition. It was decided to column leach the HPGR samples without any cement addition or agglomeration for this phase of test work.

All column-leach residue charges were subjected to evaluation of percent slump, maximum percolation rate and load permeability tests. The results are shown respectively in Appendix 13, 14, and 15 from the Metallurgical Report (Simmons, 2019).

The medium and high press-force HPGR column-leach residues failed load permeability testing at 50 m height. Based upon these results it is recommended that future testing continue to evaluate cement agglomeration on HPGR-comminuted samples to support heap heights of at least 50 m and possibly 75 m.

13.4 2019 GOLD STANDARD PINION DEPOSIT METALLURGICAL TEST WORK

Gold Standard drilled additional metallurgical core holes in the Pinion North and Main zones in 2017-2018, that were tested in 2019. A total of 26 composites were made from intervals selected from 22 core holes. Metallurgical core drill hole locations, for all phases of work, is shown in Figure 13-7, and the 2017- 2018 composites are shown in green and blue. These composites were used for geo-metallurgical characterization, comminution testing, column-leach, bottle-roll, load permeability testing, and environmental characterization, at KCA in Reno, Nevada, and results are documented in a final report by KCA (2019a).

Nine of the 26 composites were selected and shipped to HRI in Golden, Colorado, for SAG mill comminution ("SMC") testing (SMC Test®) and Bond Abrasion index ("Ai") testing. Comminution and abrasion final test results were reported in KCA (2019a) and in a separate letter report from HRI (Stepperud, 2019a).

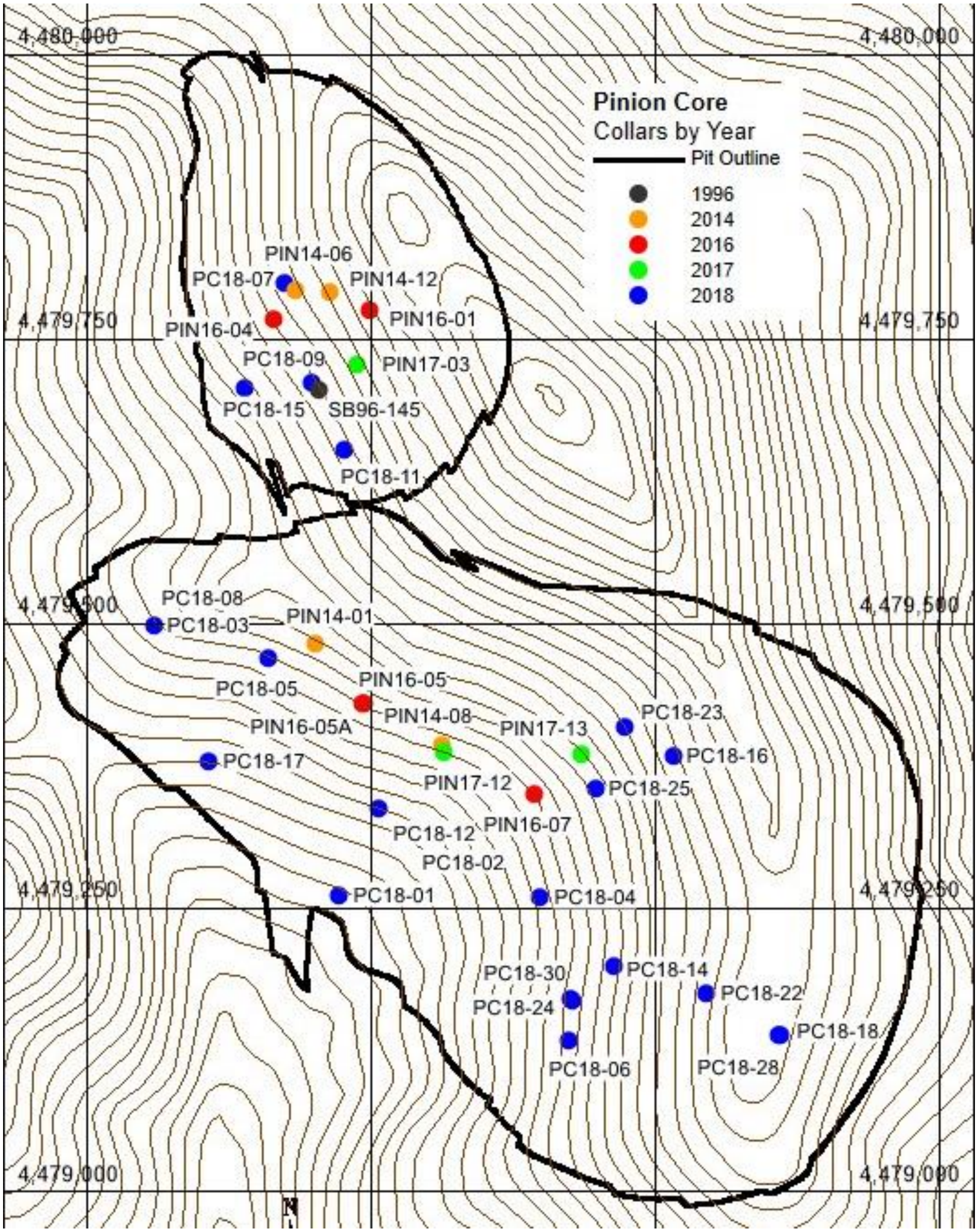


Figure 13-7: Pinion Deposit Metallurgical Core Location Map

13.4.1 2019 Pinion Head Assays

Head assays and geo-metallurgical characterization were conducted on all composites using a combination of three separate laboratories: KCA, ALS, and University of British Columbia ("UBC").

Head assays are tabulated for gold, silver, copper, cyanide gold solubility, carbon and sulfur species, and preg-robb analysis (Simmons, 2019, Appendix 16). In the Metallurgical Report, ICP multi-element analyses are shown in Appendix 17, whole-rock analyses are shown in Appendix 18 and QXRD analysis in Appendix 19 (Simmons, 2019). Gold cyanide-solubility (“Au_{CN}”) assays presented are the average of two ALS assay procedures: AuAA13 and AuAA13s. The results for the 2017 – 2018 drill core composites are summarized below:

- Gold grades ranged from 0.25 to 2.87 ppm and averaged 0.85 ppm;
- Silver grades ranged from 0.5 to 29.1 ppm and averaged 7.7 ppm;
- Organic carbon ranged from 0.08 to 0.45% and averaged 0.25%;
- Sulfide sulfur ranged from 0.005 to 0.67% and averaged 0.078%;
- Preg-robb analyses ranged from -4.0 to 16.7% and averaged 4.5% (considered non-preg robbing);
- Copper values were very low, ranging from 1.2 to 38.9 ppm and averaged 6.0 ppm;
- Gold cyanide solubility ranged from 43.6 to 87.3% and averaged 74.8%;
- Concentrations of the deleterious elements were: selenium averaged 8.4 ppm, mercury ranged from 0.2 to 4.3 ppm with an average of 1.4 ppm, and arsenic levels were low ranging from 1 to 607 ppm with an average of 273 ppm;
- Concentrations of the primary cyanide consumers were low and suggest minimum potential for affecting cyanide consumption rates. Copper averaged 119 ppm (with 1 composite containing 2260 ppm), nickel averaged 29 ppm and zinc averaged 134 ppm;
- Whole-rock SiO_2 content ranged from 11.0 to 94.8% and averaged 73.3%.

13.4.2 2019 Pinion Bottle Roll and Column Leach Testing at KCA

Twenty-six drill core composites were subjected to bottle-roll leach testing at target P_{80} sizes of 75 µm and 1,700 µm, and to column-leach testing at 12.5 mm or 25.0 mm crush sizes. The main objective of these tests was to evaluate the laboratory-scale leachability character of the Pinion mineral resource in terms of gold extraction, extraction rate, reagent consumption, and sensitivity to feed size.

Geologic information for selected metallurgical composites, together with feed sizes, retention times, reagent consumptions, and gold and silver extraction balances are shown in the Metallurgical Report (Simmons, 2019, Appendix 20).

The bottle-roll testing used a standard procedure that is described in the final laboratory report (KCA 2019a), using 144 hours of retention time for 1,700 µm tests, and 96 hours for 75 µm tests.

Column-leach tests were conducted utilizing material crushed to target P_{80}’s and placed in columns of 10 and 15 cm diameters. During testing the material was leached for 59, 70, 94 or 130 days with a dilute NaCN solution. After leaching, each column was washed for four days with water. A portion of the leached and washed material (“tailings”) from each column was assayed for “tail screen” analyses by size fraction.

Tailings material from 19 columns was utilized for compacted permeability test work. Additionally, tailings material from the same 19 columns was submitted to Western Environmental Testing Laboratory (“WETLAB”) in Sparks, Nevada for environmental characterization.

The following is offered as a summary of the findings from the 2019 column and bottle-roll test results:

13.4.2.1 2019 Pinion Bottle Roll Tests on 75-µm Composite Samples

Gold head grades for the composites ranged from 0.138 to 2.63 ppm Au, with an average of 0.81 ppm Au. From this material the gold extraction ranged from 30.1 to 87.4%, with an average extraction rate of 68.4%.

Silver head grades for the composites ranged from 0.60 to 32.0 ppm Ag, with an average of 7.6 ppm Ag. Silver extraction from this material ranged from 31.7 to 84.3%, with an average extraction rate of 56.2%.

Cyanide consumption averaged 0.30 kg/t and lime consumption averaged 0.64 kg/t.

13.4.2.2 2019 Pinion Bottle-Roll Tests on 1,700 µm Composite Samples

Gold head grades for the composites ranged from 0.156 to 2.59 ppm Au, with an average of 0.78 ppm Au. Gold extraction from this material ranged from 37.5 to 79.0%, with an average of 61.5%.

Silver head grades for the composites ranged from 0.55 to 31.8 ppm Ag, with an average of 7.63 ppm Ag. Silver extraction from this material ranged from 12.0 to 82.2%, with an average of 30.7%.

Cyanide consumption averaged 0.22 kg/t and lime consumption averaged 1.07 kg/t.

13.4.2.3 2019 Pinion Column-Leach Tests on Conventional Crushed Composite Samples

Column-leach test extraction results were calculated based upon loaded carbon assays and tails assays. Gold head grades for the sixteen 12.5 mm column composites ranged from 0.198 to 3.19 ppm Au (average = 0.95 ppm Au). Gold extraction results ranged between 29.8 and 80.0%, with an average of 63.0%.

Silver head grades for the sixteen 12.5 mm column-leach composites ranged from 0.65 to 27.9 ppm Au, with an average of 7.84 ppm Ag. Silver extraction results ranged between 9.5 and 76.4%, with an average of 30.6%.

Cyanide consumption averaged 0.92 kg/t and lime consumption averaged 1.06 kg/t.

Gold head grades for the ten 25.0 mm column-leach composites ranged from 0.313 to 1.65 ppm Au, with an average of 0.72 ppm Au. Gold extraction results ranged between 30.5 and 81.2%, with an average of 59.9%.

Silver head grades for the ten 25.0 mm column-leach composites ranged from 1.94 to 22.2 ppm Ag, with an average of 7.0 ppm Ag. Silver extraction results ranged between 9.3 and 25.0%, with an average of 18.2%.

Cyanide consumption averaged 0.76 kg/t and lime consumption averaged 0.93 kg/t.

KCA advises that commercial-scale, operational cyanide consumption typically runs in the range of 25 to 33% of laboratory consumption.

Gold extraction plotted by days under leach for the column-leach tests are shown graphically in Figure 13-8.

13.4.2.4 2019 Pinon Column Leach Tests on HPGR Crushed Composite Samples

Column-leach test extraction results were calculated based upon loaded carbon assays and tails assays. Gold head grades for the five HPGR crush column-leach composites ranged from 0.467 to 0.891 ppm Au (average = 0.65 ppm Au). Gold extraction results ranged between 56.6 and 78.3%, with an average of 70.3%.

Silver head grades for the five HPGR crush column-leach composites ranged from 1.72 to 28.0 ppm Au, with an average of 7.27 ppm Ag. Silver extraction results ranged between 27.9 and 58.3%, with an average of 40.4%.

Cyanide consumption averaged 0.73 kg/t and lime consumption averaged 0.31 kg/t.

Gold extraction plotted by days under leach for the column-leach tests are shown graphically in Figure 13-8.

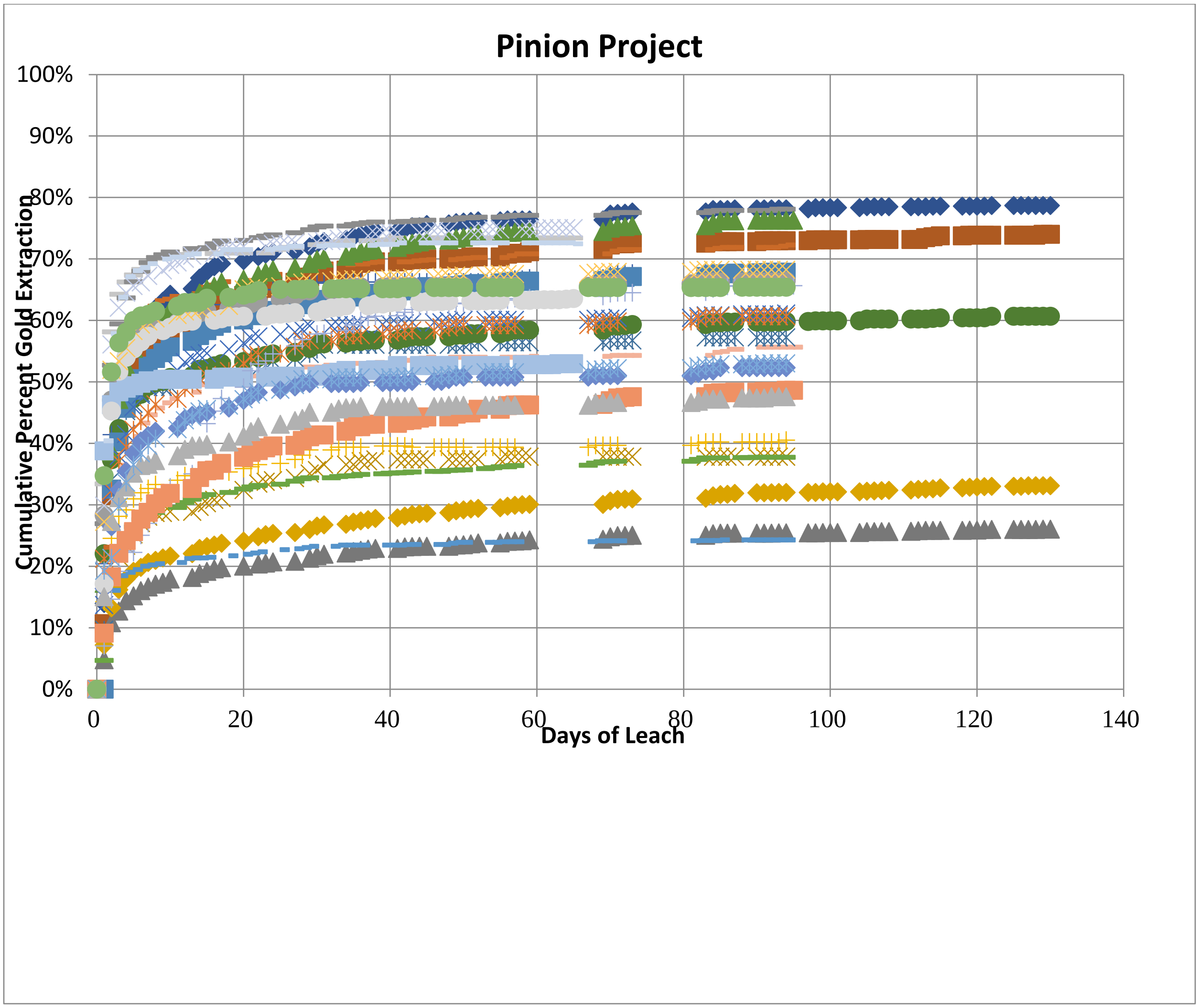


Figure 13-8: 2019 Pinion Gold Extraction vs. Days under Leach for Column-Leach Tests

13.4.3 2019 Pinion Comminution Characterization at HRI

Nine drill core samples were selected for comminution test work and were subjected to the modified SMC Test at HRI to generate data for SAG mill comminution parameters, crushing index ("M_{ic}") by JKTech, and Ai testing. A final letter report number 12635 was issued by HRI, March 6, 2019 (Stepperud, 2019a).

13.4.3.1 2019 Pinion SMC Test Results

The 2019 HRI SMC Test® results for the 9 samples are given in the Metallurgical Report (Simmons, 2019, Appendix 21). This table includes the average rock density, A x b (a measure of resistance to impact breakage) and drop-weight index ("DW_i") values that are the direct result of the SMC Test® procedure. The values determined for the M_{ia}, M_{ih} and M_{ic} parameters, and the definitions of these abbreviations developed by SMCT, are also presented in this table.

The DW_i ranged from 5.34 to 7.30 kWh/m^3, indicating soft to medium-hard material, and is tabulated along with other parameters of the SMC evaluation.

The Pinion samples A x b and DW_i values can be categorized as moderate in comparison to the SMC worldwide database values. Although the Pinion oxide mineral resource material is not envisioned to require a milling circuit, the SAG comminution parameters are a primary component (output) of the SMC test, which also provides conventional crushing parameters that can be used to design conventional crushing circuits.

The 2019 Pinion comminution samples can be considered in line with previous testing and is amenable to conventional, multi-stage crushing and screening circuit design. M_{ic}, the SMC crusher component value, with an average of 6.8 kWh/t, would be ranked in the mid-range of the SMC worldwide database.

13.4.3.2 2019 Pinion Bond Abrasion Index (Ai) Tests

Bond Abrasion index tests were performed at HRI on 9 composite samples. The Metallurgical Report (Simmons, 2019, Appendix 22) lists the Ai values for the 9 composites that were tested. Ai values ranged from a low of 0.4005 g to a high of 0.8481 g, indicating moderate to above average abrasiveness of the materials tested. The silica content of the Pinion mineral resource is the inferred rock component that contributes to the corresponding high Ai test results.

The 2019 Pinion Ai values (average = 0.6948 g) are lower than the Phase one samples (0.9725 g) and can be considered as moderate to above average (see Appendix 22, Simmons, 2019) and represent the potential for slightly elevated rates of wear on crusher liners, screen panels, and conveyor drop boxes.

13.4.4 2019 Pinion Load Permeability Test Work on Column Tailings

A portion of tailings material from ten 12.5 mm, five 25 mm, and five 4 HPGR column-leach test residues was utilized for load permeability test work. The purpose of the load permeability test work was to examine the permeability of the crushed material under compaction loading equivalent to heap heights of 25 m, 50 m, 75 m, and 100 m.

Load Permeability Test procedures and guidelines have been described earlier in this Technical Report. Refer to Section 13.2.4 for details.

All ten 12.5 mm and five 25 mm conventional crush columns passed load permeability test criteria up to 100-meter heap height, except for PM #59, which failed at 100 meters. The conventional crushed column load permeability test results are summarized in the Metallurgical Report, Appendix 23 (Simmons, 2019).

All five of the HPGR crushed columns passed load permeability test criteria at 75 meters and two of the five (PM #37 and PM #56) failed at 100 meters. 2.0 kg/t of cement was added to PM #51 and 6.0 kg/t to PM #59. The HPGR crushed column load permeability test results are summarized in the Metallurgical Report, Appendix 24 (Simmons, 2019).

13.5 1991 DARK STAR DEPOSIT METALLURGICAL TESTING

Figure 13-9 shows drill hole locations for samples used for Dark Star bottle roll tests conducted by McClelland Laboratories for Crown Resources in 1991. Bottle roll test results are summarized in Table 13-1.

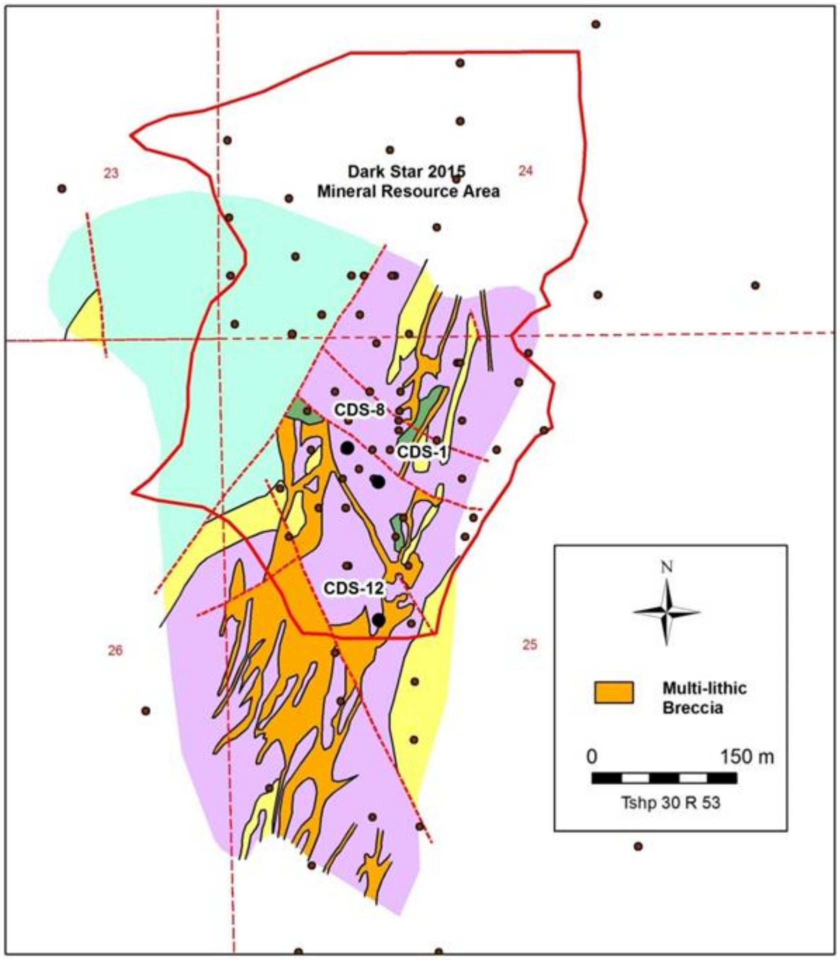


Figure 13-9: RC Drill Hole Locations for the 1991 Dark Star Bottle-Roll Tests

13.6 2017 GOLD STANDARD DARK STAR DEPOSIT METALLURGICAL TESTING

In 2017, Gold Standard commissioned KCA to complete a metallurgical testing program on drill core composite samples from the Dark Star Main and North mineral resources. Test results were documented in KCA (2017b).

13.6.1 2017 Dark Star Head Assays for Bottle-Roll and Column-Leach Tests

Head assays and geo-metallurgical characterization analyses were obtained for 68 composites using a combination of four separate laboratories: KCA, ALS, UBC, and FLS. The head assays are tabulated in Appendix 25, 26, and 27 (Simmons, 2019) and show:

- Gold grade ranged from 0.177 to 7.35 ppm and averaged 1.59 ppm;
- Silver grade ranged from 0.27 to 5.07 ppm and averaged 0.71 ppm;
- Organic carbon ranged from <0.10 to 2.14% (sulfide sample) and averaged 0.24%;
- Sulfide sulfur ranged from <0.01 to 2.14% (sulfide sample) and averaged 0.21%;
- Preg-robb analysis ranged from 0.0 to 19.2% and averaged 1.6%;
- Copper values were very low, ranging from 5 to 42 ppm;
- Gold cyanide solubility ranged from 25.7% (sulfide sample) to 100% and averaged 88.3%;

- Concentrations of deleterious elements by ICP were low: <5 ppm selenium on average, mercury ranged from 0.99 to 127.4 ppm (sulfide sample) and averaged 9.54 ppm, and arsenic ranged from 61 to 605 ppm with an average of 196 ppm;
- Concentrations of the primary cyanide consumers were low and suggest minimum potential for effecting cyanide consumption rates. Copper averaged 18 ppm, nickel averaged 32 ppm and zinc averaged 126 ppm.
- Whole-rock quartz (SiO_2) analyses were high ranging from 42.4 to 95.8% and averaged 85.0%.

13.6.2 2017 Dark Star Bottle-Roll and Column-Leach Tests at KCA

Sixty-eight drill core composites were subjected to bottle-roll leach testing at target P_{80} sizes of 75 µm and 1,700 µm. A subset of 41 of the 68 composites were subjected to column-leach testing at crush sizes of 12.5 mm (on all 41 composites) and 25.0 mm (six of the 41 composites), depending upon available mass. The main objective of the bottle-roll and column-leach testing was to evaluate laboratory-scale leachability of the Dark Star mineral resource in terms of gold extraction, extraction rate, reagent consumption, and sensitivity to feed size.

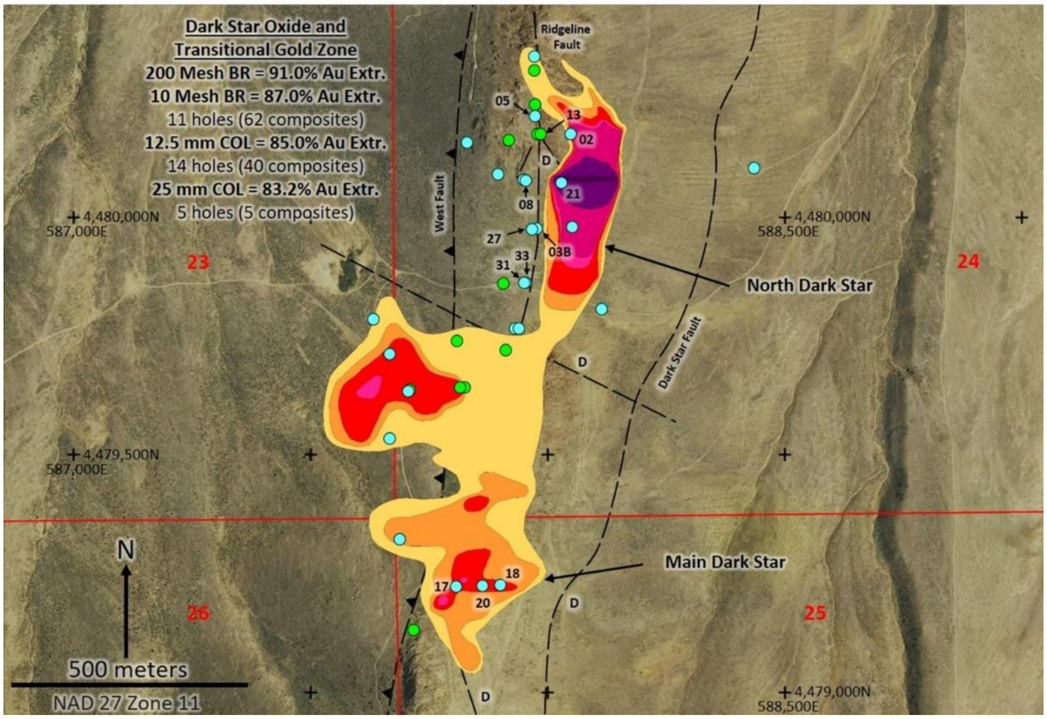
13.6.2.1 2017 Dark Star Bottle Roll Tests

Bottle-roll leach testing was conducted on portions of material from each of the 68 composites. A 500 or 1,000 g portion of head material was crushed to a nominal size of 1,700 µm (1.70 mm) and utilized for leach testing. A second portion of material was milled in a laboratory rod mill to a target size of 80% passing 75 µm (0.075 mm). The milled slurry was then utilized for leach testing. The tests, which are described in detail by the laboratory report (KCA 2017), employed retention times of 144 hours for the 1,700 µm material and 72 hours for the 75 µm material.

The tailing material from the 1,700 µm tests was wet screened at 0.075 mm. The undersized material was dried and set aside. The oversized material was dried and dry screened at 4.75, 3.35, 2.36, 1.70, 1.18, 0.850, 0.600, 0.425, 0.300, 0.212, 0.150, 0.106, and 0.075 mm. The dry-screened -0.075 mm material was then combined with the wet screened material. Each separate size fraction was then weighed and reported. The material was then recombined. From the recombined material, three portions were split out and individually ring and puck pulverized to 80% passing 0.075 mm. The pulverized portions were then assayed for residual gold and silver content. The reject material was stored.

The tailing material from the 75 µm tests was wet screened at 0.038 mm. The undersized material was dried and set aside. The oversized material was dried and dry screened at 0.212, 0.150, 0.106, 0.075, 0.053, and 0.038 mm. The dry-screened, -0.038 mm material was then combined with the wet-screened material. Each separate size fraction was then weighed and reported. The material was then recombined. From the recombined material, three portions were split out and individually ring and puck pulverized to 80% passing 0.075 mm. The pulverized portions were then assayed for residual gold and silver content. The reject material was stored.

Gold Standard has divided the Dark Star deposit into two zones for metallurgical testing: Dark Star Main and Dark Star North. The drill holes, shown with numbers in Figure 13-10, are core holes from 2015-2016 drilling, from which metallurgical composites were compiled. Dark Star bottle-roll gold and silver extraction results are summarized in Appendix 28 and 29 from the Metallurgical Report (Simmons, 2019). The zones from which the 2015-2016 composite sample material originated are listed in Appendix 30 and 31 (Simmons, 2019).



Note: BR = bottle roll test; COL = column-leach test.

Figure 13-10: Location Map for 2017 Dark Star Metallurgical Composites

The following is a summary of the findings from the Dark Star bottle roll test results.

13.6.2.2 2017 Dark Star 1.70 mm (10 Mesh) Bottle-Roll Results

Dark Star 10-mesh bottle-roll gold and silver extraction results are shown in the Metallurgical Report (Simmons, 2019, Appendix 28). Gold head grades for the 10-mesh composite samples ranged from 0.18 to 6.22 ppm Au, with an average of 1.56 ppm Au. Gold extraction ranged between 26.1 and 97.7% and averaged 81.8%. Five of the composites were sulfide/carbon refractory, with gold cyanide solubility <60%, nine of the composites were transitional with gold cyanide solubility >60% and <85%, and 54 of the composites were oxide with Au_{CN} solubility >85%.

Silver grades are very low at Dark Star. Silver head grades for the 10-mesh composites ranged from 0.31 to 5.01 ppm Ag with an average of 0.71 ppm Ag. Silver extraction ranged from 0.0 to 83.6% and averaged 20.2%. Cyanide consumption averaged 0.42 kg/t and lime consumption averaged 1.11 kg/t.

13.6.2.3 2017 Dark Star 0.74 mm (200 Mesh) Bottle-Roll Results

Dark Star 200-mesh bottle roll gold and silver extraction results are shown in the Metallurgical Report (Simmons, 2019, Appendix 29). Gold head grades for the 200-mesh composite samples ranged from 0.22 to 6.48 ppm Au with an average of 1.55 ppm Au. Gold extraction ranged between 30.9 and 97.9% and averaged 85.6%. Five of the composites were sulfide/carbon refractory with gold cyanide solubility <60%, nine of the composites were transitional with gold cyanide solubility >60% and <85%, and 54 of the composites were oxide with gold cyanide solubility >85%.

Silver grades are very low at Dark Star. Silver head grades for the 200-mesh composites ranged from 0.24 to 5.06 ppm Ag with an average of 0.69 ppm Ag. Silver extraction ranged from 5.6 to 85.8% and averaged 31.5%.

Cyanide consumption averaged 1.79 kg/t and lime consumption averaged 0.77 kg/t.

13.6.2.4 2017 Dark Star 12.5 mm and 25.0 mm Column Leach Results

Forty-one of the 2017 composites were column leached utilizing material crushed to 100% passing 19 mm (target P_{80} = 12.5 mm), and six of the 41 composites were crushed to 100% passing 37.5 mm (target P_{80} = 25 mm). During testing the material was leached for 60, 90 or 121 days with dilute NaCN solution and placed, respectively, in columns of 100 mm and 150 mm diameters. After leaching, each test was washed for four days with water. A portion of the tailings material from each column-leach test was utilized for tail screen analyses with assays by size fraction. Column-leach gold and silver extraction results are summarized in the Metallurgical Report (Simmons, 2019, Appendix 32).

None of the columns required agglomeration in the laboratory column set-up. Column-leach extraction results were calculated based upon loaded carbon assays and tails assays. Calculated gold head grades for the 41 columns ranged from 0.18 to 6.39 ppm Au with an average of 1.58 ppm Au. Gold extraction ranged between 15.0 and 94.8% with an average of 78.9%.

- Two of the column-leach composites were sulfide/carbon refractory with gold cyanide solubility <60% and gold extraction ranged from 15.0 to 25.5% and averaged 20.3%.
- Eight of the column-leach composites were transitional with gold cyanide solubility >60% and <85%. Gold extraction for these columns ranged from 57.8 to 85.8% and averaged 69.7%.
- Thirty-seven of the column-leach composites were oxide with gold cyanide solubility >85%. Gold extraction for these columns ranged from 56.3 to 94.9% and averaged 84.1%.

Calculated silver head grades for the 47 columns ranged from 0.30 to 2.54 ppm Ag with an average of 0.58 ppm Ag. Silver extraction ranged between 14.3 and 68.0% with an average of 31.1%. Silver head grades for Dark Star are very low and of minimal economic significance.

Cyanide consumption averaged 1.07 kg/t and lime consumption averaged 1.15 kg/t. Commercial scale ROM cyanide consumptions are expected to be in the range of 25 to 33% of laboratory-scale test results. Laboratory lime consumptions are assumed to be similar to commercial-scale consumptions.

Gold extraction versus days under leach for the 47 column-leach tests are shown graphically in Figure 13-11. The two low gold extraction plots show in Figure 13-11, are for the sulfide composites discussed in the first bullet above.

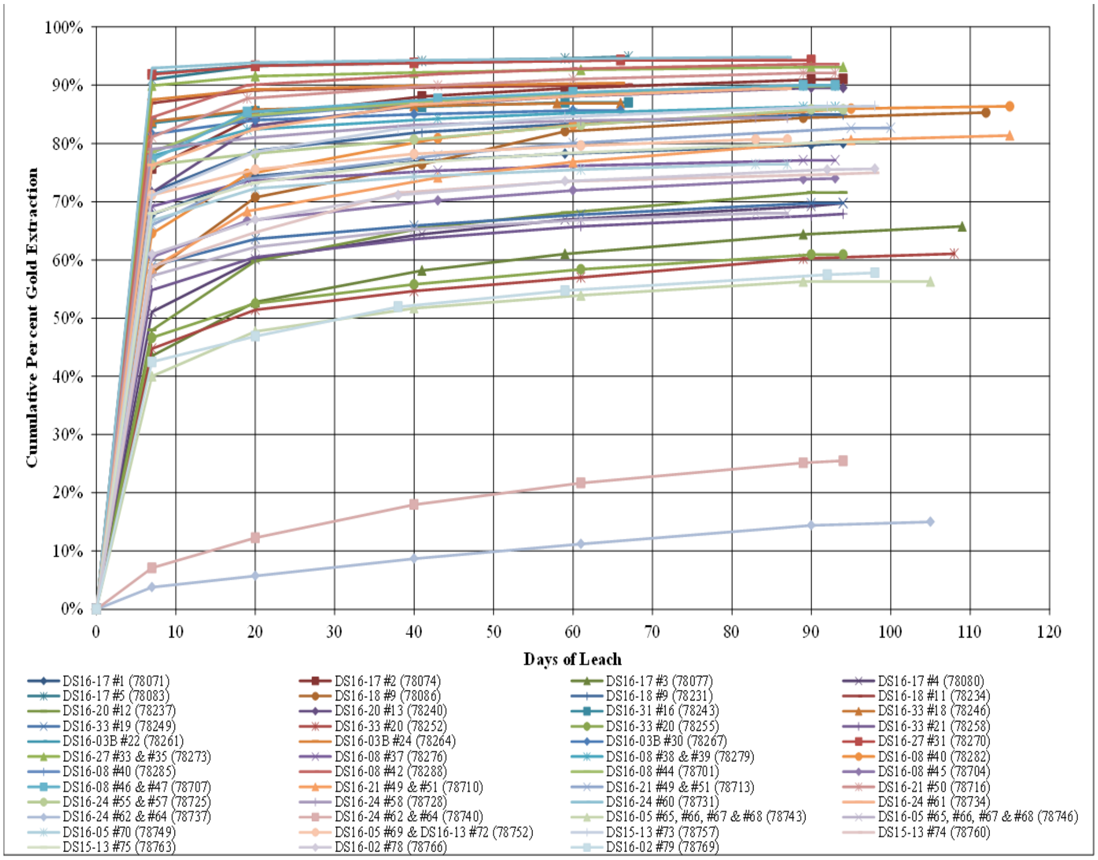


Figure 13-11: 2017 Dark Star Column-Leach Gold Extraction vs. Days under Leach

13.6.3 2017 Dark Star Comminution Characterization at HRI

Twelve Dark Star drill core samples were selected for comminution test work. These samples were splits from metallurgical composites and represent major material types. They were subjected to the modified SMC Test at HRI to generate data for SMC parameters; M_{ic} by JKTech and Ai testing was also completed. A final letter report was issued: Comminution Testing, Hazen Project 12391 Report and Appendices A and B – July 5, 2017 (Stepperud, 2017b).

13.6.3.1 2017 Dark Star SMC Test Results

The 2017 Hazen SMC Test® results for the twelve samples are given in the Metallurgical Report (Simmons, 2019, Appendix 33). The table includes the average rock density, A x b and drop-weight index values that are the direct result of the SMC Test® procedure. The values determined for the M_{ia}, M_{ih}, and M_{ic} parameters and the definitions of these abbreviations developed by SMCT are also presented in the table.

13.6.3.2 2017 Dark Star SAG Mill Comminution Test

The drop weight index ranged from 2.57 to 8.53 kWh/m^3, indicating soft to medium-hard material, and is tabulated along with other parameters of the SMC evaluation in Appendix 33 (Simmons, 2019). The range of A x b for the 12 composites spanned a low of 30.7 (moderately hard) to a high of 99.4 (soft) and averaged 49.6.

13.6.3.3 2017 Dark Star Bond Abrasion Index (Ai) Tests

Bond Abrasion index testing was performed at Hazen on 12 Dark Star composite samples. The Metallurgical Report (Simmons, 2019, Appendix 34) lists the Ai values for the 12 composites that were tested. Ai values ranged from a low of 0.2432 g to a high of 1.2381 g, indicating moderate to high abrasiveness of the materials tested. The silica content of the Dark Star mineralized material is the inferred rock component that contributes to the corresponding high Ai test results.

13.6.3.4 2017 Dark Star Comminution Test Summary

The Dark Star comminution samples tested can be considered amenable to conventional, multi-stage crushing and screening circuit design. M_{ic}, the SMC crusher-component value (average = 6.8 kWh/t), would be ranked in the mid-range of the SMC worldwide database.

The Ai values are modest to high (average = 0.7864 g) and represent the potential for above average rates of wear on crusher liners, screen panels, and conveyor drop boxes.

13.6.4 2017 Dark Star Load Permeability Testing

A portion of tailings material from twenty-four (24) column-leach test was utilized for load permeability test work. The purpose of the load permeability test work was to examine the permeability of the crushed material under compaction loading equivalent to heap heights of 25, 50, 75, and 100 m.

The test cell utilized for modeling the permeability of stacked material at various heap heights was a steel column or cell. Staged axial (vertical) loading of the test material was utilized to simulate the incrementally increased pressure obtained when loading the heap.

Drainage layers were installed at the top and at the base of the column. External load was applied to the charge of material in the column utilizing a perforated steel plate that moved freely within the walls of the column.

Guidelines that KCA utilizes when reviewing the results from this type of test were listed in Section 13.2.4. The results of the Dark Star load permeability test work are summarized in the Metallurgical Report (Simmons, 2019, Appendix 35).

Twenty of the 24 column residues that were tested passed using KCA's criteria at all simulated heap heights. One sample failed at the 100 m simulated height and three samples failed at the 25 m simulated height.

The Metallurgical Report (Simmons, 2019, Appendix 36) summarizes geologic information and column-residue screen analysis data for the three column residue samples that failed load permeability testing at the 25 m height. Of specific note, these three column-residue samples had the highest percentage of -200-mesh (75 µm) fines reported in the column residue screen analysis, of all 24 residue samples that were tested, and geologic logging of two of the samples identified appreciable amounts of fault and clay material. It is unknown at this time how much of the total mineral resource tonnage may be represented by these three samples, but it is believed to be minor and it is assumed that this material can be blended during mining and processing.

13.7 2018 GOLD STANDARD DARK STAR HPGR METALLURGICAL TEST WORK

Two Dark Star HPGR composite samples were comprised of selected core samples (Simmons, 2019, Appendix 37) remaining from the 2017 Dark Star bottle-roll and column-leach test program.

13.7.1 2018 Dark Star HPGR Head Assays

Geological information and head assays for the two 2018 Dark Star HPGR Master Composites are shown in Appendix 37 and 38 (Simmons, 2019).

13.7.2 2018 Dark Star HPGR Composite Bottle-Roll and Column-Leach Tests

The Dark Star HPGR composite samples were subjected to bottle-roll leach testing at target P_{80} sizes of 38 µm, 75 µm, and 1,700 µm. Column-leach testing was conducted on conventional-crushed material at a P_{80} of 12.5 mm and on HPGR-crushed samples subjected to low, medium, and high HPGR press forces. The objective of this bottle-roll and column-leach testing was to evaluate the differences in gold extraction, comparing conventional-crush results to HPGR-crush results.

13.7.2.1 2018 Dark Star Bottle-Roll Tests on HPGR Composite Samples

Bottle-roll leach tests were performed on 500 g or 1,000 g portions of head material comminuted to a P_{80} target size of 1,700 microns (1.70 mm), 75 microns (0.075 mm), and 38 microns (0.038 mm). Bottle-roll tests, wet screening and assay methods were performed with the same procedures outlined in Section 13.6.2. The 2018 bottle-roll results are shown in the Metallurgical Report (Simmons, 2019, Appendix 39).

Bottle-roll cyanide-leach gold extractions are lower for the Dark Star Main composite but appear to be in line with the lower gold head grade material from Dark Star North. Silver extractions are low for both Dark Star Main and North composites, this is expected for the low silver head grades which are of minimal economic significance.

13.7.2.2 2018 Dark Star Column-Leach Tests on HPGR Composite Samples

Column-leach tests were performed on eight HPGR composite-sample charges, four from Dark Star Main and four from Dark Star North, prepared in the following manner sample:

- Conventional crush to target P_{80} = 12.5 mm
- HPGR crush at low press force (2.20 N/mm^2) setting, P_{80} = 7,000 µm
- HPGR crush at medium press force (3.35 N/mm^2) setting, P_{80} = 6,500 µm
- HPGR crush at high press force (4.30 N/mm^2) setting, P_{80} = 5,000 µm

The column tests were leached for 80 days with a dilute sodium cyanide solution, utilizing the same procedures as outlined in Section 13.2.2. Column-leach test results are summarized in the Metallurgical Report (Simmons, 2019, Appendix 40); extractions results are based upon the calculated head derived from the loaded carbon assays + tails assays.

For the Dark Star “Main Master Composite #1” gold extractions ranged from 81% (conventional crush) to 86% (HPGR average, all pressure settings) based upon calculated heads ranging from 0.709 g Au/t to 0.736 g Au/t. Sodium cyanide consumption ranged from 0.76 kg/t to 0.84 kg/t and hydrated-lime consumption ranged from 1.01 kg/t to 1.04 kg/t.

For the Dark Star “North Master Composite #2” gold extractions ranged from 86% (conventional crush) to 91% (HPGR high pressure) based upon calculated heads ranging from 1.20 g Au/t to 1.70 g Au/t. Sodium cyanide consumption ranged from 0.59 kg/t to 0.89kg/t and hydrated lime consumption ranged from 1.00 kg/t to 1.03 kg/t.

A graphical comparison of gold extraction from conventionally-crushed versus HPGR-crushed sample charges, from the Dark Star Main Master Composite #1, is shown in Figure 13-12.

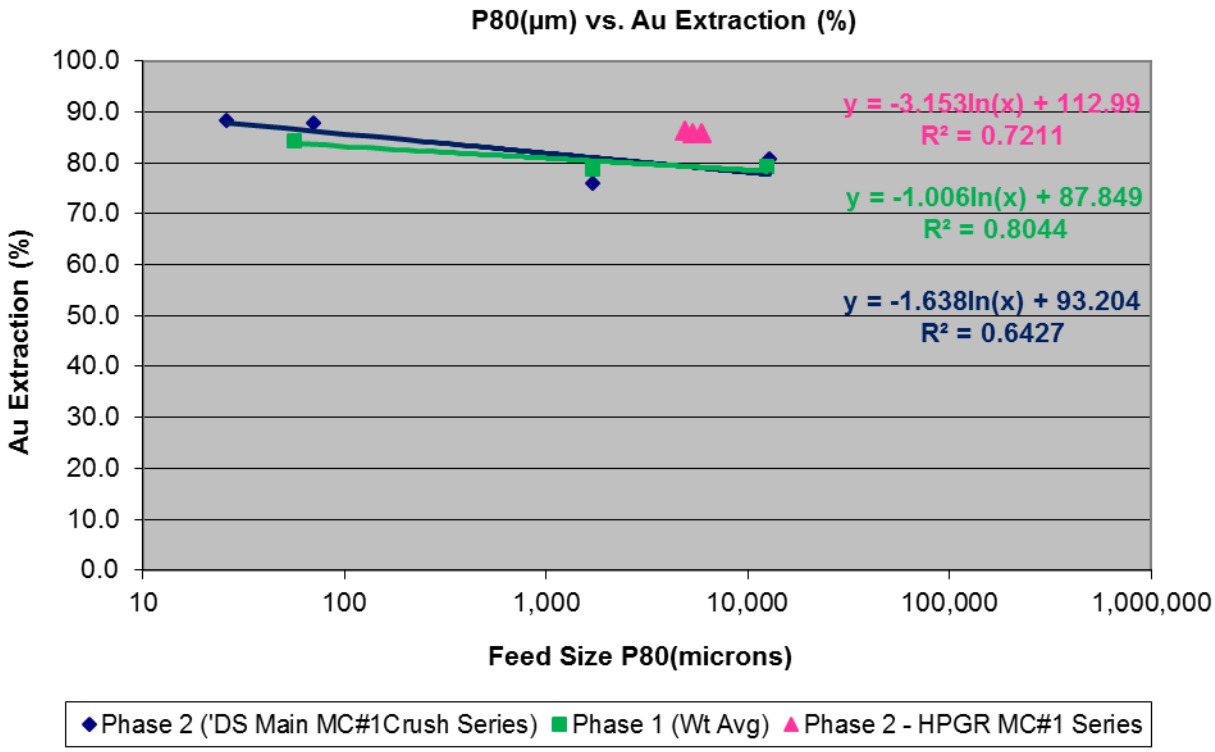


Figure 13-12: 2018 Dark Star Main - Conventional Crush vs. HPGR Gold Extraction

The green line in Figure 13-12 is provided for benchmarking purposes and represents the original 2017 Phase 1 conventional-crush gold extraction results by weight-averaging the variability composite samples that were included in the Dark Star Main Master Composite #1. The blue line represents conventional-crush gold extraction results on HPGR Master Composite #1 from the 2018 HPGR tests. The magenta triangles represent gold-extraction results for the three HPGR Master Composite #1 column-leach tests at low, medium, and high HPGR press forces.

A graphical comparison of gold extraction for conventionally-crushed versus HPGR-crushed sample charges from the Dark Star North Master Composite #2 is shown in Figure 13-13. The green and blue lines and the magenta triangles represent, respectively: the original 2017, Phase 1, conventional-crush gold-extraction results by weight averaging the variability composite samples that were included in the Dark Star North Master Composite #2, the conventional-crush gold extraction results from HPGR Master Composite #2 in the 2018 HPGR tests, and gold extraction results from the three HPGR Master Composite #2 column-leach tests at low, medium, and high HPGR press forces.

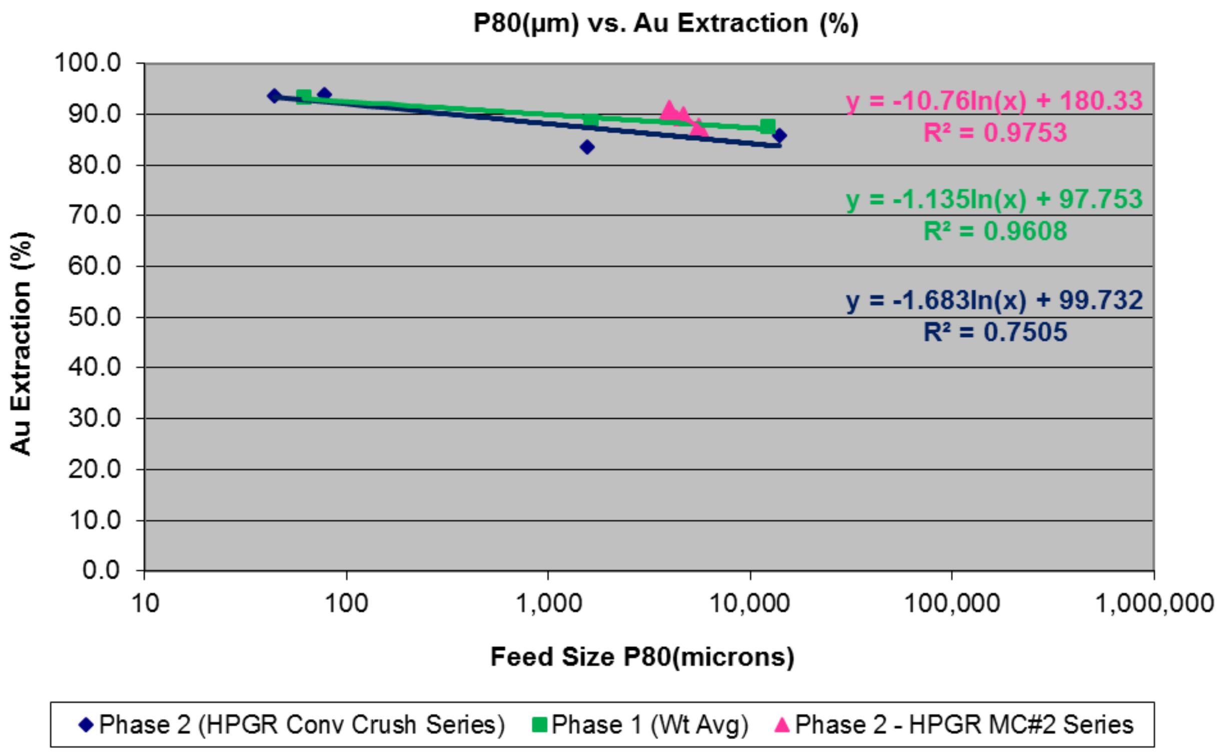


Figure 13-13: Dark Star North - Conventional Crush vs. HPGR Gold Extraction

The Dark Star Main HPGR column-leach gold extractions are significantly higher than the conventional-crushed column charge. The Dark Star North HPGR gold extractions are only marginally higher than the conventional-crushed composite at similar P_{80}'s. While it is relatively simple to design a flowsheet to produce any specific P_{80} particle size from conventional crushing, it is not for HPGR comminution. The P_{80}'s shown in Figure 13-12 and Figure 13-13 represent a close approximation to the product size that would be produced in a commercial HPGR comminution circuit.

13.7.3 2018 Dark Star Main & North HPGR-Crushed Load Permeability Testing

All column-leach charges were leached without cement addition or agglomeration for this phase of testing. Column-leach residues were subjected to evaluation of percent slump maximum percolation rate and load permeability tests. Results are shown respectively in Appendix 41, 42, and 43 (Simmons, 2019).

The medium press-force column-leach residue from Dark Star Main HPGR Master Composite #1 failed load permeability testing at all heights. The medium and high press-force column-leach residues from two of the Dark Star North HPGR Master Composite #2 charges failed at all heights. All other column-leach residues passed at all heights tested. It is recommended that future testing continue to evaluate cement agglomeration on HPGR-comminuted samples to support heap heights of at least 50 m, and possibly 75 m.

13.8 2019 GOLD STANDARD DARK STAR DEPOSIT METALLURGICAL TEST WORK

In 2018 Gold Standard commissioned KCA to complete a bottle roll, conventional crush and HPGR crush column leach metallurgical test program on 2017-2018 drill core composite samples from the Dark Star Main and North deposits. Test results are documented in KCA (2019b).

13.8.1 2019 Dark Star Head Assays for Bottle-Roll and Column-Leach Tests

Head assays and geo-metallurgical characterization analyses were obtained for 50 composites using a combination of four separate laboratories: KCA, ALS, UBC, and FLS. The head assays are tabulated in Appendix 44 through 47 (Simmons, 2019) showing that:

- Gold grade ranged from 0.182 to 5.62 ppm and averaged 1.23 ppm.
- Silver grade ranged from 0.50 to 3.50 ppm and averaged 1.01 ppm.
- Organic carbon ranged from 0.01 to 1.13% (sulfide sample) and averaged 0.16%.
- Sulfide sulfur ranged from <0.01 to 0.83% (sulfide sample) and averaged 0.18%.
- Preg-robbing analysis ranged from 0.0 to 5.3% and averaged 0.7% (non-preg-robbing).
- Copper values were very low, ranging from 9 to 43 ppm and averaged 18 ppm.
- Gold cyanide solubility ranged from 33.4% (sulfide sample) to 100% and averaged 83.2%.
- Concentrations of deleterious elements by ICP were low: <5 ppm selenium on average, mercury ranged from 0.1.3 to 63.0 ppm (sulfide sample) and averaged 7.8 ppm, and arsenic ranged from 1.1 to 562 ppm with an average of 198 ppm.
- Concentrations of the primary cyanide consumers were low and suggest minimum potential for effecting cyanide consumption rates. Copper averaged 18 ppm, nickel averaged 36 ppm, and zinc averaged 131 ppm.
- Whole-rock quartz (SiO_2) analyses were high, ranging from 51.4 to 93.7% and averaged 88.3%.

13.8.2 2019 Dark Star Bottle-Roll and Column-Leach Tests at KCA

Fifty drill core composites were subjected to bottle-roll leach testing at target P_{80} sizes of 75 µm and 1,700 µm, conventional crush column-leach testing at crush sizes of 12.5 mm and 25.0 mm and six of the fifty composites were HPGR crushed (at medium press) force and column leached. The main objective of the bottle-roll and column-leach testing was to evaluate laboratory-scale leachability of the Dark Star mineral resource in terms of gold extraction, extraction rate, reagent consumption, sensitivity to feed size, and to evaluate comparative differences between conventional crush and HPGR crush Au recovery.

13.8.2.1 2019 Dark Star Bottle Roll Tests

Bottle-roll leach testing was conducted on portions of material from each of the 50 composites. A 500 or 1,000 g portion of head material was crushed to a nominal size of 1,700 µm (1.70 mm) and utilized for leach testing. A second portion of material was milled in a laboratory rod mill to a target size of 80% passing 75 µm (0.075 mm). The milled slurry was then utilized for leach testing. The tests which are described in detail by the laboratory report (KCA 2019b), employed retention times of 144 hours for the 1,700 µm material and 72 hours for the 75 µm material.

Gold Standard has divided the Dark Star deposit into two zones for metallurgical testing: Dark Star Main and Dark Star North. Dark Star metallurgical core holes are color coded by year in Figure 13-14 (below). The 2017 (green) and 2018 (blue) core holes were used in the 2019 bottle-roll and column leach test work.

Gold and silver extraction results are summarized in Appendix 48(75 µm Bottle Rolls), Appendix 49(1,700 µm Bottle Rolls), Appendix 50 (Conventional Crush Columns), and Appendix 51(HPGR Crush Columns) from the Metallurgical Report (Simmons, 2019). Dark Star zones from which composite sample material originated is shown in Figure 13-14.

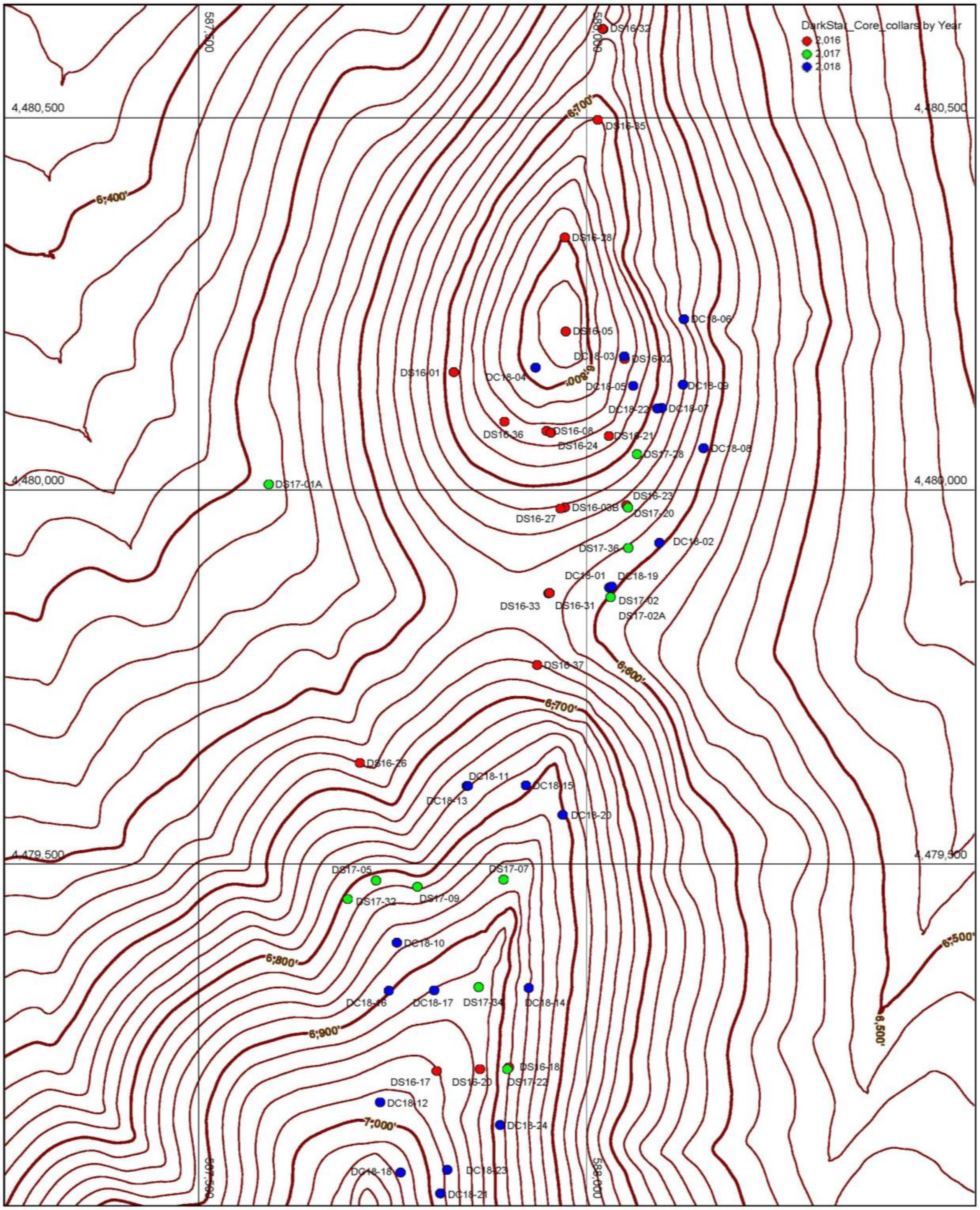


Figure 13-14: Location Map for 2017-8 Dark Star Metallurgical Composites

The following is a summary of the findings from the 2019 Dark Star bottle roll test results:

13.8.2.2 2019 Dark Star 75 µm (200 Mesh) Bottle-Roll Results

Dark Star 200-mesh bottle-roll gold and silver extraction results are shown in the Metallurgical Report (Simmons, 2019, Appendix 48). Gold head grades for the 200-mesh composite samples ranged from 0.18 to 5.85 ppm Au with an average of 1.19 ppm Au. Gold extraction ranged between 24.7 and 96.1% and averaged 80.8%. Three of the composites were sulfide/carbon refractory with gold cyanide solubility <60%, 20 of the composites were transitional with gold cyanide solubility >60% and <85%, and 27 of the composites were oxide with Au_{CN} solubility >85%.

Silver grades are very low at Dark Star. Silver head grades for the 75 µm composites ranged from 0.31 to 2.81 ppm Ag with an average of 0.87 ppm Ag. Silver extraction ranged from 7.3 to 85.4% and averaged 42.7%. Cyanide consumption averaged 0.90 kg/t and lime consumption averaged 1.08 kg/t.

13.8.2.3 2019 Dark Star 1,700 µm (10 Mesh) Bottle-Roll Results

Dark Star 10-mesh bottle roll gold and silver extraction results are shown in the Metallurgical Report (Simmons, Appendix 49). Gold head grades for the 1,700 µm composite samples ranged from 0.15 to 5.89 ppm Au with an average of 1.15 ppm Au. Gold extraction ranged between 26.0 and 94.5% and averaged 75.0%. Three of the composites were sulfide/carbon refractory with gold cyanide solubility <60%, 20 of the composites were transitional with gold cyanide solubility >60% and <85%, and 27 of the composites were oxide with Au_{CN} solubility >85%.

Silver grades are very low at Dark Star. Silver head grades for the 1,700 µm composites ranged from 0.38 to 2.77 ppm Ag with an average of 1.25 ppm Ag. Silver extraction ranged from 4.3 to 67.1% and averaged 24.9%.

Cyanide consumption averaged 0.59 kg/t and lime consumption averaged 1.27 kg/t.

13.8.2.4 2019 Dark Star 12.5 mm and 25.0 mm Conventional Crush Column Leach Results

Eleven of the 2019 composites were column leached utilizing material crushed to 100% passing 19 mm (target P_{80} = 12.5 mm), and thirty-nine composites were crushed to 100% passing 37.5 mm (target P_{80} = 25 mm) for column leach testing. During testing, the material was leached for 66, 95, 98 or 99 days with dilute NaCN solution and placed, respectively, in columns of 100 mm and 150 mm diameters. After leaching, each test was washed for four days with water. A portion of the tailings material from each column-leach test was utilized for tail screen analyses with assays by size fraction. Column-leach gold and silver extraction results are based upon pregnant solution carbon assays and tails screen assays and are summarized in the Metallurgical Report (Simmons, 2019, Appendix 50).

Seven of the columns were agglomerated with 2 kg/t of cement in the laboratory column set-up. Column-leach extraction results were calculated based upon loaded carbon assays and tails screen assays. Calculated gold head grades for the 50 columns ranged from 0.19 to 5.39 ppm Au with an average of 1.32 ppm Au. Gold extraction ranged between 28.4 and 94.7% with an average of 74.5%.

- Three of the column-leach composites were sulfide/carbon refractory with gold cyanide solubility <60%. Gold extraction ranged from 28.4 to 39.9% and averaged 35.1%.
- Twenty of the column-leach composites were transitional with gold cyanide solubility >60% and <85%. Gold extraction for these columns ranged from 47.5 to 84.7% and averaged 67.2%.
- Twenty-seven of the column-leach composites were oxide with gold cyanide solubility >85%. Gold extraction for these columns ranged from 63.3 to 94.7% and averaged 84.4%.

Calculated silver head grades for the 50 columns ranged from 0.41 to 2.90 ppm Ag with an average of 1.17 ppm Ag. Silver extraction results ranged between 12.0 and 76.1% with an average of 35.5%. Silver head grades for Dark Star are very low and of minimal economic significance.

Cyanide consumption averaged 0.95 kg/t and lime consumption averaged 0.92 kg/t. Commercial scale ROM cyanide consumptions are expected to be in the range of 25 to 33% of laboratory-scale test results. Laboratory lime consumptions are assumed to be similar to commercial-scale consumptions.

Gold extraction versus days under leach for the 50 column-leach tests are shown graphically in Figure 13-15.

13.8.2.5 2019 Dark Star HPGR Crush (Medium Press Force) Column Leach Results

Seven duplicate splits from the fifty 2019 composites were HPGR Crushed using medium press force conditions and column leached under the same conditions as their conventional crush column pairs. After leaching, each test was washed for four days with water. A portion of the tailing material from each column-leach test was utilized for tail screen analyses with assays by size fraction.

Column-leach gold and silver extraction results are based upon pregnant solution carbon assays and tails screen assays and are summarized in the Metallurgical Report (Simmons, 2019, Appendix 51).

Plots of the laboratory column leach gold extractions, for the HPGR and conventionally crushed composites are shown in Figure 13-15.

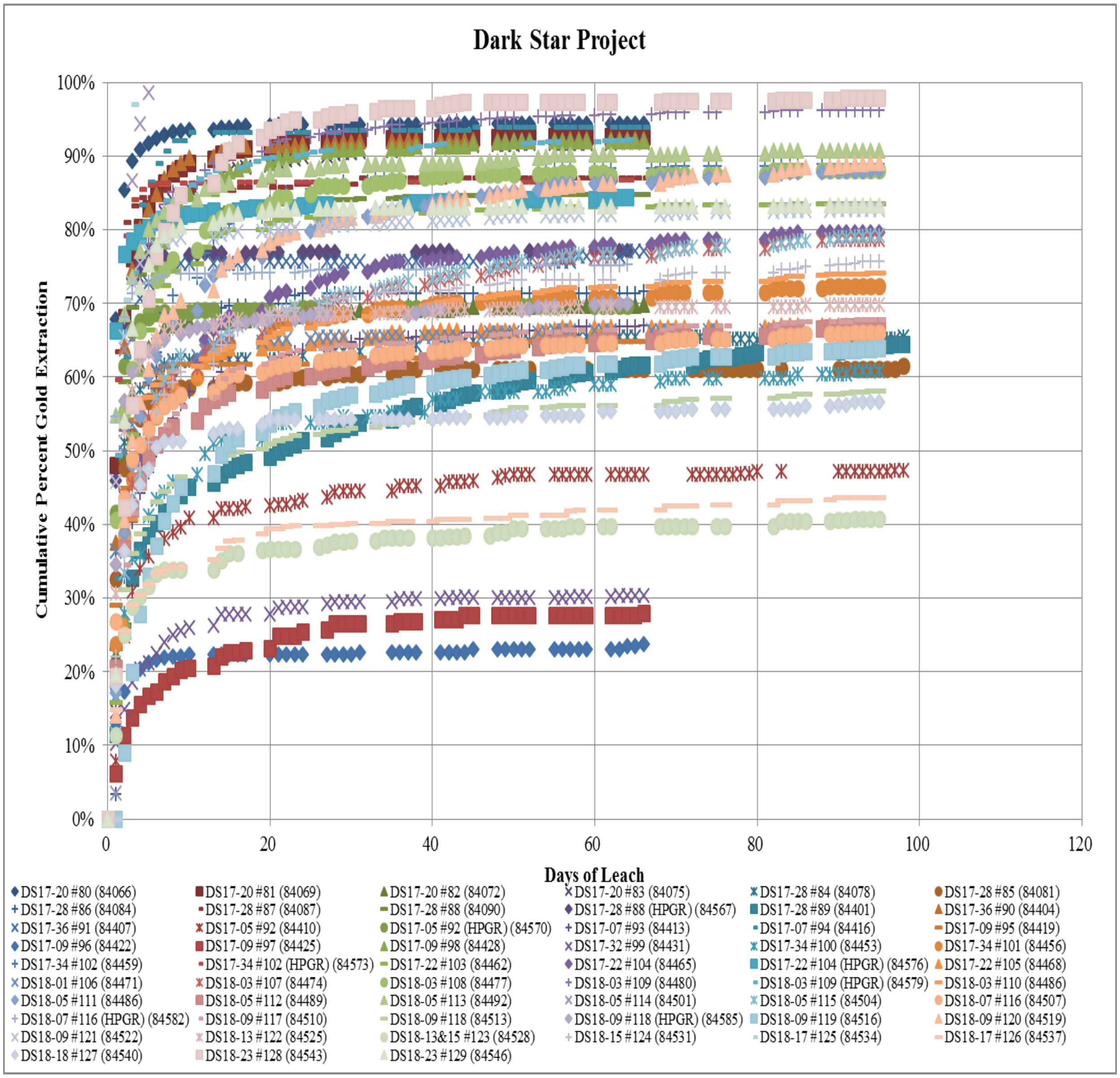


Figure 13-15: 2019 Dark Star Column-Leach Gold Extraction vs. Days under Leach

13.8.3 2019 Dark Star Comminution Characterization at HRI

Thirteen of the 2019 Dark Star drill core samples were selected for comminution test work. These samples were splits from metallurgical composites and represent major material types. They were subjected to the modified SMC Test at HRI to generate data for SMC parameters; M_{ic} by JKTech and Ai testing was also completed. A final letter report was issued: Comminution Testing, Hazen Project 12620 Report and Appendices A and B – February 11, 2019 (Stepperud, 2019b).

13.8.3.1 2019 Dark Star SMC Test Results

The 2019 Hazen SMC Test® results for the thirteen samples are given in the Metallurgical Report (Simmons, 2019, Appendix 52). This table includes the average rock density, A x b and drop-weight index values that are the direct result of the SMC Test® procedure. The values determined for the M_{ia}, M_{ih}, and M_{ic} parameters, and the definitions of these abbreviations developed by SMCT are also presented in this table.

13.8.3.2 2019 Dark Star SAG Mill Comminution Test

The drop weight index ranged from 2.05 to 9.62 kWh/m^3, indicating soft to medium-hard material, and is tabulated along with other parameters of the SMC evaluation in Appendix 52 (Simmons, 2019). The range of A x b for the 12 composites spanned a low of 34.6 (moderately hard) to a high of 123.3 (soft) and averaged 49.3.

13.8.3.3 2019 Dark Star Bond Abrasion Index (Ai) Tests

Bond Abrasion index testing was performed at Hazen on thirteen Dark Star composite samples. Appendix 53 from the Metallurgical Report (Simmons, 2019) lists the Ai values for the 13 composites that were tested. Ai values ranged from a low of 0.0306 g to a high of 1.1656 g, indicating very soft to high abrasiveness of the materials tested. The silica content of the Dark Star mineralized material is the inferred rock component that contributes to the corresponding high Ai test results.

13.8.3.4 2019 Dark Star Comminution Test Summary

The Dark Star comminution samples tested can be considered amenable to conventional, multi-stage crushing and screening circuit design. M_{ic}, the SMC crusher-component value (average = 6.8 kWh/t), would be ranked in the mid-range of the SMC worldwide database.

The Ai values range from low to high (average = 0.6895 g) and represent the potential for average to above average rates of wear on crusher liners, screen panels and conveyor drop boxes.

13.8.4 2019 Dark Star Load Permeability Testing

A portion of material from fifteen (15) conventionally crushed column-leach residues and four (4) HPGR crushed column residues were utilized for load permeability testing. The purpose of the load permeability test work was to examine the permeability of the crushed material under compaction loading equivalent to heap heights of 25, 50, 75, and 100 m.

Test cell set up and guidelines for interpreting load permeability results have been described earlier in this Technical Report. Refer to Section 13.2.4 for details.

All fifteen conventional crush column residues passed at simulated heap heights up to 100 meters except for the column residue from composite DS17-07 #94, which failed at 75 and 100-meter simulated heap height, using the KCA criteria. See Appendix 54 in the Metallurgical Report (Simmons, 2019) for a summary of the conventional crush load permeability test results.

All four HPGR crush column residues passed at simulated heap heights of 75 meters. Three of the four column residues were agglomerated with 6 kg/t of cement and failed at 100 meters, using the KCA criteria. See Appendix 55 in the Metallurgical Report (Simmons, 2019) for a summary of the HPGR load permeability test results.

13.9 2020 GOLD STANDARD PINION DEPOSIT TRANSITION METALLURGICAL TESTING

In 2020, three variability composites, targeting transition ore from the Pinion deposit, were made from intervals selected from 5 core holes (PC19-04, PC19-05, PC19-06, PC19-12 and PC19-13). Drill hole locations for the three composites are shown in Figure 13-16 (highlighted in yellow).

These composites were used for conventional and HPGR column-leach and bottle-roll testing at KCA in Reno, Nevada, and results are documented in a final report by KCA (2020).

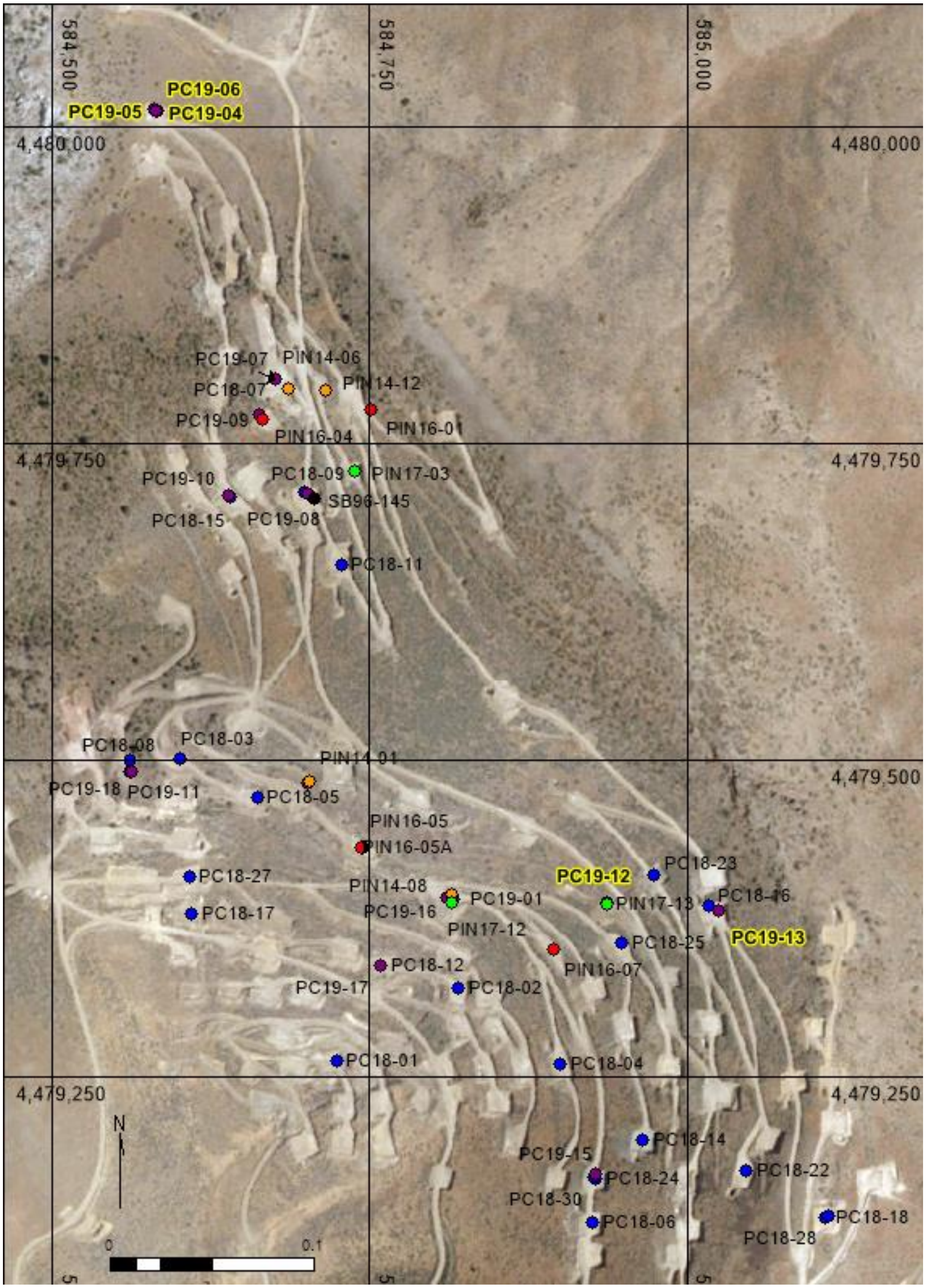


Figure 13-16: Pinon Metallurgical Core Hole Locations

13.9.1 2020 Pinion Variability Composite Head Assays

Head assays and geo-metallurgical characterization were conducted on all composites using three separate laboratories: KCA, ALS Laboratory Group (ALS), and University of British Columbia ("UBC"). Table 13-6 summarizes gold, silver carbon and sulfur assays.

Table 13-6: Variability Composite Head Assays

			Head Assays										
KCA Sample No.	Description	Zone	Au & Ag Assays					Sulfur and Carbon Species					Preg-robb %
			AuFA ppm	AuCN %	Ag ppm	AgCN %	Cu ppm	C(tot) %	C(org) %	$S_{(total)}$ %	$S^{=}$ %	SO_4 %	
Phase 4 - Variability Composites													
84851 A	PW#61-Trans	PW	0.326	85.9	2.00	74.5	30	0.16	0.01	2.46	0.03	2.43	-3.8%
84852 A	PE#62-Trans	PE	0.942	82.8	10.40	56.9	25	0.60	0.35	1.49	0.20	1.29	0.5%
84853 A	PE#63-Trans	PE	1.260	36.5	5.90	36.6	35	0.28	0.05	4.27	0.97	3.30	5.8%

Note: The search for targeted transitional Pinion ore types (Au_{CN} >50%, <70%) was unsuccessful. Two of the composites were oxide and one was sulfide. The oxide composites were added to the oxide database and incorporated into the updated Au and Ag recovery models.

ICP multi-element, whole rock and QXRD analyses are shown in Appendix 1 of Metallurgy Report – South Railroad Feasibility Update (Simmons, 2021). Geo-metallurgical highlights for the three variability composites are summarized below:

- Gold grades ranged from 0.32 to 1.26 ppm and averaged 0.84 ppm;
- Silver grades ranged from 2.0 to 10.4 ppm and averaged 6.1 ppm;
- Organic carbon ranged from 0.01 to 0.35% and averaged 0.14%;
- Sulfide sulfur ranged from 0.03 to 0.97% and averaged 0.40%;
- Preg-robb analyses ranged from -3.80 to 5.8% and averaged 0.80%;
- Copper values were very low, ranging from 25 to 35 ppm and averaged 30 ppm;
- Gold cyanide solubility ranged from 36.5 to 85.9% and averaged 68.4%;
- Concentrations of the deleterious elements were: selenium averaged <5 ppm, mercury averaged of 6.8 ppm, and arsenic levels were low, averaging 299 ppm;
- Concentrations of the primary cyanide consumers were low and suggest minimum potential for affecting cyanide consumption rates. Copper averaged 30 ppm, nickel averaged 35 ppm, and zinc averaged 98 ppm;
- Whole-rock silica content ranged from 69.0 to 80.4% and averaged 76.2%.

13.9.2 2020 Bottle Roll and Column Leach Testing (KCA)

Three drill core composites were subjected to bottle-roll leach testing at target P80 sizes of 75 µm and 1,700 µm, column-leach testing at 12.5 mm and HPGR testing at medium press force. The main objective of this test work was to evaluate the laboratory-scale leachability character of the Pinion transition resources in terms of gold extraction, extraction rate, reagent consumption, and sensitivity to feed size.

The bottle-roll testing used a standard procedure that is described in the final laboratory report (KCA 2020a), using 144 hours of retention time for 1,700 µm tests, and 96 hours for 75 µm tests.

Column-leach tests were conducted utilizing material crushed to target P80's and placed in columns of 10 cm diameters. Conventional column and HPGR column leach material was leached for 94 days with a dilute 0.50 g/l NaCN solution. After leaching, each column was washed for four days with water. A portion of the leached and washed material ("tailings") from each column was assayed for "tail screen" analyses by size fraction.

Select geological information for the composites, together with feed sizes, retention times, reagent consumptions, and gold and silver extractions are shown in Table 13-7.

Table 13-7: 2020 Pinion Variability Composite Column and Bottle Roll Leach Test Results

KCA Sample No.	Test No	Description	GSV Geology				Feed Size		Leach Time (hrs/days)	Cement Add'n kg/t	Au Balance		Ag Balance		Reagents	
			Zone	Form.	Rock Type 1	Vein 1	Target P80 (µm)	Screen P80 (µm)			Au Ext %	Calc Hd Au (ppm)	Ag Ext %	Calc Hd Ag (ppm)	NaCN kg/t	Lime kg/t
PHASE4- Transition Testing																
84851 A	89032	PW#61-Trans	PW	**mlbx**	**ls**	**qzv**	HPGR	6,300	**94d**	2.1	**63.9**	0.377	**39.5**	3.040	1.53	0.00
84851 A	89041	PW#61-Trans	PW	**mlbx**	**ls**	**qzv**	12,500	12,200	**94d**	0.0	**51.0**	0.343	**34.3**	2.800	1.39	0.98
84851 A	89018A	PW#61-Trans	PW	**mlbx**	**ls**	**qzv**	1,700	1,560	144		**61.8**	0.353	**38.8**	2.500	0.20	0.75
84851 A	89050A	PW#61-Trans	PW	**mlbx**	**ls**	**qzv**	75	62	72		**76.3**	0.379	**62.8**	3.010	0.24	0.75
84852 A	89035	PE#62-Trans	PE	**mlbx**	**stmic**	**ccv**	HPGR	6,100	**94d**	2.0	**68.9**	0.939	**43.4**	12.060	1.18	0.00
84852 A	89044	PE#62-Trans	PE	**mlbx**	**stmic**	**ccv**	12,500	11,600	**94d**	0.0	**63.8**	0.910	**26.0**	12.170	1.43	0.99
84852 A	89018 B	PE#62-Trans	PE	**mlbx**	**stmic**	**ccv**	1,700	1,440	144		**66.3**	0.925	**51.1**	11.180	0.19	1.00
84852 A	89050 B	PE#62-Trans	PE	**mlbx**	**stmic**	**ccv**	75	66	72		**70.7**	0.891	**65.5**	11.640	0.53	0.73
84853 A	89038	PE#63-Trans	PE	**mlbx**	**mlbx**	**bav**	HPGR	5,000	**94d**	2.0	**33.0**	1.326	**27.3**	6.090	1.25	0.00
84853 A	89407	PE#63-Trans	PE	**mlbx**	**mlbx**	**bav**	12,500	12,100	**94d**	0.0	**24.9**	1.363	**15.1**	5.220	1.35	0.99
84853 A	89018 C	PE#63-Trans	PE	**mlbx**	**mlbx**	**bav**	1,700	1,660	144		**28.3**	1.382	**21.7**	5.750	0.39	1.00
84853 A	89050 C	PE#63-Trans	PE	**mlbx**	**mlbx**	**bav**	75	63	72		**31.8**	1.300	**51.9**	5.880	0.66	1.00

The following is offered as a summary of the findings from the 2020 column and bottle-roll test results:

2020 Bottle-Roll Tests on 1,700 µm Composite Samples

Gold head grades for the composites ranged from 0.35 to 1.38 ppm Au, with an average of 0.89 ppm Au. Gold extraction ranged from 28.3 to 66.3% and averaged 52.1%.

Silver head grades for the composites ranged from 2.5 to 11.2 ppm Ag, with an average of 6.5 ppm Ag. Silver extraction ranged from 21.7 to 51.1% and averaged 37.2%.

Cyanide consumption averaged 0.26 kg/t and lime consumption averaged 0.91 kg/t.

2020 Bottle-Roll Tests on 75 µm Composite Samples

Gold head grades for the composites ranged from 0.38 to 1.30 ppm Au, with an average of 0.86 ppm Au. Gold extraction ranged from 31.8 to 76.3% and averaged 59.6%.

Silver head grades for the composites ranged from 3.0 to 11.6 ppm Ag, with an average of 6.8 ppm Ag. Silver extraction ranged from 51.9 to 65.5% and averaged 60.1%.

Cyanide consumption averaged 0.48 kg/t and lime consumption averaged 0.83 kg/t.

2020 Conventional Column-Leach Tests on Composite Samples

Column-leach test extraction results were calculated based upon loaded carbon assays and tails assays. Gold head grades for the three 12.5 mm column composites ranged from 0.34 to 1.36 ppm Au (average = 0.87 ppm Au). Gold extraction ranged from 24.9 to 63.8% and averaged 46.3%.

Silver head grades for the three 12.5 mm column-leach composites ranged from 2.8 to 12.2 ppm Au and averaged 6.7 ppm Ag. Silver extraction results ranged from 15.1 to 34.3% and averaged 25.1%.

Cyanide consumption averaged 0.1.39 kg/t and lime consumption averaged 0.99 kg/t.

2020 HPGR Column-Leach Tests on Composite Samples

Column-leach test extraction results were calculated based upon loaded carbon assays and tails assays. Gold head grades for the three HPGR medium press force column composites ranged from 0.38 to 1.33 ppm Au (average = 0.88 ppm Au). Gold extraction results ranged between 33.0 to 68.9%, with an average of 55.3%.

Silver head grades for the three HPGR medium press force column-leach composites ranged from 3.0 to 11.6 ppm Au and averaged 7.1 ppm Ag. Silver extraction results ranged between 27.3 and 43.4% and averaged 36.7%.

Cyanide consumption averaged 1.32 kg/t, lime consumption averaged 0.00 kg/t and cement addition averaged 2.0 kg/t.

KCA advises that commercial-scale cyanide consumption typically runs in the range of 25 to 33% of laboratory consumption.

Gold extraction plotted by days under leach for the column-leach tests are shown graphically in Figure 13-17.

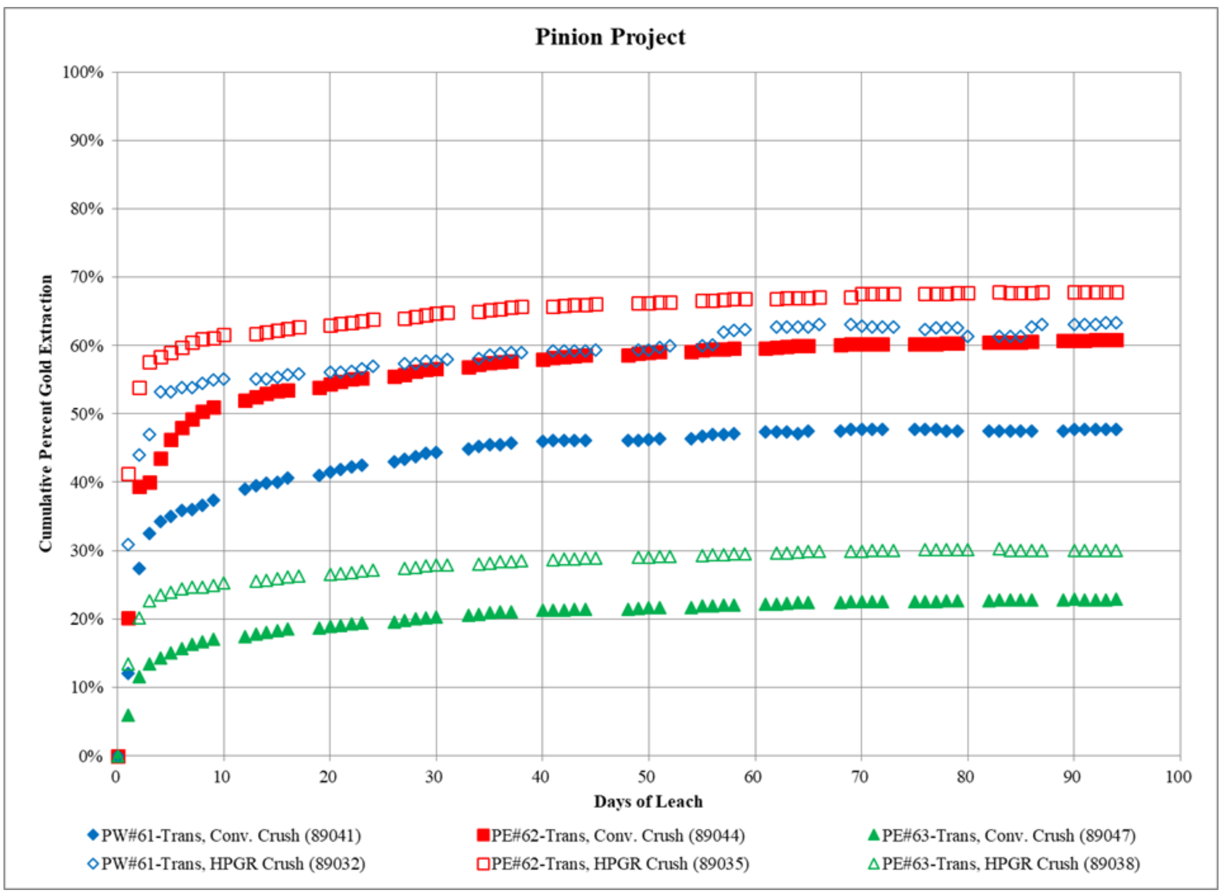


Figure 13-17: 2020 Gold Extraction vs. Days under Leach for Conventional and HPGR Column-Leach Tests

13.10 GOLD STANDARD 2020 HPGR FEASIBILITY COMPOSITES – PINION AND DARK STAR SAMPLES TESTED BY THYSSEN-KRUPP INDUSTRIAL SOLUTIONS

Gold Standard commissioned KCA and Thyssen-Krupp Industrial Solutions (TKIS) to perform feasibility level HPGR testing on two composites from the Pinion deposit and two from the Dark Star Deposit.

TKIS conducted semi-industrial scale MAGRO-HPGR testing and ATWAL abrasion testing, from splits of composites prepared by KCA in Reno, Nevada and shipped to Thyssen-Krupp's Industrial Solutions AG Research Center in Germany. Test results are documented in their final report (TKIS 2020), dated July, 21, 2020.

ATWAL abrasion testing was conducted on the following four samples:

1. Dark Star KCA Sample No. 84847 C, Dark Star Main (DSM) HPGR Feasibility #1 (Hi Si).
2. Dark Star KCA Sample No. 84848 B, Dark Star North (DSN) HPGR Feasibility #2 (Hi Si).
3. Pinion KCA Sample No. 84849 C, Pinion East (PE) HPGR Feasibility #1.
4. Pinion KCA Sample No. 84850 B, Pinion West (PW) HPGR Feasibility #2.

MAGRO large scale HPGR testing was conducted on:

1. Dark Star KCA Sample No. 84847 B, DSM HPGR Feasibility #1 (Hi Si).
2. Pinion KCA Sample No. 84849 B, PE HPGR Feasibility #1.

The MAGRO-HPGR final products were sent to KCA in Reno for column leach testing to determine gold and silver extraction.

KCA conducted bottle rolls, conventional column leaching, PILOTWAL-HPGR and MAGRO-HPGR column leaching testing in their Reno, Nevada testing facility. Test results are reported in their final report (KCA 2021), dated March 2021.

Metallurgical core drill locations for the Dark Star and Pinion Feasibility HPGR Composites are shown in Figure 13-18 through Figure 13-21 below. Pinion HPGR Feasibility drill hole numbers and locations are shown in yellow.

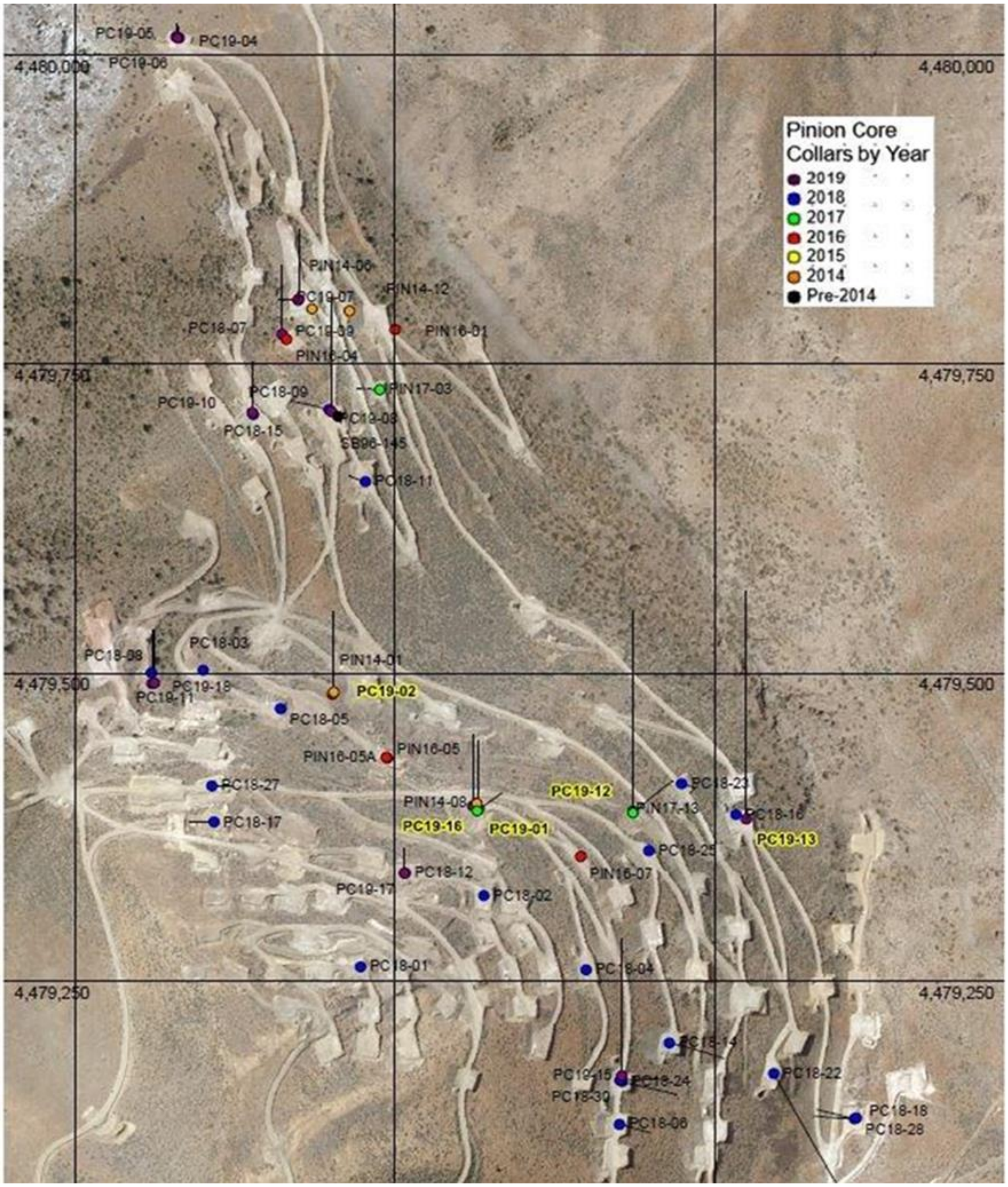


Figure 13-18: Pinion East HPGR Feasibility #1 Core Hole Location Map (Hi Ba and Hi Si low recovery zone)

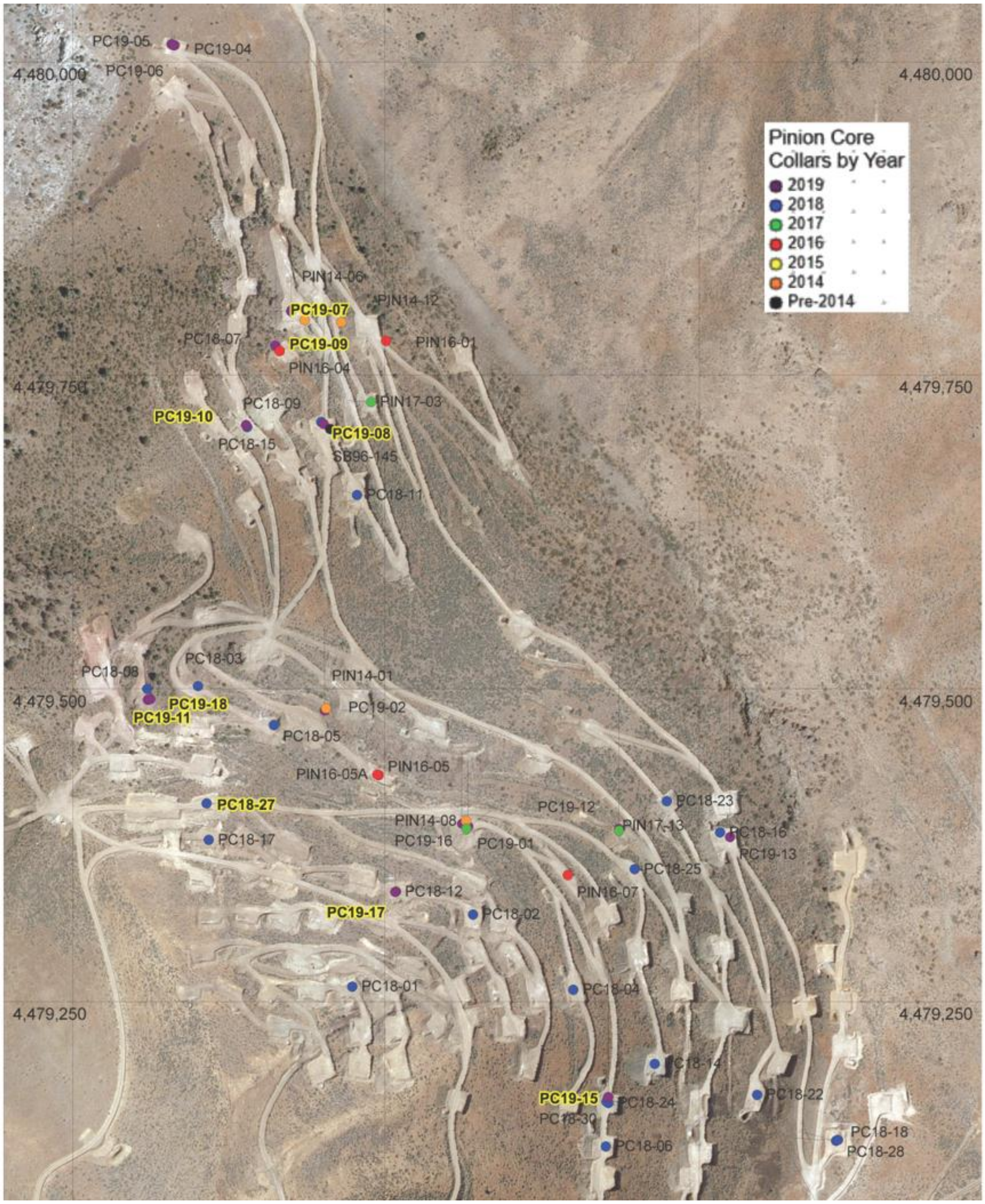


Figure 13-19: Pinion West HPGR Feasibility #2 Core Hole Location Map (higher recovery zone)

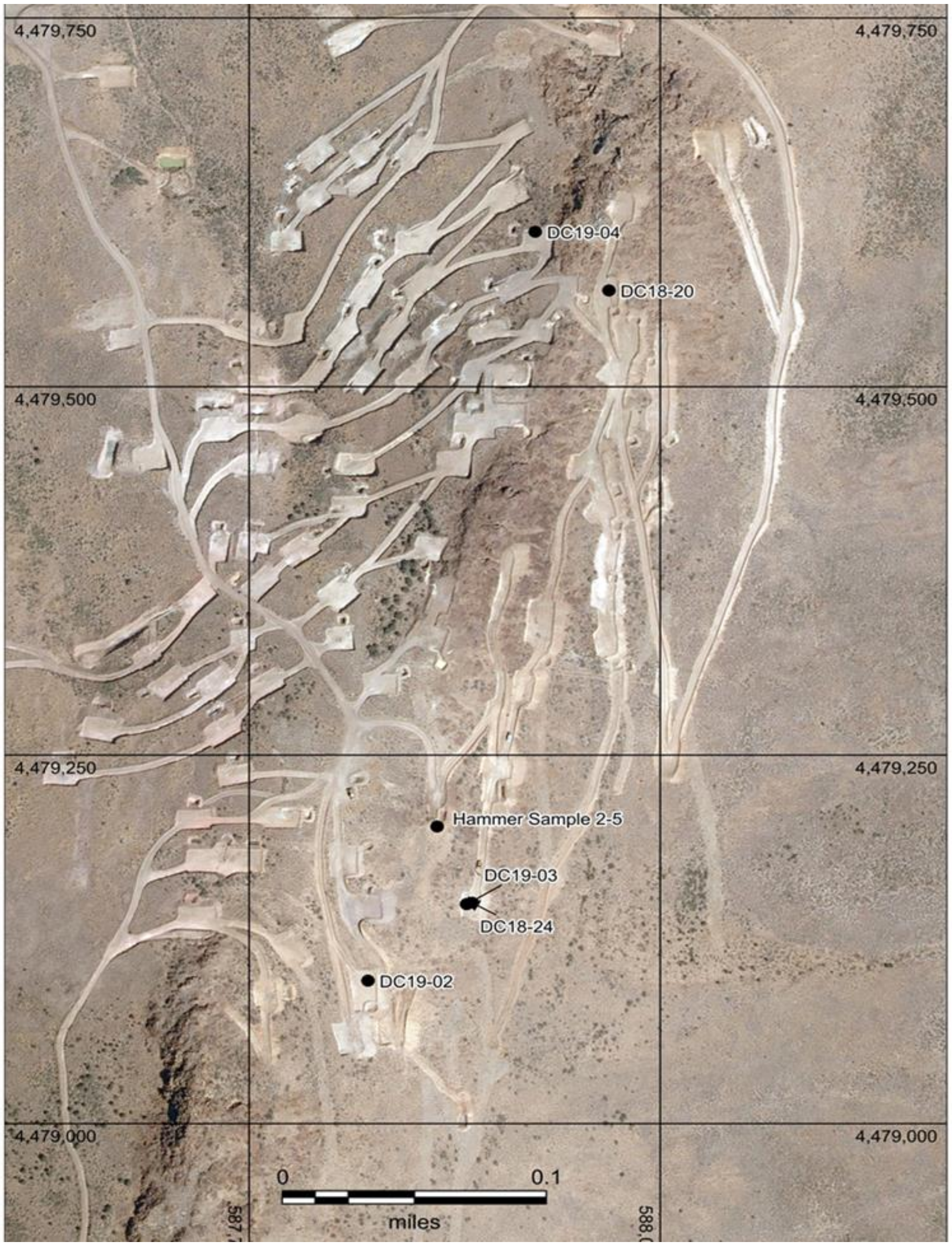


Figure 13-20: Dark Star Main HPGR Feasibility #1 Core and Hammer Sample Locations

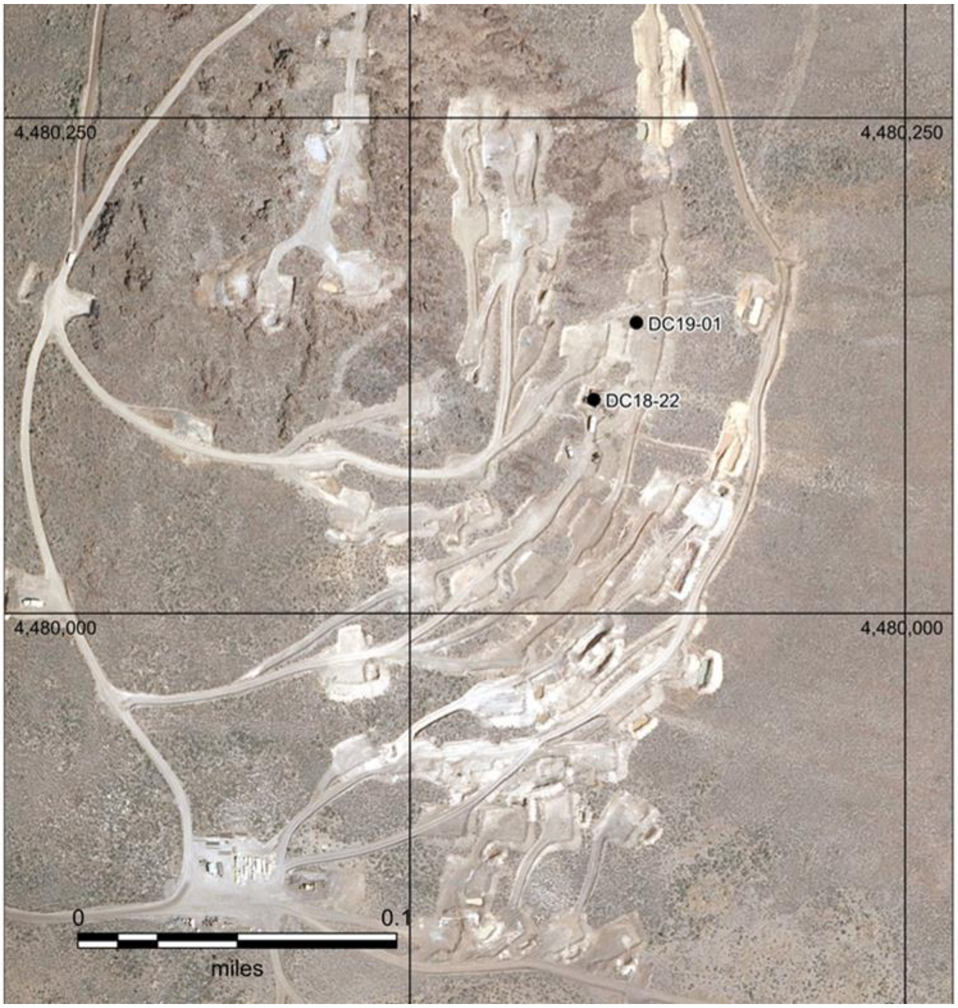


Figure 13-21: Dark Star North Feasibility #2 Core Sample Locations

13.10.1 2020 Thyssen-Krupp testing on Dark Star and Pinion HPGR Feasibility Composites

The Dark Star and Pinion HPGR Feasibility composites were comprised of intervals from PQ-diameter core holes (Pinion and Dark Star) and additional mass was taken from trench hammer samples at Dark Star to achieve the minimum weight requirements for the test program.

Kappes, Cassiday Associates performed initial sample preparation on the Dark Star and Pinion PQ core and on the Dark Star trench samples, in their Reno, Nevada laboratory before shipping splits to TKIS in Germany.

Thyssen-Krupp's scope-of-work was to investigate the suitability of HPGR's for the comminution on the Dark Star and Pinion ore samples.

The results of this test work is described in their report (TKIS 2020). Objectives of the conducted tests on a semi-industrial HPGR unit (MAGRO) were as follows:

- Determination of the optimum grinding force to achieve a certain product fineness.
- Determination of the absorbed energy at the required grinding force.

The results of the test work provide the basis for the following aspects:

- Sizing of full scale industrial HPGR's, in order to match the throughput and fineness requirements.
- Simulation of the industrial HPGR discharge particle size distribution achievable on full scale HPGR's

Abrasion tests on a lab scale HPGR were conducted in order to determine the abrasiveness of the ore in relation to high pressure grinding rolls and to establish the data required to estimate the lifetime of the wear protection in an industrial HPGR.

13.10.1.1 Key Parameters for Sizing of High-Pressure Grinding Rolls

The objectives in sizing HPGRs are to meet the throughput requirements and to achieve a certain product fineness. The key parameters are therefore the **specific throughput rate** and the **specific press force** which should be applied to obtain the desired comminution result.

Definitions, formulas and description for **specific throughput rate, specific press force and specific energy input** are described in detail in the Thyssen-Krupp report (TKIS, 2020).

13.10.1.2 Description of Test Facilities

The ATWAL abrasion test procedure is applied to determine the wear rates of different ores in HPGR's. The ATWAL is fed with 100 kg of material for per test run. The weight of the rolls is measured before and after the test. The specific wear rate is then calculated as the ratio of the "loss of weight of the rolls" divided by the amount of material tested. Pictures of the equipment and a more detailed information can be found in the (TKIS 2020) report.

The MAGRO equipment is a semi-industrial scale HPGR, equipped with a 0.95 m diameter by 0.35 m wide studded roll. Process data obtained from test work allow for sizing of industrial scale machines.

MAGRO data logging includes:

- Feed rate
- Zero gap, Cake thickness
- Operating gap
- Preset nitrogen pressure
- Zero hydraulic pressure
- Operating hydraulic pressure
- Power draw of motors
- Circumferential speed of rolls

These data allow for the calculation, using computer analysis, of important process data such as:

- Specific throughput rate
- Grinding force and specific energy input
- Required for achieving a certain product fineness

A picture of the ATWAL HPGR and more detailed information obtained from the testing of Dark Star and Pinion Feasibility composites are in the (TKIS, 2020) final report.

13.10.1.3 Provided Samples

Six samples were provided by KCA to TKIS in Germany, as shown in Table 13-8.

Table 13-8: Dark Star and Pinion HPGR Feasibility Composites Delivered to TK Industrial Solutions AG

Test Work Outline	No. of Samples	Dark Star KCA Sample No. 84847 C, DSM_HPGR Feas #1 (Hi Si)	Dark Star KCA Sample No. 84848 B, DSN_HPGR Feas #2 (Hi Si)	Pinion KCA Sample No. 84849 C, PE_HPGR Feas #1	Pinion KCA Sample No. 84850 B, PW_HPGR Feas #2	Dark Star KCA Sample No. 84847 B, DSM_HPGR Feas #1 (Hi Si)	Pinion KCA Sample No. 84849 B, PE_HPGR Feas #1 (Hi Ba & Hi Si)
ATWAL, 1% and 3% Moisture at 4 N/mm^2	2	317.1 kg	311.2 kg				
ATWAL, 1% and 3% Moisture at 4 N/mm^2	2			301.5 kg	306.8 kg		
MAGRO, Single Pass Test, Pressure & Moisture TBD	1					664.4 kg	
MAGRO, Single Pass Test, Pressure & Moisture TBD	1						656.0 kg
KCA Sample No.		84847 C	84848 B	84849 C	84850 B	84847 B	84849 B
TKIS Test No.		A1, A2	A3, A4	A5, A6	A7, A8	M1, M2	M3, M4

All samples were provided in the size of <31.5 mm. For the abrasion tests the material had to be pre-crushed to 3.15 mm.

The bulk density for the ore to the MAGRO feed was 1.546 t/m^3 for the Dark Star sample and 1.609 t/m^3 for the Pinion sample.

The ore densities were 2.566 t/m^3 for the Dark Star sample and 2.649 t/m^3 for the Pinion sample.

13.10.1.4 Test Results

ATWAL Test Results

Four ATWAL abrasion tests were carried out on the ore. The tests were conducted on minus 3.15 mm pre-crushed samples. The specific grinding force was set to 4 N/mm^2 and the moisture was varied between 1 and 3%. Results of the ATWAL tests are summarized in Table 13-9.

Table 13-9: ATWAL Abrasion Test Results

Gold Ore	Test	Top Feed Sise (mm)	Moisture (% H_2O)	Grinding Force (N/mm^2)	Wear Rate (g/t)	Wear Rate (mm/rev)
84847C	A1	3.15	1.0	4	58.65	13.31
84847C	A2	3.15	3.0	4	72.64	14.09
84848B	A3	3.15	1.0	4	113.72	22.77
84848B	A4	3.15	3.0	4	129.45	21.19
84849C	A5	3.15	1.0	4	69.14	12.66
84849C	A6	3.15	3.0	4	81.93	13.93
84850	A7	3.15	1.0	4	53.04	10.18
84850	A8	3.15	3.0	4	41.78	10.39

The gold ore was classified as "highly abrasive" for all tested samples. The wear rates determined are given in "g/t" (loss of wear material per metric ton treated). They refer to Nihard IV as wear material and to the particular test conditions. It is important to keep in mind though that the wear rate determined is not the wear rate to be expected for industrial operation. The scale-up of the test results in order to estimate the service life of industrial wear protection surfaces has to take into account the final roll diameter and speed, type and length of the studs employed, as well as the characteristics of the feed material, i.e. size distribution and moisture. The scale-up is founded on a data basis collected on various ores treated in industrial High Pressure Grinding Rolls. Projected wear life needs to be confirmed once the final process and machine parameters have been defined.

MAGRO Test Results

Semi Industrial MAGRO HPGR tests were conducted on a "single pass" basis at different pressure settings and constant feed moisture.

The objectives of the "single pass" tests were to determine the influence of the specific grinding force on the product fineness.

The tested feed material size was <31.5 mm for the two tested samples. The speed of the rolls was kept constant at 0.20 m/s during the tests. The applied specific grinding forces were in the range of 3.5 to 4.5 N/mm². The feed moisture was constant at 3%.

The feed and product particle size distributions were analyzed by dry screening. The center and edge portion of the MAGRO discharges were collected separately. Both fractions were analyzed individually. The product was disagglomerated in a rotating drum prior to size analysis in order to break up agglomerates (cakes).

The MAGRO test results are summarized in Table 13-10.

Table 13-10: Summary of MAGRO Semi-industrial Test Results

Test	Feed Size	Moisture		Specific	Specific	Net	Working	Specific	Fineness (Center)			Fineness (discharge)		
		Feed	Disch.	Force	Energy (dry)	Power	Gap	Throughput(dry)	% -200µm	% <1mm	% <6.3mm	% -200µm	% <1mm	% <6.3mm
		%	%	N/mm²	kWh/t	kW	(mm)	t*s/(m3*h)	%	%	%	%	%	%
	Dark Star													
Feed				0	0				4.7	8.6	23.4	4.7	8.6	23.4
M1	-32mm	3.0	2.8	3.5	1.8	30.5	24.9	239.4	24.3	40.5	79	20.8	35.2	70.9
M2	-32mm	3.0	3.1	4.5	2.4	38.8	23.7	233.2	25.6	43	82.9	21.6	37	73.5
	Pinion													
Feed				0	0				2.8	5.5	16.9	2.8	5.5	16.9
M1	-32mm	3.0	2.9	3.5	1.8	33.3	24.9	259.2	18.1	35.6	78	16.7	32	69.8
M2	-32mm	3.0	2.8	4.5	2.1	37.8	23.5	252.8	25.2	41.3	78.3	22.8	37.4	71.3

The specific throughput varied for all truncated feed tests between 233 and 239 t*s/(m³*h) for the Dark Star sample and between 253 and 259 t*s/(m³*h) for the Pinion sample. The specific grinding force had a minor impact on the specific throughput rate.

Higher grinding forces resulted in a higher power absorption of the material and consequently in a higher specific energy input. The specific energy input was between 1.8 and 2.4 kWh/t for the tested samples.

Specific energy input at 3.5 N/mm² was 1.83 kWh/t for the Dark Star sample and 1.72 kWh/t for Pinion sample.

13.11 2021 KCA DARK STAR AND PINION BOTTLE ROLL, CONVENTIONAL CRUSHED COLUMN AND PILOTWAL HPGR CRUSHED COLUMN LEACH TESTING ON FEASIBILITY COMPOSITES

In January 2020, the laboratory facility of KCA in Reno, Nevada received fourteen (14) pallets of material from the Dark Star and Pinion projects containing intervals of whole, split and broken PQ core as well as surface hammer samples. Refer to Figure 13-18 through Figure 13-21 for Dark Star and Pinion HPGR Feasibility Composites locations.

The material was then combined into four (4) samples. A portion from each separate sample was conventionally crushed utilizing laboratory scale jaw crushers. Additionally, a portion of each sample was crushed utilizing a High Pressure Grinding Roll (PILOTWAL HPGR). Splits of the four samples were also shipped to ThyssenKrupp Industrial Solution's (TKIS) laboratory facility in Germany for HPGR crushing (MAGRO HPGR) and ATWAL abrasion testing.

A description of the received material is presented in Table 13-11.

Table 13-11: HPGR Feasibility Composite Descriptions

KCA Sample No.	Client I.D.	Zone	Received Weight, kg
84847 A	DSM_HPGR Feas#1(Hi Si)	Ox-Main	2323.14
84848 A	DSN_HPGR Feas#2(Hi Si)	Ox-North	2596.86
84849 A	PE -HPGR Feas#1	Ox-East	1911.22
84850 A	PW-HPGR Feas#2	Ox-West	2559.72

13.11.1 Head Assays

A portion of the head material for each separate sample was crushed to a target size of 80% passing 1.70 millimeters. From the blended 1.70 millimeter material, portions were split out and individually ring and puck pulverized to a target grind size of 80% passing 0.075 millimeters and assayed (in triplicate) for gold and silver content by standard fire assay and wet chemistry methods.

The head material was also assayed semi-quantitatively for an additional series of elements (ICP Analysis) and for whole rock constituents. Additional head material was assayed by quantitative methods for carbon, sulfur and mercury. Cyanide shake tests were also conducted on portions of the pulverized head material.

A portion of the pulverized head material was submitted to the University of British Columbia (UBC) for quantitative x-ray diffraction analyses (QXRD).

Partial head assay results are presented in detail in Table 13-12.

Table 13-12: Head Assays for Dark Star and Pinion HPGR Feasibility Composites

			Head Assays															
			Au, Ag, Cu, Hg, Pb & Zn Head Assays										Sulfur and Carbon Species					
KCA Sample No.	Description	Zone	AuFA ppm	AuCN ppm	AuCN %	Ag ppm	AgCN ppm	AgCN %	Cu ppm	Hg ppm	Pb ppm	Zn ppm	C(tot) %	C(org) %	CO3 %	$S_{(total)}$ %	$S_{(sulfide)}$ %	Preg-robb, %
HPGR Feasibility Composites																		
84849 D	PE -HPGR Feas#1	PE	0.738	0.647	87.6	8.89	7.25	81.5	24	1.4	10	71	0.61	<0.01	3.1	2.24	<0.01	-5.0%
84850 D	PW-HPGR Feas#2	PW	0.690	0.560	81.1	7.63	5.05	66.1	20	7.4	14	91	2.75	0.11	13.2	0.75	<0.01	4.0%
84847 D	DSM HPGR Feas#1(Hi Si)	DS Main	0.777	0.673	86.6	0.78	0.39	49.4	14	6.3	6	85	0.11	0.10	0.50	0.28	0.14	0.0%
84848 C	DSN HPGR Feas#2 (Hi Si)	DS North	1.810	1.687	93.2	1.06	0.27	25.3	31	3.1	17	142	0.10	0.07	0.35	0.30	0.01	2.0%

Head assays in Table 13-12 show sulfide sulfur head assays, ranging from <0.01% to 0.14% demonstrating the oxide character of these composites. The presence of C(org), ranging from <0.01% to 0.11% and the preg-robb assays, ranging from -5.0% to 4.0% (all within assay procedure tolerances) indicate that these composites are non-preg-robbing.

Cu, Hg, Pb and Zn assays are all very low and do not present any issues in heap leach processing of these ore types.

Multi-element ICP, whole rock and QXRD analyses are shown in Appendix 2 of Metallurgy Report – South Railroad Feasibility Update (Simmons, 2021). Geo-metallurgical characterization highlights for the four HPGR Feasibility Composites are summarized below:

- Gold grades ranged from 0.69 to 1.81 ppm and averaged 1.00 ppm;
- Silver grades ranged from 0.8 to 8.9 ppm and averaged 4.6 ppm;
- Organic carbon ranged from <0.01 to 0.11% and averaged 0.07%;
- Sulfide sulfur ranged from <0.01 to 0.14% and averaged 0.04%;
- Preg-robb analyses ranged from -5.0 to 4.0% and averaged 1.5%;
- Copper values were very low, ranging from 14 to 31 ppm and averaged 22 ppm;
- Gold cyanide solubility ranged from 81.1 to 93.2% and averaged 87.1%;
- Concentrations of the deleterious elements were as follows: selenium averaged <3 ppm, mercury averaged of 4.5 ppm, and arsenic levels were low, averaging 278 ppm.
- Concentrations of the primary cyanide consumers were low and suggest minimum potential for affecting cyanide consumption rates. Copper averaged 22 ppm, nickel averaged 20 ppm, and zinc averaged 97 ppm;
- Whole-rock silica (SiO_2) for the Pinion composite samples averaged 70.4%.
- Whole-rock silica (SiO_2) for Dark Star composite samples averaged 93.7%.

13.11.2 2021 Dark Star and Pinion HPGR Feasibility Composite Bottle-Roll Testing

The Dark Star and Pinion HPGR Feasibility composites were subjected to the following cyanide leach procedures:

1. Bottle-roll leach testing at target P80 sizes of 75 µm and 1,700 µm,
2. Conventional column-leach testing at target P80 of 25 mm,
3. PILOTWAL HPGR column-leach testing at medium press force and
4. MAGRO HPGR column leach testing at medium press force.

The main objective of the bottle-roll and column-leach tests was to evaluate the differences in gold and silver extraction, over a wide range of feed size. In particular comparing conventional-crush laboratory column-leach results to PILOTWAL and MAGRO HPGR crushed materials. Test results are summarized in Table 13-13.

Table 13-13: Dark Star and Pinion: Bottle Roll and Column Leach Test Results

KCA Sample No.	Test No	Description	GSV Geology					Feed Size			NaCN (g/l)	Leach Time (hrs/days)	Cement Add'n lbs/st	Au Balance		Ag Balance		Reagents	
			Zone	Formation	Sub Unit	Si Intensity	Ba %	Target P80 (µm)	Screen P80 (µm)	% -200M				Au Ext %	Calc Hd Au (ppm)	Ag Ext %	Calc Hd Ag (ppm)	NaCN kg/t	Lime kg/t
Pinion Feasibility Composite Testing																			
89058 A	89064	PE-HPGR Feas #1	PE	**mlbx**		2.7	8.43	MAGRO	8,000	13.2%	0.5	101d	0	**73.4**	0.771	**34.8**	9.638	0.92	0.97
89006 A	89025	PE-HPGR Feas #1	PE	**mlbx**		2.7	8.43	PILOTWAL	5,900	12.9%	0.5	96d	0	**63.8**	0.931	**33.1**	11.366	1.39	1.04
84849 A	84865	PE-HPGR Feas #1	PE	**mlbx**		2.7	8.43	12,500	25,300	1.3%	0.5	125d	0	**58.0**	0.861	**10.9**	9.553	1.03	1.01
84849 D	89001 C	PE-HPGR Feas #1	PE	**mlbx**		2.7	8.43	1,700	1,990		1.0	144		**65.5**	0.713	**31.0**	9.487	0.10	0.75
84849 D	89003 C	PE-HPGR Feas #1	PE	**mlbx**		2.7	8.43	75	53		1.0	72		**79.8**	0.748	**64.0**	9.540	0.29	0.75
89007 A	89028	PW-HPGR Feas#2	PW	**mlbx**		2.2	2.49	PILOTWAL	5,200	9.6%	0.5	96d	2.1	**76.4**	0.719	**42.2**	9.140	1.00	0.00
84850 A	84868	PW-HPGR Feas#2	PW	**mlbx**		2.2	2.49	12,500	29,300	1.2%	0.5	125d	0	**67.6**	0.757	**28.7**	9.287	1.12	1.02
84850 C	89002 A	PW-HPGR Feas#2	PW	**mlbx**		2.2	2.49	1,700	1,830		1.0	144		**67.2**	0.626	**35.8**	7.762	0.19	0.75
84850 C	89003 D	PW-HPGR Feas#2	PW	**mlbx**		2.2	2.49	75	40		1.0	72		**75.7**	0.629	**53.4**	8.271	0.28	0.75
Dark Star Feasibility Composite Testing																			
89054 A	89061	DSM HPGR Feas#1(Hi Si)	DS Main	**Pp**	CGL	2.8		MAGRO	8,400	15.5	0.5	101	3.0	**84.5**	0.717	**13.5**	0.916	1.10	0.00
89004 A	89019	DSM HPGR Feas#1(Hi Si)	DS Main	**Pp**	CGL	2.8		PILOTWAL	5,900	13.0	0.5	96	3.1	**85.5**	0.722	**19.5**	0.678	1.20	0.00
84847 A	84859	DSM HPGR Feas#1(Hi Si)	DS Main	**Pp**	CGL	2.8		25,000	25,900	2.2	0.5	125	0.0	**82.4**	0.743	**17.5**	0.920	1.07	1.02
84847 D	89001 A	DSM HPGR Feas#1(Hi Si)	DS Main	**Pp**	CGL	2.8		1,700	1,890		1.0	144		**81.3**	0.749	**33.9**	0.978	0.25	1.75
84847 D	89003 A	DSM HPGR Feas#1(Hi Si)	DS Main	**Pp**	CGL	2.8		75	64		1.0	72		**86.6**	0.739	**39.1**	1.051	0.48	1.50
89005 A	89022	DSN HPGR Feas#2 (Hi Si)	DS North		CGL	2.9		PILOTWAL	5,200	12.8	0.5	96		**90.9**	2.105	**27.5**	0.643	1.31	1.00
84848 A	84862	DSN HPGR Feas#2 (Hi Si)	DS North		CGL	2.9		25,000	25,200	0.6	0.5	125		**86.0**	2.139	**15.2**	0.875	1.30	1.03
84848 C	89001 B	DSN HPGR Feas#2 (Hi Si)	DS North		CGL	2.9		1,700	2,190		1.0	144		**84.5**	1.904	**17.2**	0.814	0.21	1.00
84848 C	89003 B	DSN HPGR Feas#2 (Hi Si)	DS North		CGL	2.9		75	57		1.0	72		**92.4**	1.919	**23.5**	0.702	0.56	0.75

Gold extraction graphical comparisons for the Pinion West HPGR Feasibility Composite #2 are shown in Figure 13-22. The Pinion deposit is envisioned as a ROM leaching of low-grade ore and HPGR crush leaching of high-grade ore. Interpretation of the data shown in Figure 13-22 is provided here:

- The diagonal blue line is a projection of gold extraction %, from 75 microns out to 150,000 microns or 150 mm (ROM feed size).
- The vertical black line represents a ROM P80 = 150,000 microns (150mm or 6"). Mine to mill fragmentation/blast studies have been conducted to determine powder factors, drill bit diameter and spacing to achieve this.
- The use of PILOTWAL HPGR crushed to a feed P80 = 5,200 microns, achieves a gold extraction of 76.4%, 12.3% higher than projected ROM leaching.

Similar gold extraction graphs for all four HPGR Feasibility composites are located in Appendix 3 of Metallurgy Report – South Railroad Feasibility Update (Simmons, 2021).

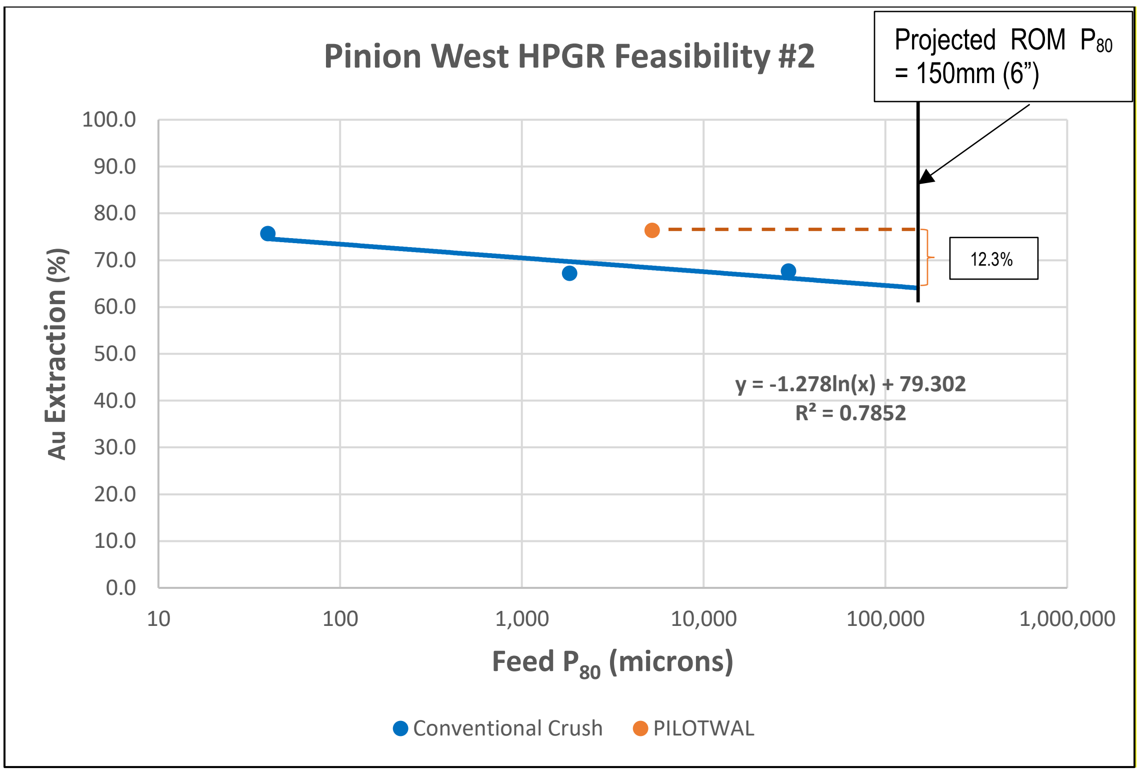


Figure 13-22: Pinion West Feasibility #2: Feed P80 vs. Au Extraction (%)

Silver extraction graphical comparisons for the same Pinion West HPGR Feasibility Composite #2 are shown in Figure 13-23. The same interpretation, as used for Figure 13-22, is applicable to the information contained in Figure 13-23.

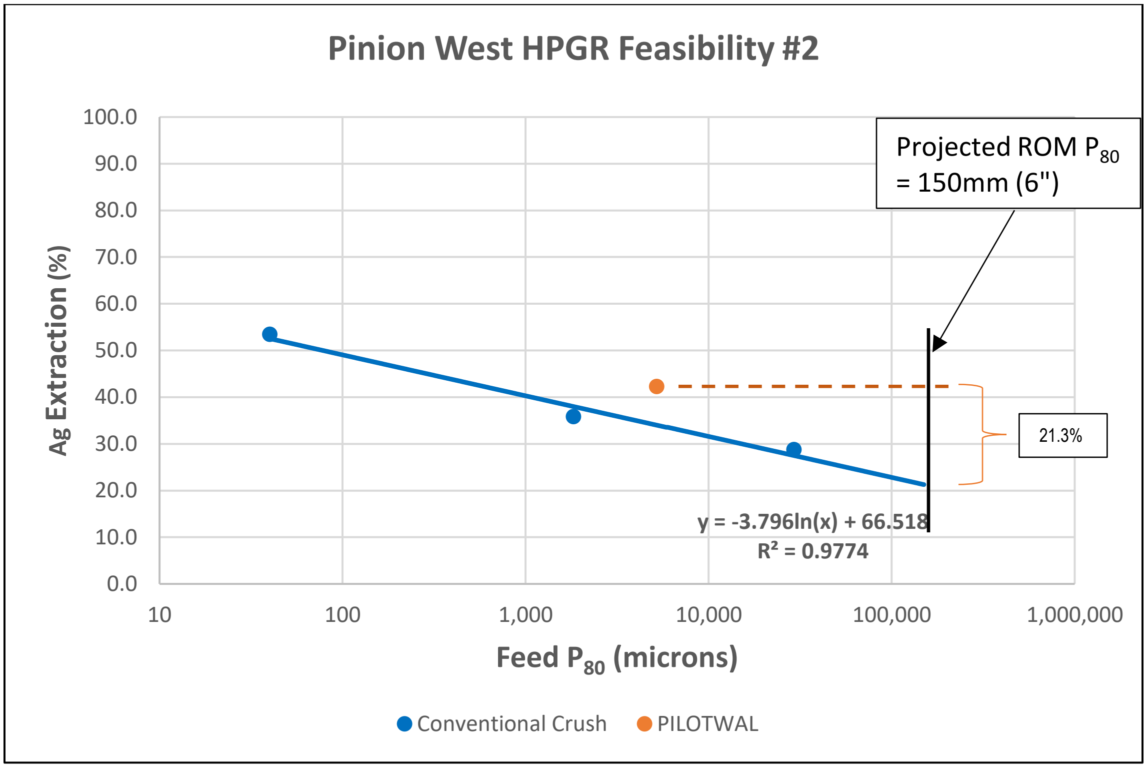


Figure 13-23: Pinion West Feasibility #2: Feed P_{80} vs. Ag Extraction (%)

The use of PILOTWAL HPGR crushed material to a feed P_{80} = 5,200 microns, achieves a silver extraction of 42.2 %, 21.3 % higher than projected ROM leaching.

Similar silver extraction graphs for all of the Pinion composites are located in Appendix 4 of *Metallurgy Report – South Railroad Feasibility Update* (Simmons, 2021).

Dark Star silver extraction graphs are excluded due to the silver grade being too low to be of economic interest.

13.12 GOLD STANDARD 2021 – PINION PHASE 4/5 MINE EXPANSION VARIABILITY COMPOSITE TESTING

In 2020 thirty (30) variability composites, targeting the Pinion deposit Phase 4 mine expansion area, were made from intervals selected from fifteen (15) core holes. Drill hole locations for the fifteen composites are shown in Figure 13-24 (highlighted in magenta).

All thirty composites were subjected to bottle roll and conventional column-leach testing and ten (10) of the thirty composites were also subjected to medium pressure HPGR column-leach testing at KCA in Reno, Nevada, and results are documented in a final report by KCA (2021B).

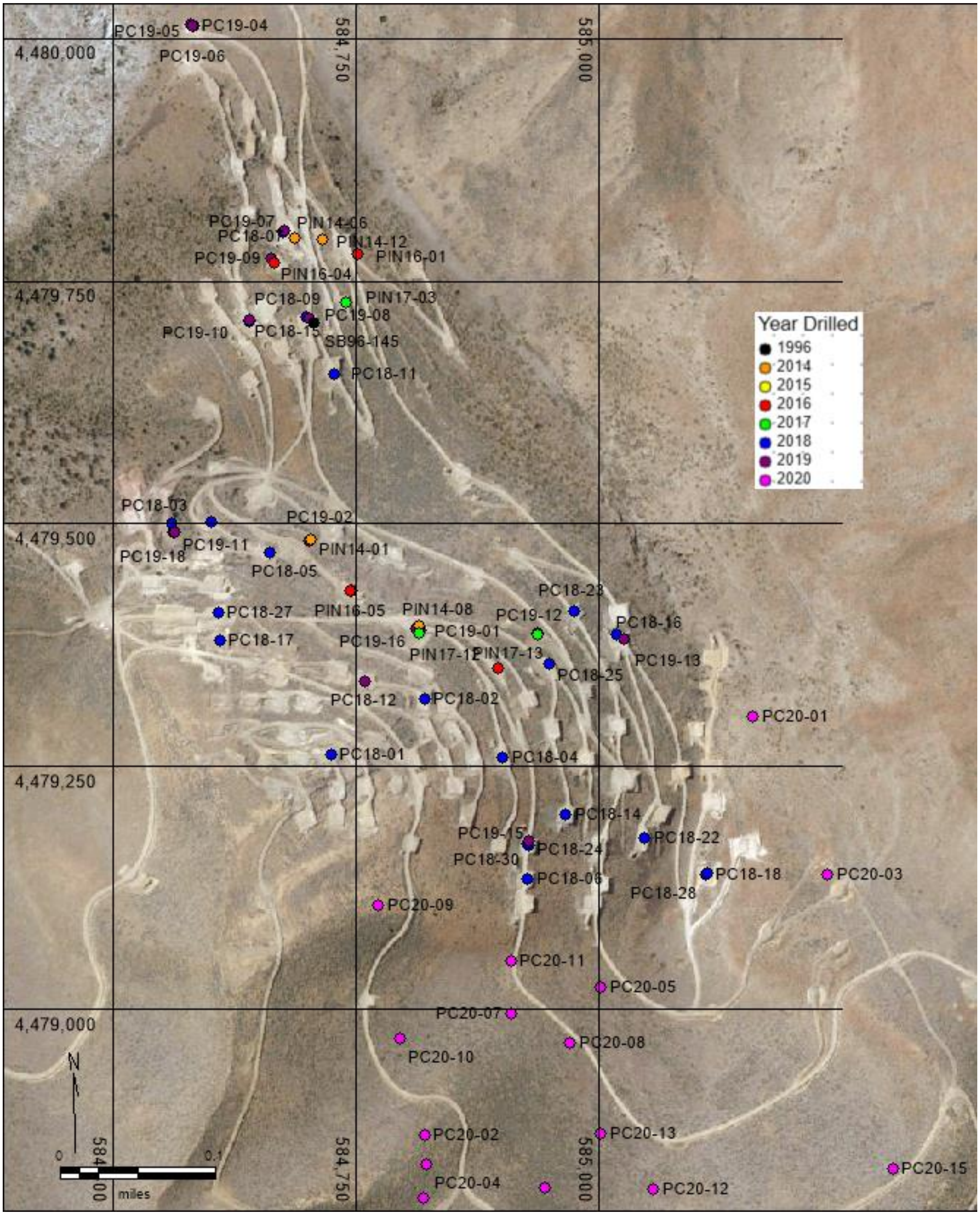


Figure 13-24: Pinion Metallurgical Core Hole Locations

13.12.1 2020 Bottle Roll and Column Leach Testing (KCA)

Head assays and geo-metallurgical characterization were conducted on all composites using three separate laboratories: KCA, ALS Laboratory Group (ALS), and FL Smidth ("FLS"). Table 13-14 summarizes gold, silver, carbon and sulfur assays.

Table 13-14: Variability Composite Head Assays

			Head Assays												
KCA Sample No.	Description	Zone	Au, Ag, Cu, Hg, Pb & Zn Head Assays							Sulfur and Carbon Species					
			AuFA ppm	AuCN ppm	AuCN %	Ag ppm	AgCN ppm	AgCN %	Cu pp	C(tot)	C(org)	CO3 %	$S_{(total)}$ %	$S_{(sulfide)}$ %	Preg-robb, %
91701 A	PPh4-#70, Mtp	Mtp	0.756	0.607	80.3	6.98	3.55	50.9	48	0.38	0.23	1.9	0.14	0.03	-1.0%
91702 A	PPh4-#71, mlbx	PE	1.043	1.020	97.8	####	18.68	86.3	20	0.68	0.24	3.4	2.54	0.08	11.9%
91703 A	PPh4-#72, mlbx	PE	0.400	0.327	81.8	4.39	2.97	67.7	28	1.33	0.22	6.7	0.15	<0.01	2.0%
91704 A	PPh4-#73, mlbx	PE	0.341	0.260	76.3	5.07	4.15	81.8	28	0.12	0.12	0.0	0.24	0.05	6.9%
91705 A	PPh4-#74, mlbx	PE	0.535	0.413	77.2	4.05	2.54	62.8	39	0.23	0.21	1.2	0.53	0.01	5.0%
91706 A	PPh4-#75, Mtp	Mtp	1.375	1.107	80.5	6.29	2.25	35.7	27	2.23	0.24	11.2	0.20	0.02	2.0%
91707 A	PPh4-#76, mlbx	PW	0.929	0.840	90.4	8.50	4.84	56.9	6	7.16	0.12	35.8	0.21	0.01	4.0%
91708 A	PPh4-#77, Ddg	Ddg	0.531	0.453	85.2	4.62	1.94	42.0	19	6.80	0.19	34.0	0.10	<0.01	2.0%
91709 A	PPh4-#78, Ddg	Ddg	0.497	0.433	87.1	1.59	0.47	29.3	10	8.23	0.10	41.2	0.02	<0.01	-2.0%
91710 A	PPh4-#79, Mtp	Mtp	0.714	0.420	58.8	1.45	0.53	36.7	13	6.16	0.25	30.8	0.16	0.01	5.0%
91711 A	PPh4-#80, mlbx	PW	0.546	0.427	78.2	8.91	5.21	58.4	34	5.21	0.23	26.1	0.05	<0.01	0.0%
91712 A	PPh4-#81, mlbx	PW	1.414	1.613	114.1	####	42.06	101.8	79	0.38	0.14	1.9	3.24	0.28	16.8%
91713 A	PPh4-#82, mlbx	PE	0.939	0.867	92.3	7.47	5.95	79.6	48	2.12	0.19	10.6	2.26	0.10	12.9%
91714 A	PPh4-#83, Ddg	Ddg	0.198	0.173	87.5	1.57	0.61	39.2	13	7.69	0.14	38.5	0.14	<0.01	4.0%
91715 A	PPh4-#84, Mtp	Mtp	2.775	2.307	83.1	5.63	2.18	38.7	32	3.20	0.25	16.0	0.29	<0.01	-9.9%
91716 A	PPh4-#85, mlbx	PE	0.989	0.753	76.2	####	24.60	84.2	91	0.84	0.24	4.2	0.28	0.01	7.9%
91717 A	PPh4-#86, Ddg	Ddg	0.384	0.340	88.5	2.21	1.47	66.8	5	8.27	0.25	41.4	0.13	<0.01	5.9%
91718 A	PPh4-#87, Mtp	Mtp	0.339	0.233	68.6	5.01	3.42	68.3	25	3.53	0.44	17.7	0.16	<0.01	5.9%
91719 A	PPh4-#88, mlbx	PE	0.919	0.747	81.3	8.91	4.75	53.3	50	3.46	0.43	17.3	0.17	<0.01	1.0%
91720 A	PPh4-#89, mlbx	PW	0.499	0.380	76.1	4.14	2.53	61.2	25	5.44	0.32	27.2	0.04	<0.01	5.0%
91721 A	PPh4-#90, Ddg	Ddg	0.149	0.120	80.5	1.61	0.79	49.0	13	10.10	0.27	50.5	0.06	0.01	5.9%
91722 A	PPh4-#91, mlbx	PW	0.395	0.340	86.0	3.67	1.62	44.2	38	5.18	0.20	25.9	0.07	<0.01	1.0%
91723 A	PPh4-#92, mlbx	PW	1.655	1.467	88.6	####	30.33	77.4	15	3.83	0.41	19.2	0.17	0.01	1.0%
91724 A	PPh4-#93, mlbx	PW	1.889	1.653	87.5	####	42.07	68.3	24	1.39	0.43	7.0	0.07	<0.01	5.9%
91725 A	PPh4-#94, Ti	Ti	0.682	0.507	74.3	####	16.37	70.5	26	0.40	0.40	0.0	0.05	<0.01	-2.0%
91726 A	PPh4-#95, Ti,>mlbx	Ti	0.637	0.387	60.8	2.88	1.40	48.6	14	0.09	0.09	0.0	0.13	<0.01	-9.9%
91727 A	PPh4-#96, mlbx	PE	1.091	0.887	81.3	5.59	4.57	81.7	38	0.37	0.20	1.9	1.66	0.20	5.0%
91728 A	PPh4-#97, mlbx	PW	1.410	1.367	96.9	####	65.92	80.4	193	0.20	0.20	0.0	0.96	0.09	-2.0%
91729 A	PPh4-#98, mlbx	PW	1.189	0.913	76.8	####	13.15	71.9	153	0.26	0.26	0.0	0.15	0.01	-2.0%
91730 A	PPh4-#99, mlbx	PW	1.385	0.127	9.2	5.50	7.06	128.4	61	0.62	0.62	0.0	0.61	0.50	47.5%

Note: Six of the composite samples had higher than background organic carbon assays (highlighted in gray) and three of the composite samples had higher than background sulfide sulfur assays (highlighted in light green).

ICP multi-element, whole rock and QXRD analyses are shown in Appendix 5, 6 and 7. Geo-metallurgical highlights for the thirty variability composites are summarized below:

- Gold grades ranged from 0.159 to 2.76 ppm and averaged 0.89 ppm;
- Silver grades ranged from 1.5 to 82.0 ppm and averaged 14.1 ppm;
- Organic carbon ranged from 0.09 to 0.62 % and averaged 0.25 %;
- Sulfide sulfur ranged from <0.01 to 0.50 % and averaged 0.09 %;
- Preg-robb analyses ranged from -9.9 to 16.88 % and averaged 3.0 %, excluding composite PPh4-#99, mlbx);
- Copper values were low, ranging from 6 to 193 ppm and averaged 41 ppm;
- Gold cyanide solubility ranged from 9.2 (carbonaceous and sulfide refractory sample) to 114.1% and averaged 80.1%;

- Concentrations of the deleterious elements were: selenium averaged 11 ppm, mercury averaged 2.0 ppm and arsenic levels were low, averaging 243 ppm;
- Concentrations of the primary cyanide consumers were low and suggest minimum potential for affecting cyanide consumption rates. Copper averaged 41 ppm, nickel averaged 16 ppm, and zinc averaged 70 ppm;
- Whole-rock quartz (SiO_2) content ranged from 14.0 to 95.1 % and averaged 67.2 %.

13.12.2 2021 Bottle Roll and Column Leach Testing (KCA)

Thirty drill core composites were subjected to bottle-roll leach testing, at target P_{80} sizes of 75 µm and 1,700 µm, column-leach testing at 12.5 mm and 25 mm. Ten of the thirty composites column-leach tested via HPGR comminution at medium press force. The main objective of this test work was to evaluate the laboratory-scale leachability character of the Pinion Phase 4 mine expansion resource in terms of gold extraction, extraction rate, reagent consumption, and sensitivity to feed size.

The bottle-roll and column leach testing used a standard procedure that is described in the final laboratory report (KCA 2021B). Bottle roll retention times were 144 hours for the 1,700 µm tests, and 96 hours for the 75 µm tests and were leached with dilute NaCN solution, maintained at 1 g/l.

Column-leach tests were conducted utilizing material crushed to target P_{80}'s and placed in their respective columns for leaching. Conventional and HPGR columns were leached between 64 and 106 days with a dilute 0.50 g/l NaCN solution. After leaching, each column was drained and washed for four days with water. A portion of the leached/washed material ("column residues") from each column was assayed for "tail screen" analyses by size fraction.

A summary of bottle roll and column leach tests are provided in Appendices 8 (75µm BR's), 9 (1,700µm BR's), 10 (12.5 & 25mm columns), and 11 (HPGR columns).

The following is offered as a summary of the findings from the Phase 4 - 2021 bottle roll and column leach test results:

2021 Bottle-Roll Tests on 75 µm Composite Samples

Gold head grades for the composites ranged from 0.15 to 2.75 ppm Au, with an average of 0.88 ppm Au. Gold extraction ranged from 7.0 to 88.8 % and averaged 74.3 %.

Silver head grades for the composites ranged from 0.70 to 54.0 ppm Ag, with an average of 11.0 ppm Ag. Silver extraction ranged from 35.2 to 79.4 % and averaged 58.8 %.

Cyanide consumption averaged 1.04 kg/t and lime consumption averaged 0.60 kg/t.

2021 Bottle-Roll Tests on 1,700 µm Composite Samples

Gold head grades for the composites ranged from 0.15 to 2.81 ppm Au, with an average of 0.89 ppm Au. Gold extraction ranged from 13.9 to 82.7 % and averaged 63.0 %.

Silver head grades for the composites ranged from 1.2 to 58.6 ppm Ag, with an average of 11.2 ppm Ag. Silver extraction ranged from 10.8 to 43.7 % and averaged 26.4 %.

Cyanide consumption averaged 0.28 kg/t and lime consumption averaged 0.90 kg/t.

2021 Conventional Column-Leach Tests on Composite Samples

Column-leach test extraction results were calculated based upon loaded carbon assays and tails assays. Gold head grades ranged from 0.15 to 12.89 ppm Au (average = 0.91 ppm Au). Gold extraction ranged from 25.2 to 88.8 % and averaged 62.4 %.

Silver head grades ranged from 0.5 to 47.0 ppm Au and averaged 9.9 ppm Ag. Silver extraction results ranged from 5.6 to 36.8 % and averaged 16.9 %.

Cyanide consumption averaged 1.03 kg/t and lime consumption averaged 0.80 kg/t.

2021 HPGR Column-Leach Tests on Composite Samples

HPGR column-leach test extraction results were calculated based upon loaded carbon assays and tails assays. Gold head grades for the ten HPGR (medium press force) column composites ranged from 0.33 to 1.27 ppm Au and averaged 0.82 ppm Au. Gold extraction results ranged from 49.3 to 78.2 % and average of 67.2 %.

Silver head grades for the ten HPGR (medium press force) column-leach composites ranged from 4.2 to 30.6 ppm Au and averaged 7.1 ppm Ag. Silver extraction results ranged between 27.3 and 43.4 % and averaged 32.0 %.

Cyanide consumption averaged 1.08 kg/t, lime consumption averaged 0.70 kg/t.

Laboratory Cyanide Consumptions - KCA advises that commercial-scale cyanide consumption typically end up in the range of 25 to 33% of laboratory consumption.

Laboratory Lime Consumptions – Are considered to be accurate for commercial scale operations.

Days under leach vs. Gold Extraction %, for the Conventional Crush vs. HPGR Crush column leach test pairs, are shown in Appendix 12. An example plot for PPh4-#76 (mlbx) is provided below in Figure 13-25.

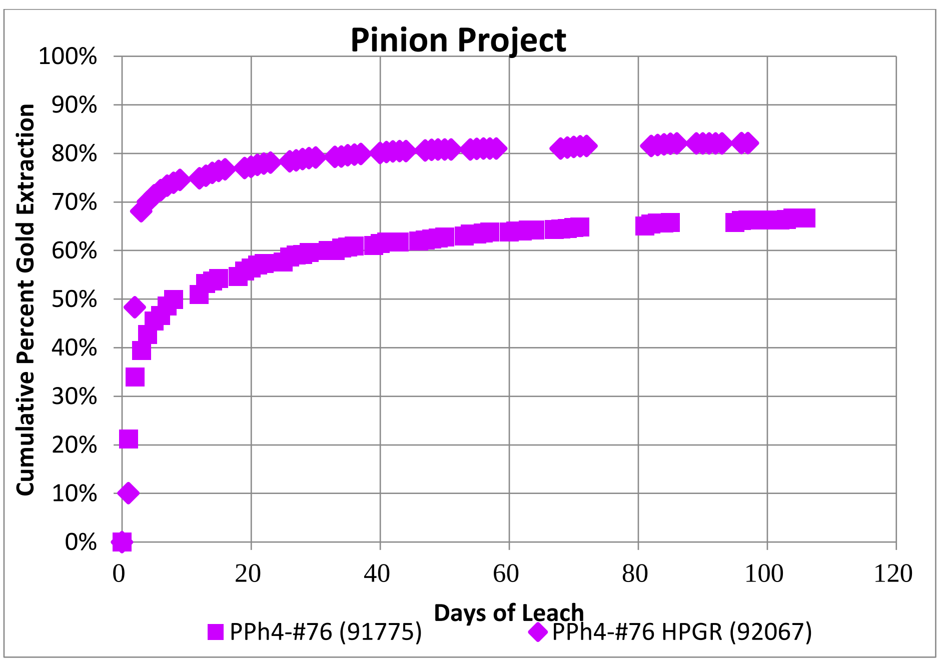


Figure 13-25: 2021 Example Plot of Conventional Crush vs. HPGR Crush - Au Extraction Curves

Note: The column leach cumulative percent gold extractions shown in Appendix 12 and Figure 10 are based upon laboratory solution assays and may be significantly different than the actual metallurgical balances that are based upon recovered gold carbon assays and triplicate tails screen assays. In addition, the gold extraction models, developed from the laboratory metallurgical balances, projected to commercial ROM Feed P_{80} = 150mm (6 inches) are significantly different than the laboratory metallurgical balances, that were conducted a finer feed P_{80}. Feed size.

For the example in Figure 13-25, laboratory gold extraction and modeled gold recovery results are summarized below.

- Laboratory Solution Balance (Feed P_{80} = 24.5mm): 66.7 % Au Extraction.
- Laboratory Carbon and tails screen triplicate assay balance (Feed P_{80} – 24.5mm): 65.9 % Au Extraction.
- Lab Data Model Gold Extraction (Feed P_{80} = 150mm (6 inches): 60.8 % Au Extraction.
- Commercial Heap Leach Au Recovery Model [Feed P80=150mm (6 inches)] = 64.7 % Au Recovery.

Note: There are approximately 100 variability and master composites that have been tested for the Pinion deposit. Therefore, the Commercial Heap Leach gold recovery models include a significant number of variability tests for each ore type. Laboratory Head vs. Tails models were used to develop head grade vs. gold recovery models for commercial heap leaching for each ore type. This explanation should help the reader understand why the Commercial Heap Leach Au Recovery of 64.7% is higher than the Lab Data Model Gold Extraction of 60.8%. There are 36 composites in the Pinion West (PW) mlbx commercial scale gold recovery model. PPh4-#76 is one of the 36 composites used to derive the commercial scale gold recovery model.

Refer to Appendix 13 for gold extraction/recovery comparisons for all Phase 4 composites.

13.13 GEO-METALLURGY CHARACTERIZATION

The Preliminary Pre-Feasibility Study (M3 2019) models were updated using the additional metallurgical testing data summarized in this report and includes any minor corrections made to the previous work. Metal recovery, head grade vs. tail grade, and S/O ratio models were updated to be consistent with previous work.

13.13.1 Pinion and Dark Star Geo-Metallurgical Recovery Zones

Large geo-metallurgy databases have been developed for the Pinion and Dark Star deposits to assist in evaluating material type selections, representing different Au and Ag recovery response. The corresponding geo-metallurgical analysis has identified key variables, within both deposits, that were used to select the different metallurgical recovery zones requiring separate gold and silver recovery modeling.

13.13.1.1 Pinion Deposit Geo-Metallurgy

The following is a summary of the four gold and silver recovery zones in the Pinion Deposit:

1. Mtp (Tripon Pass) – Tripon Pass mineralization is a formation unit that sits on top of the multi-lithic breccia (mlbx) which hosts the majority of the Au mineralization at Pinion.
2. Mlbx Pinion East (Ba > 4.0%, Hi SiO_2) – The Pinion East Zone is carved out of a larger mlbx zone that is characterized by high barium (Ba) > 4.0% and high quartz (SiO_2) > 65%.
3. Mlbx Pinion West – The Pinion West Zone captures all the remaining Pinion mlbx zone of mineralization that is not contained within the Pinion East.
4. Ddg (Devils Gate) – Devils Gate mineralization is stratigraphically positioned underneath the Pinion mlbx.

13.13.1.2 Dark Star Deposit Geo-Metallurgy

The Dark Star mineralization is hosted in two connected deposits: Dark Star North and Dark Star Main. Dark Star North can be characterized as a relatively high-grade heap leachable deposit, whereas Dark Star Main is lower grade and contains more transitional mineralization. Within both deposits, gold mineralization is mainly contained within three formation units: ST-U (upper siltstone), CGL (middle conglomerate), and ST-L (lower siltstone). Geo-metallurgical evaluations did not detect significant variation in gold recovery based upon the host formation but did identify a significant difference is gold recovery response in local regions of low and high silica Intensity (SI), as logged by the geologists. Silica Intensity (SI) is characterized by the geologists using a scale of 0 to 3, with 0 indicating no (or low) silica and 3 being the highest silica.

Recovery models for silver were not developed for Dark Star because of its low silver contents.

The following is a summary of the four gold recovery zones, in the Dark Star deposit:

1. Dark Star Main (SI<2.0)
2. Dark Star Main (SI>2.0)
3. Dark Star North (SI<2.0)
4. North Dark Star North (SI>2.0)

13.14 GOLD AND SILVER RECOVERY UPDATE

For a detailed description of the gold and silver recovery modelling methodology, used for the Pinion and Dark Star deposits, refer to the M3 Engineering South Railroad Project Preliminary Feasibility Study (M3 2019).

The Preliminary Feasibility Study (M3 2019) models were updated using additional metallurgical test data summarized in this report and includes any minor corrections made to the previous work. Metal recovery and head grade vs. tail grade models were updated to be consistent with previous work.

Forte Dynamics is providing the life-of-mine gold/silver recovery timing model for Gold Standard Ventures, based upon final heap loading mine/process plan from MDA. The commercial scale metal recovery model updates, in this report, assume that Forte's design solution/ore ratio application is sufficient to extract the heap leach recoverable metal content through the projected life-of-mine operations, including closure.

A meeting was held with MDA in Reno, NV in late November, 2021 to "truth check" and revise the Pinion West and Pinion East 3D ore type shapes, incorporating the new variability test data. At that meeting a change to the Pinion Oxide and Transition cyanide solubility ranges was made.

- The Oxide ore category definition was changed from >70% to >65%.
- The Transition ore category definition was changed from 50% -70% to 35% - 65%.

The oxide/transition cyanide solubility cut-off change from >70% to >65% was based upon a better gold recovery model fit, incorporating the new variability test data.

The change in the Transition range from 50%-70%, to 35%-65% results from a combination of three factors:

- The insensitivity of column leach gold recovery for the cyanide solubility range of 35% to 65%.
    - Low cyanide solubility, Pinion Transition ore types, can be categorized by any one or a combination of three factors:
        - Silica locking
        - Refractory gold in sulfides

  - Preg-robbing organic carbon
- Little to no change in cyanide or lime consumption at the lower cyanide solubility. Limiting transition ore types ability to generate acid in the heap leach.

It is recommended that Pinion Transition ores be segregated on the leach pad to prevent intermixing with oxide ores to prevent any degradation of Oxide ore heap leach gold and silver recovery performance

13.14.1 Pinion Gold and Silver Recovery Model Update

Conventional ROM and HPGR crushed ore gold and silver recovery models are provided for the Pinion East (mlbx lower recovery) zone, Pinion West (mlbx higher recovery) zone, Tripon Pass formation and Devils Gate formation. Oxide and Transition ore type recovery equations are provided in Table 13-15 through Table 13-18.

13.14.1.1 ROM Pinion Oxide Gold and Ag Recovery Equations

Table 13-15: ROM Pinion Gold and Silver Recovery Equations (Oxide)

ROM Pinion Gold and Silver Recovery Equations (OXIDE: AuCN > 65%)			
Geomet Recovery Zone	**Equation**	**Equation Gold Recovery, %**	**Range**
ROM - mlbx Pinion West	1	=7.6257*ln(HG) + 66.776	Au LG < 0.40 g/t
	2	=5.4756*ln(HG) + 64.985	Au HG ≥ 0.40 g/t
ROM - mlbx Pinion East	3	=7.7255*ln(HG) + 46.504	Au LG < 0.40 g/t
	4	=4.6417*ln(HG) + 45.591	Au HG ≥ 0.40 g/t
ROM - Mtp (Tripon Pass)	5	=11.354*ln(HG) + 74.905	Au LG < 0.40 g/t
	6	=6.9619*ln(HG) + 71.223	Au HG ≥ 0.40 g/t
ROM - Ddg (Devils Gate)	7	=5.6671*ln(HG) + 63.160	Au LG < 0.40 g/t
	8	=1.0819*ln(HG) + 58.880	Au HG ≥ 0.40 g/t
Geomet Recovery Zone	**Equation**	**Equation Silver Recovery, %**	**Range**
ROM - mlbx Pinion West	9	=1.0697*ln(HG) + 8.304	Ag LG < 6.0 g/t
	10	=0.8726*ln(HG) + 8.664	Ag HG ≥ 6.0 g/t
ROM - mlbx Pinion East	11	=2.1848*ln(HG) + 6.200	Ag LG < 6.0 g/t
	12	=1.9309*ln(HG) + 6.669	Ag HG ≥ 6.0 g/t
ROM - Mtp (Tripon Pass)	1	=0.0990*ln(HG) + 6.302	Ag LG < 6.0 g/t
	14	=0.0990*ln(HG) + 6.302	Ag HG ≥ 6.0 g/t
ROM - Ddg (Devils Gate)	15	=8.1407*ln(HG) + 6.873	Ag LG < 6.0 g/t
	16	=1.9953*ln(HG) + 17.903	Ag HG ≥ 6.0 g/t

13.14.1.2 HPGR Pinion Oxide Gold and Silver Recovery Equations

Table 13-16: HPGR Pinion Gold and Silver Recovery Equations (Oxide)

HPGR Pinion Gold and Silver Recovery Equations (OXIDE: AuCN > 65%)			
Geomet Recovery Zone	**Equation**	**Equation Gold Recovery, %**	**Range**
HPGR - mlbx Pinion West	17	=3.5672*ln(HG) + 71.761	Au LG < 0.40 g/t
	18	=2.7334*ln(HG) + 71.047	Au HG ≥ 0.40 g/t
HPGR - mlbx Pinion East	19	=3.1069*ln(HG) + 65.042	Au LG < 0.40 g/t
	20	=2.4562*ln(HG) + 64.476	Au HG ≥ 0.40 g/t
HPGR - Mtp (Tripon Pass)	21	=11.354*ln(HG) + 82.895	Au LG < 0.40 g/t
	22	=6.9619*ln(HG) + 79.303	Au HG ≥ 0.40 g/t
HPGR - Ddg (Devils Gate)	23	=3.5672*ln(HG) + 71.761	Au LG < 0.40 g/t
	24	=2.7334*ln(HG) + 71.047	Au HG ≥ 0.40 g/t
Geomet Recovery Zone	**Equation**	**Equation Silver Recovery, %**	**Range**
HPGR - mlbx Pinion West	25	=16.139*ln(HG) - 3.8636	Ag LG < 6.0 g/t
	26	=12.100*ln(HG) + 3.6241	Ag HG ≥ 6.0 g/t
HPGR - mlbx Pinion East	27	=7.3893*ln(HG) + 23.853	Ag LG < 6.0 g/t
	28	=6.1583*ln(HG) + 26.135	Ag HG ≥ 6.0 g/t
HPGR - Mtp (Tripon Pass)	29	=0.1170*ln(HG) + 26.27	Ag LG < 6.0 g/t
	30	=0.1170*ln(HG) + 26.27	Ag HG ≥ 6.0 g/t
HPGR - Ddg (Devils Gate)	31	=8.1407*ln(HG) + 16.873	Ag LG < 6.0 g/t
	32	=1.9953*ln(HG) + 27.903	Ag HG ≥ 6.0 g/t

Mtp and Ddg are minor ore types and there is very limited HPGR test data. Equations 21-24 and 31-32 take into account the available data and are best estimates provided to MDA for resource modelling.

- Equation 21 – Limited test data, best estimate.
- Equation 22 – Limited test data, best estimate, limit max Au recovery to 80%.
- Equation 23 & 24 – No test data, using PW HPGR recovery model.
- Equation 31 – No test data, using Ddg ROM Ag recovery model (very conservative estimate).
- Equation 32 – No test data, using Ddg ROM Ag recovery model (very conservative estimate).

13.14.1.3 ROM Pinion Transition ROM Gold and Silver Recovery Equations

Table 13-17: ROM Pinion Gold & Silver Recovery Equations (Transition)

ROM Pinion Gold and Silver Recovery Equations (TRANSITION: AuCN > 35%, <65%)			
Geomet Recovery Zone	**Equation**	**Equation Gold Recovery, %**	**Range**
ROM - mlbx Pinion West	33	=0.1979*ln(HG) + 25.5780	Au LG < 0.40 g/t
	34	=0.1979*ln(HG) + 25.5780	Au HG ≥ 0.40 g/t
ROM - mlbx Pinion East	35	=0.1979*ln(HG) + 25.5780	Au LG < 0.40 g/t
	36	=0.1979*ln(HG) + 25.5780	Au HG ≥ 0.40 g/t
ROM - Mtp (Tripon Pass)		No Data	Au LG < 0.40 g/t
		No Data	Au HG ≥ 0.40 g/t
ROM - Ddg (Devils Gate)		No Data	Au LG < 0.40 g/t
		No Data	Au HG ≥ 0.40 g/t
Geomet Recovery Zone	**Equation**	**Equation Silver Recovery, %**	**Range**
ROM - mlbx Pinion West	37	=0.0099*ln(HG) + 12.705	Au LG < 6.0 g/t
	38	=0.0099*ln(HG) + 12.705	Au HG ≥ 6.0 g/t
ROM - mlbx Pinion East	39	=0.0099*ln(HG) + 12.705	Au LG < 6.0 g/t
	40	=0.0099*ln(HG) + 12.705	Au HG ≥ 6.0 g/t
ROM - Mtp (Tripon Pass)		No Data	Au LG < 6.0 g/t
		No Data	Au HG ≥ 6.0 g/t
ROM - Ddg (Devils Gate)		No Data	Au LG < 6.0 g/t
		No Data	Au HG ≥ 6.0 g/t

Pinion West and East Transition ROM test data was modelled together for gold and silver recovery. There is no Transition ROM test data for Mtp and Ddg.

13.14.1.4 HPGR Pinion Transition Gold and Silver Recovery Equations

Table 13-18: HPGR Pinion Gold & SILVER Recovery Equations (Transition)

HPGR Pinion Gold and Silver Recovery Equations (TRANSITION: AuCN > 35%, <65%)			
Geomet Recovery Zone	**Equation**	**Equation Gold Recovery, %**	**Range**
HPGR - mlbx Pinion West	41	=3.5817*LN(HG)+37.917	Ag LG < 6.0 g/t
	42	=3.0400*LN(HG)+36.720	Ag HG ≥ 6.0 g/t
HPGR - mlbx Pinion East	43	=3.5817*LN(HG)+37.917	Ag LG < 6.0 g/t
	44	=3.0400*LN(HG)+36.720	Ag HG ≥ 6.0 g/t
HPGR - Mtp (Tripon Pass)		No Data	Ag LG < 6.0 g/t
		No Data	Ag HG ≥ 6.0 g/t
HPGR - Ddg (Devils Gate)		No Data	Ag LG < 6.0 g/t
		No Data	Ag HG ≥ 6.0 g/t
Geomet Recovery Zone	**Equation**	**Equation Silver Recovery, %**	**Range**
HPGR - mlbx Pinion West	45	=5.6215*LN(HG)+19.793	Ag LG < 6.0 g/t
	46	=4.9880*LN(HG)+20.965	Ag HG ≥ 6.0 g/t
HPGR - mlbx Pinion East	47	=5.6215*LN(HG)+19.793	Ag LG < 6.0 g/t
	48	=4.9880*LN(HG)+20.965	Ag HG ≥ 6.0 g/t
HPGR - Mtp (Tripon Pass)		No Data	Ag LG < 6.0 g/t
		No Data	Ag HG ≥ 6.0 g/t
HPGR - Ddg (Devils Gate)		No Data	Ag LG < 6.0 g/t
		No Data	Ag HG ≥ 6.0 g/t

Pinion West and East HPGR Transition test data was modelled together for gold and silver recovery. There is no Transition test data for Mtp and Ddg.

13.14.2 Dark Star Gold Recovery Model Update

Conventional ROM and HPGR crushed ore commercial scale gold recovery models were updated for the Dark Star North and Dark Star Main deposits. Oxide and Transition ore type recovery models are provided.

No silver recovery models are provided for Dark Star North and Main, due to their low silver grade, deemed to be of minimal economic value to the project.

13.14.2.1 ROM and HPGR Dark Star North and Main Oxide Gold Recovery Equations

ROM and HPGR Oxide gold recovery equations are provided in

Table 13-19 for Dark Star North and Main deposits. ROM and HPGR Transition gold recovery equations are provided in Table 13-20.

Table 13-19: ROM and HPGR Dark Star North and Main Gold Recovery Equations (Oxide)

ROM Dark Star Gold Recovery Equations (OXIDE: AuCN > 85%)			
Geomet Recovery Zone	**Equation**	**Equation Gold Recovery, %**	**Range**
ROM - Dark Star North (Si < 2.0)	49	=5.1422*ln(HG)+88.295	Au LG < 0.40 g/t
	50	=0.7864*ln(HG)+84.371	Au HG ≥ 0.40 g/t
ROM - Dark Star North (Si > 2.0)	51	=5.6670*ln(HG)+81.503	Au LG < 0.40 g/t
	52	=0.8666*ln(HG)+77.178	Au HG ≥ 0.40 g/t
ROM - Dark Star Main (Si < 2.0)	53	=3.6204*ln(HG)+89.475	Au LG < 0.40 g/t
	54	=0.5536ln(HG)+86.712	Au HG ≥ 0.40 g/t
ROM - Dark Star Main (Si > 2.0)	55	=2.5183*ln(HG)+77.163	Au LG < 0.40 g/t
	56	=0.3851*ln(HG)+75.241	Au HG ≥ 0.40 g/t

HPGR Dark Star Gold Recovery Equations (OXIDE: AuCN > 85%)			
Geomet Recovery Zone	**Equation**	**Equation Gold Recovery, %**	**Range**
ROM - Dark Star North (Si < 2.0)	57	=3.0751*ln(HG)+91.333	Au LG < 0.40 g/t
	58	=0.4739*ln(HG)+88.989	Au HG ≥ 0.40 g/t
ROM - Dark Star North (Si > 2.0)	59	=3.0751*ln(HG)+88.569	Au LG < 0.40 g/t
	60	=0.4613*ln(HG)+86.235	Au HG ≥ 0.40 g/t
ROM - Dark Star Main (Si < 2.0)	61	=3.0751*ln(HG)+91.333	Au LG < 0.40 g/t
	62	=0.4739*ln(HG)+88.569	Au HG ≥ 0.40 g/t
ROM - Dark Star Main (Si > 2.0)	63	=3.0751*ln(HG)+88.569	Au LG < 0.40 g/t
	64	=0.4687*ln(HG)+86.238	Au HG ≥ 0.40 g/t

Table 13-20: ROM and HPGR Dark Star North and Main Gold Recovery Equations (Transition)

ROM Dark Star Gold Recovery Equations (TRANSITION: AuCN > 65%, <85%)			
Geomet Recovery Zone	**Equation**	**Equation Gold Recovery, %**	**Range**
ROM - Dark Star North (Si < 2.0)	65	=5.9294*ln(HG)+69.158	Au LG < 0.40 g/t
	66	=0.9067*ln(HG)+64.633	Au HG ≥ 0.40 g/t
ROM - Dark Star North (Si > 2.0)	67	=6.1918*ln(HG)+58.948	Au LG < 0.40 g/t
	68	=0.9468*ln(HG)+54.222	Au HG ≥ 0.40 g/t
ROM - Dark Star Main (Si < 2.0)	69	=4..6651*ln(HG)+70.373	Au LG < 0.40 g/t
	70	=0.7134*ln(HG)+66.812	Au HG ≥ 0.40 g/t
ROM - Dark Star Main (Si > 2.0)	71	=8.7639*ln(HG)+66.188	Au LG < 0.40 g/t
	72	=5.8232*ln(HG)+63.941	Au HG ≥ 0.40 g/t

HPGR Dark Star Gold Recovery Equations (TRANSITION: AuCN > 65%, <85%)			
Geomet Recovery Zone	**Equation**	**Equation Gold Recovery, %**	**Range**
ROM - Dark Star North (Si < 2.0)	73	=5.9300*ln(HG)+71.821	Au LG < 0.40 g/t
	74	=0.8932*ln(HG)+67.313	Au HG ≥ 0.40 g/t
ROM - Dark Star North (Si > 2.0)	75	=6.1924*ln(HG)+72.029	Au LG < 0.40 g/t
	76	=0.9327*ln(HG)+67.321	Au HG ≥ 0.40 g/t
ROM - Dark Star Main (Si < 2.0)	77	=4.6191*ln(HG)+73.075	Au LG < 0.40 g/t
	78	=0.6956*ln(HG)+69.546	Au HG ≥ 0.40 g/t
ROM - Dark Star Main (Si > 2.0)	79	=8.7645*ln(HG)+71.331	Au LG < 0.40 g/t
	80	=5.8133*ln(HG)+69.069	Au HG ≥ 0.40 g/t

Silver grade at Dark Star is very low and of minimal economic value. ROM and HPGR silver recovery was not modelled.

13.15 REAGENT CONSUMPTIONS SOUTH RAILROAD PROPERTY

Reagent consumptions and requirements, including cyanide, lime, and cement were estimated by KCA based on metallurgical test work completed to date for the Pinion and Dark Star material. Reagent consumptions are summarized below.

13.15.1 Cyanide

The column leach test cyanide consumptions were studied for the ROM and HPGR crushed Pinion and Dark material and adjusted to provide a basis for the expected field cyanide consumptions. In KCA's experience, field cyanide consumptions are typically 25% to 50% of observed lab consumptions and have been estimated at 33% of the lab consumptions for this study.

ROM cyanide consumptions have been estimated based on column leach tests at 37.5 mm crush size for the Pinion and Dark Star materials. Because there are no ROM column leach test data available and ROM cyanide consumptions in the field are typically less than crushed ore consumptions, the estimated field cyanide consumptions for the ROM material is considered to be 80% of the crushed material cyanide consumptions. Lab cyanide consumptions for Pinion material at 37.5 mm crush ranged from 0.66 kg/t to 1.19 kg/t with an average consumption of 0.85 kg/t. Dark Star lab cyanide consumptions at 37.5 mm crush ranged from 0.46 kg/t to 1.31 kg/t with an average consumption of 0.87 kg/t. Based on this data, field cyanide consumptions are estimated at 0.22 kg/t and 0.23 kg/t for ROM Pinion and Dark Star material, respectively.

13.15.2 Lime

Lime is required for pH control for the ROM and Pinion crushed ore during leaching. Because hydrated lime was utilized in the lab leach tests, the laboratory lime consumptions are adjusted to accurately predict consumptions of quicklime (pebble lime, CaO) in the field. Estimated quicklime consumptions for the Pinion and Dark Star ROM ores are 1.0 kg/t of ore and 0.5 kg/t of ore for Pinion crushed ore.

13.16 METALLURGICAL TESTING ON JASPEROID WASH AND NORTH BULLION SAMPLES

13.16.1 Jasperoid Wash Deposit Metallurgical Testing

In 2017, Gold Standard commissioned KCA to complete metallurgical testing of composited core samples from the Jasperoid Wash deposit (KCA 2018c). Drill-core composites were subjected to bottle-roll cyanide-leach testing at target P80 sizes of 75 µm (200 mesh) and 1,700 µm (10 mesh), column-leach testing at eighty percent passing (P80) 12.5 mm, and one column leach tested at P80 = 25 mm. Additionally, three (3) metallurgical core holes were drilled in 2018, from which composites will be tested at a later date. Jasperoid Wash was not included in the current financial model. Accordingly, only a brief summary of the 2017 test results is presented below.

Gold extraction in the 200-mesh bottle rolls ranged from 67.7 and 96.6%, while Silver extraction ranged from 15.6 to 43.1%. Cyanide consumption averaged 0.46 kg/t for the eight oxide composites.

Gold extraction from the 10-mesh bottle rolls ranged between 52.6 and 93.7% (average = 76.1%). Silver extraction ranged from 12.8 to 83.6%. Silver grades are considered low at Jasperoid Wash. Cyanide consumption averaged 0.24 kg/t for the eight oxide samples.

A composite that was classified as sulfide carbon refractory had one of the lowest recoveries and the highest cyanide consumption.

Column-leach gold extractions ranged between 65.3 and 95.3% and averaged 82.9%. Silver head grades for Jasperoid Wash are low and of minimal economic significance. Cyanide consumption averaged 1.01 kg/t and lime consumption averaged 1.23 kg/t for the five oxide composites.

One of the composites, despite being a sulfide/carbon refractory material (Au_{CN} = 38.2%), achieved a high gold extraction of 90.1%. NaCN and lime consumptions were high, 3.12 kg/t and 10.95 kg/t respectively, which is expected due to its high sulfide sulfur content (1.6%).

Other tests on the Jasperoid Wash samples were performed to characterize the comminution, abrasion, and load permeability properties of the materials. Details on these may be found in the metallurgical report (KCA, 2018c).

13.16.2 North Railroad Deposits Metallurgical Testing

Two separate preliminary metallurgical tests were performed on the North Bullion (POD deposit) and Bald Mountain areas, which are part of the North Railroad portion of the property (Dufresne et al., 2017b).

In 2006, a total of 63 bottle-roll tests and three column-leach tests were completed by KCA on core material from the POD prospect located in the North Railroad portion of the property (KCA 2006). The results of the 63 individual bottle roll tests were highly variable, yielding gold extractions from 0% to 83%. The high variability of the extraction results was attributed to carbonaceous materials in the samples. The column-leach tests at 1.5, 0.5, and 0.25-inch crusher resulted in an average gold recovery of 85%.

Bench-top roasting tests were conducted by Newmont on North Bullion drill-core samples. Gold recoveries from three calcined samples were 83%, 90%, and 79%, with high lime demands of 15 to 22 lb/ton (Arthur, 2013).

Fourteen agitated cyanide leach tests were performed on samples from one drill hole in the Bald Mountain target. The average gold recovery attained was 82.2%, with better recoveries resulting from higher-grade samples.

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14 MINERAL RESOURCE ESTIMATES

14.1 INTRODUCTION

The statistical analysis, geological modeling, and mineral resource estimation for all deposits were performed under the supervision of Mr. Lindholm. These estimated mineral resources were classified in order of increasing geological and quantitative confidence into inferred, indicated, and measured mineral resource categories to be in accordance with the "CIM Definition Standards - For Mineral Resources and Mineral Reserves" (2014) and therefore Canadian National Instrument 43-101. CIM mineral resource definitions are given below, with CIM's explanatory material shown in italics:

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.

The authors of this section report mineral 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 mineral resource exists "in such form and quantity and of such a grade or quality that it has reasonable prospects for eventual economic extraction."

14.2 DARK STAR MINERAL RESOURCES

The Dark Star gold mineral resource estimate was completed on June 28, 2021, based on data derived from drilling completed in 2021 through drill holes, DR20-23, DC20-05, DS20-04, SS21-14 and MW19-01. The drill-hole database has an effective date of June 15, 2021, when the latest LECO data was received. The Dark Star mineral resource estimate has an effective date of January 31, 2022. Five holes for a total of 1,220 ft were drilled in 2021 by the effective date of the Dark Star drill-hole database but were not used to update the gold model because assays were not yet completed.

References to Tomera Formation equivalent stratigraphy at the Dark Star and Jasperoid Wash deposits have been noted historically. However, recent work suggests these units in the Railroad-Pinion property may not be of equivalent age, so all usage of Tomera Formation equivalent in this Technical Report refer to units that are Pennsylvanian-Permian undifferentiated.

Following the Pre-Feasibility study of Ibrado et al. (2020), Gold Standard made a decision to convert all project data from metric to Imperial units. MDA converted all length data, including collar northings and eastings, from meters to feet (1 m = 3.280833333 ft), and assay grades from g/tonne to oz/ton (1.0 oz/ton = 34.285714 g/tonne). Section plane spacing, block model block sizes, and other modeling dimensions were changed. Specifics and ramifications of the conversions are discussed in various sections below.

14.2.1 Dark Star Database

Six companies have conducted exploration drilling programs in the Dark Star deposit area since 1984, including Gold Standard, which began drilling in 2015. In all, 483 holes totaling 344,275.5 ft have been drilled (see Table 14-1). Holes drilled or with assays received after the effective date of the database are not included in the table. These drill holes, as well as Gold Standard's property limits and the Dark Star mineral resource outlines, are shown in Figure 14-1. The figure also shows the two separate subdivisions, referred to as the Dark Star North and Dark Star Main areas, of the Dark Star Deposit. RC and core drill holes account for 81% and 18.5% of the footage drilled, respectively.

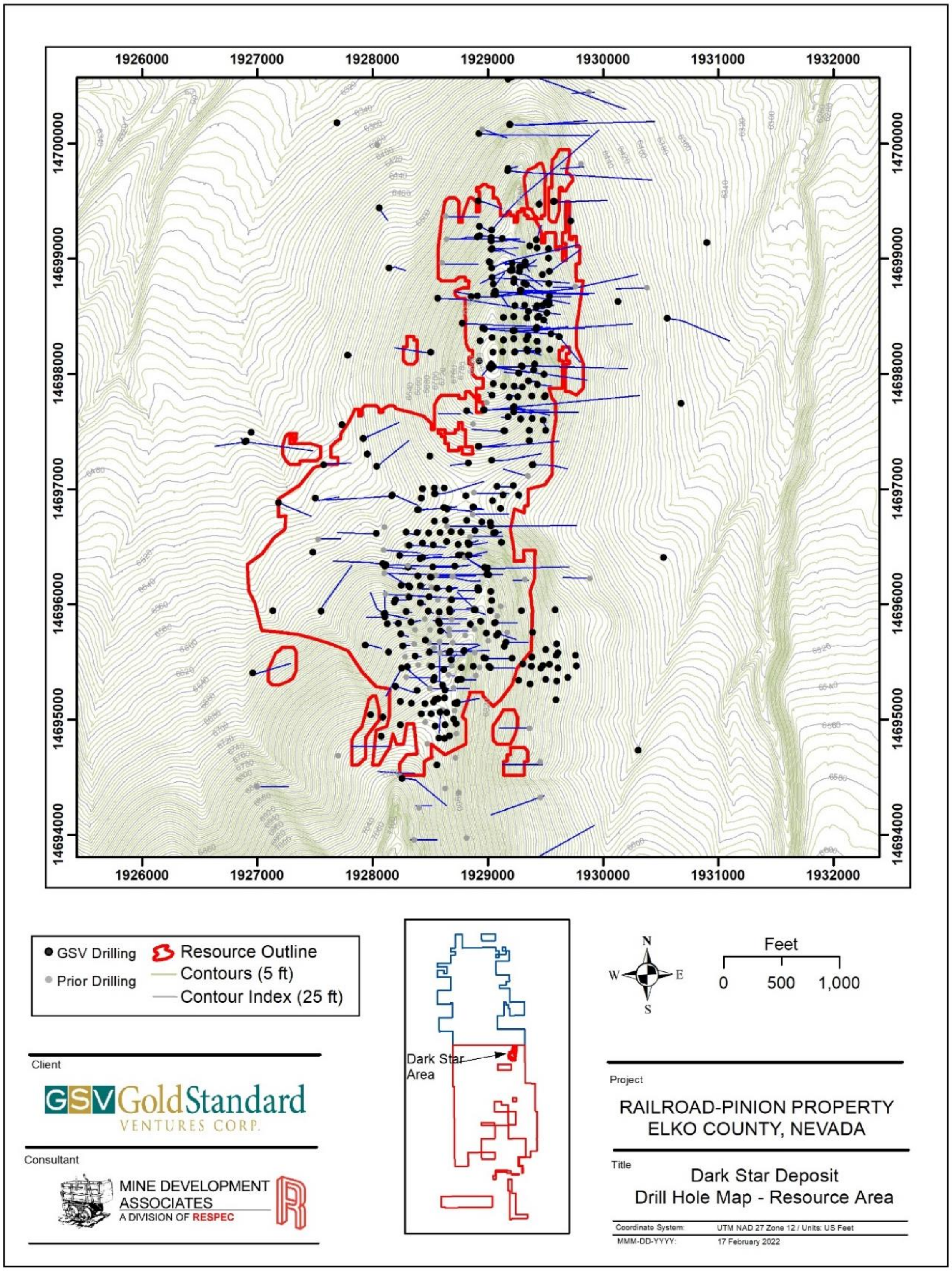


Figure 14-1: Dark Star Deposit Drill-Hole Map and Mineral Resource Outline

Table 14-1: Summary of Drilling at Dark Star to June 2021

Type of hole	Count	Drilled Feet
Core	71	62085
RC	402	277383.5
RC/Core Tail	2	4062
Sonic	8	745
Grand Total	483	344,275.5

Table 14-2 presents descriptive statistics of all Dark Star drill-hole analytical sample data audited and imported into MineSight by MDA. Measured density and core geotechnical data are also summarized. Rejected sample assay data have been excluded from the table. Trace element and whole-rock geochemical data have also been provided by Gold Standard but are not shown in Table 14-2.

Table 14-2: Descriptive Statistics of Sample Assays in Dark Star Drill-Hole Database
(accepted sample data only)

	Valid	Median	Mean	Std Dev	CV	Min.	Max.	Units
From	66,257					0.0	3100.0	ft
To	66,257					1.0	3105.0	ft
Length	66,257	5.0	5.1			0.1	730.3	ft
Au	63,726	0.0006	0.0068	0.0248	3.65	0.0	0.6504	oz Au/ton
Ag	25,565	0.005	0.009	0.063	6.99	0.0	3.9780	oz Ag/ton
Au_{CN}	13,479	0.007	0.021	0.041	1.95	0.0	0.6533	oz Au/ton
Au_{CN}/Au_{FA} Ratio	13,478	85.0	77.4	25.5	0.30	0.0	110	%
Density	1,137	2.520	2.449	0.249	0.10	1.24	4.47	g/cm3
Core recovery*	6,238	100.0	90.680	20.160	0.22	0.0	409.3	%
RQD*	6,238	40.0	50.860	55.150	1.08	0.0	409.3	%
*Core recovery and RQD data have not been audited and contain values exceeding the maximum of 100%.								

The Dark Star database contains 63,726 accepted gold assay records (Table 14-2). The total number of rejected gold assays is 425. These records from five Dark Star North RC drill holes were rejected due to suspected down-hole contamination as demonstrated by cyclicity of assay grades relative to depths of drill-rod changes.

Only 25,565 (40%) of the accepted gold assay samples were analyzed for silver, and 13,479 samples (21%) were analyzed for gold by cyanide extraction ("Au_{CN}"). Of the silver assays, 21,403 (84%) are repeated values. A few of these could be individual assays with coincidentally the same assay value, but nearly all represent assays of composited samples for which the silver assay was assigned to multiple individual sample intervals. The composites with a single silver value are generally about 20 ft long and composed of four samples.

Collar locations, downhole survey data, and gold, silver, barium, Au_{CN}, and Ag_{CN} analyses were audited for verification purposes. Logged core recovery and RQD were loaded into the database but were not verified. A few RQD values greater than 100% were noted, but not investigated. The database also contains logged geologic features, including rock types, formations, faults, vein type, silicification, clay, dolomite, barite, limonite, hematite, carbonate, sulfide percent, and percent reduced (unoxidized), all of which were imported. The logged geology was reviewed and used in modeling the gold domains.

Analyses of various carbon and sulfur species were also provided by Gold Standard, verified, and loaded into the mineral resource database. Metallurgical bottle-roll, column-leach, comminution, density, and flotation test results were compiled and loaded, but not verified.

14.2.2 Dark Star Geologic Model

Gold Standard provided geologic interpretations as surfaces and solids for faults, formation contacts, silicification, and metallurgically refractive material. MDA combined the formation and fault surfaces into solids that represent each formation, which includes the Chainman Formation (Mississippian), undifferentiated section of Pennsylvanian-Permian units, and Tertiary conglomerates and Indian Well Formation tuffs and sediments. The Pennsylvanian-Permian undifferentiated is further divided into lower siltstone, middle conglomerate (which is the primary host for Dark Star mineralization), and upper siltstone units. All formational units and faults are summarized in Section 7 of this Technical Report. MDA determined that Quaternary colluvium is present in sufficient quantities to be distinguished from heavier bedrock, so it was modeled on section and as solids to potentially improve stripping costs.

Mr. Lindholm reviewed silicification solids provided by Gold Standard. The solids compare well with logged silicification values of ‘2’ and ‘3’ (‘3’ representing the strongest silicification). Continuity in the modeled solids was broadly established by default as a function of the logged data, although continuity was lacking somewhat between sections where silicification was more localized.

All geologic interpretations, in combination with assays and logged data, were used to guide metal domain modeling and to define metallurgical domains.

14.2.3 Dark Star Gold Domains and Estimation

14.2.3.1 Gold Domain Model

Gold domains defined from sample assay ranges were explicitly modeled on sections spaced 98.5 ft apart, oriented east-west and looking north. This spacing was originally 30 m. Domains were defined based on population breaks on the cumulative probability plot (“CPP”) for all gold data (Figure 14-2). The domain grade ranges were originally determined using assay data in g Au/t and converted to oz Au/ton. The CPP was remade to reflect Imperial units, however, some of the grade breaks apparent on the metric chart were not as readily apparent on the Imperial chart. The lower limit of the outer shell gold domains does not plot well on the CPP because the level of precision of the statistical package used is only three decimal places. Grade ranges converted from those originally determined in metric units were retained, and used for modeling gold domains as follows:

- Outer shell domain: ~0.0012 oz Au/ton to ~0.009 oz Au/ton;
- Low-grade domain: ~0.009 oz Au/ton to ~0.102 oz Au/ton; and
- High-grade domain: >~0.102 oz Au/ton.

A Quaternary colluvium (“Qc”) gold domain was modeled at the request of Gold Standard, because a significant quantity of mineralized colluvium was encountered in drilling east of Dark Star Main. Essentially, all grades greater than 0.001 oz Au/ton were included in the modeled Qc domains, which are entirely above the gold domains in bedrock material. The Qc domains are not included in the mineral resource estimate.

A higher-grade domain >~0.03 oz Au/ton was considered, but there was insufficient continuity for modeling, and it would contain less than 0.5% of the assays. Descriptive statistics of assays by the modeled domains are presented in Table 14-3.

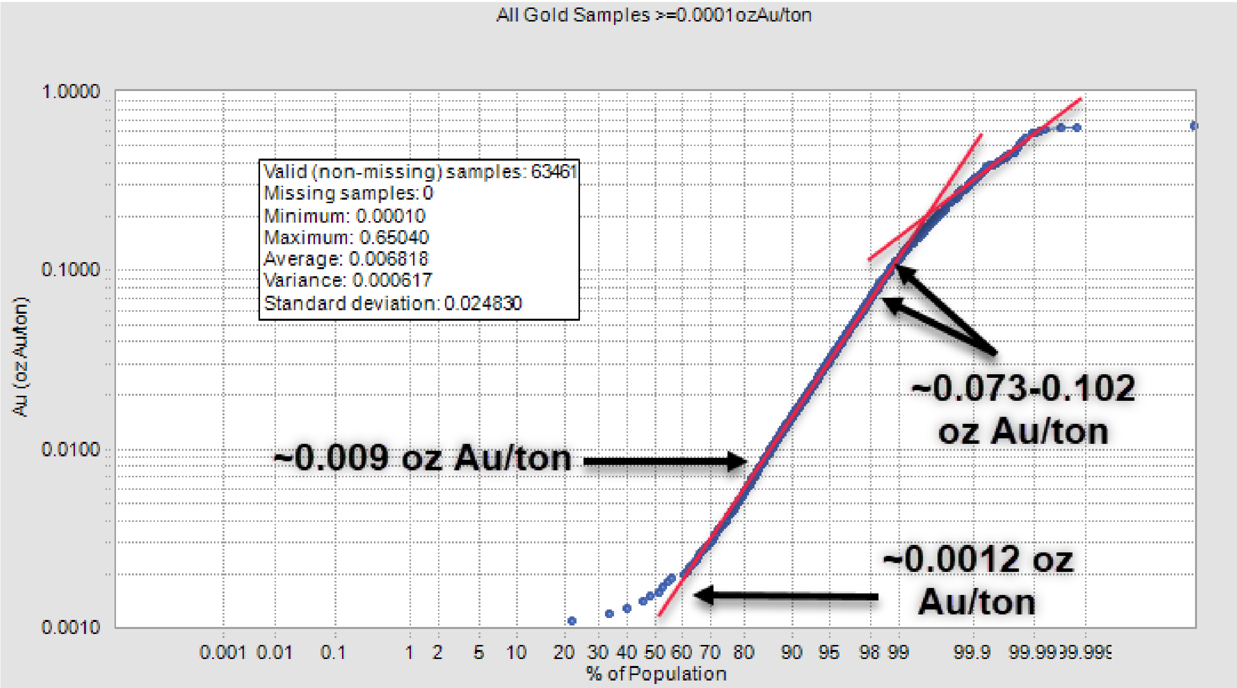


Figure 14-2: Cumulative Probability Plot of Dark Star Gold Assays

Table 14-3: Dark Star Descriptive Statistics by Domain
(accepted sample data only)

Outer Shell Gold Domain								
	Valid	**Median**	**Mean**	**Std Dev**	**CV**	**Minimum**	**Maximum**	**Units**
Length	12,467	5.0	5.0			0.1	132.1	ft
Type	12,460					1	7	
Au	12,359	0.0026	0.0032	0.0025	0.7872	0.0001	0.1010	oz Au/ton
Au capped	12,359	0.0026	0.0032	0.0022	0.6868	0.0001	0.0250	oz Au/ton
Au_{CN}	4,476	0.0035	0.0037	0.0023	0.6174	0.0004	0.0464	oz Au/ton
Au_{CN}/Au_{FA} ratio	4,476	80	74	25	0.30	3	110	%
Density	214	2.54	2.47	0.27	0.11	1.78	4.47	g/cm3
Core Recovery*	1,302	100	88	22	0.24	0	120	%
RQD*	1,302	40	49	50	1.04	0	344	%
Low-Grade Gold Domain								
	Valid	**Median**	**Mean**	**Std Dev**	**CV**	**Minimum**	**Maximum**	**Units**
Length	8,982	5.0	5.1			0.2	28.3	ft
Type	8,982					1	7	
Au	8,936	0.0150	0.0203	0.0166	0.8203	0.0002	0.2631	oz Au/ton
Au capped	8,936	0.0150	0.0203	0.0166	0.8203	0.0002	0.2631	oz Au/ton
Au_{CN}	6,939	0.0120	0.0170	0.0160	0.9380	0.0004	0.2223	oz Au/ton
Au_{CN}/Au_{FA} ratio	6,939	87	79	25	0.30	1	110	%

Density	219	2.57	2.54	0.25	0.10	1.72	4.36	g/cm3
Core Recovery*	1,158	100	92	17	0.18	0	313	%
RQD*	1,158	38	55	62	1.12	0	409	%
High-Grade Gold Domain								
	Valid	**Median**	**Mean**	**Std Dev**	**CV**	**Minimum**	**Maximum**	**Units**
Length	1,505	5.0	4.8			1.0	11.0	ft
Type	1,505					1	7	
Au	1,499	0.0991	0.1247	0.0866	0.6940	0.0045	0.6504	oz Au/ton
Au capped	1,499	0.0991	0.1247	0.0866	0.6940	0.0045	0.6504	oz Au/ton
Au_{CN}	1,382	0.0814	0.1013	0.0804	0.7939	0.0004	0.6533	oz Au/ton
Au_{CN}/Au_{FA} ratio	1,382	92	82	26	0.30	3	110	%
Density	86	2.54	2.53	0.20	0.08	1.93	3.43	g/cm3
Core Recovery*	454	100	93	16	0.18	0	100	%
RQD*	454	54	69	69	1.01	0	409	%
Outside Modeled Gold Domain								
	Valid	**Median**	**Mean**	**Std Dev**	**CV**	**Minimum**	**Maximum**	**Units**
Length	42,902	5.0	5.2			0.2	730.3	ft
Type	42,738					1	7	
Au	40,531	0.0002	0.0006	0.0054	9.1785	0.0000	0.5104	oz Au/ton
Au capped	40,531	0.0002	0.0005	0.0010	2.1313	0.0000	0.0160	oz Au/ton
Au_{CN}	576	0.0020	0.0091	0.0404	4.4468	0.0004	0.5230	oz Au/ton
Au_{CN}/Au_{FA} ratio	575	85	74	35	0.50	0	110	%
Density	618	2.47	2.40	0.24	0.10	1.24	2.99	g/cm3
Core Recovery*	3,324	100	91	21	0.23	0	409	%
RQD*	3,324	38	48	52	1.08	0	409	%
Qc Gold Domain								
	Valid	**Median**	**Mean**	**Std Dev**	**CV**	**Minimum**	**Maximum**	**Units**
Length	401	5.0	5.0			5.0	10.0	ft
Type	401					2	6	
Au	401	0.0030	0.0037	0.0034	0.9393	0.0004	0.0363	oz Au/ton
Au capped	401	0.0030	0.0036	0.0028	0.7859	0.0004	0.0200	oz Au/ton
Au_{CN}	106	0.0035	0.0044	0.0039	0.8905	0.0004	0.0289	oz Au/ton
Au_{CN}/Au_{FA} ratio	106	76	75	19	0.20	10	110	%
Density	0	0.00	0.00	0.00	0.00	0.00	0.00	g/cm3
Core Recovery*	0	0	0	0	0.00	0	0	%
RQD*	0	0	0	0	0.00	0	0	%
*Core recovery and RQD data have not been audited and contain values exceeding the maximum of 100%.								

Mr. Lindholm reviewed core from DC18-05, DC18-07, and DC18-09 during a site visit on September 18 and 19, 2018 in an effort to determine the geologic characteristics of each domain. Gold Standard staff geologists provided guidance and expertise with respect to the geology of the deposits and the nature of gold mineralization. The following characteristics were observed with respect to gold domains, and mineralization in general:

- The middle conglomerate of the Pennsylvanian-Permian undifferentiated (or Tomera Formation age equivalent) is the primary host for mineralization. The upper and lower siltstone units are mineralized as well, but to a lesser degree;
- One of the primary characteristics associated with gold grade is the presence and quantity of limonite on fractures;
- Gold grade increases with increased fracture permeability (structural preparation);
- More porous, coarser-grained sedimentary lithologies tend to be better hosts. Some porous zones were created by decalcification of calcareous sedimentary rocks;
- Gold mineralization is commonly confined between less permeable lithologies, such as argillized fault gouges or stratigraphic horizons;
- Grade decreases from relatively coarse-grained rocks in the low-grade domain, to more fine-grained micritic lithologies in the outer-shell domains;
- Barite, scorodite, and jarosite were observed at moderate to higher grades, greater than ~0.029 oz Au/ton.
- Degree of silicification does not seem to be associated with strong gold mineralization. Where rocks are silicified, grades of ~0.029 to 0.175 oz Au/ton were found in zones of increased limonite on fractures; and
- Some pervasive, very fine-grained pyrite was observed with moderate gold grades, particularly in gouge zones.

To summarize, gold mineralization increases with increasing limonite on fractures, and increasing porosity. More favorable porosity is inherent in coarser-grained sedimentary lithologies or developed by structural preparation and/or decalcification. Structural preparation ranges from localized fractures to wider gouge zones, and to broad zones of fractures and stockwork breccias. Silicification and argillic alteration may be indirectly associated with gold grade, *i.e.,* clay can be abundant in structurally deformed zones, but may or may not be related to gold deposition.

As noted in the previous section, geologic logging and interpretations, along with observations of core directly or in photos, were used to guide mineral-domain modeling. Mineral domains were generally drawn parallel to stratigraphic contacts, per guidance from Gold Standard. Gold domains were offset across faults according to sense-of-movement indicated by Gold Standard interpretations. Schematic cross sections in the Dark Star Main zone and Dark Star North zone are given in Figure 14-3 and Figure 14-4, respectively.

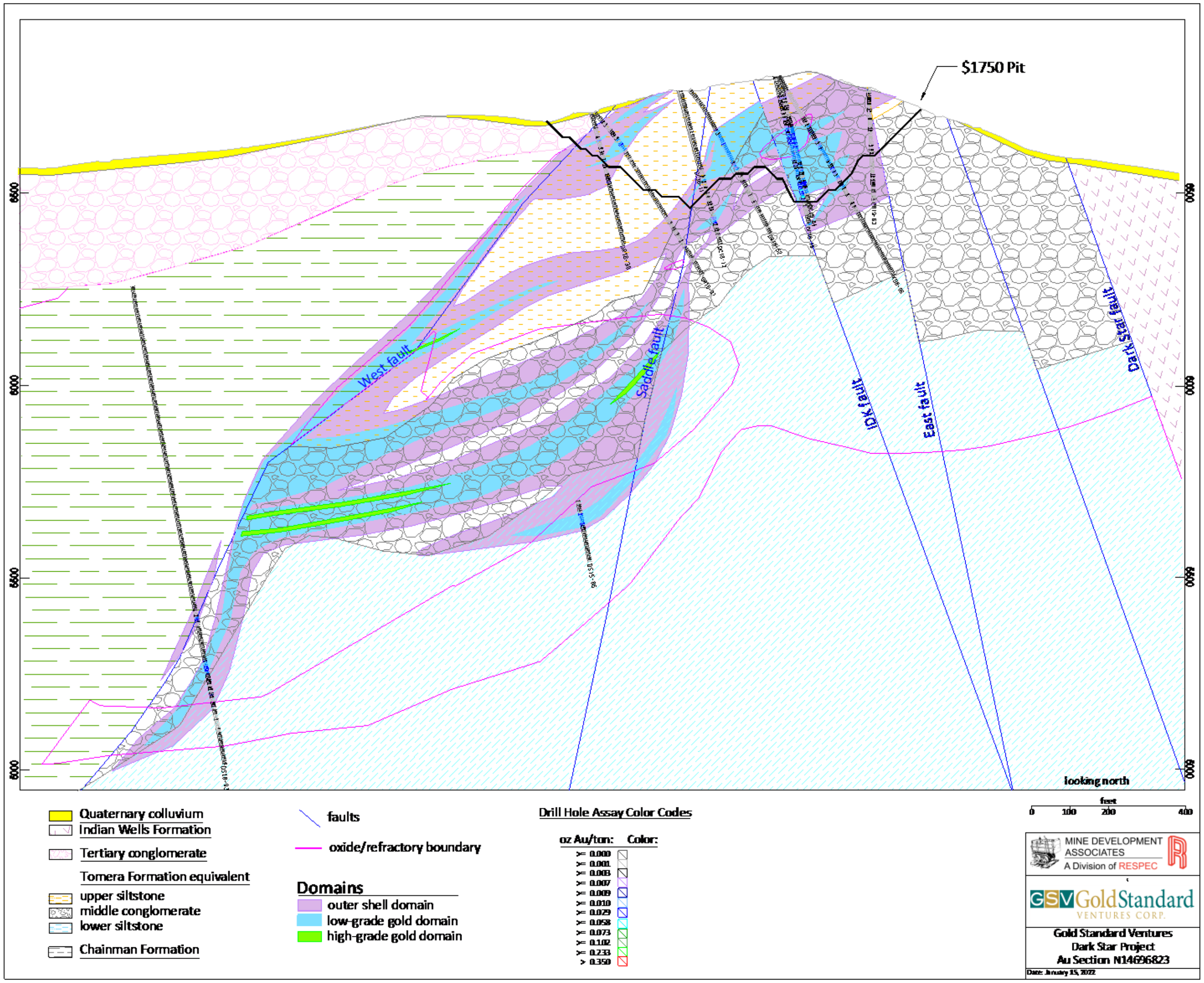


Figure 14-3: Dark Star Main Zone Gold Domains and Geology – Section N14696823

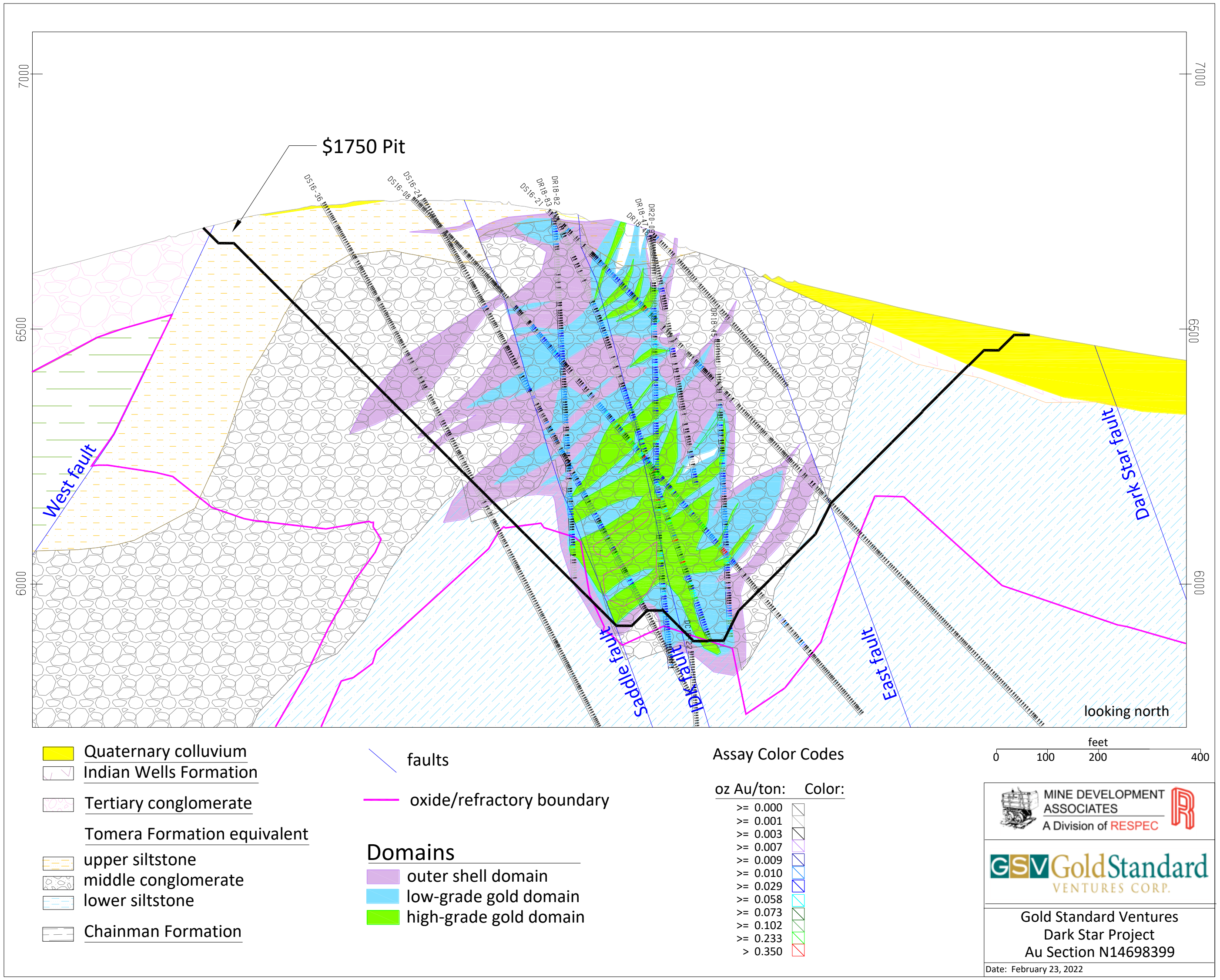


Figure 14-4: Dark Star North Zone Gold Domains and Geology – Section N14698399

The relationship between gold mineralization and major faults mapped on the surface or interpreted on section is not well understood. The primary bounding structures of the major horst block are the West and Dark Star faults, although some mineralization does cross the West Fault into the Chainman Formation and appears to terminate against an unrecognized barrier somewhere to the west of the East fault. The Ridgeline and IDK faults are located within the deposits, and gold grades appear to be strongest and more widespread between them.

Some significant gold grades have been intercepted in multiple drill holes extending downward between the Ridgeline and IDK faults in the Dark Star North zone (see Figure 14-4). Gold Standard describes and interprets the mineralization in this area as follows:

> "*The zone between the Ridgeline and IDK faults appear to be* [a] *highly brecciated structural corridor. The gold zone follows down between these two faults, but generally has a floor at/near the Conglomerate and underlying ST-L* [lower Tomera Formation equivalent siltstone] *contact. The contact is likely a chemistry change from high to low carbonate, causing mineralization above the contact, and much weaker below. We suspect both faults are feeders and long term might see a small breccia pipe or feeder along one or both faults to some depth"*

The unusual occurrence and precise geometry of mineralization in this deeper area is still not fully understood, however, new drilling between the faults continues to confirm the existence of relatively high gold grades in the zone.

Gold grade decreases in intensity and thickness down-dip and up-dip along stratigraphy from the Ridgeline and IDK faults. The relationship between mineralization in the footwall and hanging wall of the Ridgeline fault in particular is not well understood. In the current model, domains were drawn as if the fault is a hard boundary to mineralization, with no continuity across the fault, although as noted above, Gold Standard suspects the faults may ultimately prove to be feeders. No domains were drawn along the fault, because it is unclear at this time whether gold was deposited along the structure. The IDK fault does not appear to be a barrier to mineralization as significantly in Dark Star North, so domains were drawn more continuously across it.

After gold domain interpretations were completed on 98.5 ft spaced cross sections oriented east-west, the domain interpretations were snapped to drill holes in three dimensions and sliced for modeling on mid-bench level plans. The modeled level plans are spaced at 30 ft and are located at the midpoint of each bench. Because there were slight differences in section and level plan locations due to the conversion to Imperial units, modifications to gold domains were required. Silver was not modeled or estimated.

14.2.3.2 Gold Sample and Composite Statistics

The modeled gold mineral domains were used to assign codes to drill-hole samples. Quantile plots were made of the coded assays. Potential capping levels for each domain were assessed by identifying the grade above which outlier values occur. Applied capping grades (Table 14-4) were then determined after reviewing the outlier samples on screen with respect to grade and proximity of surrounding samples, geology, general location, and materiality. Descriptive statistics of sample assays by domain were also considered to evaluate the necessity for capping of assays (Table 14-3).

Table 14-4: Dark Star Capping Levels for Gold by Domain

Domain	Capping Grade (oz Au/ton)
Outer Shell	0.025
High-Grade	NONE
Low-Grade	NONE
Outside Domains	0.016
Quaternary Colluvium	0.020

After the capping was completed, the drill holes were down-hole composited to 10 ft intervals honoring domain boundaries. The composite length was chosen to avoid de-compositing small fractions of the original drilled sample intervals. Descriptive statistics by domain of the composited database are given in Table 14-5.

Table 14-5: Dark Star Descriptive Composite Statistics by Domain

Outer Shell Gold Domain								
	Valid	Median	Mean	Std Dev	CV	Minimum	Maximum	Units
Length	6,641	10.00	9.27			0.00	10.00	ft
Au	6,556	0.0028	0.0032	0.0021	0.6626	0.0002	0.0547	oz Au/ton
Au capped	6,556	0.0028	0.0032	0.0019	0.5933	0.0002	0.0250	oz Au/ton
Au_{CN}	2,951	0.0035	0.0036	0.0020	0.5390	0.0004	0.0280	oz Au/ton
Au_{CN}/Au_{FA} ratio	2,951	79.0	74.1	24.2	0.3	4	110	%
Low-grade Gold Domain								
	Valid	Median	Mean	Std Dev	CV	Minimum	Maximum	Units
Length	4,894	10.00	9.32			0.00	10.00	ft
Au	4,874	0.0154	0.0200	0.0144	0.7189	0.0008	0.1858	oz Au/ton
Au capped	4,874	0.0154	0.0200	0.0144	0.7189	0.0008	0.1858	oz Au/ton
Au_{CN}	3,648	0.0124	0.0169	0.0142	0.8423	0.0004	0.1870	oz Au/ton
Au_{CN}/Au_{FA} ratio	3,648	87.0	78.9	23.8	0.3	2	110	%
High-grade Gold Domain								
	Valid	Median	Mean	Std Dev	CV	Minimum	Maximum	Units
Length	813	10.00	8.84			0.00	10.00	ft
Au	812	0.1024	0.1224	0.0695	0.5677	0.0091	0.5000	oz Au/ton
Au capped	812	0.1024	0.1224	0.0695	0.5677	0.0091	0.5000	oz Au/ton
Au_{CN}	744	0.0840	0.1001	0.0670	0.6693	0.0033	0.4419	oz Au/ton
Au_{CN}/Au_{FA} ratio	744	92.0	82.9	24.6	0.3	4	110	%
Outside Modeled Gold Domain								
	Valid	Median	Mean	Std Dev	CV	Minimum	Maximum	Units
Length	22,266	10.00	9.01			0.00	10.00	ft
Au	20,456	0.0003	0.0006	0.0050	8.5860	0.0	0.4010	oz Au/ton
Au capped	20,456	0.0003	0.0005	0.0009	1.8609	0.0	0.0160	oz Au/ton
Au_{CN}	356	0.0022	0.0079	0.0352	4.4690	0.0004	0.4056	oz Au/ton
Au_{CN}/Au_{FA} ratio	354	84.0	72.7	34.1	0.5	2	110	%
Qc Gold Domain								
	Valid	Median	Mean	Std Dev	CV	Minimum	Maximum	Units
Length	20	10.00	9.75	0.0	0.0	5.00	10.00	ft
Au	20	0.0024	0.0024	0.0007	0.2770	0.0	0.0040	oz Au/ton
Au capped	20	0.0024	0.0024	0.0007	0.2770	0.0	0.0040	oz Au/ton
Au_{CN}	6	0.0031	0.0029	0.0005	0.1661	0.0020	0.0032	oz Au/ton
Au_{CN}/Au_{FA} ratio	6	79.0	82.7	14.9	0.2	63	100	%

Correlograms were generated from the composited gold grades to evaluate grade continuity. Correlogram parameters were determined and applied to the kriged estimate, against which the reported inverse distance estimate was compared. The evaluated continuity of grade also contributed to classification of mineral resources. The correlogram results by domain are summarized as follows:

> Outer shell gold domain – The nugget is 45% of the total sill. The first sill is 30% of the total sill with a range of 33 ft to 130 ft depending on direction. The remaining 25% of the total sill has a range of 360 ft to 755 ft depending on direction.
>
> Low-grade gold domain – The nugget is 50% of the total sill. The first sill is 35% of the total sill with a range of 65 ft to 100 ft depending on direction. The remaining 15% of the total sill has a range of 525 ft to 920 ft depending on direction.
>
> High-grade gold domain – The nugget is 40% of the total sill. The first sill is 40% of the total sill with a range of 33 ft to 150 ft depending on direction. The remaining 20% of the total sill has a range of 100 ft to 195 ft depending on direction

14.2.3.3 Gold Estimation

The mineral resource block model is not rotated, and the blocks are 30 ft north-south by 30 ft vertical by 30 ft east-west. Four gold estimates were completed: a polygonal, nearest neighbor, inverse distance, and kriged, with the inverse-distance estimate being reported. All the estimates, excluding the polygonal, were run several times in order to determine sensitivity to estimation parameters, and to evaluate and optimize results. The inverse distance power was three (“ID^3”). The model was divided into nine estimation areas (“ESTAR”) to control search anisotropy, orientation, and distances according to the differing geometries of mineralization in each area during estimation. Table 14-6 summarizes the estimation areas and associated search orientations and maximum search distances by domain. Figure 14-5 depicts the spatial relationship of the estimation areas to the drilling and the gold domains.

Table 14-6: Dark Star Estimation Areas, Search-Ellipse Orientations and Maximum Search Distances by Domain

Estimation Area	Search Ellipse Orientation			Maximum Search Distance (ft)			
	Azimuth (degrees)	Dip (degrees)	Rotation (degrees)	Outer Shell	Low-Grade	High-Grade	Outside Domains
1	12.5	0	0	820	660	490	160
2	12.5	0	27.5	820	890	490	160
3	12.5	0	52.5	820	720	490	160
4	12.5	0	77.5	660	490	490	160
5	0	0	50	660	490	490	160
6	0	0	0	660	490	490	160
7	0	0	27.5	660	490	490	160
8	0	0	52.5	660	490	490	160
9	0	0	77.5	660	490	490	160
Qc	0	0	-20		150		

Note: Semi-major search distance = major search distance ÷ 1, 1.5 or 2, and the vertical search distance = major search distance ÷ 4

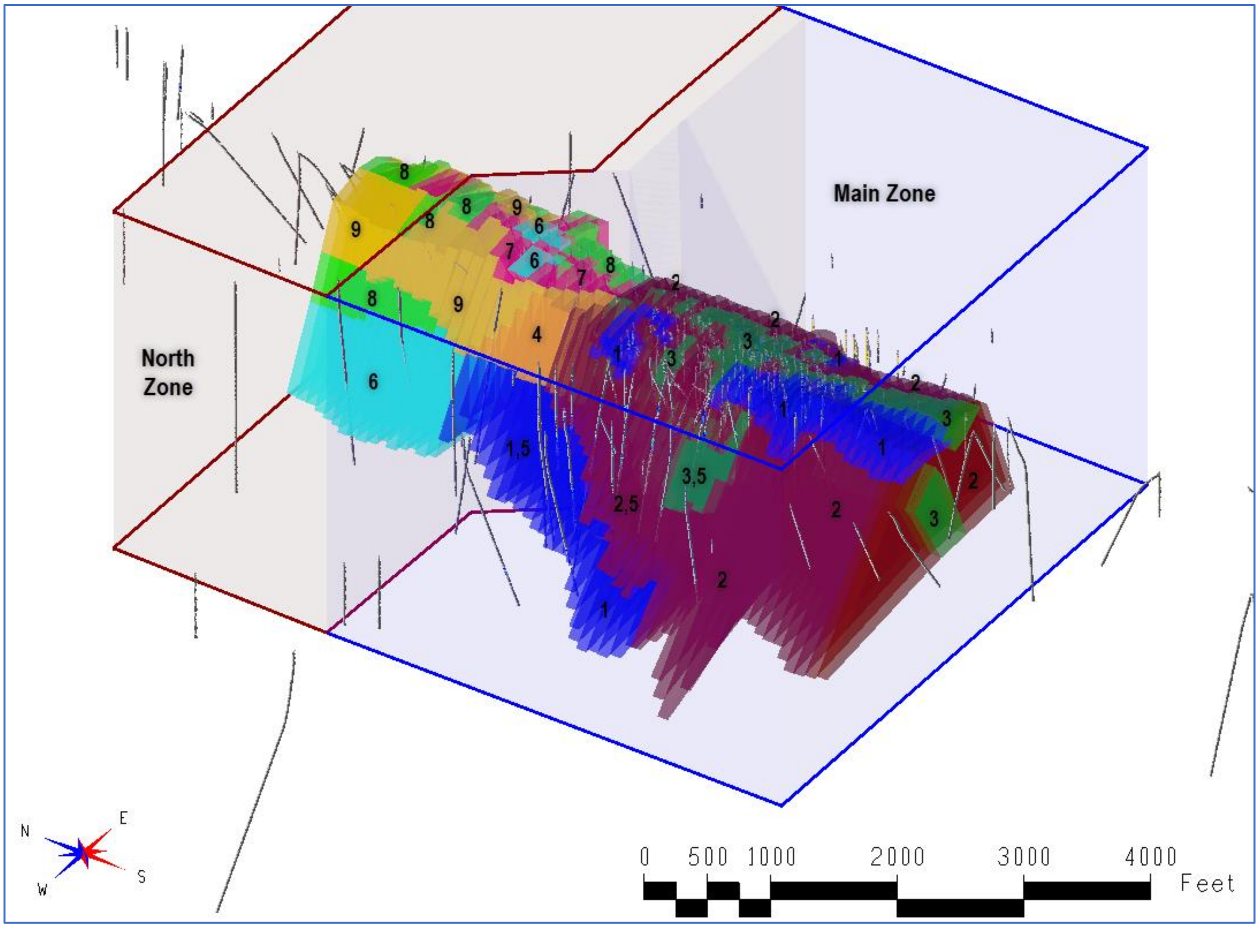


Figure 14-5: Dark Star Spatial Relationship Between Estimation Areas, Gold Domains and Drill Holes

One estimation pass was run for each domain, up to a maximum anisotropic search distance of 890 ft along the major axis. Search ellipse anisotropy varies from 1:1:4 to 1:2:4 (major versus semi-major versus minor axes). Composite-length weighting was applied to all estimation runs. Estimation parameters for each domain are given in Table 14-7.

Table 14-7: Dark Star Estimation Parameters
(for search orientations and maximum distances, see Table 14-6)

Description	Parameter
Outer Shell Gold Domain	
Samples: minimum/maximum/maximum per hole	1 / 12 / 3
Search anisotropies (ft): major/semimajor/minor (vertical)	1 / varies 0.5 to 1 / 0.25
Inverse distance power	3
High-grade restrictions (grade in oz Au/ton, distance in ft)	None
Low-Grade Gold Domain	
Samples: minimum/maximum/maximum per hole	1 / 12 / 3
Search anisotropies (ft): major/semimajor/minor (vertical)	1 / varies 0.5 to 0.67* / 0.25
Inverse distance power	3
High-grade restrictions (grade in oz Au/ton, distance in ft)	0.079 / half max search

High-Grade Gold Domain	
Samples: minimum/maximum/maximum per hole	1 / 12 / 4
Search anisotropies (ft): major/semimajor/minor (vertical)	1 / 0.5* / 0.25
Inverse distance power	3
High-grade restrictions (grade in oz Au/ton, distance in ft)	0.292 / 245
Outside Modeled Gold Domains	
Samples: minimum/maximum/maximum per hole	2 / 12 / 3
Search anisotropies (ft): major/semimajor/minor (vertical)	1 / 0.5 / 0.25
Inverse distance power	2
High-grade restrictions (grade in oz Au/ton, distance in ft)	0.003 / 30
Qc Gold Domain	
Samples: minimum/maximum/maximum per hole	1 / 9 / 3
Search anisotropies (ft): major/semimajor/minor (vertical)	1 / 1 / 0.17
Inverse distance power	2
High-grade restrictions (grade in oz Au/ton, distance in ft)	0.01 / 60
** - Exception, ESTAR 5 major to semi-major axis search anisotropy is 1*	

14.2.4 Dark Star Gold Mineral Resources

Mr. Lindholm classified the Dark Star mineral resources giving consideration to confidence in the underlying database, sample integrity, analytical precision/reliability, QA/QC results, and confidence in geologic interpretations. The classification parameters are given in Table 14.48.

Table 14-8: Dark Star Classification Parameters

Measured
In modeled domain, and
*Drill-hole confidence code ≥ 0.9, and
Number of holes ≥ 3, and average distance ≤ 115 ft; Or
Number of samples ≥ 3, and closest distance ≤ 50 ft
Indicated
In modeled domain and Main area, and
Number of Samples ≥ 7 and isotropic distance ≤ 195 ft; Or
Number of Samples ≥ 4 and isotropic distance ≤ 80 ft; Or
Number of Samples ≥ 2 and closest distance ≤ 50 ft, Or
Or
In modelled domain and North area, and
Number of Samples ≥ 7 and isotropic distance ≤ 165 ft; Or
Number of Samples ≥ 4 and isotropic distance ≤ 65 ft; Or
Number of Samples ≥ 2 and isotropic distance ≤ 35 ft, Or
Measured Reduced to Indicated if:
Metallurgy code indicates refractory or uncategorized material (METC = 100-199)
Measured and Indicated Reduced to Inferred if:
Inside reduced classification solid and closest distance ≥ 50 ft; Or
In modeled domain and closest distance ≥ 100 ft and drill-hole confidence code ≤ 0.5*; Or
In Tertiary Conglomerates and modeled domain, and closest distance ≥ 100 ft
Inferred
In modeled domain that is not Measured or Indicated; Or
All estimated blocks outside modeled domains, and isotropic distance ≤ 65 ft**, Or
In Qc gold domain
**Confidence code of '1' assigned to holes drilled by Gold Standard with collar surveys, '0.5' to Gold Standard holes with no collar surveys, and '0' to historical drill holes*
***A strong search restriction on composites ≥0.003oz Au/ton within this distance (at 30 ft) was applied*

As described in Table 14-8, the amount of influence that historical data has on a given block decreases confidence in the estimated grade and consequently the classification. For a block to be classified as Measured mineral resources, 90% or more of the estimating composite grades must be derived from Gold Standard data. Similarly, block grades estimated with all composites beyond 100 ft based on 50% or more historical data are classified as Inferred mineral resources.

The results of the QA/QC evaluation revealed a project risk that warrants additional comment. There is no historical QA/QC except for 11 Mirandor drill holes. Consequently, the reliability of pre-Gold Standard data, and therefore model block grades derived predominantly from historical data, is diminished and contributes to the reduction in classification. Gold Standard did infill drill areas where historical drilling dominated, so the risk is mitigated in these areas.

Since the April 2019 effective date of the database for Dark Star used in the 2020 PFS of Ibrado et al. (2020), 23, 32 and two additional holes were drilled in 2019, 2020 and 2021, respectively. Data for these holes, as well as assays for core hole DC19-01, were received with finalized assays from Gold Standard by the effective date of the database of June 15, 2021, and have been incorporated into the current resource model. Gold domains were updated with the newer information, and in general, the 57 added assay sets caused incremental changes to the domains and impacted in-pit mineral resources only locally. A number of holes were drilled as step-outs to the east of the Dark Star Main zone mineral resource pit, and encountered consistent very low-grade gold mineralization in Quaternary Colluvium, which was modeled separately from gold domains in Tertiary and older units. Overall, these added holes tested the veracity of the 2019 gold domain model, and the lack of significant changes to the 2019 resource estimate adds to the level of confidence in the block model. However, no increase in classification was necessary or warranted for the current resources, as essentially all of the Dark Star North mineralization in the optimized pit is classified as Measured or Indicated, and the primary cause for Inferred classification in the Dark Star Main pit is the heavier reliance on historical drilling.

Due to excessive snow conditions following the 2019 drilling program, many of the 2018-2019 drill collars were not surveyed. In all, 81 drill holes in the Dark Star database did not have surveyed collars. The assays associated with these holes were assigned confidence codes of 0.5. The net effect for classification is that Measured and Indicated mineral resources beyond 100 ft from a composite were reduced to Inferred status if the block was estimated using a combination of unsurveyed Gold Standard and historical drill holes. However, 63 of the unsurveyed collars have since been surveyed, so that only 18 holes remain unsurveyed. Gold domains have been modified to the slightly different drill-hole locations, and drill-hole confidence codes and resulting classification have been modified accordingly.

Another 20 RC and five core holes have been since the effective date of the current Dark Star database. Mr. Lindholm loaded these holes into the MineSight database, and evaluated the potential changes these holes would cause to the gold domains. The core holes were drilled to provide samples for metallurgical test work. However, recovery was poor, reportedly due to the inexperience of the drillers. No assays were obtained from these core holes. Of the RC holes, one was a step-out hole south of the modeled area that intercepted minimal grades, and nine were drilled into the Quaternary gravels west of Dark Star Main, which is not part of the reported resource. The remaining ten were infill holes within the modeled mineralization. Three and seven holes were drilled into Dark Star North and Main, respectively. Generally, the infill holes confirm the existing gold domain model and would cause minor changes to domains. Two holes did not confirm high-grade domain extensions from adjacent sections but resulting in-pit losses would be minimal. None of the late 2021 drilling would cause changes in pit size and shape, and in-pit resources would increase and/or decrease minor amounts only locally.

The exact nature of deep high-grade mineralization protruding down between the Ridgeline and IDK faults in the Dark Star North zone is not completely understood. Gold Standard interprets the zone as a possible breccia pipe or feeder for gold mineralization, although drilling does not yet confirm the hypothesis. However, despite this uncertainty, drilling consistently intersected mineralization in deep Dark Star North, and continues to confirm the presence of relatively high-grade mineralization in the zone.

Greater restrictions were applied to Measured and Indicated mineral resource material in specific areas of the gold domain block model due to locally limited understanding of geology and/or gold mineralization (excluding Dark Star North area discussed in the previous paragraph), or suspected (but not proven) down-hole contamination. For example, classification was restricted for mineralization associated with deep, isolated intercepts on the West fault.

A small amount of mineralization has been intercepted in drilling near the surface in Tertiary conglomerates at the southwest end of Dark Star Main. Although the mineralization is present in rocks younger than the bulk of the Dark Star deposit, Gold Standard has observed similar occurrences in Tertiary rocks in other areas of the district. No metallurgical test work has been performed on this material, although there are cyanide-soluble assays that provide a measure of gold recovery. The existence and shape of this mineralization has been confirmed in numerous drill holes, but because the exact nature of gold mineralization in Tertiary conglomerates is not understood, Indicated material was limited to within 100 ft of a composite.

The author reports the Dark Star mineral resources at cutoffs that are reasonable for Carlin-type deposits of comparable size and grade. Technical and economic factors likely to influence the requirement "*in such form and quantity and of such a grade or quality that it has reasonable prospects for eventual economic extraction*" were evaluated using the best judgement of the author responsible for this section of the report. For evaluating the open-pit potential, MDA modeled a series of optimized pits using variable gold prices, mining costs, processing costs, and anticipated metallurgical recoveries. The authors used costs appropriate for open-pit mining in Nevada, estimated processing costs and metallurgical recoveries related to heap leaching, and G&A costs. The factors used in defining cutoff grades are based on a gold price of $1,750/oz.

The Dark Star mineral resource estimate is the fully block diluted ID^3 estimate and is reported at variable cutoffs for open-pit mining. The cutoff for oxidized and transitional material is 0.005 oz Au/ton, whereas the cutoff for sulfide material is 0.045 oz Au/ton. No reported sulfide material is classified as Measured mineral resources. Table 14-9 through Table 14-12 present the estimates of the Measured, Indicated, combined Measured, and Indicated and Inferred gold mineral resources within the $1,750/oz Au pits. The breakdown of mineral resources by oxidation state is given in Appendix C. Representative cross sections of the gold block model in the Dark Star Main and North zones are given in Figure 14-6 and Figure 14-7, respectively. Mineral resources that are not mineral reserves do not have demonstrated economic viability.

Table 14-9: Dark Star Total In-Pit Gold Mineral Resources – Measured*

Cutoff			
oz Au/ton	**Tons**	**oz Au/ton**	**oz Au**
0.001	14,126,000	0.021	302,000
0.002	11,926,000	0.025	300,000
0.003	9,785,000	0.030	294,000
0.004	8,625,000	0.034	290,000
0.005	**7,964,000**	**0.036**	**288,000**
0.006	7,468,000	0.038	285,000
0.007	7,101,000	0.040	282,000
0.008	6,721,000	0.042	280,000
0.009	6,417,000	0.043	277,000
0.010	6,072,000	0.045	274,000
0.015	4,630,000	0.055	256,000
0.020	3,744,000	0.064	241,000
0.025	3,148,000	0.072	228,000
0.030	2,740,000	0.079	217,000
0.035	2,415,000	0.085	206,000
0.040	2,188,000	0.090	197,000
0.045	1,991,000	0.095	189,000
0.050	1,816,000	0.100	181,000
0.075	1,129,000	0.123	139,000
0.100	752,000	0.141	106,000
*mineral resources are inclusive of mineral reserves.			

Table 14-10: Dark Star Total In-Pit Gold Mineral Resources – Indicated*

Cutoff			
oz Au/ton	**Tons**	**oz Au/ton**	**oz Au**
0.001	47,966,000	0.015	701,000
0.002	41,454,000	0.017	689,000
0.003	35,795,000	0.019	677,000
0.004	31,521,000	0.021	662,000
0.005	28,708,000	0.023	650,000
0.006	26,342,000	0.024	637,000
variable	**27,081,000**	**0.023**	**625,000**
0.007	24,499,000	0.026	625,000
0.008	22,774,000	0.027	612,000
0.009	21,320,000	0.028	599,000
0.010	19,918,000	0.029	586,000
0.015	13,443,000	0.038	507,000
0.020	9,308,000	0.047	436,000
0.025	6,852,000	0.055	380,000
0.030	5,377,000	0.063	341,000
0.035	4,315,000	0.071	305,000
0.040	3,566,000	0.078	278,000
0.045	3,032,000	0.084	255,000
0.050	2,623,000	0.090	236,000
0.075	1,437,000	0.115	165,000
0.100	890,000	0.131	117,000
*mineral resources are inclusive of mineral reserves			

Table 14-11: Dark Star Total In-Pit Gold Mineral Resource- Measured and Indicated*

Cutoff			
oz Au/ton	**Tons**	**oz Au/ton**	**oz Au**
0.001	62,092,000	0.016	1,003,000
0.002	53,380,000	0.019	989,000
0.003	45,580,000	0.021	971,000
0.004	40,146,000	0.024	952,000
0.005	36,672,000	0.026	938,000
0.006	33,810,000	0.027	922,000
variable	**35,045,000**	**0.026**	**913,000**
0.007	31,600,000	0.029	907,000
0.008	29,495,000	0.030	892,000
0.009	27,737,000	0.032	876,000
0.010	25,990,000	0.033	860,000
0.015	18,073,000	0.042	763,000
0.020	13,052,000	0.052	677,000
0.025	10,000,000	0.061	608,000
0.030	8,117,000	0.069	558,000
0.035	6,730,000	0.076	511,000
0.040	5,754,000	0.083	475,000
0.045	5,023,000	0.088	444,000
0.050	2,623,000	0.090	236,000
0.075	1,437,000	0.115	165,000
0.100	890,000	0.131	117,000
*mineral resources are inclusive of mineral reserves.			

Table 14-12: Dark Star Total In-Pit Gold Mineral Resources – Inferred*

Cutoff oz Au/ton	Tons	oz Au/ton	oz Au
0.001	3,650,000	0.007	26,000
0.002	2,178,000	0.011	24,000
0.003	1,784,000	0.013	23,000
0.004	1,597,000	0.014	22,000
0.005	1,425,000	0.015	21,000
0.006	1,281,000	0.016	21,000
0.007	1,152,000	0.017	20,000
0.008	1,053,000	0.018	19,000
variable	**1,296,000**	**0.015**	**19,000**
0.009	962,000	0.019	18,000
0.010	864,000	0.021	18,000
0.015	549,000	0.026	14,000
0.020	690,000	0.022	15,000
0.025	178,000	0.039	7,000
0.030	118,000	0.042	5,000
0.035	75,000	0.053	4,000
0.040	54,000	0.056	3,000
0.045	44,000	0.045	2,000
0.050	38,000	0.053	2,000
0.075	2,000	0.000	-
0.100	-	-	-
*mineral resources are inclusive of mineral reserves.			

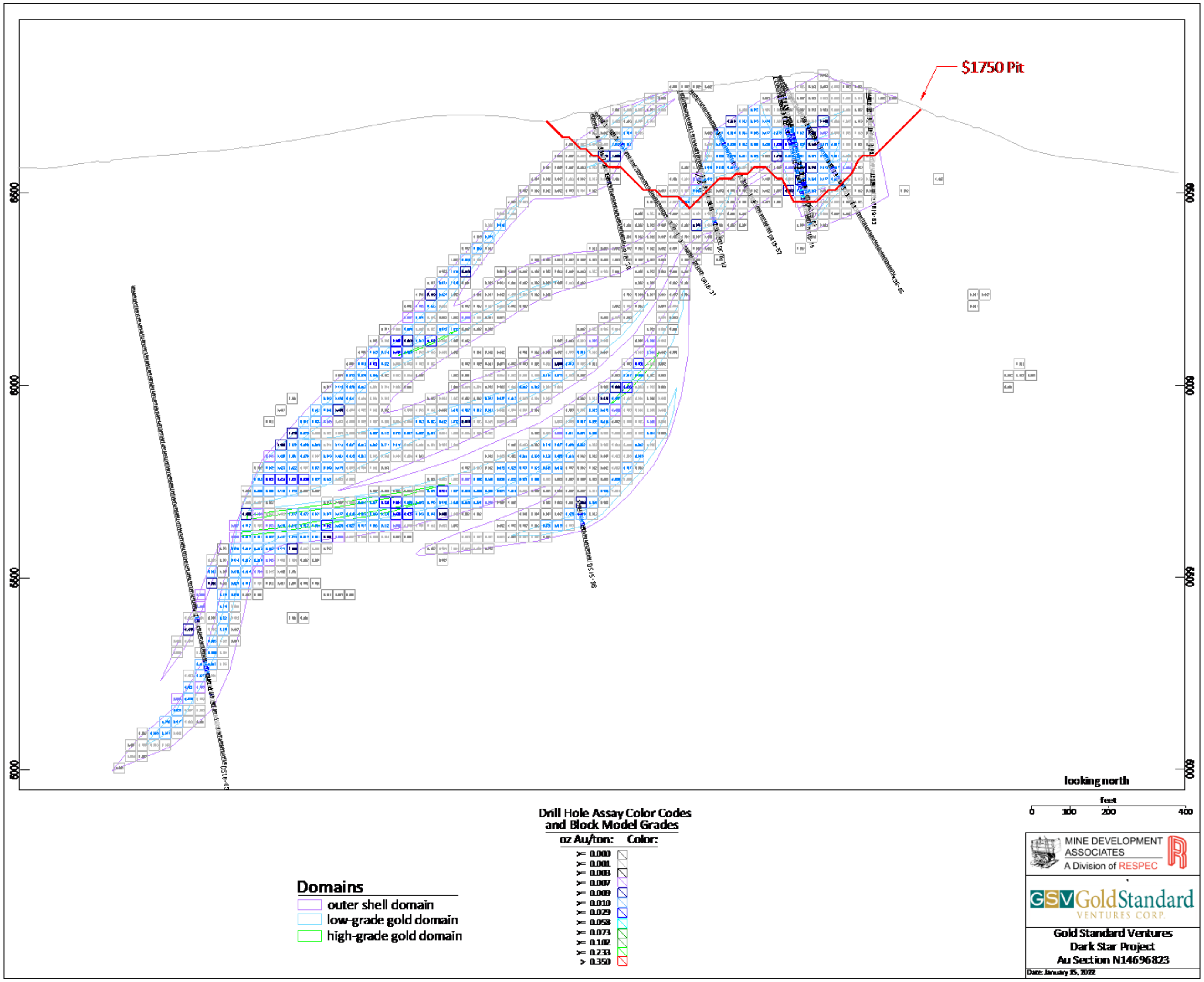


Figure 14-6: Dark Star Main Zone Gold Domains and Block Model – Section N14696823

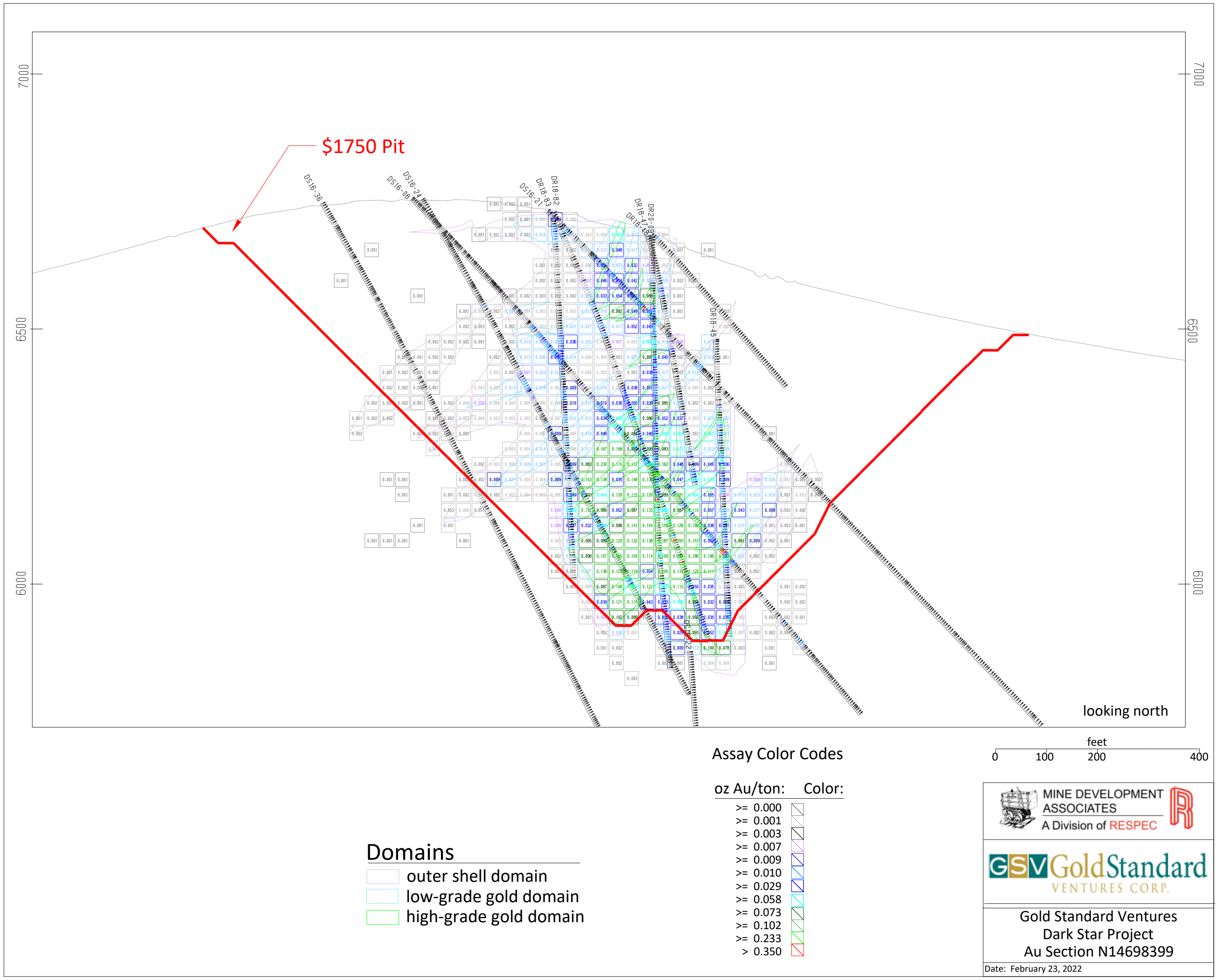


Figure 14-7: Dark Star North Zone Gold Domains and Block Model – Section N14698399

Although the authors are not experts with respect to environmental, permitting, legal, title, taxation, socio-economic, marketing, or political matters, the authors are not aware of any unusual factors relating to these matters that may materially affect the Dark Star mineral resources as of the effective date of this Technical Report.

14.2.5 Dark Star Cyanide-Soluble Gold and Geo-Metallurgical Models

A cyanide-soluble gold block model was produced to characterize the spatial variability of cyanide solubility of gold at Dark Star. The model was estimated using the ratio of cyanide-soluble gold assays to fire-assay gold contents (“Au_{CN}/Au_{FA}”). These ratios are graphically depicted in the cumulative probability plot in Figure 14-8 and were capped at 110% in samples because using data capped at 100% would introduce a low bias in the estimated ratio values. Composites were also not modified, but all estimated values in the block model were capped at 100%. Two distinct Au_{CN}/Au_{FA} ratio populations, separated by a broad gradational zone from 65% to 90% cyanide-solubility, are apparent in the plot.

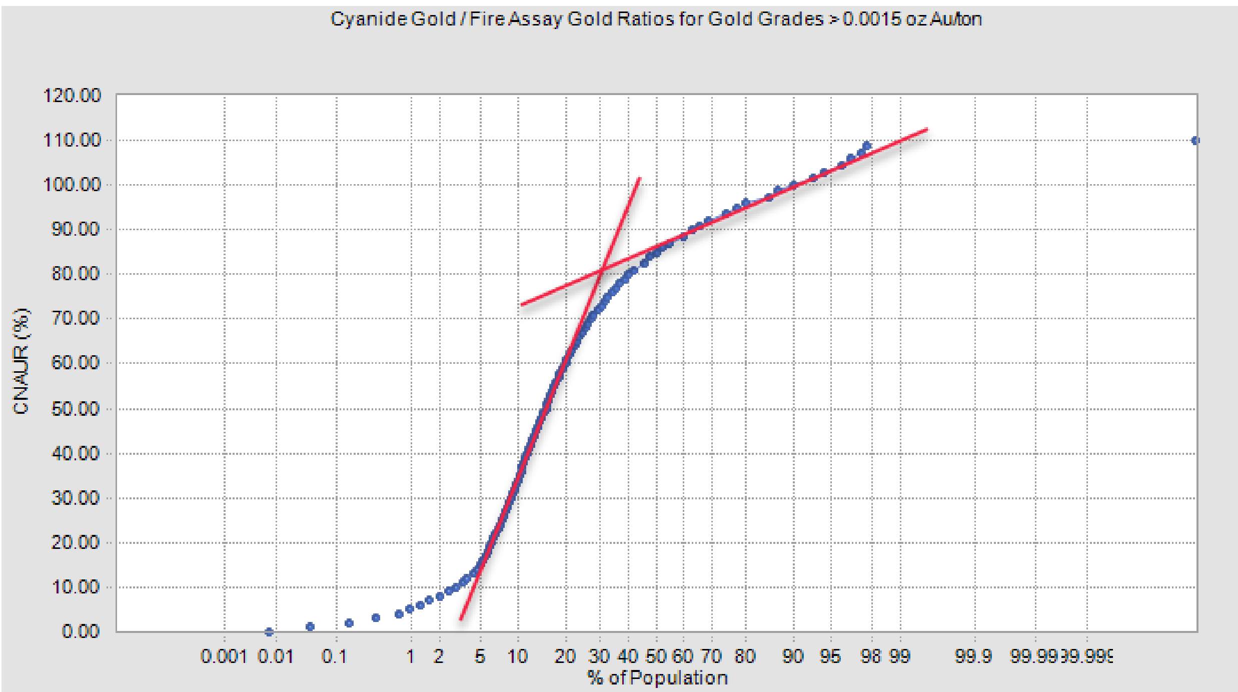


Figure 14-8: Cumulative Probability Plot of Dark Star Au_{CN}/Au Ratios

Au_{CN}/Au_{FA} ratios were estimated by rock units separately within the Chainman Formation, within each of the lower siltstone, middle conglomerate, and upper siltstone units of the Pennsylvanian-Permian undifferentiated, and within the Tertiary conglomerates. Ratios were not estimated in the post-mineralization Tertiary Indian Well Formation and Quaternary rocks, which contain no gold. ID^3 methodology was used, and only Au_{CN}/Au_{FA} ratios with fire-assay gold grades >0.0015 oz Au/ton were included in the estimate. Maximum major and semi-major search distances applied were 1150 ft, with strong anisotropy of 4:1 relative to the minor search axis. Estimated block Au_{CN}/Au_{FA} ratios were capped at 100%.

Refractory solids were modeled by Gold Standard to segregate zones in the deposit for which gold will not likely be extractable by cyanide heap-leach methods. The authors evaluated the solids and determined that they appear reasonable compared to Au_{CN}/Au_{FA} ratios, assayed sulfide-sulfur percent, and logged redox and sulfide percentages. Assayed total-sulfur percent correlates moderately well, but there is relatively high total sulfur with correspondingly low sulfide sulfur percent (presumably representing sulfate minerals) outside the refractory solid. The correlation between refractory solids and logged oxide minerals in drill holes is not as good, because there are zones of mixed iron oxide and sulfide material outside the solids that do not represent completely non-refractory material. In summary, the refractory solids represent material that contains little or no oxidation, whereas the areas outside the solids are mixed oxide and sulfide, or predominantly oxidized rock.

As per metallurgical guidance provided in Section 13, unique metallurgical codes were assigned to the block model based on estimated Au_{CN}/Au_{FA} ratios, refractory zones, rock units, and silicification solids (discussed in Section 14.2.2). Cyanide solubilities and refractory zones were used to define the base metallurgical code group, whereas rock units and silicification were used to further sub-divide those groups of codes. Metallurgical codes were assigned as follows:

- Sulfide, low gold recovery: Au_{CN}/Au_{FA} ratios less than 60% or greater than 50% of block is in refractory solid; gold recovery is low;
- Transitional, moderate gold recovery: Au_{CN}/Au_{FA} ratios between 60% and 85%, moderate gold recovery; and
- Oxide, high gold recovery: Au_{CN}/Au_{FA} ratios greater than 85%.

14.2.6 Dark Star Acid-Base Accounting Model and Estimation

An acid-base accounting ("ABA") block model was produced to characterize the spatial variability of potential acid-generating ("PAG") or neutralizing potential ("NAG") for mine planning and handling of mined material. The authors estimated inorganic carbon ("CINO") and sulfide sulfur ("SSUL") into this block model, and designated model blocks as either PAG or NAG. All calculations and PAG/NAG designation criteria were provided by Stantec.

Gold Standard provided LECO analyses of carbon and sulfur species for samples that varied between those on original core intervals (1 ft to 6 ft) to RC sample composites (10 ft to 35 ft). Assayed CINO values were used, or the values were converted from assayed CO_2%. The relationship between total organic and inorganic carbon was applied as well where necessary. In the data received from Gold Standard, below-detection limit values were substituted for assays below detection. MDA modified the below-detection assays per Stantec guidance, so that carbon species assays were equal to one-half the below-detection value, and sulfur species assays below detection were set to '0'.

The authors evaluated CINO and SSUL statistics by rock unit, refractory zone and silicified zone (Table 14-13 and Table 14-14). The statistics in the tables are summarized according to categories chosen for estimation into the block model.

Table 14-13: Number of Samples and Mean Inorganic Carbon Values for Dark Star Estimation Categories
(by rock unit, zones inside [refractory] or outside [oxide and transitional] refractory solids, and in/out of silicified zones)

Estimation Category	Chainman Formation		Lower Siltstone	
	# of Samples	Mean Value (%)	# of Samples	Mean Value (%)
Oxide and Transitional, not silicified	100	0.199	529	1.054
Oxide and Transitional, silicified			138	0.285
Refractory, not silicified	326	0.683	523	3.009
Refractory, silicified			39	0.218

Estimation Category	Middle Conglomerate		Upper Siltstone		Tertiary Conglomerates	
	# of Samples	Mean Value (%)	# of Samples	Mean Value (%)	# of Samples	Mean Value (%)
Not silicified	961	0.776	490	0.189	118	0.176
Silicified	3,449	0.102	520	0.035	110	0.008

Estimation Category	Indian Wells Formation		Quaternary Alluvium	
	# of Samples	Mean Value (%)	# of Samples	Mean Value (%)
All Data	110	0.051	27	0.148

Table 14-14: Number of Samples and Mean Sulfide Sulfur Values for Dark Star Estimation Categories
(by rock unit, zones inside [refractory] or outside [oxide and transitional] refractory solids)

Estimation Category	Chainman Formation		All Tomera Formation		Tertiary Conglomerates	
	# of Samples	Mean Value (%)	# of Samples	Mean Value (%)	# of Samples	Mean Value (%)
Oxide and Transitional	100	0.327	7,396	0.085	329	0.182
Refractory	326	1.956	1,007	0.768	18	0.959

Estimation Category	Indian Wells Formation		Quaternary Alluvium	
	# of Samples	Mean Value (%)	# of Samples	Mean Value (%)
All Data	180	0.025	138	0.037

CINO statistics varied systematically by rock unit in combination with silicification for the middle conglomerate, upper siltstone, and Tertiary conglomerate. This correlation is indicative of the inverse relationship between silica and carbonate contents in increasingly altered and mineralized rocks due to silicification and decarbonization. CINO in the lower siltstone showed similar trends, but statistics also indicated differences inside and outside the modeled refractory solids. In the Chainman Formation, which is only locally mineralized, the variability observed was by refractory zone only. SSUL statistics indicated strong relationships by refractory zone within each of the Chainman Shale, all units of the Tomera Formation equivalent together, and the Tertiary conglomerate. No systematic differences were observed in CINO or SSUL for the Indian Well Formation or the Quaternary colluvium, so each was estimated using all respective contained data.

CINO and SSUL were estimated independently into the block model, according to the categories described above. CPPs for each species estimated were evaluated by category for potential capping of assays, but none was warranted. Nearly half the sample composites are 30 ft in length. Given the model block dimension of 30 ft^3, and the adverse effect of de-compositing to shorter interval lengths, assay data were composited to 30 ft.

All estimates were done using the same search orientations and associated estimation areas as applied to the gold estimate (Table 14-6). The maximum search distance applied for both CINO and SSUL estimates was 985 ft. Search ellipses were moderately anisotropic, with major, semi-major and minor search distances at 985 ft, 790 ft, and 395 ft, respectively, and inverse distance squared methodology was used. Due to the relatively long composite length, the maximum number of composites, and maximum composites per hole allowed to estimate a block were limited to five and two, respectively. Review of CPP's justified search restrictions for a limited number of the estimated CINO categories, which were applied; however, none were necessary for SSUL estimates.

Correlograms were generated to evaluate continuities in the data with respect to distance. These demonstrated reasonable continuity at ranges up to 1,310 ft, depending on rock unit, refractory type, and/or silicification zones. However, the LECO data is not evenly distributed within the deposits. The data at Dark Star Main is relatively well-distributed, but at Dark Star North, data is concentrated in the central portion of the gold mineralization. As a result, there are significant volumes of rock within potentially mined areas, particularly to the east and west of Dark Star North, where data is sparse or absent. Estimated grades of CINO and SSUL in these areas are relatively far from assayed samples. To flag model blocks that are at relatively greater distances from assays, Mr. Lindholm assigned confidence codes (value of ‘0’) to all estimated blocks with closest composite greater than 590 ft away. Because CINO and SSUL were estimated according to different criteria, these codes were assigned separately for each, and a combined code was assigned if either CINO or SSUL confidence codes was ‘0’.

Model blocks were designated as PAG (code of ‘1’) or NAG (code of ‘2’) according to criteria as defined by Stantec. First, acid-neutralizing potential (“ANP”), acid-generating potential (“AGP”), and net neutralizing potential (“NNP”) values were calculated from estimated CINO and SSUL values. Next, PAG/NAG designation was assigned according to criteria for three potential waste-characterization scenarios in Table 14-15. A fourth scenario was added by Stantec and Gold Standard to help with planning prior to mining but will not be considered for handling waste during mining.

Table 14-15: PAG/NAG Designation Criteria

PAG/NAG Designation - Scenario 1
Designate as NAG if NNP ≥ 20 and ANP/AGP ≥ 3
Designate as PAG if NNP < 20 or ANP/AGP < 3
PAG/NAG Designation - Scenario 2
Designate as NAG if SSUL ≥ 0.1% and NNP ≥ 20 and ANP/AGP ≥ 3; Or SSUL < 0.1% and ANP/AGP ≥ 3
Designate as PAG if SSUL ≥ 0.1%, and NNP < 20 or ANP/AGP < 3; Or SSUL < 0.1% and ANP/AGP < 3
PAG/NAG Designation - Scenario 3
Designate as NAG if NNP ≥ 0.92 and ANP/AGP ≥ 0.77
Designate as PAG if: NNP < 0.92 or ANP/AGP < 0.77
PAG/NAG Designation - Scenario 4 (not considered for mining)
Designate as NAG if SSUL > 0.25% and NNP ≥ -20 and ANP/AGP ≥ 1.2; Or SSUL ≤ 0.25%
Designate as PAG if SSUL ≥ 0.25% and ANP/AGP < 1.2; Or SSUL > 0.25% and NNP < -20

In Dark Star North there are areas in the upper reaches of potentially mineable pits, along the east and west sides, where no CINO or SSUL composite data was within 985 ft, and either or both species remained un-estimated. As a result, designation as PAG or NAG was not possible using the above criteria. In agreement with Stantec, the authors assigned PAG or NAG designations for each of the four options described by rock unit, based on the PAG/NAG designation of adjacent blocks. The assignments were only necessary for blocks in Upper Siltstone, Tertiary conglomerate, and Quaternary colluvium. These assigned designations represent about one percent of the model tonnage within potential pits, nearly all of which is in Dark Star North.

14.2.7 Dark Star Clay Model and Estimation

Gold Standard requested a clay model to determine the relative quantity of clay material that will be encountered and potentially affect crushing and grinding. A source of under-liner material for leach pads and waste dumps was also sought. According to Gold Standard geologists, the most abundant clay alteration or weathering at Dark Star is found in post-mineral units, particularly tuffs and conglomerates. It also occurs in structural zones in a more limited in extent.

The only comprehensive clay data is subjective logging in drill holes on a scale from 0 (no clay) to 3 (strong clay alteration). The authors evaluated logged clay values statistically with respect to formation, gold domains, silicification and redox. Based on the statistical analysis, clay was estimated in the block model as follows:

- Chainman Formation and Tomera Formation equivalent in silicification solid within all gold domains,
- Chainman Formation and Tomera Formation equivalent in silicification solid outside all gold domains,
- Chainman Formation and Tomera Formation equivalent outside silicification solid within all gold domains, and
- Outside above estimated blocks by individual formations.

Because the logged clay data is subjective and the scale of the logging is broadly qualitative, the estimate is a very generalized representation of the clay content in the deposit. The values in the block model (0.00 to 3.00) provide a rough, imprecise estimation of the strength of clay alteration in a given area. The maximum search distance was limited to 150 ft, and un-estimated blocks were left as blank values.

14.2.8 Dark Star Density

Application of density values to the block model was dependent on numerous modeled criteria that have been discussed in various prior sections. There are 1,122 density measurements in the Dark Star database. All samples were measured using the immersion method by an independent laboratory. The values assigned to the model, by rock unit (Section 14.2.2), gold domains (Section 14.2.3), and refractory zone (Section 14.2.5), are summarized in Table 14-16. Spatially, the Dark Star North zone is well represented; however, there is no density data in the northern 650 ft of the deposit. The Dark Star Main zone is moderately well-represented, although core holes are somewhat clustered locally so that there are areas with no density data.

Table 14-16: Density Values Applied to the Dark Star Block Model

Formation	Gold Domains	Refractory Zone	Number of Samples	Density (g/cm^3)	Tonnage Factor
Chainman Fm	All	All	29	2.46	13.03
Tomera Fm equivalent - STL	OS and Outside Domains	Out	74	2.27	14.12
Tomera Fm equivalent - STL	LG and HG	Out	4	2.41	13.30
Tomera Fm equivalent - STL	OS and Outside Domains	In	170	2.47	12.98
Tomera Fm equivalent - STL	LG and HG	In	1	2.63	12.19
Tomera Fm equivalent - CGL	OS and Outside Domains	Out	336	2.39	13.41

Tomera Fm equivalent - CGL	LG and HG	Out	249	2.50	12.82
Tomera Fm equivalent - CGL	OS and Outside Domains	In	46	2.39	13.41
Tomera Fm equivalent - CGL	LG and HG	In	19	2.59	12.38
Tomera Fm equivalent - STU	OS and Outside Domains	Out	104	2.41	13.30
Tomera Fm equivalent - STU	LG and HG	Out	28	2.56	12.52
Tomera Fm equivalent - STU	OS and Outside Domains	In	3	2.46	13.03
Tomera Fm equivalent - STU	LG and HG	In	2	2.61	12.28
Tertiary Conglomerates	All	All	32	2.45	13.08
Tertiary Indian Well Formation	All	All	21	2.30	13.94
Quaternary Colluvium	All	All	4	1.90	16.87
Formation acronyms: STL - lower siltstone, CGL - middle conglomerate, STU - upper siltstone					
Gold Domain acronyms: OS - outer shell, LG - low-grade, HG - high-grade					
*Tonnage Factor = 2000 / (Density * 62.4)*					

The middle conglomerate unit of the Pennsylvanian-Permian undifferentiated (possibly Tomera Formation equivalent), the primary host of gold at Dark Star, is well-represented with nearly 650 density samples. There are at least 70 density samples within the outer shell/outside domains in the lower siltstone unit, a secondary host. However, there are only four samples in the low- or high-grade domains of the lower siltstone. Where a low number of density samples (<~20) were measured for a given category, the density values were evaluated and modified using data from units with similar geological characteristics that are based on more density measurements. A density value of 2.46 g/cm^3 was assigned to the Chainman Formation based on 29 measurements. A similar value was assigned to the same unit for the Pinion deposit, where there were more measurements.

Lower densities are associated with clay alteration. However, Gold Standard has indicated that clay zones are not common or pervasive in the Dark Star mineralized zones. Although there are some density measurements of clay material that have been included in the statistical groupings in Table 14-16, density values that represent clay zones were not assigned locally in the block model. As a result, there are likely some inaccuracies with respect to tonnages in parts of the block model. Potentially more significant is clay alteration or weathering considered to be responsible for the variable density values observed for the Tertiary Indian Well Formation. Drilling is limited in the unit, and although Gold Standard believes the unit consists primarily of unwelded tuffs that are weathered to clays, the clay zones and associated densities cannot be properly represented. Of 21 samples measured, ten density values ranged from 1.73 to 2.08 (presumably clay) and nine between 2.23 and 2.58 (presumably unaltered). A value of 2.30 was assigned to the unit as a whole, based on data localized in one area over the deposit. However, given the actual variability in densities in the formation, and since the rock unit is entirely waste material, local tonnages are probably not well-defined, and total waste tons in the resource block model may be overstated.

14.2.9 Discussion of Dark Star Estimated Gold Mineral Resource and Supporting Models

Since the April, 2019 effective date of the database for Dark Star used in the 2020 PFS of Ibrado et al. (2020), an additional 23, 32 and two holes were drilled in 2019, 2020 and early 2021, respectively. Data for these holes, as well as assays for core hole DC19-01, were received with finalized assays from Gold Standard by the effective date of the database of June 15, 2021, and have been incorporated into the current resource model. Gold domains were updated with the newer information. In general, the 57 added assay sets caused minor, incremental changes to the domains and impacted in-pit mineral resources only locally. A number of holes were drilled as step-outs to the east of the Dark Star Main zone mineral resource pit, and encountered consistent, very low-grade gold mineralization in Quaternary Colluvium, which was modeled separately from gold domains in Tertiary and older units. Overall, new drilling tested the veracity of the 2019 gold domain model, and the lack of significant changes to the 2019 resource estimate adds to the level of confidence in the block model and gold estimate. However, no increase in classification was necessary or warranted for the current resources, as essentially all of the Dark Star North mineralization in the optimized pit is classified as Measured or Indicated, and the primary cause for Inferred classification in the Dark Star Main pit is the heavier reliance on historic drilling.

Gold domains were also modified slightly for 63 newly surveyed holes that were drilled in 2018-2019. Only 18 holes in the Dark Star database remain unsurveyed, and drill-hole confidence codes and resulting classification have been modified accordingly.

Twenty RC and five core holes have been drilled since the effective date of the current database. Recovery was low in the core holes, and no assays were obtained. Nine of the RC holes were drilled into the Quaternary gravels west of Dark Star Main, which is not part of the reported resource, and one hole was drilled outside modeling to the south. The remaining ten were infill holes within the modeled mineralization, and generally confirm the existing gold model. None of the infill holes would cause changes in pit size and shape, and in-pit resources would increase and/or decrease minor amounts only locally.

Dark Star has a long history of exploration drilling dating back to 1984, and consequently there are many drill holes of varying quality and reliability, and with varying amounts of supporting documentation. In all, six companies, including Gold Standard, have performed exploration drilling on the property. About 78% of the holes were drilled by Gold Standard, for which QA/QC procedures were consistently performed. About 73% of the assay certificates exist for all data, and MDA had access to essentially 100% of the Gold Standard certificates. There is a lack of documentation for historical drilling, and QA/QC exists for only 11 holes drilled by Mirandor. As a result, classification of the mineral resources was reduced in areas relying predominantly on historical data. Overall, this reduction did not significantly affect the mineral resources because Gold Standard compensated for the lack of confidence by infill drilling in areas that are predominantly defined by historical drilling. However, there are still a few areas, *e.g.,* the southeast part of Dark Star Main, where little or no Gold Standard drilling exists, and classification is consequently lower.

In general, the geology of gold mineralization is well understood. The geometry of mineralized zones is well defined, particularly in shallow areas between the Ridgeline and IDK faults in the Dark Star Main and North zones, as well as in the footwall of the Ridgeline fault in the Main zone, where drilling is relatively dense. However, the relationship between mineralization and the Ridgeline fault is not well understood.

Some significant gold grades have been intercepted in multiple drill holes extending down between the Ridgeline and IDK faults in Dark Star North. Although the geometry and occurrence of this mineralization are not fully understood, drilling has continued to intersect relatively high-grade mineralization in the area. Measured and Indicated mineral resource classification consistent with the bulk of the Dark Star deposit has been applied to most of this deep Dark Star North mineralization.

Classification as Indicated mineral resource was made more restrictive in the deepest zones, where the general depth below the water table and the presence of anomalous cyanide-soluble gold ratios suggest the possibility of down-hole contamination. Because potential contamination is suspected by some geologists, it remains a risk, which is represented by the slightly stricter classification criteria.

One obvious association between faults and mineralization is the consistent occurrence of gold along the West fault. Mineralization has been intercepted in drill holes down-dip along this fault and represents potential for additional mineralization at depth.

The cyanide-soluble gold block model appears reasonable in areas with Gold Standard drilling. In some areas, such as where historical drilling is predominant, Au_{CN} assays are lacking and there is less confidence in the block model.

Also, the Au_{CN} data lacks QA/QC support. The refractory solids are sufficient for use in the block model to define refractory material. It is believed that there is enough data to further refine the refractory model by delineating transitional oxide/sulfide from generally completely oxidized material.

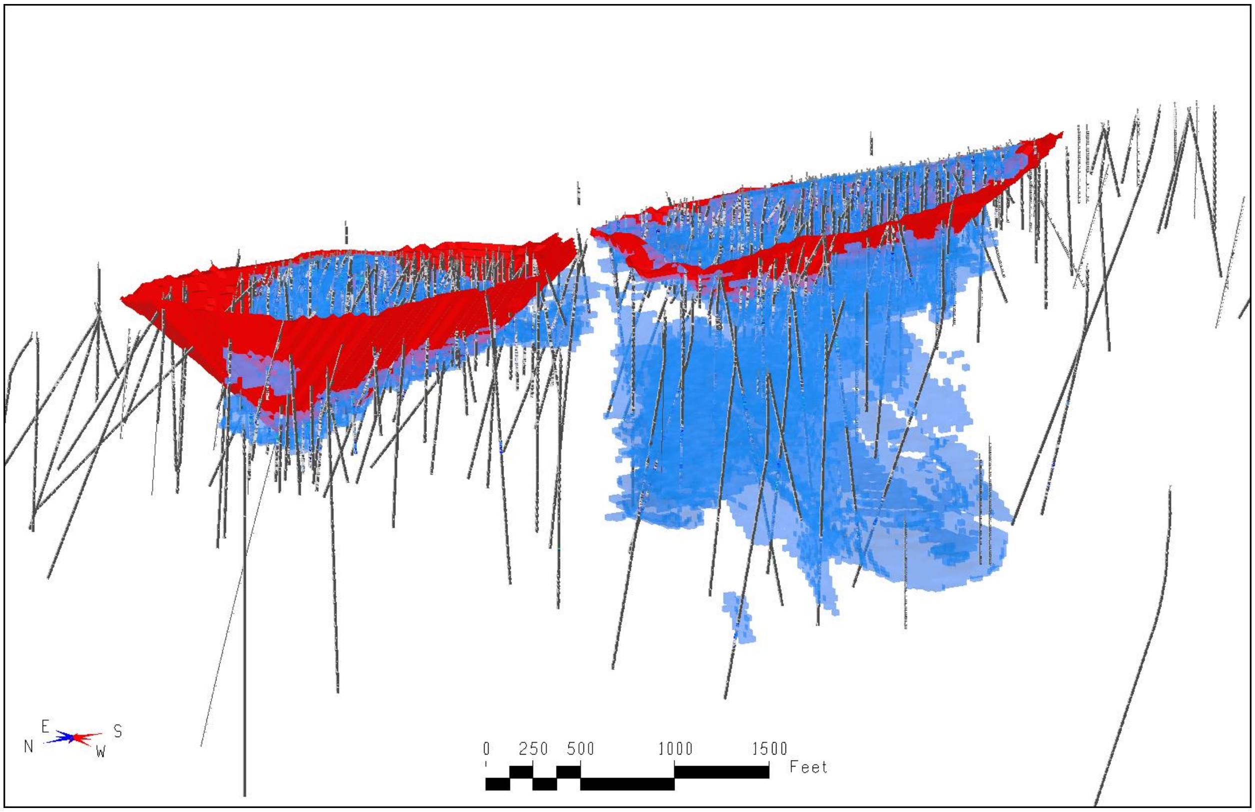
The ABA block model estimate is reasonable within data limits, although the estimate may be too smooth because of long 30 ft composites. This was somewhat offset by limiting the maximum number of composites to estimate a block. Distribution of LECO data in Dark Star Main is reasonable. However, there are substantial areas in Dark Star North that are at significant distances from assayed samples. To help qualify risks relative to distance from data, estimated model blocks >590 ft from the nearest LECO composite were flagged with a lower confidence code. Also, CINO and/or SSUL were not estimated in some of areas of the model, and therefore, blocks cannot be designated as PAG or NAG using the criteria applied to the rest of the model. PAG or NAG was assigned to these unclassified blocks according to the designation of the nearest groups of blocks with similar geologic characteristics where CINO and SSUL were both estimated.

For all classified material, the current mineral resource tons at 0.005 oz Au/ton were larger by ~3%, gold grade was lower by ~5%, and total gold ounces were lower by ~2% compared to the 2019 Dark Star mineral resource estimate reported in the PFS update (Ibrado et al, 2020). A significant number of the 87 holed drilled since the PFS update are considered infill and delineation holes, which generally do not result in increases in gold resources but contributed to increases in classification. The gold price of the reported optimized pit was increased from $1,500 to the currently reported $1,750. It has been demonstrated at Dark Star that optimized pits increase in size only incrementally with changes in gold price, generally less than 1% for each $25 increase in the price of gold, so the difference between the reported pits is relatively small.

There were differences in the gold model and resources estimated as a result of the conversion from metric to Imperial units. For example, the block dimensions were increased slightly from 9 m x 9 m x 9 m to 30 ft x 30 ft x 30 ft. Additional dilution, albeit only a small amount, would be expected with the larger block sizes. MDA performed a bench-height study on composite data to evaluate the potential changes to the mineral resource attributed to the additional dilution with the changed bench height, and showed that, for resources above a 0.006 oz Au/ton cutoff, the gold grade would decrease by about 2% and tons would increase by about 6%. Also, there are incremental differences in the section and level plan locations causing changes to the modeled gold domains, and consequently to the gold resources.

There is the possibility of additional risk that has resulted from the conversion from metric to Imperial units of drill-hole collar coordinates. Gold Standard holes were surveyed in metric units, so the direct conversion of northings and eastings using a factor of 1 m = 3.280833333 ft maintained the spatial relationship between these drill-hole data and associated geology modeling, domains and block model, which were also converted using identical values. However, it is believed that some historical drill collars were originally surveyed in feet and later converted to metric. Comparisons of metric and Imperial coordinates in the collar tables received from Gold Standard indicate conversion factors were inconsistently applied. Because values of northings and eastings are so large, discrepancies up to 150 ft can result by application of conversion factors that differ in the fifth decimal place. The risks associated with such potential discrepancies have been accounted for in the reduced classification of mineral resources in areas relying predominantly on historical data.

In addition to the mineral resources reported herein, there is mineralization that continues beyond and contiguous with the reported mineral resources. The reported mineral resources are pit-constrained and therefore most of the estimated contiguous mineralization outside the pits (tons, grade, and ounces) is unreported. That additional mineralization is shown graphically in Figure 14-9.



Note: dark lines are drill holes; blue solid is the 0.004 oz Au/ton grade shell; red is the mineral resource pit shell.

Figure 14-9: Dark Star Optimized Pit and Additional Mineralization

The Dark Star deposit has clustered drill data, which lies primarily within the optimized-pit limits where mining would likely take place. This area also contains a large proportion of the highest-grade material, particularly in the Dark Star North zone. Gold grades from clustered data will tend to project into areas with sparse, non-clustered data during estimation, and a large number of block grades are attributed to only a small number of samples. This effect, which was noted to some extent during gold domain model checking, is mitigated somewhat by estimating with ID^3 rather than ID^2. De-clustering of composite data was not necessary because the majority of the adverse effect in the estimate occurs outside potential open pits and is not part of the reported mineral resource. Also, new drilling in 2019 to 2021 has mitigated the effects of clustered data somewhat, although it is still evident.

Significant clay alteration or weathering is likely responsible for the variable density values observed for the Tertiary Indian Well Formation. Of 21 samples measured, ten values ranged from 1.73 to 2.08 (presumably clay) and nine between 2.34 and 2.58 (presumably unaltered). A value of 2.30 was assigned to the unit as a whole, based on data localized in one area over the deposit. Given the variability in densities in the Indian Well Formation, local tonnages of the unit are probably not well-defined. However, Gold Standard believes the unit consists primarily of unwelded tuffs that are weathered to clays, so total waste tons in the model may be overstated.

14.3 PINION DEPOSIT MINERAL RESOURCES

This Pinion estimate is based on data derived from drilling completed into 2020, through drill holes PR20-60, PC20-15, SS19-09 and ST19-02. All gold, silver and barium data were received for the 2020 drilling by March 21, 2021. The LECO assays were received on June 2, 2021, which is the effective date of the database. Although the gold, silver and barium estimates, as well as the ABA model, were completed as of May 13, 2021, the effective date of the Pinion mineral resource estimate is January 31, 2022 when new optimized pit shells using more current mining costs were generated. Gold and silver resources, as well as barium, Au_{CN}/Au_{FA} ratios and ABA models are reported herein.

Following the Pre-Feasibility study of Ibrado et al. (2020), Gold Standard made a decision to convert all project data from metric to Imperial units. MDA converted all length data, including collar northings and eastings, from meters to feet (1 m = 3.280833333 ft), and assay grades from g/tonne to oz/ton (1 oz/ton = 34.285714 g/tonne). Section plane spacing, block model block sizes, and other modeling dimensions were changed. Specifics and ramifications of the conversions are discussed in various sections below.

14.3.1 Pinion Database

The Pinion drilling mineral resource database received from Gold Standard and then audited by MDA contains 814 drill holes with 422,703.5 ft of drilling (Table 14-17). That drilling was done by twelve companies since 1981, including Gold Standard, which began drilling in 2014. Of those holes, 87% are RC and 12% are core. The Pinion database also contains two and 27 RC holes drilled at the Ski Track and LT targets, respectively. One sonic hole was drilled, and the remainder are of unknown type. Holes drilled or with assays received after the effective date of the database are not included in the table. A drill-hole map is given in Figure 14-10.

Table 14-17: Drill Holes at Pinion

Type of hole	Count	Drilled Feet
Core	96	43,569.3
RC	705	375,232.0
Sonic	1	97.0
Unknown	12	3,805.0
Grand Total	814	422,703.3

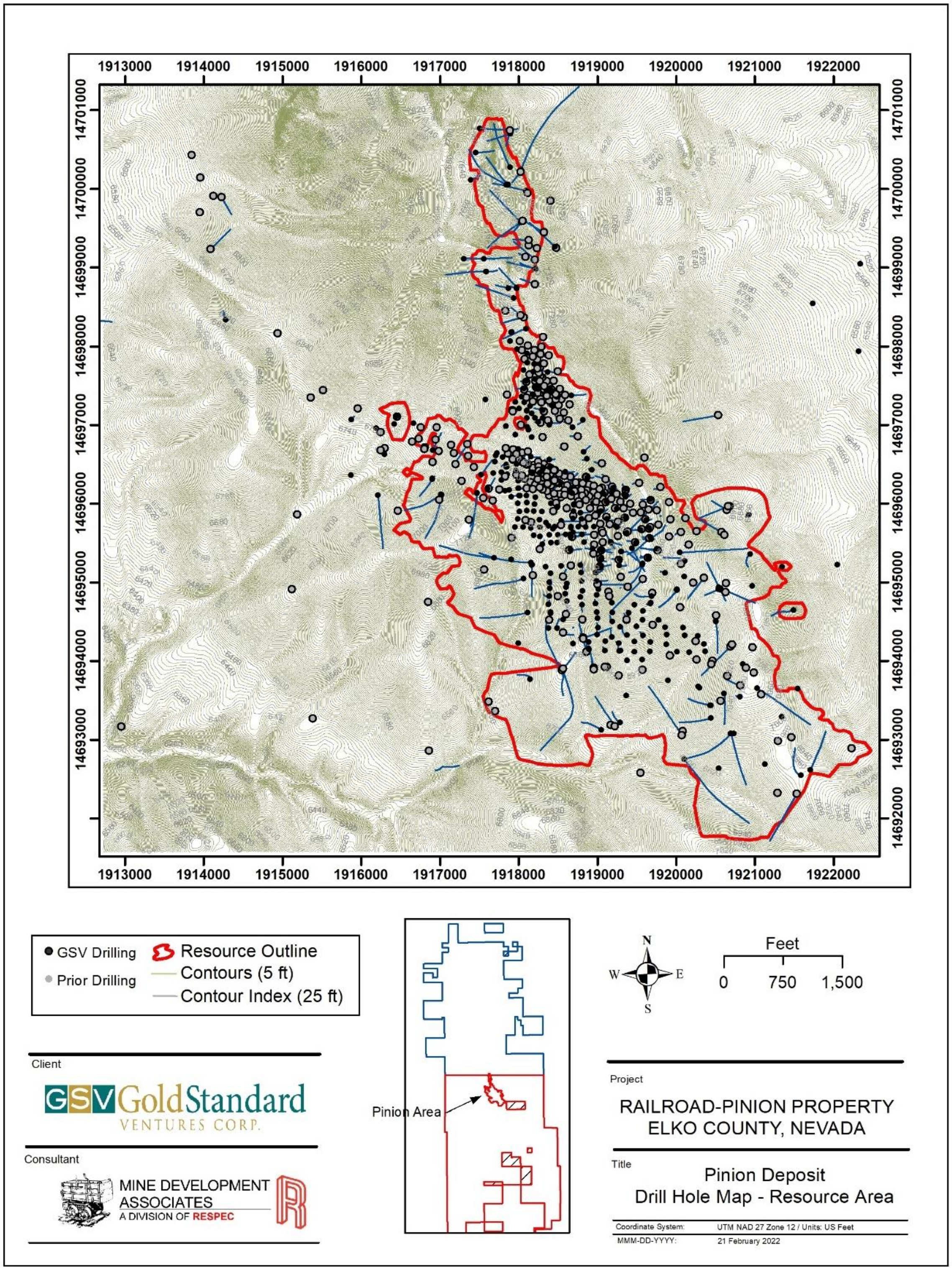


Figure 14-10: Pinion Deposit Drill-Hole Map and Mineral Resource Outline

Table 14-18 presents descriptive statistics of all accepted analytical or measured Pinion drill-hole sample data that was audited and imported into MineSight by MDA, except for the geochemical trace elements. The Pinion drill database contains 60,389 gold assay records, of which 59,751 were accepted and are summarized in Table 14-18. There were 638 records rejected due to suspected down-hole contamination, core recovery of less than 50% or intervals with geology and mineralization that conflicted with surrounding holes. There are fewer silver assays than gold because many prior operators did not analyze for silver. Initially, Gold Standard submitted composites for silver assays, however, pulps were rerun on individual assay intervals within and adjacent to gold mineralization. Barium, trace elements, cyanide-soluble gold and silver, and carbon and sulfur species were analyzed as well as gold and silver, and densities were measured. Logged core recovery and RQD were loaded into the database but were not audited. A few recoveries and RQD values >100% exist. Logged geologic data, including rock types, formation, faults, vein type and intensity, silicification, clay, dolomite, barite, limonite, hematite, carbon, sulfide percent, and percent reduced were imported into the database, generally reviewed, and used for geologic and domain modeling where applicable. Collar locations, downhole survey data, and gold, silver, barium and LECO analyses, were verified as described in Section 12.

Table 14-18: Pinion Descriptive Statistics - Exploration and Mineral Resource Drill-Hole Database
(accepted sample data only)

	Valid	Median	Mean	Std Dev	CV	Minimum	Maximum	Units
FROM	61,427					0.0	2550.0	ft
To	61,427					3.0	2555.0	ft
Length	61,427	5.0	5.5			0.3	187.0	ft
Au	59,751	0.000	0.004	0.013	3.1	0.000	0.4	oz Au/ton
Ag	47,115	0.007	0.036	0.239	6.7	0.000	44.7	oz Ag/ton
Au_{CN}	6,132	0.006	0.011	0.017	1.5	0.000	0.3	oz Au/ton
Ag_{CN}	3,265	0.015	0.047	0.120	2.6	0.000	4.2	oz Ag/ton
Density	443	2.600	2.578	0.233	0.1	1.750	4.0	g/cm3
Core recovery*	3,235	98.300	91.260	15.600	0.2	0.000	166.6	%
RQD*	3,235	24.600	34.080	35.030	1.0	0.000	204.5	%
*Core recovery and RQD data have not been audited and contain values exceeding the maximum of 100%.								

14.3.2 Pinion Geologic Model

Gold Standard built digital, cross-sectional interpretations for faults, formations, rock units, occurrence of logged barite, silicification, and metallurgically refractive material. MDA combined the formation contacts and fault surfaces to produce 3D formation solids, and revised the barite solids. Silicification solids provided by Gold Standard were used to separate a moderate to strong silicified zone within the solids from weak or absent silicification outside. These geologic interpretations were used to guide the metal domain, ABA and geo-metallurgical modeling.

MDA's formation solids produced from Gold Standard's geologic model define the location of multi-lithic breccia, Sentinel Mountain Dolomite, Devils Gate Limestone, and the Webb, Chainman, and Tripon Pass formations. Alluvial cover at Pinion is minimal and was not modeled. Several of the fault surfaces provided by Gold Standard were used to project offsets of formations and metal domains, and in some cases explain deeper mineralization that may be structurally controlled. The formational units and faults are summarized in Section 7 of this Technical Report.

The authors reviewed the silicification solids provided by Gold Standard. The solids compare well with logged silicification values of '2' and '3' ('3' representing the strongest silicification). Continuity in the modeled solids was broadly established by default as a function of the logged data, although continuity was lacking somewhat between sections where silicification was more localized.

14.3.3 Pinion Gold Domains and Estimation

14.3.3.1 Gold Domain Model

Gold domains based on sample assays were modeled on cross sections spaced 98.5 ft apart, oriented east-west and looking north. This spacing was originally 30 m. The geologic model guided interpretation and explicit modeling of the gold domains. These domains were defined based on population breaks on cumulative probability plots of the gold assays prior to compositing (Figure 14-11). The domain grade ranges were originally determined using assay data in g Au/t, and converted to oz Au/ton. The CPP was remade to reflect Imperial units; however, some of the grade breaks apparent on the metric chart were not as readily apparent on the Imperial chart. The lower limit of the outer shell gold domains does not plot well on the CPP because the level of precision of the statistical package used is only three decimal places. Grade ranges converted from those originally determined in metric units were retained, and used for modeling gold domains as follows:

- Low-grade gold domain: ~0.0012 oz Au/ton to ~0.009 oz Au/ton, and
- High-grade gold domain >~0.009 oz Au/ton.

Descriptive statistics are presented in Table 14-19. Core photos, where available, were reviewed, and were helpful in interpretations.

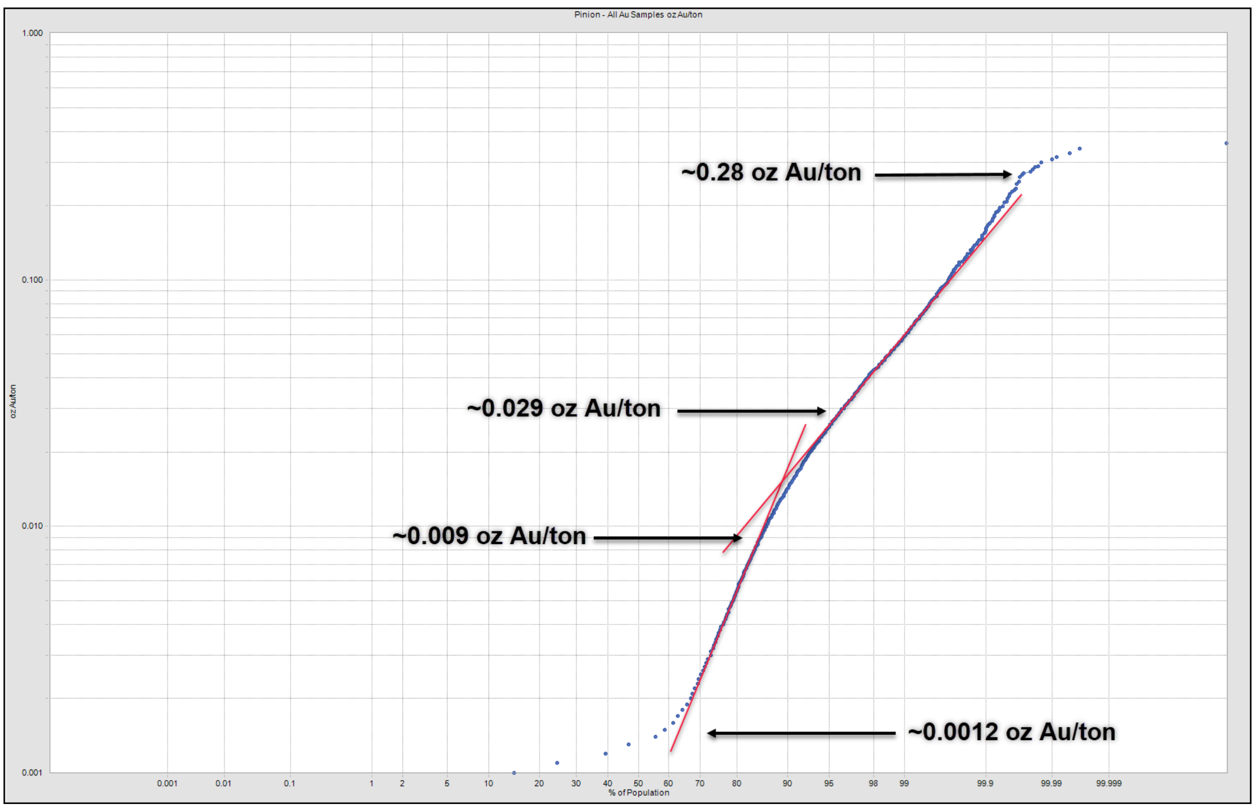


Figure 14-11: Cumulative Probability Plot of Pinion Deposit Gold Assays

Table 14-19: Pinion Deposit Descriptive Gold Statistics by Domain
(accepted sample data only)

Low-grade Gold Domain								
	Valid	**Median**	**Mean**	**Std Dev**	**CV**	**Minimum**	**Maximum**	**Units**
Length	6,346	5.0	5.0			1.0	20.0	ft
TYPE	6,346					1	9	
Au	6,231	0.0025	0.0031	0.0034	1.09	0.0	0.1219	oz Au/ton
Capped Au	6,231	0.0025	0.0031	0.0029	0.94	0.0	0.0379	oz Au/ton
Au_{CN}	1,412	0.0032	0.0035	0.0029	0.84	0.0004	0.0353	oz Au/ton
Au_{CN}/Au_{FA} ratio	1,412	79.0	75.0	27.8	0.40	2.0	253.0	%
Density	60	2.58	2.54	0.20	0.08	1.88	2.79	g/cm3
Core recovery*	440	95.8	88.0	19.5	0.22	0.0	125.0	%
RQD*	440	42.0	40.5	32.6	0.81	0.0	125.0	%
High-grade Gold Domain								
	Valid	**Median**	**Mean**	**Std Dev**	**CV**	**Minimum**	**Maximum**	**Units**
Length	10,769	5.0	4.9			0.5	15.0	ft
TYPE	10,769					1	9	
Au	10,557	0.0146	0.0220	0.0250	1.14	0.0	0.3576	oz Au/ton
Capped Au	10,557	0.0146	0.0220	0.0250	1.14	0.0	0.3576	oz Au/ton
Au_{CN}	3,813	0.0102	0.0159	0.0202	1.27	0.0004	0.3135	oz Au/ton
Au_{CN}/Au_{FA} ratio	3,813	82.0	76.5	22.5	0.30	1.0	253.0	%
Density	130	2.62	2.69	0.30	0.11	2.06	4.00	g/cm3
Core recovery*	819	96.0	87.6	18.7	0.21	0.0	126.7	%
RQD*	819	21.8	31.2	33.5	1.07	0.0	100.0	%
Outside Gold Domains								
	Valid	**Median**	**Mean**	**Std Dev**	**CV**	**Minimum**	**Maximum**	**Units**
Length	44,312	5.0	5.8			0.3	187.0	ft
TYPE	44,309					1	9	
Au	42,963	0.0002	0.0006	0.0024	4.24	0.0	0.2728	oz Au/ton
Capped Au	42,963	0.0002	0.0005	0.0015	2.81	0.0	0.0263	oz Au/ton
Au_{CN}	907	0.0029	0.0051	0.0108	2.11	0.0004	0.1916	oz Au/ton
Au_{CN}/Au_{FA} ratio	900	81.0	86.7	54.2	0.60	1.0	253.0	%
Density	253	2.55	2.53	0.18	0.07	1.75	2.88	g/cm3
Core recovery*	1,976	100.0	93.3	12.9	0.14	0.0	166.6	%
RQD*	1,976	21.0	33.8	35.9	1.06	0.0	204.5	%
*Core recovery and RQD data have not been audited and contain values exceeding the maximum of 100%.								

On the original CPP plot in g Au/t, a prominent domain was evident beginning around 0.02 g Au/t, the low-grade domain was modeled excluding many 0.02 and 0.05 g Au/t (0.0006 to 0.0012 oz Au/ton) samples, particularly beneath the deposit where the boundary of the mineralization is not defined by abrupt grade changes. It is difficult to determine if the deep halo of low-grade mineralization is real, due to drilling conditions (*i.e.,* down-hole contamination) or both, because the grades are so low. This material deliberately left outside the modeled domains was classified as Inferred and was estimated with strong restrictions placed on the rare high-grade sample assays. The gold grades are mostly low and sub-economic under current economic conditions.

The high-grade domain greater than ~0.009 oz Au/ton lies almost exclusively within the multi-lithic breccia. It shows excellent visual continuity between drill holes, although the continuity of the higher grades within this domain is more variable. Based on variography studies (Section14.3.3.2), that continuity ranges from 150 ft to 200 ft. The highest grades within the high-grade domain are not sufficiently continuous to be explicitly modeled, so such grades were estimated with the rest of this domain. Because the domain including the relatively higher grades has a low coefficient of variation (Table 14-3), and the higher grades are not extreme, there is little risk in not explicitly modeling as a separate higher-grade domain. There is high confidence in this zone based on its geologic support and on analytical distributions lying within it. A typical cross section is given in Figure 14-12.

There are some zones of mineralization that seem to follow high-angle structures. The modeled fault surfaces were used to guide definition of high-angle mineralized domains. Because these are poorly defined and poorly understood, these high-angle volumes were classified as Inferred.

A number of holes have significant, often isolated intersections below the multi-lithic breccia contact and within the Devils Gate Formation. The lack of continuity of this mineralization, coupled with the lack of drill density in the Devils Gate requires that this mineralization in almost all cases be projected short distances and has been classified as Inferred.

After sectional interpretations were completed, the gold domains were snapped to drill holes and sliced on north-south-oriented long sections. The long sections are spaced at 30 ft, are located at each midblock in the block model, and are perpendicular to the 98.5 ft spaced cross sections. Because there were slight differences in section and level plan locations due to the conversion to Imperial units, modifications to gold domains were required in addition to those resulting from new drilling.

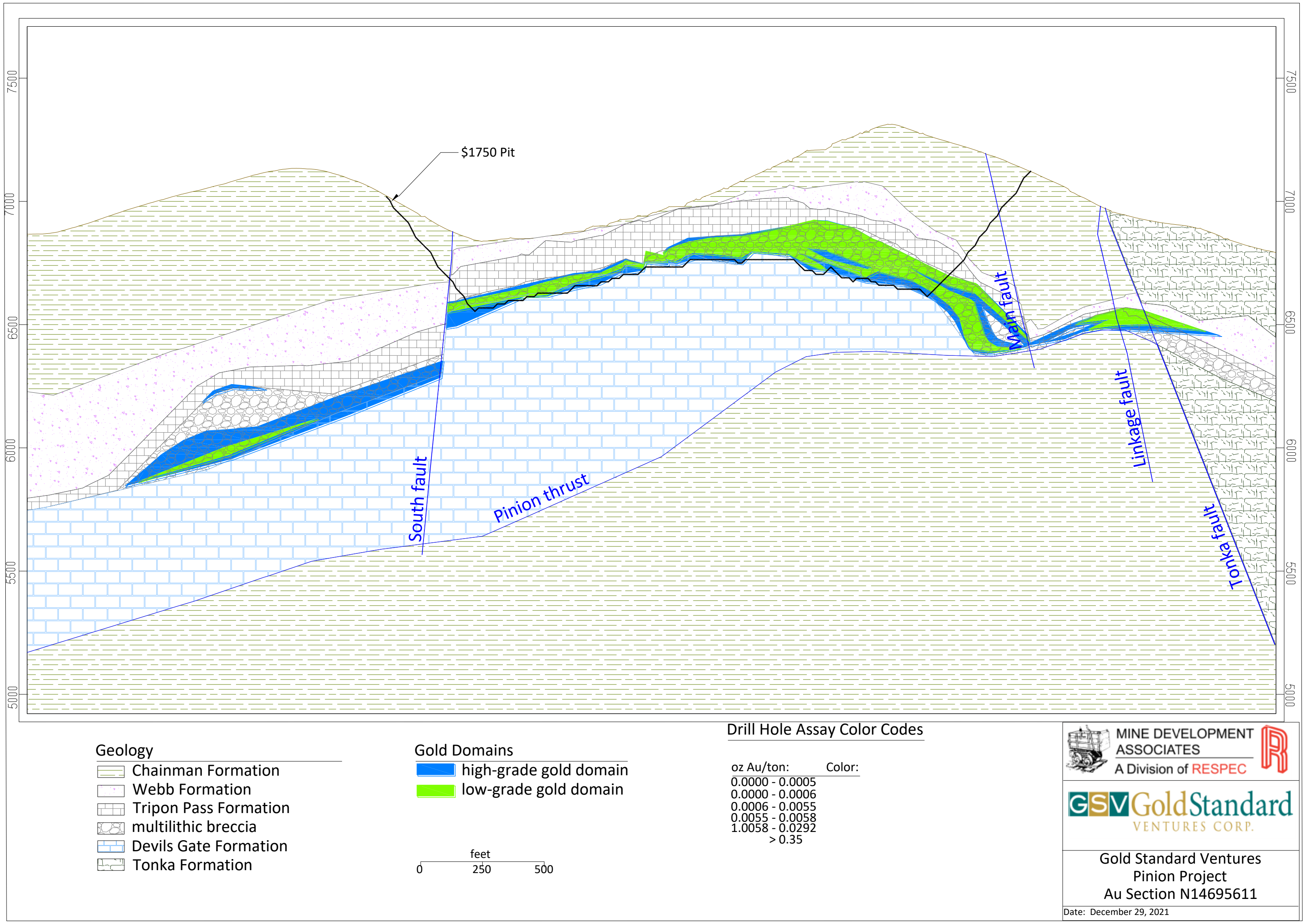


Figure 14-12: Pinion Gold Domains and Geology – Section N14695611

14.3.3.2 Gold Sample and Composite Statistics

After the gold domains were defined and modeled on 98.5 ft spaced cross sections, the domains were used to assign gold-domain codes to drill-hole samples. Quantile plots were made of the coded assays. Capping for each domain was determined by first assessing the grade above which the outliers occur. Then the outlier grades were reviewed on screen to determine materiality, grade, and proximity of the closest samples and general location. Descriptive statistics were generated and considered with respect to capping levels. Capping values were determined for each of the gold domains separately. Capping levels and number of samples capped are presented in Table 14-20.

Table 14-20: Pinion Gold Capping Levels for Gold by Domain

Domain	Number*	oz Au/ton
Low grade	11	0.0379
High grade	none	N/A
Outside	80	0.0263
** Excludes No Use samples (USEG = 1)*		

Once the capping was completed, the assays were down-hole composited to 10 ft intervals honoring domain boundaries. The composite length was chosen to avoid de-compositing small fractions of the original drilled sample intervals, which was predominantly 5 ft. Descriptive statistics of the composite database are given in Table 14-21.

Table 14-21: Pinion Deposit Descriptive Gold Assay Composite Statistics by Domain

Low-grade Gold Domain								
	Valid	**Median**	**Mean**	**Std Dev**	**CV**	**Minimum**	**Maximum**	**Units**
Length	4,069	10.00	8.88			0.0	10.0	ft
Au	4,032	0.0025	0.0030	0.0028	0.90	0.0	0.0830	oz Au/ton
Capped Au	4,032	0.0025	0.0030	0.0024	0.79	0.0	0.0379	oz Ag/ton
Au_{CN}	1,160	0.0033	0.0037	0.0029	0.78	0.0004	0.0414	oz Au/ton
Au_{CN}/Au_{FA} ratio	1,160	79.0	76.1	24.5	0.30	5.0	253.0	%
High-grade Gold Domain								
	Valid	**Median**	**Mean**	**Std Dev**	**CV**	**Minimum**	**Maximum**	**Units**
Length	6,229	10.00	9.37			0.0	10.0	ft
Au	6,175	0.0160	0.0228	0.0234	1.02	0.0003	0.3210	oz Au/ton
Capped Au	6,175	0.0160	0.0228	0.0234	1.02	0.0003	0.3210	oz Ag/ton
Au_{CN}	2,582	0.0115	0.0179	0.0207	1.15	0.0004	0.2320	oz Au/ton
Au_{CN}/Au_{FA} ratio	2,582	82.0	77.5	20.0	0.30	1.0	198.0	%
Outside Gold Domains								
	Valid	**Median**	**Mean**	**Std Dev**	**CV**	**Minimum**	**Maximum**	**Units**
Length	31,994	10.00	9.41			0.0	10.0	ft
Au	30,806	0.0003	0.0006	0.0021	3.84	0.0	0.1505	oz Au/ton
Capped Au	30,806	0.0003	0.0005	0.0014	2.63	0.0	0.0263	oz Ag/ton
Au_{CN}	686	0.0034	0.0054	0.0094	1.74	0.0	0.1475	oz Au/ton
Au_{CN}/Au_{FA} ratio	684	82.0	86.6	50.7	0.60	1.0	253.0	%

Correlograms were built from the composited gold grades in order to evaluate grade continuity. Correlogram parameters were used in the kriged estimate, which was used as a check on the reported inverse distance estimate, and also to give guidance to the classification of mineral resources. The correlogram results by area and domain are summarized as follows:

> Low-grade gold domain – The nugget is 40% of the total sill. The first sill is 85% of the total sill with a range of 23 to 49 ft depending on direction. The remaining sill (15%) has a range of around 82 to 131 ft depending on direction.
>
> High-grade gold domain – The nugget is 55% of the total sill. The first sill is 90% of the total sill with a range of 53 to 66 ft depending on direction. The remaining sill (10%) has a range of around 148 to 197 ft depending on direction.

14.3.3.3 Gold Estimation

The block model is not rotated, and the blocks are 30 ft north-south by 30 ft vertical by 30 ft east-west.

Four estimates were completed: a polygonal, nearest neighbor, inverse distance, and kriged, with the inverse-distance estimate being reported. The nearest neighbor, inverse distance and kriged estimates were run several times in order to determine sensitivity to estimation parameters, and to evaluate and optimize results. The inverse distance power was three (“ID^3”) and four (“ID^4”) for the low- and high-grade domain estimates, respectively. The model was divided into 11 estimation areas (“ESTAR”) to control search anisotropy, orientation and distances according to the differing geometries of mineralization in each area during estimation. Table 14-22 lists these areas along with the search orientations and the maximum search per area by low-grade and high-grade domains. Figure 14-13 presents the spatial relationship of those estimation areas to the drilling and the gold domains.

Table 14-22: Pinion Estimation Areas

Area	Azimuth (degrees)	Dip (degrees)	Rotation (degrees)	LG-Max Search (ft)	HG-Max Search (ft)
1	320	0	35	1,150	1,150
2	320	0	35	980	980
3	0	0	0	650	650
4	0	0	-20	980	980
5	30	0	-35	820	820
6	320	8	0	500	330
7	330	5	-20	650	500
8	295	0	-40	330	330
9	0	0	10	650	500
10	340	0	-25	650	330
11	15	0	-60	650	500
Notes: maximum distance is 196.85 ft for Indicated					

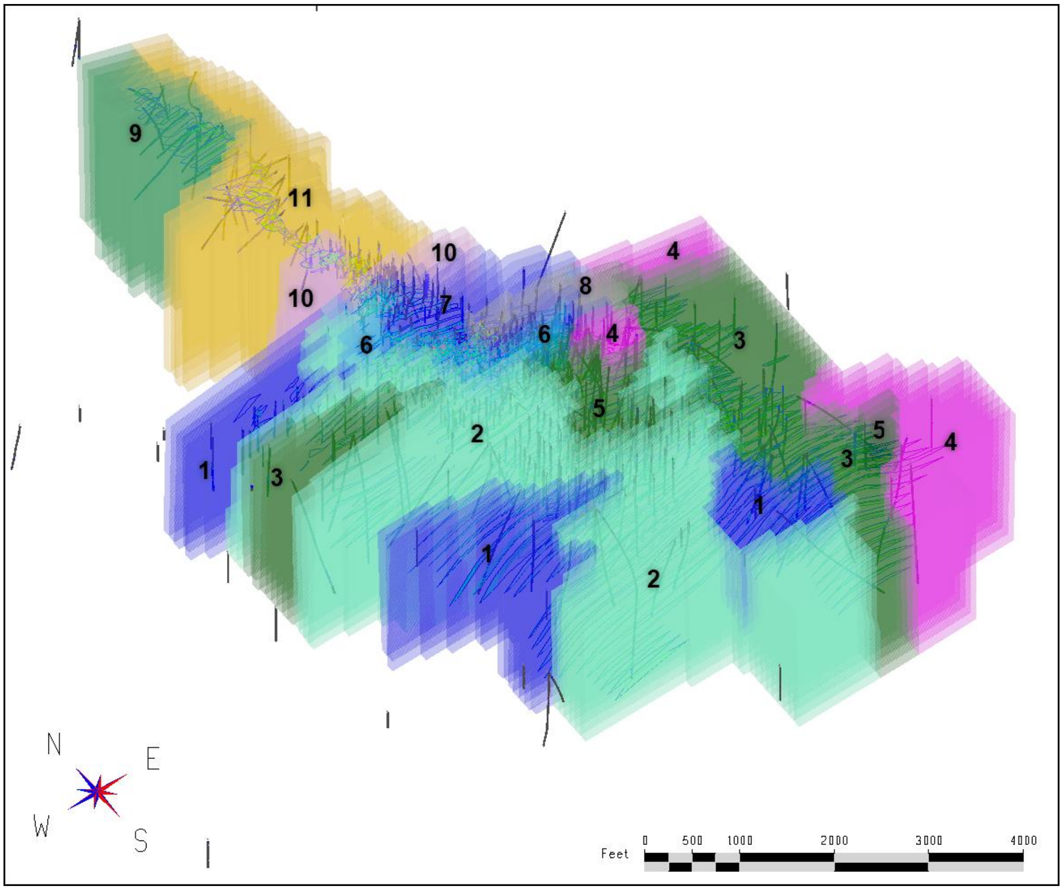


Figure 14-13: Pinion Estimation Areas

One estimation pass was run for each domain ranging up to 1,150 ft along the primary axis with a 4:1 anisotropy (major axis versus minor axis). All estimates and estimation runs weighted the samples by the sample lengths. Estimation parameters are given in Table 14-23.

Table 14-23: Pinion Gold Estimation Parameters
(for all rotations/dip/tilt values, see Table 14-22)

Domain	Parameter
Low-grade Gold Domain	
Samples: minimum/maximum/maximum per hole	1 / 12 / 3
Search anisotropies: major/semimajor/minor (vertical)	1 / 0.5 / 0.25*
Inverse distance power	3
High-grade restrictions (grade in oz Au/ton/distance in ft)	0.00875 / 0.5 x max search
High-grade Gold Domain	
Samples: minimum/maximum/maximum per hole	1 / 12 / 3
Search (m): major/semimajor/minor (vertical)	1 / 0.5 / 0.25*
Inverse distance power	4
High-grade restrictions (grade in oz Au/ton/distance in ft)	0.175 / 0.66 x max search

Outside Modeled Gold Domains	
Samples: minimum/maximum/maximum per hole	2 / 12 / 3
Search (m): major/semimajor/minor (vertical)	1 / 0.5 / 0.25
Inverse distance power	2
High-grade restrictions (grade in oz Au/ton/distance in ft)	0.00292 / 30
* - Vertical search distance = 0.20 * max search distance for ESTAR 2 and 11	

14.3.4 Pinion Silver Modeling and Estimation

14.3.4.1 Silver Domain Model

Silver domains based on sample assays were modeled on cross sections spaced 98.5 ft apart, oriented east-west and looking north. The geologic model and gold domains guided the explicit modeling of the silver domains. Domains were defined based on population breaks on cumulative probability plots (Figure 14-11). The following grade ranges were identified and used for silver domains:

- Low-grade silver domain: ~0.0012 oz Ag/ton to ~0.0583 oz Ag/ton, and
- High-grade silver domain >~0.0583 oz Ag/ton.

Descriptive statistics are presented in Table 14-24. Core photos, where available, were reviewed, and were helpful in interpretations.

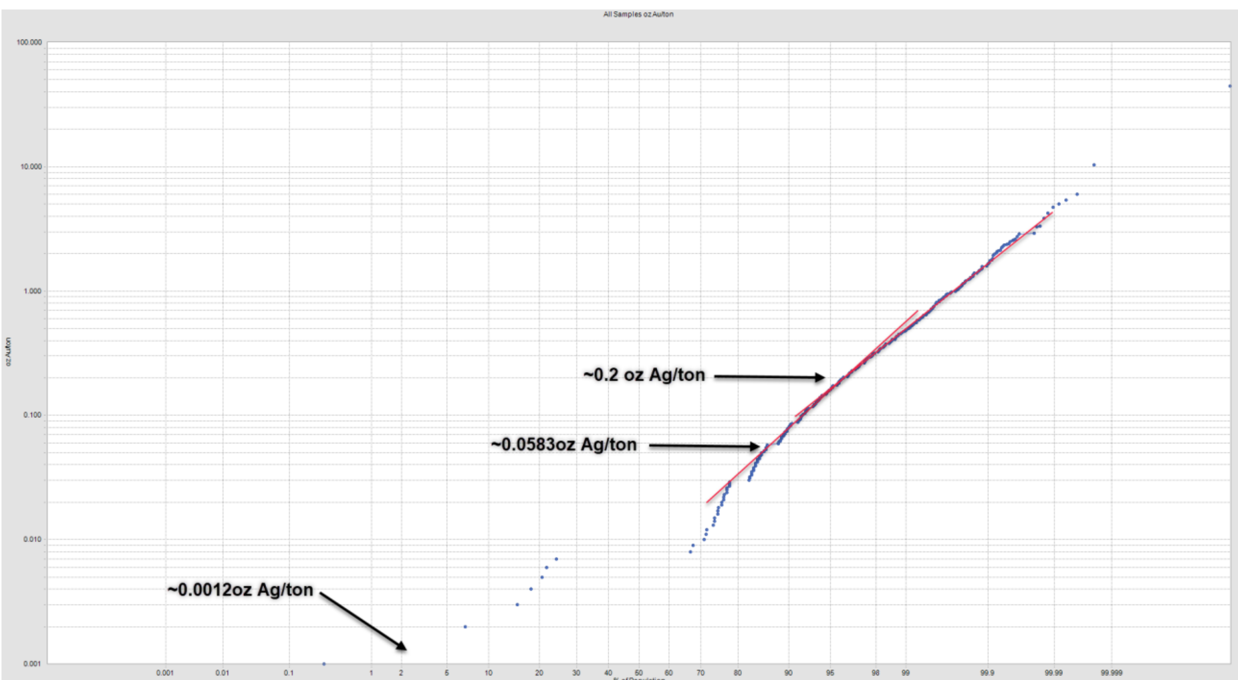


Figure 14-14: Cumulative Probability Plot of Pinion Deposit Silver Assays

Table 14-24: Pinion Deposit Descriptive Silver Statistics by Domain
(accepted sample data only)

Low-grade Silver Domain								
	Valid	**Median**	**Mean**	**Std Dev**	**CV**	**Minimum**	**Maximum**	**Units**
Length	6,479	5.0	5.0			0.6	20.0	ft
TYPE	6,479					1	9	
Ag	4,465	0.0288	0.0335	0.0389	1.16	0.0	0.6420	oz Ag/ton
Capped Ag	4,465	0.0290	0.0328	0.0318	0.97	0.0	0.2920	oz Ag/ton
Ag_{CN}	1,178	0.0100	0.0142	0.0139	0.98	0.0000	0.2080	oz Ag/ton
Ag_{CN}/Au_{FA} ratio	1,178	39.0	42.8	25.2	0.60	0.0	253.0	%
Density	66	2.59	2.60	0.25	0.10	1.88	3.53	g/cm3
Core recovery*	459	95.0	86.8	18.2	0.21	0.0	126.7	%
RQD*	459	28.0	34.4	31.9	0.93	0.0	125.0	%
High-grade Silver Domain								
	Valid	**Median**	**Mean**	**Std Dev**	**CV**	**Minimum**	**Maximum**	**Units**
Length	7,864	5.0	4.9			0.5	15.0	ft
TYPE	7,864					1	9	
Ag	5,484	0.1248	0.2253	0.7000	3.11	0.0	44.6540	oz Ag/ton
Capped Ag	5,484	0.1250	0.2080	0.2504	1.20	0.0	1.7500	oz Ag/ton
Ag_{CN}	1,121	0.0660	0.1113	0.1843	1.66	0.0010	4.2220	oz Ag/ton
Ag_{CN}/Au_{FA} ratio	1,121	50.0	47.7	14.9	0.30	2.0	129.0	%
Density	101	2.63	2.69	0.29	0.11	2.06	4.00	g/cm3
Core recovery*	620	94.6	86.0	19.7	0.23	0.0	117.1	%
RQD*	620	2.6	25.8	32.8	1.27	0.0	100.0	%
Outside Silver Domains								
	Valid	**Median**	**Mean**	**Std Dev**	**CV**	**Minimum**	**Maximum**	**Units**
Length	47,084	5.0	5.7			0.3	187.0	ft
TYPE	47,081					1	9	
Ag	37,166	0.0069	0.0109	0.0347	3.18	0.0	2.6220	oz Ag/ton
Capped Ag	37,166	0.0070	0.0094	0.0150	1.59	0.0	0.1170	oz Ag/ton
Ag_{CN}	966	0.0040	0.0135	0.0558	4.15	0.0000	1.3360	oz Ag/ton
Ag_{CN}/Au_{FA} ratio	966	31.0	36.0	28.5	0.80	0.0	253.0	%
Density	276	2.55	2.53	0.18	0.07	1.75	2.88	g/cm3
Core recovery*	2,156	100.0	93.4	13.2	0.14	0.0	166.6	%
RQD*	2,156	32.0	36.1	35.8	0.99	0.0	204.5	%

*Core recovery and RQD data have not been audited and contain values exceeding the maximum of 100%.

Prior to 2019, silver assays for the Gold Standard drilling were obtained from 20ft to 30 ft composites of 5 ft pulps. For the 2019 PFS update (Ibrado et al., 2020), Gold Standard re-assayed pulps from original, un-composited intervals for all samples within the modeled deposit area. The horizontal shift in Figure 14-14 at 0.0073 oz Ag/ton represents an abundance (~19,000) of values at one-quarter of the 0.029 oz Ag/ton (1.0 g Ag/t) detection limit of the re-assayed samples. Original silver assays were performed using different analytical procedures at various detection limits of 0.015 oz Ag/ton (0.5 g Ag/t) or less.

Silver grades are generally similar in morphology and location to the gold and multi-lithic breccia. However, the silver domains are wider or narrower, or are less extensive in some areas, than the gold domains. Some low-grade to anomalous silver mineralization exists in the Devils Gate Limestone but is not modeled except in one area. Elsewhere, the drill-hole spacing is too wide to define silver domain continuity beneath the multi-lithic breccia.

There were slight differences in section and level plan locations due to the conversion to Imperial units. Modifications to silver domains were required in addition to those resulting from new drilling.

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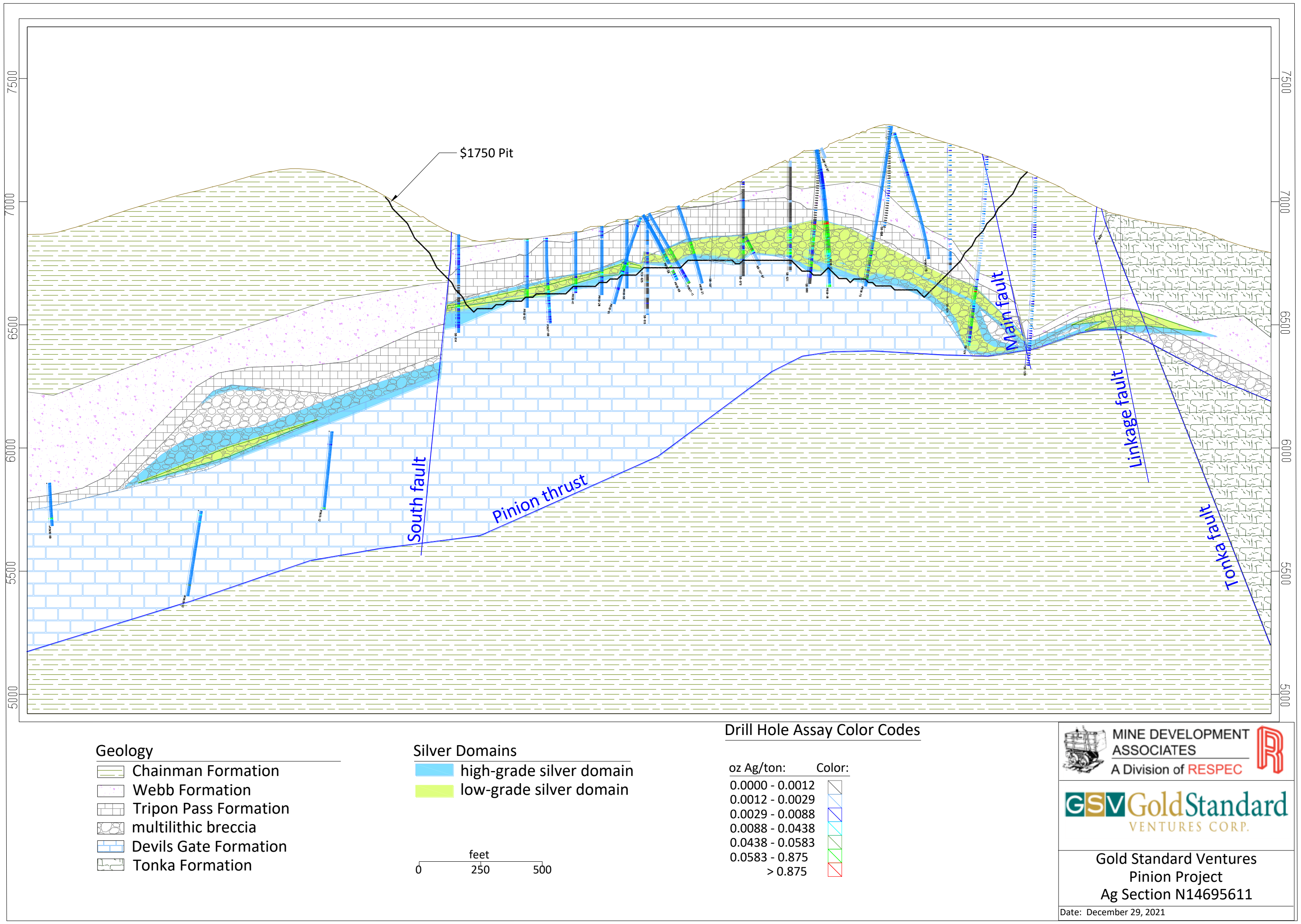


Figure 14-15: Pinion Silver Domains and Geology – Section N14695611

14.3.4.2 Silver Sample and Composite Statistics

After the silver mineral domains were defined and modeled on 98.5 ft spaced cross sections, the domains were used to assign silver-domain codes to drill-hole samples. Cumulative probability plots were made of the coded assays. Capping for each domain was determined by first assessing the grade above which the outliers occur, then the outlier grades were reviewed on screen to determine materiality, grade and proximity of the closest samples, and general location. Descriptive statistics were generated and considered with respect to capping levels, which were determined for each of the silver domains separately. Capping levels and number of samples capped are presented in Table 14-25.

Table 14-25: Pinion Capping Levels for Silver by Domain

Domain	Number Capped*	oz Ag/ton
Low grade	19	0.292
High grade	81	1.75
Outside	302	0.117
Excludes No Use samples (USES = 1)		

When the capping was completed, the silver assays were down-hole composited to 10 ft intervals honoring domain boundaries. The composite length was chosen to avoid de-compositing small fractions of the original drilled sample intervals, which was predominantly 5 ft. Descriptive statistics of the composite database are given in Table 14-26.

Table 14-26: Pinion Deposit Descriptive Silver Assay Composite Statistics by Domain

Low-grade Silver Domain								
	Valid	**Median**	**Mean**	**Std Dev**	**CV**	**Minimum**	**Maximum**	**Units**
Length	32,871	10.00	7.67			0.0	10.0	ft
Ag	25,785	0.0071	0.0108	0.0255	2.37	0.0	2.7200	oz Ag/ton
Capped Ag	25,785	0.0070	0.0103	0.0110	1.07	0.0	0.1170	oz Ag/ton
Ag_{CN}	574	0.0050	0.0140	0.0420	3.00	0.0000	0.7070	oz Ag/ton
Ag_{CN}/Au_{FA} ratio	574	34.0	36.7	25.3	0.70	0.0	136.0	%
High-grade Silver Domain								
	Valid	**Median**	**Mean**	**Std Dev**	**CV**	**Minimum**	**Maximum**	**Units**
Length	3,890	10.00	6.38			0.0	10.0	ft
Ag	2,804	0.0280	0.0319	0.0281	0.88	0.0010	0.5250	oz Ag/ton
Capped Ag	2,804	0.0280	0.0314	0.0229	0.73	0.0010	0.2920	oz Ag/ton
Ag_{CN}	658	0.0120	0.0147	0.0137	0.93	0.0000	0.1870	oz Ag/ton
Ag_{CN}/Au_{FA} ratio	658	41.0	43.5	23.1	0.50	0.0	253.0	%
Outside Silver Domains								
	Valid	**Median**	**Mean**	**Std Dev**	**CV**	**Minimum**	**Maximum**	**Units**
Length	4,692	10.00	6.98			0.0	10.0	ft
Ag	3,496	0.1461	0.2480	0.5412	2.18	0.0	22.5300	oz Ag/ton
Capped Ag	3,496	0.1460	0.2247	0.2299	1.02	0.0	1.7500	oz Ag/ton
Ag_{CN}	578	0.0720	0.1111	0.1455	1.31	0.0	2.2520	oz Ag/ton
Ag_{CN}/Au_{FA} ratio	578	49.0	47.8	13.6	0.30	2.0	93.0	%

Correlograms were built from the composited silver grades to evaluate grade continuity, to use in the kriged estimate, and to provide a check on the reported inverse distance estimate, and also to give guidance to the classification of mineral resources. The correlogram results were similar to those for gold, so the same parameters were used and are summarized as follows:

- Low-grade silver domain – The nugget is 40% of the total sill. The first sill is 85% of the total sill with a range of 23 to 49 ft depending on direction. The remaining sill (15%) has a range of around 82 to 131 ft depending on direction.
- High-grade silver domain – The nugget is 55% of the total sill. The first sill is 90% of the total sill with a range of 53 to 66 ft depending on direction. The remaining sill (10%) has a range of around 148 to 197 ft depending on direction.

14.3.4.3 Silver Estimation

Four estimates were completed for silver as was done for gold: a polygonal, nearest neighbor, inverse distance, and kriged, with the inverse-distance estimate being reported. The nearest neighbor, inverse distance and kriged estimates were run several times in order to determine sensitivity to estimation parameters, and to evaluate and optimize results. ID^3 and ID^4 was applied to the low and high-grade domain estimates, respectively. The same 11 estimation areas used for gold to control search anisotropy, orientation and distances during estimation were used for silver (Table 14-22). One estimation pass was run for each domain ranging up to 980 ft along the primary axis with a 4:1 anisotropy (major axis versus minor axis). Composite assay values were weighted by interval lengths for all silver estimation runs. Estimation parameters are given in Table 14-27.

Table 14-27: Pinion Silver Estimation Parameters
(for all rotations/dip/tilt values, see Table 14-22)

Domain	Parameter
Low-grade Silver Domain	
Samples: minimum/maximum/maximum per hole	1 / 9 / 3
Search anisotropies: major/semimajor/minor (vertical)	1 / 0.5 / 0.25
Inverse distance power	3
High-grade restrictions (grade in g Ag/t)	0.0875 / 0.33 x max search
High-grade Silver Domain	
Samples: minimum/maximum/maximum per hole	1 / 9 / 3
Search (m): major/semimajor/minor (vertical)	1 / 0.5 / 0.25
Inverse distance power	4
High-grade restrictions (grade in g Ag/t)	None
Outside Modeled Silver Domains	
Samples: minimum/maximum/maximum per hole	2 / 12 / 3
Search (m): major/semimajor/minor (vertical)	1 / 0.5 / 0.25
Inverse distance power	2
High-grade restrictions (grade in g Ag/t and distance in m)	0.0233 / 30

14.3.5 Pinion Gold and Silver Resources

Mr. Lindholm classified the Pinion mineral resources considering the confidence in the underlying database, sample integrity, analytical precision/reliability, QA/QC results, and confidence in geologic interpretations. The gold classification was applied to the reported gold and silver mineral resources. The classification parameters for gold are given in Table 14-28. Although the author of this section is not an expert with respect to environmental, permitting, legal, title, taxation, socio-economic, marketing or political matters, the author is not aware of any unusual factors relating to these matters that may materially affect the Pinion mineral resources as of the effective date of this Technical Report.

Table 14-28: Pinion Classification Parameters

Measured			
Inside modeled domains	Yes	Yes	
Minimum number of holes	3	N/A	
Minimum number of composites	3	3	
Average anisotropic distance (ft)	≤100	N/A	
Closest anisotropic distance (ft)	N/A	≤35	
Gold Standard drill hole influence	≥90%	≥90%	
Indicated		or	or
Inside modeled domains	Yes	Yes	Yes
Minimum number of holes	3	2	1
Minimum number of composites	7	4	2
Closest isotropic distance (ft)	≤165	≤65	≤35
Inferred		or	
Inside modeled domains	Yes	No*	
Minimum number of composites	N/A	1	
Closest isotropic distance (ft)	N/A	≤65	
Measured and Indicated Reduced to Inferred if:		or	
Closest anisotropic distance (ft)	≥100	north area; high-angle areas	
Gold Standard drill hole influence	≤1%	N/A	
**extreme pullbacks are applied on higher grades outside domains*			

As described in the table, the amount of influence that historical data has on a block affects the classification. For a block to be classified as Measured mineral resources, more than 90% of the sample influence must be derived from Gold Standard data. On the other hand, no block with the closest sample beyond 100 ft and entirely based on historical data may be classified as Measured or Indicated mineral resources. Under most circumstances the confidence of a block would be lower if it were based entirely on historical data. However, the drilling is very dense in areas dominated by historical drill holes, the suspect holes and samples have been culled, and multiple drill campaigns are mutually supportive. There are also areas where the geology and domains are more speculative, *e.g.*, the northern area where the deposit is less well-delineated, and steep zones below the multi-lithic breccia. The classification in these areas, which were defined in the block model using 3D solids, is reduced to inferred.

The results of the QA/QC evaluation revealed a project risk that warrants additional comment. There is no QA/QC information for the historical drilling, and some of those data do not have supporting documentation. Consequently, the veracity of historical data relies on corroboration from nearby Gold Standard drilling, mutual support between drilling campaigns conducted by ten historic exploration companies, and to a lesser degree, that most of the previous operators were reputable. As noted above, the lower confidence in historical drilling is taken into account in mineral resource classification.

Since the May 2019 effective date of the database for Pinion used in the 2020 PFS of Ibrado et al. (2020), 46 and 82 additional holes were drilled or added to the database in 2019 and 2020, respectively. Data for these holes were received with finalized assays from Gold Standard by the effective date of the current database of June 2, 2021, and have been incorporated into the current resource model. Gold, silver and barium domains were updated with the newer information. Of the 128 added assay sets, 34 holes were new and historical drill holes at the LT and Ski Track exploration targets outside the modeled area. One sonic hole was also drilled outside the resource area. Another 18 were core holes drilled predominantly for metallurgical test work material; only three of these had assays and were essentially twins of older RC holes that caused few changes to domains. The remaining 75 were infill and step-out holes drilled to delineate areas of known mineralization extending to the south. In summary, all relevant new drilling moderately to strongly supported the 2019 resource block model. Metallurgical core holes correlated with RC twins extremely well. Infill holes confirmed the previous block model in areas of relatively close-spaced drilling, and caused incremental changes to the domains that impacted in-pit mineral resources only locally. Step-out and infill holes where drilling was wide-spaced prompted more significant changes, such as a consistent deepening of domains by up to 100 ft. Horizontal continuity, however, was generally confirmed, and the overall grade relative to surrounding holes appeared to increase.

Overall, the new holes added to the veracity of the 2019 gold domain model, and the lack of significant changes to the 2019 resource estimate where drilling was already dense adds to the level of confidence in the block model. Classification of material was elevated to Indicated and Measured with the delineation drilling to the south. The addition of more reliable Gold Standard holes in these areas where historical drilling was predominant also helped increase classification levels.

Another 31 holes have been drilled since the effective date of the current Pinion database. MDA loaded these holes into the MineSight database, and Mr. Lindholm evaluated the potential changes these holes would cause to the gold, silver and barium domains. Eight holes were drilled at the LT target, and one was a geotechnical core hole drilled outside the modeled domains. Another three historical monitor wells were added to the database, and a new water well was drilled, all with no assays. Of the remaining 18 holes drilled in the Pinion modeled area, four have no assays and six are infill or twin holes that would cause only localized, incremental changes to domains. Three were infill holes in areas with earlier wide-spaced drilling that generally confirm current modeling, but would locally widen, narrow, and/or change the vertical location of domains. Lastly, there are five step-out holes to the south and southeast well outside or below the current optimized pit limits. These could extend, widen and/or increase the grade of current resources, but would be unlikely to cause the pit dimensions to increase without further delineation drilling.

For reporting, the technical and economic factors likely to influence the requirement "*reasonable prospects for eventual economic extraction*" were evaluated using the best judgement of the author responsible for this section of the report. For evaluating the open-pit potential, MDA modeled a series of optimized pits using variable gold prices. MDA used costs appropriate for open-pit mining in Nevada, estimated processing costs and metallurgical recoveries related to heap leaching, and G&A costs. The cutoff grades are based on a gold price of $1,750/oz.

The reported Pinion mineral resource estimate is the fully block diluted ID^3 and ID^4 estimate. The blocks are 30 ft^3. The mineral resources are reported at a cutoff of 0.005 oz Au/ton for open-pit mining. No sulfide mineralization is reported at Pinion. Table 14-29 to Table 14-32 present the estimated Measured, Indicated, and Inferred gold and silver mineral resources at Pinion within the optimized $1,750/oz Au pits. The breakdown of mineral resources by oxidation state is given in Appendix C. Representative cross sections of the gold and silver block models are shown in Figure 14-16 and Figure 14-17, respectively. Mineral resources that are not mineral reserves do not have demonstrated economic viability.

Table 14-29: Pinion Measured Gold and Silver Resources*

Cutoff					
oz Au/ton	**Tons**	**oz Au/ton**	**oz Au**	**oz Ag/ton**	**oz Ag**
0.001	2,950,000	0.019	56,000	0.17	504,000
0.002	2,812,000	0.020	55,000	0.18	501,000
0.003	2,722,000	0.020	55,000	0.18	499,000
0.004	2,650,000	0.021	55,000	0.19	493,000
0.005	**2,575,000**	**0.021**	**55,000**	**0.19**	**488,000**
0.006	2,445,000	0.022	54,000	0.19	475,000
0.007	2,320,000	0.023	53,000	0.20	462,000
0.008	2,172,000	0.024	52,000	0.20	440,000
0.009	2,023,000	0.025	51,000	0.21	418,000
0.010	1,911,000	0.026	49,000	0.21	404,000
0.015	1,361,000	0.032	43,000	0.23	319,000
0.020	946,000	0.038	36,000	0.25	237,000
0.025	654,000	0.044	29,000	0.26	170,000
0.030	501,000	0.050	25,000	0.27	133,000
0.035	360,000	0.058	21,000	0.27	98,000
0.040	261,000	0.061	16,000	0.29	76,000
0.045	203,000	0.069	14,000	0.28	56,000
0.050	167,000	0.072	12,000	0.29	48,000
*mineral resources are inclusive of mineral reserves.					

Table 14-30: Pinion Indicated Gold and Silver Resources*

Cutoff					
oz Au/ton	**Tons**	**oz Au/ton**	**oz Au**	**oz Ag/ton**	**oz Ag**
0.001	60,930,000	0.014	859,000	0.12	7,084,000
0.002	55,659,000	0.015	853,000	0.13	7,012,000
0.003	51,680,000	0.016	840,000	0.13	6,907,000
0.004	48,271,000	0.017	828,000	0.14	6,764,000
0.005	**45,408,000**	**0.018**	**816,000**	**0.15**	**6,617,000**
0.006	42,777,000	0.019	803,000	0.15	6,455,000
0.007	40,233,000	0.019	784,000	0.16	6,282,000
0.008	37,577,000	0.020	767,000	0.16	6,058,000
0.009	34,932,000	0.021	745,000	0.17	5,797,000
0.010	32,400,000	0.022	720,000	0.17	5,548,000
0.015	21,756,000	0.027	588,000	0.19	4,201,000
0.020	13,841,000	0.033	451,000	0.21	2,913,000
0.025	8,640,000	0.039	335,000	0.23	1,955,000
0.030	5,584,000	0.045	252,000	0.24	1,345,000
0.035	3,748,000	0.051	193,000	0.25	928,000
0.040	2,480,000	0.059	146,000	0.25	626,000
0.045	1,768,000	0.065	115,000	0.26	456,000
0.050	1,329,000	0.071	95,000	0.26	339,000
*mineral resources are inclusive of mineral reserves.					

Table 14-31 Pinion Measured and Indicated Gold and Silver Resources*

Cutoff					
oz Au/ton	**Tons**	**oz Au/ton**	**oz Au**	**oz Ag/ton**	**oz Ag**
0.001	63,880,000	0.014	915,000	0.12	7,588,000
0.002	58,471,000	0.016	908,000	0.13	7,513,000
0.003	54,402,000	0.016	895,000	0.14	7,406,000
0.004	50,921,000	0.017	883,000	0.14	7,257,000
0.005	**47,983,000**	**0.018**	**871,000**	**0.15**	**7,105,000**
0.006	45,222,000	0.019	857,000	0.15	6,930,000
0.007	42,553,000	0.020	837,000	0.16	6,744,000
0.008	39,749,000	0.021	819,000	0.16	6,498,000
0.009	36,955,000	0.022	796,000	0.17	6,215,000
0.010	34,311,000	0.022	769,000	0.17	5,952,000
0.015	23,117,000	0.027	631,000	0.20	4,520,000
0.020	14,787,000	0.033	487,000	0.21	3,150,000
0.025	9,294,000	0.039	364,000	0.23	2,125,000
0.030	6,085,000	0.046	277,000	0.24	1,478,000
0.035	4,108,000	0.052	214,000	0.25	1,026,000
0.040	2,741,000	0.059	162,000	0.26	702,000
0.045	1,971,000	0.065	129,000	0.26	512,000
0.050	1,496,000	0.072	107,000	0.26	387,000
*mineral resources are inclusive of mineral reserves.					

Table 14-32 Pinion Inferred Gold and Silver Resources

Cutoff					
oz Au/ton	**Tons**	**oz Au/ton**	**oz Au**	**oz Ag/ton**	**oz Ag**
0.001	3,865,000	0.005	20,000	0.03	125,000
0.002	2,158,000	0.008	18,000	0.05	113,000
0.003	1,782,000	0.010	17,000	0.06	107,000
0.004	1,491,000	0.011	16,000	0.07	99,000
0.005	**1,299,000**	**0.012**	**15,000**	**0.07**	**92,000**
0.006	1,142,000	0.012	14,000	0.07	83,000
0.007	984,000	0.014	14,000	0.08	76,000
0.008	877,000	0.015	13,000	0.08	71,000
0.009	738,000	0.015	11,000	0.09	63,000
0.010	661,000	0.015	10,000	0.09	58,000
0.015	321,000	0.022	7,000	0.10	33,000
0.020	120,000	0.025	3,000	0.13	15,000
0.025	49,000	0.041	2,000	0.08	4,000
0.030	26,000	0.038	1,000	0.08	2,000
0.035	13,000	0.077	1,000	0.08	1,000
0.040	2,000	0.000	-	0.00	-
0.000	-	-	-	0.00	-
0.000	-	-	-	0.00	-

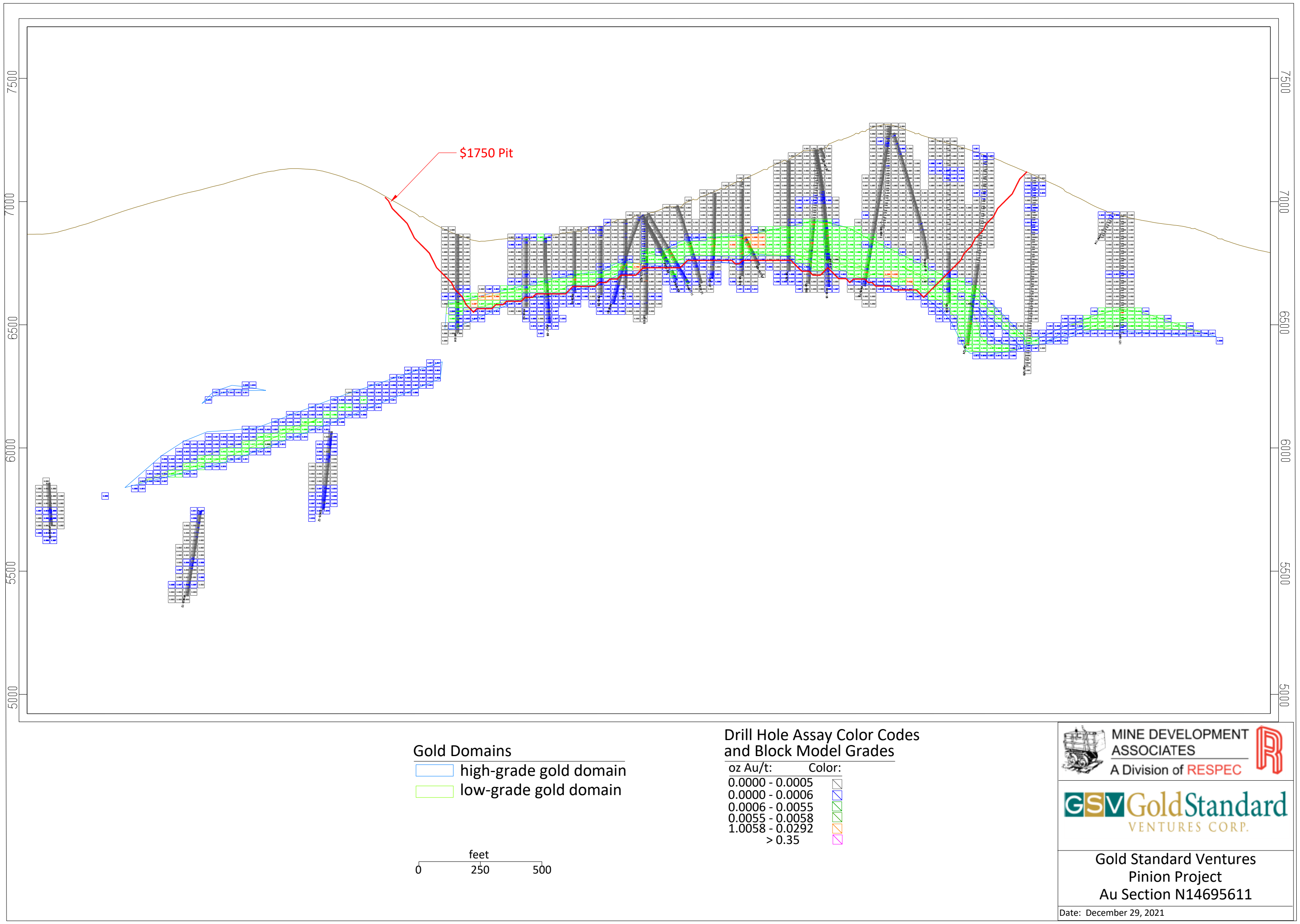


Figure 14-16: Pinion Gold Domains and Block Model– Section N14695611

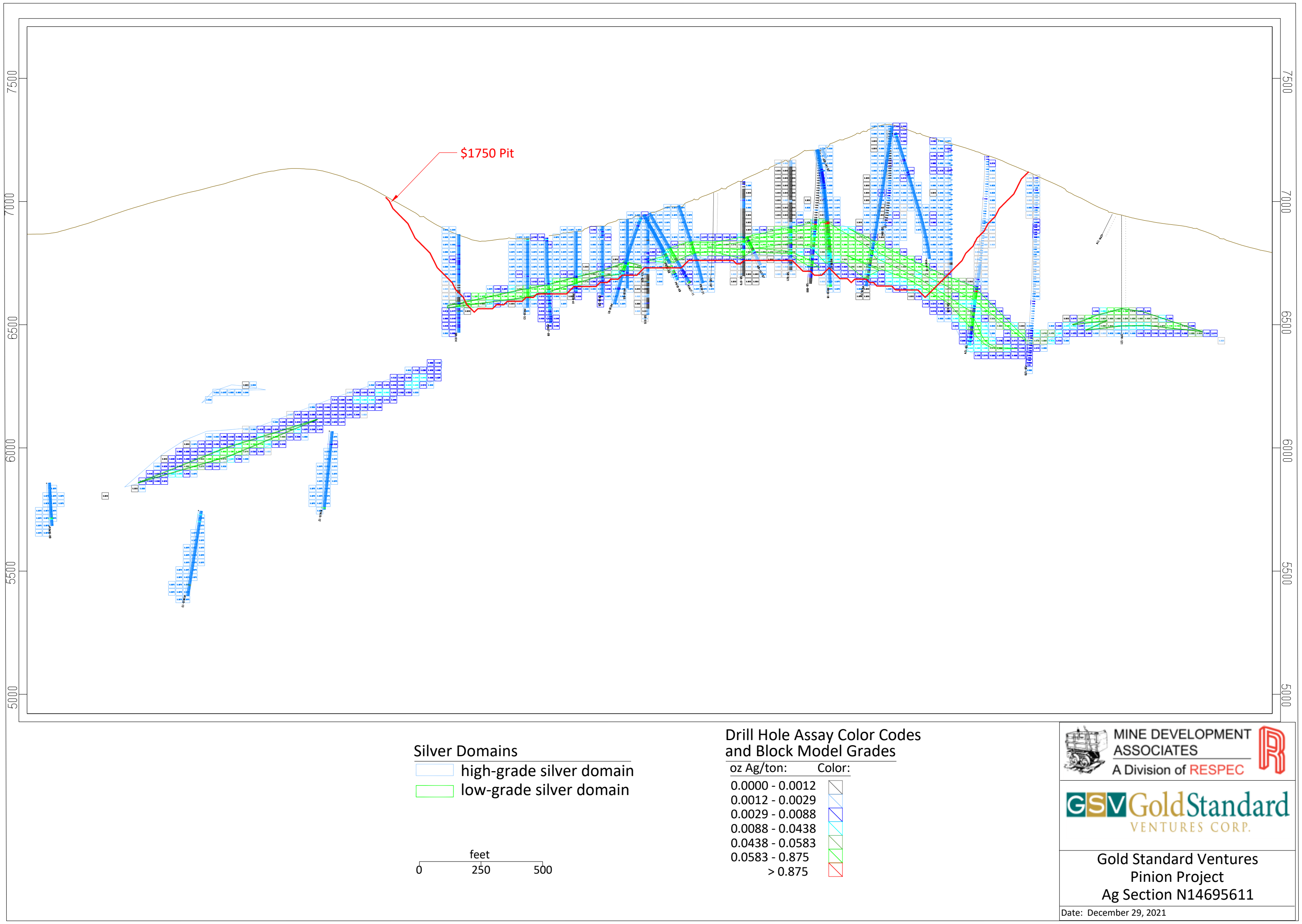


Figure 14-17: Pinion Silver Domains and Block Model– Section N14695611

14.3.6 Pinion Geo-Metallurgical Model

Four additional models, collectively called the Pinion geo-metallurgy model, were produced based on guidelines given from metallurgical test work and interpretations presented in Section 13: barium concentration (estimated within modeled domains), cyanide-soluble gold grade (estimated by rock units), refractory material (modeled 3D solids), and organic carbon grade (estimated by rock units).

14.3.6.1 Pinion Barium Domains and Estimation

The occurrence of barite and silicification seems to have significant impacts on gold recoveries. Consequently, a barium concentration (in lieu of barite) model was necessary for assigning gold recoveries to the deposit. The estimation of a silicification block model was also considered, but the available qualitative and logged geologic data was determined to be insufficient. There was no correlation demonstrated in a comparison of SiO_2 assays from metallurgical composites and the relatively larger XRF data set.

Metallurgical testing of drill samples included the ED-XRF-E5 method of analysis for barium; there are 938 analyses of this type that were performed at AAL on pressed powder pulp material. In addition, 21,747 NITON XRF analyses of barium were taken by independent contractor Rangefront Geological on loose powder pulp material. Following the PFS update (Ibrado, et al, 2020), Gold Standard obtained 14,069 new XRF assays in-house using NITON and Olympus units, and through AAL and Paragon Laboratories. A significant low bias was noted in the NITON XRF compared to the ED-XRF-E5 analyses (Section 12.6.6) but since there are substantially more NITON XRF values, the larger data set was chosen for modeling and estimation. MDA developed a regression equation to factor the 938 ED-XRF-E5 measurements to NITON XRF equivalents and merge them with the 21,747 NITON XRF barium analyses as follows:

$$NITON\ XRF_{eq} = 0.5682 \times ED\text{-}XRF\text{-}E5$$

The R^2 for this equation is 0.96 but there are only 32 samples from which the relationship was built. After estimation into the geo-metallurgical block model, the estimated NITON XRF barium grades were refactored to ED-XRF-E5 equivalents to be comparable to the metallurgical data, using the following equation:

$$ED\text{-}XRF\text{-}E5_{eq} = 1.760 \times NITON\ XRF$$

There were a total of 36,754 samples analyzed for barium by either NITON XRF, ED-XRF-E5, or by both methods, which compares to 59,751 accepted gold samples. All NITON XRF barium analyses were plotted in a cumulative probability plot (Figure 14-18) and were used to define domains. No values factored from ED-XRF-E5 analyses are included on the plot. The resulting high-grade (>~6% Ba) and low-grade (~0.4 to ~6% Ba) barium domains were then modeled on 98.5 ft spaced east-west sections, as was done for gold and silver. The geologic model was the primary guide for barium domain modeling. Barium is spatially related to the multi-lithic breccia, which is generally tabular and folded into the Pinion anticline. Gold domains correlate reasonably well with the barium domains and were used as guides as well. The high-grade domain is spatially restricted to the north- to northwest-trending axis of the Pinion anticline within the mineral resource pit. Logged barite intensity data was used to augment the analytical barium data in supporting the domain interpretations. Sectional interpretations were then snapped to drill holes and sliced to north-south sections on every 30 ft mid-block in the block model.

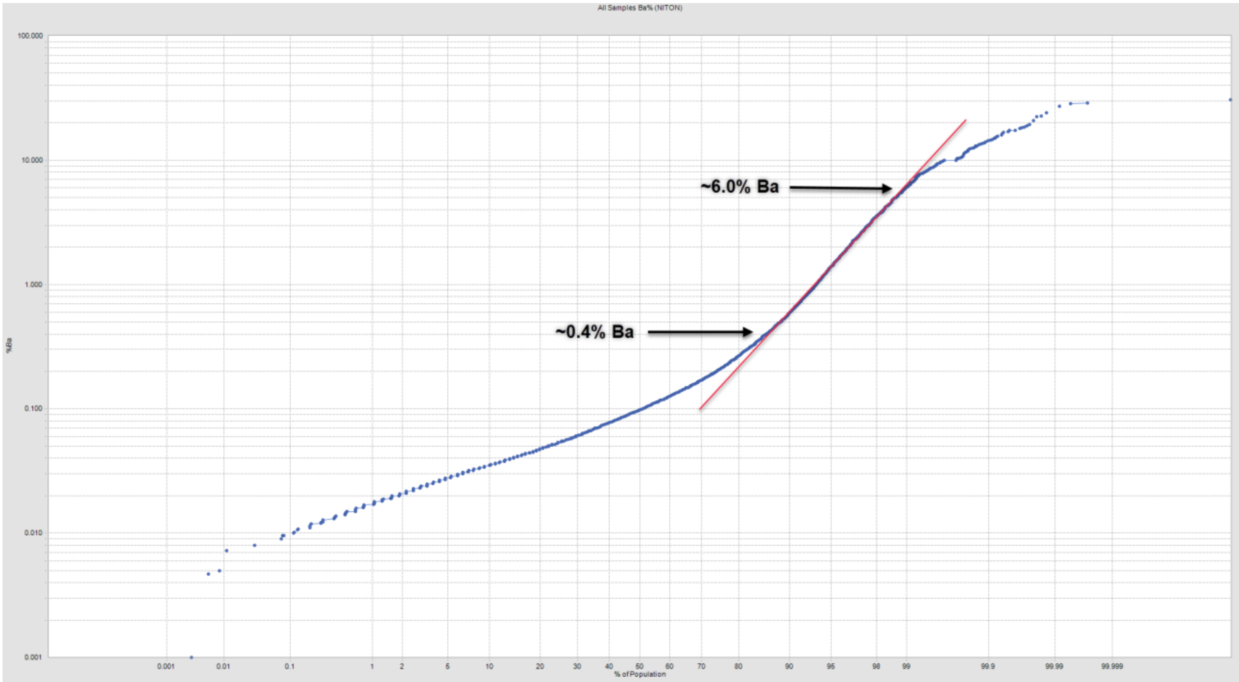


Figure 14-18: Cumulative Probability plot of Barium (NITON XRF) Sample Grades at Pinion

Descriptive statistics of the sample barium grades by domain are given in Table 14-33. These samples were composited to 10 ft lengths. Descriptive statistics of the composited barium grades by domain are given in Table 14-34. A representative cross section showing geology and barium domains is given in Figure 14-19. Estimation parameters are presented in Table 14-35.

Table 14-33: Pinion Samples Barium Statistics by Domain

Low-grade Barium Domain								
	Valid	**Median**	**Mean**	**Std Dev**	**CV**	**Minimum**	**Maximum**	**Units**
Length	14,452	5.00	4.93			0.50	20.0	ft
Ba	5,987	0.34	0.85	1.31	1.54	0.0009	18.0	%
Ba capped	5,987	0.34	0.85	1.31	1.54	0.0009	18.0	%
High-grade Barium Domain								
	Valid	**Median**	**Mean**	**Std Dev**	**CV**	**Minimum**	**Maximum**	**Units**
Length	932	5.00	4.85			1.00	10.0	ft
Ba	414	7.82	8.68	4.72	0.54	0.1510	30.7	%
Ba capped	414	7.82	8.68	4.72	0.54	0.1510	30.7	%
Outside Barium Domains								
	Valid	**Median**	**Mean**	**Std Dev**	**CV**	**Minimum**	**Maximum**	**Units**
Length	46,043	5.00	5.72	0.00	0.0	0.25	187.0	ft
Ba	22,024	0.07	0.16	0.50	3.21	0.0000	18.1	%
Ba capped	22,024	0.07	0.15	0.33	2.28	0.0000	4.0	%

Table 14-34: Pinion Composites Barium Statistics by Domain

Low-grade Barium Domain								
	Valid	**Median**	**Mean**	**Std Dev**	**CV**	**Minimum**	**Maximum**	**Units**
Length	4,083		9.35			0.2	10.0	ft
Ba	4,083	0.37	0.82	1.17	1.42	0.01	15.6	%
Capped Ba	4,083	0.37	0.82	1.17	1.42	0.01	15.6	%
High-grade Barium Domain								
	Valid	**Median**	**Mean**	**Std Dev**	**CV**	**Minimum**	**Maximum**	**Units**
Length	280		8.24			1.00	10.0	ft
Ba	280	8.03	8.65	4.01	0.46	0.16	25.2	%
Capped Ba	280	8.03	8.65	4.01	0.46	0.16	25.2	%
Outside Barium Domains								
	Valid	**Median**	**Mean**	**Std Dev**	**CV**	**Minimum**	**Maximum**	**Units**
Length	14,186		9.55			0.10	10.0	ft
Ba	14,186	0.08	0.15	0.37	2.52	0.00	14.1	%
Capped Ba	14,186	0.08	0.14	0.26	1.87	0.00	4.0	%

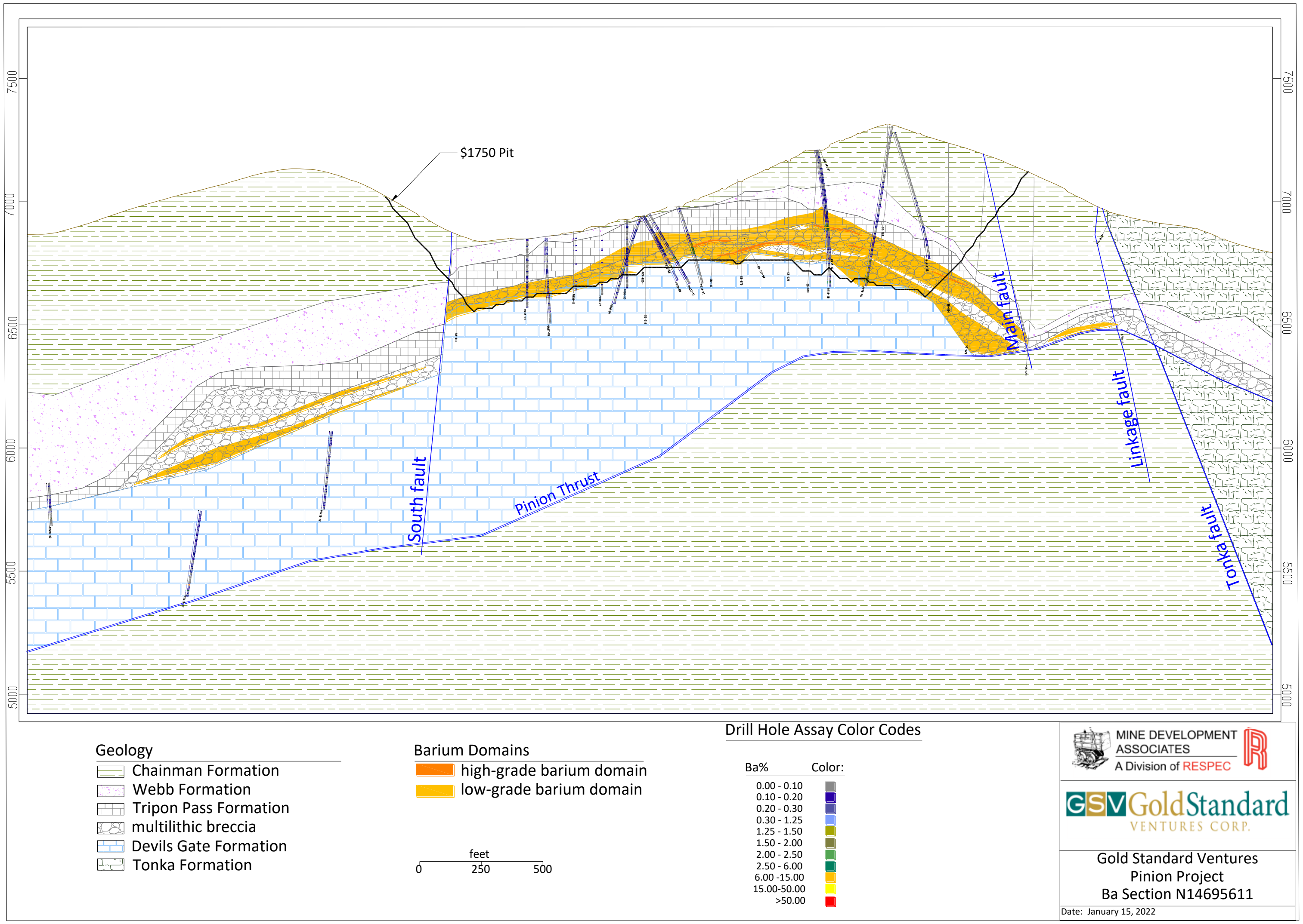


Figure 14-19: Pinion Barium Domains and Geology – Section N14695611

Table 14-35: Pinion Barium Estimation Parameters
(for all rotations/dip/tilt values, see Table 14-22)

Domain	Parameter
Low-grade Barium Domain	
Samples: minimum/maximum/maximum per hole	1 / 12 / 3
Search anisotropies: major/semimajor/minor (vertical)	1 / 0.5 / 0.25*
Inverse distance power	3
High-grade restrictions (grade in %Ba/distance in ft)	3.5 / 30
High-grade Barium Domain	
Samples: minimum/maximum/maximum per hole	1 / 12 / 3
Search (m): major/semimajor/minor (vertical)	1 / 0.5 / 0.25*
Inverse distance power	4
High-grade restrictions (grade in %Ba/distance in ft)	N/A
Outside Modeled Barium Domains	
Samples: minimum/maximum/maximum per hole	2 / 12 / 3
Search (m): major/semimajor/minor (vertical)	1 / 0.5 / 0.25
Inverse distance power	3
High-grade restrictions (grade in %Ba/distance in ft)	0.15 / 9
* - Vertical search distance = 0.20 * max search distance for ESTAR 2 and 11	

The average barium grade for the gold mineralization grading at least 0.005 oz Au/ton in potentially mineable material is ~2.25%. There are substantially fewer barium analyses than gold analyses, so the barium estimate has lower confidence than the gold estimate. If precision of barium grades is critical to the economics of the deposit, then additional samples with barium grades should be obtained.

14.3.6.2 Pinion Cyanide-Soluble Gold Model

A cyanide-soluble gold block model was produced using cyanide-recoverable gold shaker test results and fire assays of sample pulps (Figure 14-20). Au_{CN}/Au_{FA} ratios were calculated from these two types of assays. ID^3 was used to estimate the Au_{CN}/Au_{FA} ratio grades. Only Au_{CN}/Au_{FA} ratios in which the fire-assay gold grades were greater than or equal to 0.0015 oz Au/ton were used in the estimation. There are relatively few cyanide-shaker tests compared to the number of gold assays, and where historical drilling is predominant, the data is limited to non-existent. There is also no quality control data associated with these analyses. As a result, the Au_{CN}/Au_{FA} ratio block model is lower in confidence than the gold and silver block models. Otherwise, the estimation procedures, block dimensions, and methodology were generally the same as those used for the gold and silver models, with the exception of the items noted below in this section.

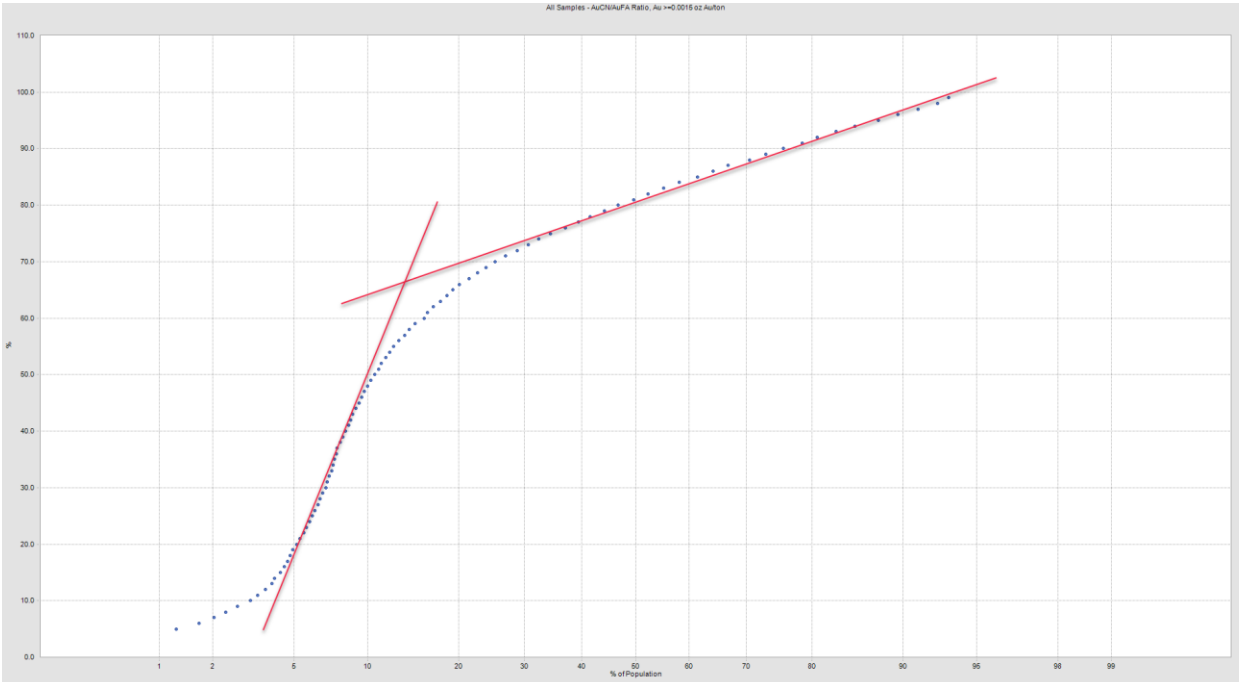


Figure 14-20: Cumulative Probability Plot of Pinion Au_{CN}/Au_{FA} Ratios

The Au_{CN}/Au_{FA} ratio block model augments the barite block model to further define metallurgical domains applicable to estimating gold recovery. Referencing criteria defined in Section 13, blocks with estimated Au_{CN}/Au_{FA} ratios of 65% or greater are considered to have relatively good recovery and are categorized as oxidized. Blocks with estimated Au_{CN}/Au_{FA} ratios of between 35 and 65% are categorized as transitional material and are considered to be moderately recoverable. Transitional and oxidized material are included in the reported mineral resources blocks, however, material with estimated Au_{CN}/Au_{FA} ratios of less than 35% are not sufficiently recoverable with cyanide processing to be reported.

14.3.6.3 Refractory Solids Model

The term “refractory” technically refers to material that contains sulfur and carbon species that render gold extraction difficult with cyanide processing. The 3D refractory solids were therefore modeled by MDA in order to provide input into metallurgical characterization and potential acid-generating properties. The refractory solids modeled at Pinion delineate unoxidized, sulfide-bearing material with carbon. Refractory zones within the solids generally correlate with material from which gold recovery is difficult as defined above using estimated barite grades and Au_{CN}/Au_{FA} ratios. Zones outside the solids are generally consistent with the oxide and transitional metallurgical domains defined above.

Gold Standard initially modeled solids using a combination of logged data, which represents the most abundant data set, augmented by Au_{CN}/Au_{FA} ratios. MDA modified these solids to include LECO sulfide-sulfur analyses. The contact of the resulting refractory solids is commonly abrupt and readily defined by the multiple data sets, which are rarely contradictory. Within the refractory solids, logged data indicates material is 30% or more refractory, Au_{CN}/Au_{FA} ratios are generally much lower than 50%, and sulfide-sulfur grades are mostly in the tenths of a percent or higher. By far the largest volume of refractory material is deep, below the multi-lithic breccia and outside the pit defining potentially minable mineral resources. Within the volume of the potential open-pit, refractory material is mostly coincident with the Chainman and to a lesser extent the Tripon Pass Formation, but a small amount is also in the Webb Formation in the southwest part of the pit. All refractory material within a potential pit lies above the multi-lithic breccia that hosts the gold mineralization. There is some known refractory material which is not modeled within the solids below mineralization in the Devils Gate Limestone, because of the limited drilling, but that material lies below and is immaterial to the estimated mineral resources.

The refractory solids model and the data on which it is based support the inference that potentially lower-recovery material, or material with the potential for having acid producing qualities, are properly represented.

14.3.6.4 Organic Carbon Model

An organic carbon ("CORG") block model was produced so that its potential effects on gold recovery could be investigated. Gold Standard provided LECO analyses of carbon and sulfur species for samples that varied between those on original core intervals (1 ft to 6 ft) to RC sample composites (10 ft to 35 ft). Assayed CORG values were used, or the values that were calculated from assayed inorganic carbon and total carbon. In the data received from Gold Standard, below-detection limit values were substituted for assays below detection. When CORG was directly assayed, MDA modified the below-detection assays per Stantec guidance, so that carbon species assays were equal to one-half the below-detection value. However, when CORG was calculated, no detection limit was assumed, and the resulting values were not modified unless negative values were produced (inorganic carbon calculated from CO_2% > total carbon), in which case values of '0' were entered.

The authors evaluated CORG statistics by rock unit, refractory zone and barium zone (Table 14-36). The statistics in the tables are summarized according to categories chosen for estimation into the block model.

Table 14-36: Number of Samples and Mean Organic Carbon Values for Pinion Estimation Categories
(by rock unit, barium domain, and zones inside [refractory] or outside [oxide and transitional] refractory solids)

Estimation Category	Multi-lithic Breccia	
	# of Samples	Mean Value (%)
Low-Grade Barium, and Outside Barium Domains, Oxide and Transitional	2,090	0.309
High-Grade Barium, Oxide and Transitional	131	0.126
Estimation Category	**Sentinel Mountain Dolomite and Devil's Gate Limestone**	
	# of Samples	**Mean Value (%)**
All Data	1,284	0.653
Estimation Category	**Chainman and Webb Formations**	
	# of Samples	**Mean Value (%)**
Low-Grade Barium, and Outside Barium Domains, Oxide and Transitional	2,991	0.292
Low-Grade Barium, and Outside Barium Domains, Refractory	1,445	0.601
Estimation Category	**Tripon Pass Formation**	
	# of Samples	**Mean Value (%)**
Low-Grade Barium, and Outside Barium Domains, Oxide and Transitional	876	0.631
Low-Grade Barium, and Outside Barium Domains, Refractory	730	0.930

Categories represented by only a small number of samples were evaluated on-screen with respect to location and volume of material to be estimated. If the volume in the block model to be estimated could be reasonably estimated without projecting CORG grades over extreme distances, they were estimated and are represented in Table 14-36. However, if unreasonable distances were required to estimate grades into model blocks, then values were assigned to those blocks rather than estimated. The assigned values (Table 14-38) were determined based on relationships between mean CORG values for categories that are well represented by data.

Table 14-37: Assigned Organic Carbon Values for Pinion Estimation Categories
(by formation, barium domain and zones inside [refractory] or outside [oxide and transitional] refractory solids)

Assigned CORG			
Formation	**Barium Domain**	**Refractory Zone**	**Assigned Value**
Multi-lithic Breccia	Low-Grade and Outside Domains	Refractory	0.55
Multi-lithic Breccia	High-Grade	Refractory	0.22
Chainman and Webb Formations	High-Grade	Oxide and Transitional	0.10
Chainman and Webb Formations	High-Grade	Refractory	0.18
Tripon Pass Formation	High-Grade	Oxide and Transitional	0.15
Tripon Pass Formation	High-Grade	Refractory	0.30

The strongest correlation apparent in CORG statistics is an inverse relationship between rock unit, and refractory zone (in/out of modeled solids) and barium domain. Silica zone (in/out of modeled solids) also varies systematically in a similar manner to barium domains relative to rock unit, but not as strongly. The inverse correlations, with lower mean CORG values in more altered and oxidized rocks, are indicative of increasing baritization, silicification, and decarbonatization. Primary organic carbon associated with clastic and micritic units is essentially flushed out of the sedimentary rocks by mineralizing hydrothermal fluids and re-deposited elsewhere. In all samples, CORG values outside high-grade barium domains are triple the amount that occurs within. Similarly, mean CORG values are nearly double inside the refractory solids versus outside (oxidized). Primary controls applied to estimation for the multi-lithic breccia, the Webb Formation and Chainman formation are a combination of barium domain and refractory zone. No systematic differences were observed in CORG values for the Sentinel Mountain Dolomite or Devil's Gate Limestone, so both were estimated together using all respective contained data.

CORG contents were estimated into the Pinion block model, according to the categories described above. CPPs were evaluated by category for potential capping of assays. Only two were warranted (Table 14-38). Half the sample composites are ~3 ft in length, however, about one-quarter of the lengths are 30 ft. Given the large number of 30-ft sample lengths and the model block dimension of 30 ft^3, assay sample data were composited to 30 ft.

Table 14-38: Organic Carbon Capping Values for Pinion Estimation Categories
(by formation, barium domain, and zones inside [refractory] or outside [oxide and transitional] refractory solids)

Capped CORG			
Formation	**Barium Domain**	**Refractory Zone**	**Capping Value (%)**
Sentinel Mountain Dolomite and Devil's Gate Limestone	All	All	3.50
Webb and Chainman Formations	Low-Grade and Outside	Refractory	3.00

All estimates were done using the same search orientations and associated estimation areas as were applied to the gold and silver estimates (Table 14-22). The maximum search distance applied to most estimates for CORG was 980 ft. The maximum distance for a few runs were extended by up to 420 ft on a limited basis to fill in a small number of un-estimated blocks. Search ellipses were strongly anisotropic, with most major, minor, and vertical search distances at 980 ft, 980 ft, and 245 ft, respectively, and ID^2 methodology was used. Due to the relatively long composite length, the maximum number of composites, and maximum composites per hole allowed to estimate a block were limited to five and two, respectively. No search restrictions were applied to CORG, except for one in the Sentinel Mountain Dolomite/Devil's Gate Limestone (restricted >2.9% CORG within 250 ft, regardless of barium domain or refractory zone).

The LECO assays are relatively well-distributed within the deposit in potentially mineable pits at lower gold prices, but there are localized areas that lack data. Also, significant areas of pits at higher gold prices contain no LECO data. Estimated grades of CORG in these areas can be relatively far from assayed samples. To flag model blocks that are at relatively greater distances from assayed samples, Mr. Lindholm assigned a confidence code of '0' to all estimated blocks with closest composite more distant than 425 ft.

14.3.7 Pinion Acid-Base Accounting Model and Estimation

An ABA block model was produced to characterize the acid-generating or neutralizing potential of mined waste material. MDA estimated CINO and SSUL into the ABA block model, and designated model blocks as either PAG or NAG. All ABA calculations and PAG/NAG designation criteria were provided by Stantec.

Gold Standard provided LECO analyses of carbon and sulfur species. The analyses were done on samples that varied from 1 ft to 6 ft for original core intervals, and for RC sample composites from 10 ft to 35 ft.

The authors evaluated the CINO and SSUL statistics by rock unit, barium domain and in/out of the refractory solids (Table 14-39 and Table 14-40). The statistics in the tables are summarized according to categories chosen for estimation. Because relationships between silica and barium contents relative to CINO and SSUL are similar, subsequent discussions regarding statistics and estimates in terms of barium domain also apply to the silica zones.

Table 14-39: Number of Samples and Mean Inorganic Carbon Values for Pinion Estimation Categories
(by rock unit, barium domain, and zones inside [refractory] or outside [oxide and transitional] refractory solids)

Estimation Category	Multi-lithic Breccia	
	# of Samples	Mean Value (%)
Low-Grade Barium, and Outside Barium Domains, Oxide and Transitional	2,090	2.242
High-Grade Barium, Oxide and Transitional	130	0.389
Estimation Category	**Sentinel Mountain Dolomite and Devil's Gate Limestone**	
	# of Samples	**Mean Value (%)**
Low-Grade Barium, and Outside Barium Domains	1,275	8.601
Estimation Category	**Chainman and Webb Formations**	
	# of Samples	**Mean Value (%)**
Low-Grade Barium, and Outside Barium Domains, Oxide and Transitional	2,990	0.672
Low-Grade Barium, and Outside Barium Domains, Refractory	1,445	1.084
Estimation Category	**Tripon Pass Formation**	
	# of Samples	**Mean Value (%)**
Low-Grade Barium, and Outside Barium Domains	1,606	4.317

Table 14-40: Number of Samples and Mean Sulfide Sulfur Values for Pinion Estimation Categories
(by rock unit, barium domain, and zones inside [refractory] or outside [oxide and transitional] refractory solids)

Estimation Category	Multi-lithic Breccia	
	# of Samples	Mean Value (%)
Oxide and Transitional	2,214	0.041
Estimation Category	**Sentinel Mountain Dolomite and Devil's Gate Limestone**	
	# of Samples	**Mean Value (%)**
All Data	1,284	0.033
Estimation Category	**Webb Formation**	
	# of Samples	**Mean Value (%)**
Oxide and Transitional, Outside Barium Domains	545	0.048
Oxide and Transitional, Low- and High-Grade Barium Domains	12	0.015
Refractory, Outside Barium Domains	573	0.200
Refractory, Low- and High-Grade Barium Domains	19	1.211
Estimation Category	**Chainman Formation**	
	# of Samples	**Mean Value (%)**
Oxide and Transitional, Outside Barium Domains	2,405	0.087
Oxide and Transitional, Low- and High-Grade Barium Domains	27	0.677
Refractory, Outside Barium Domains	844	0.334
Refractory, Low- and High-Grade Barium Domains	9	0.384
Estimation Category	**Tripon Pass Formation**	
	# of Samples	**Mean Value (%)**
Oxide and Transitional, Outside Barium Domains	690	0.048
Oxide and Transitional, Low- and High-Grade Barium Domains	183	0.068
Refractory, Outside Barium Domains	612	0.203
Refractory, Low- and High-Grade Barium Domains	115	0.259

Categories represented by only a small number of samples were evaluated on-screen with respect to location and volume of material to be estimated. If the volume in the block model to be estimated could be reasonably estimated without projecting CINO and SSUL grades over extreme distances, they were estimated and are represented in Table 14-39 and Table 14-40. However, if unreasonable distances were required to estimate grades into model blocks, then values were assigned to those blocks rather than estimated. The assigned values (Table 14-41) were determined based on relationships between mean CINO and SSUL values for categories that are well represented by data.

Table 14-41: Assigned Inorganic Carbon and Sulfide Sulfur Values for Pinion Estimation Categories
(by formation, barium domain and zones inside [refractory] or outside [oxide and transitional] refractory solids)

Assigned CINO			
Formation	**Barium Domain**	**Refractory Zone**	**Assigned Value**
Sentinel Mountain Dolomite and Devil's Gate Limestone	Low-Grade	All	7.46
Sentinel Mountain Dolomite and Devil's Gate Limestone	High-Grade	All	3.57
Sentinel Mountain Dolomite and Devil's Gate Limestone	Outside Domains	All	8.97
Chainman and Webb Formations	Low-Grade	All	0.52
Chainman and Webb Formations	High-Grade	All	0.16
Chainman and Webb Formations	Outside Domains	All	0.81

Assigned SSUL			
Formation	**Barium Domain**	**Refractory Zone**	**Assigned Value**
Multi-lithic Breccia	Low-Grade and Outside Domains	Refractory	0.17
Multi-lithic Breccia	High-Grade	Refractory	0.39
Sentinel Mountain Dolomite and Devil's Gate Limestone	Low-Grade	All	0.02
Sentinel Mountain Dolomite and Devil's Gate Limestone	Outside Domains	All	0.04
Webb Formation	All	Oxide and Transitional	0.05
Webb Formation	All	Refractory	0.23
Chainman Formation	All	Oxide and Transitional	0.09
Chainman Formation	All	Refractory	0.34
Tripon Pass Formation	All	Oxide and Transitional	0.05
Tripon Pass Formation	All	Refractory	0.21

CINO statistics varied inversely and systematically by rock unit in combination with barium domain and silica zone (in/out of modeled solids). The inverse correlation is indicative of increasingly altered and mineralized rocks due to baritization, silicification, and decarbonatization. CINO values in the multi-lithic breccia and Webb and Chainman formations differ in each barium domain. In low-grade barium and outside the barium domains, CINO also varies by refractory zone (in/out of modeled solids). CINO contents in low-grade barium domains and outside modeled barium domains behave similarly compared to high-grade barium domains in the Sentinel Mountain Dolomite, Devil's Gate Limestone, and Tripon Pass Formation, and there is no distinction by refractory zone. SSUL statistics show strong relationships by refractory zone within the multi-lithic breccia. In the Webb, Chainman, and Tripon Pass Formations, SSUL varies by both refractory zone and barium domain. Statistics for SSUL in low- and high-grade barium domains are similar compared to outside barium domains in these units. No systematic differences were observed in SSUL values for the Sentinel Mountain Dolomite or Devil's Gate Limestone, so both were estimated together using all respective contained data.

CINO and SSUL contents were estimated independently into the ABA block model, according to the categories described above. CPPs for each species estimated were evaluated by category for potential capping of assays. Only one was warranted for CINO, and several caps were applied to the SSUL data (Table 14-42). Half the sample composites are ~3 ft in length. However, about one-quarter of the lengths are 30 ft. Given the model block dimension of 30 ft^3, assay sample data were composited to 30 ft.

Table 14-42: Inorganic Carbon and Sulfide Sulfur Capping Values for Pinion Estimation Categories
(by formation, barium domain, and zones inside [refractory] or outside [oxide and transitional] refractory solids)

Capped CINO			
Formation	**Barium Domain**	**Refractory Zone**	**Capping Value (%)**
Multi-lithic Breccia	High Grade	Oxide and Transitional	4.00

Capped SSUL			
Formation	**Barium Domain**	**Refractory Zone**	**Capping Value (%)**
Webb Formation	Outside Domains	Oxide and Transitional	0.70
Chainman Formation	Outside Domains	Oxide and Transitional	4.00
Tripon Pass Formation	Outside Domains	Oxide and Transitional	0.90

All estimates were done using the same search orientations and associated estimation areas as were applied to the gold and silver estimates (Table 14-22). The maximum search distance applied to most estimates for both CINO and SSUL was 980 ft. The maximum distance for a few runs were extended by up to 420 ft on a limited basis to fill in a small number of un-estimated blocks. Search ellipses were strongly anisotropic, with most major, minor, and vertical search distances at 980 ft, 980 ft, and 245 ft, respectively, and ID^2 methodology was used. Due to the relatively long composite length, the maximum number of composites, and maximum composites per hole allowed to estimate a block were limited to five and two, respectively.

No search restrictions were applied to CINO, except for one in the high-grade barium domain of oxidized and transitional multi-lithic breccia (restricted >2.0% CINO within 500 ft). Two were applied to SSUL estimates in oxidized and transitional material outside barium domains, one in the Webb Formation (restricted >0.7% SSUL within 500 ft) and another in the Chainman Formation (restricted >1.1% SSUL within 500 ft).

Correlograms were generated to evaluate continuities in the data with respect to distance. These demonstrated reasonable continuity for CINO at ranges up to 1,210 ft in low-grade and outside the barium domains. There was not enough data to build meaningful correlograms in the high-grade barium domain.

Correlograms of SSUL data indicate continuity to a maximum of 330 ft, depending on refractory zone. As noted above, the maximum search distance applied to most estimates for CINO and SSUL was 980 ft. The maximum distance for estimation applied to SSUL was the same as applied to CINO. The relatively short continuity indicated by correlograms might preclude the application of longer search distances, but PAG/NAG designation is dependent on the estimated grades of both CINO and SSUL, and a significant portion of blocks would not be characterized as PAG or NAG. So, although there is lower confidence in the SSUL estimated values beyond distances of 330 ft, most blocks within potential open pits can be designated as PAG or NAG. This added risk was recorded as a block attribute.

The LECO assays are relatively well-distributed within the deposit in potentially mineable pits at lower gold prices, but there are localized areas that lack data. Also, significant areas of pits at higher gold prices contain no LECO data. Estimated grades of CINO and SSUL in these areas can be relatively far from assayed samples. To flag model blocks that are at relatively greater distances from assayed samples, Mr. Lindholm assigned a confidence code of '0' to all estimated blocks with closest composite more distant than 425 ft. This confidence code compensates for the shorter continuities demonstrated in correlograms for SSUL. Because CINO and SSUL were estimated according to different criteria, these codes were assigned separately for each, and a combined code was assigned if either CINO or SSUL confidence codes was '0'.

Like Dark Star, model blocks were designated as PAG (code of '1') or NAG (code of '2') according to criteria as defined by Stantec. First, ANP, AGP, and NNP values were calculated from estimated CINO and SSUL values. Next, a PAG/NAG designation was assigned according to criteria for four potential waste characterization scenarios, as shown in Table 14-15 located in Dark Star Section 14.2.6.

14.3.8 Pinion Clay Model and Estimation

Gold Standard requested a clay model to determine the relative quantity of clay material that will be encountered and potentially affect crushing and grinding. A source of under-liner material for leach pads and waste dumps was also sought. According to Gold Standard geologists, clay alteration or weathering at Pinion is found in in structural zones in the multi-lithic breccia but is limited in abundance and extent.

The only comprehensive clay data is subjective logging in drill holes on a scale from 0 (no clay) to 3 (strong clay alteration). Mr. Lindholm evaluated logged clay values statistically with respect to formation, gold and barium domains, silicification and redox. Based on the statistical analysis, clay was estimated in the following order:

1. In high-grade barite domains,
2. In the silicification solid outside high-grade barium domains, and
3. The remainder by formation.

Because the logged clay data is subjective and the scale of the logging is broadly qualitative, the estimate is a very generalized representation of the clay content in the deposit. The values in the block model (0.00 to 3.00) provide a rough, imprecise estimation of the strength of clay alteration in a given area. The maximum search distance was limited to 150 ft, and un-estimated blocks were left as blank values.

14.3.9 Pinion Density

All densities were measured using the immersion method by an independent laboratory. There are 654 density-sample measurements in the Pinion database within assayed intervals. Application of density values to the Pinion block model was dependent on numerous supporting modeled (formation/rock unit and silicification zone in/out of solids) and estimated (barium grade) criteria that have been discussed in various prior sections. The mean density values, and the values assigned to the units in the model, are summarized in Table 14-43.

Table 14-43: Density Values Applied to the Pinion Block Models

Formation	Barium Domain	Silicification Zone	Number of Samples	Density (g/cm^3)	Tonnage Factor
Multi-lithic breccia	Outside	Outside	11	2.55	12.57
Multi-lithic breccia	Low barite	Any	137	2.59	12.38
Multi-lithic breccia	Low and high barium*	Any		2.79	11.49
Multi-lithic breccia	High barium	Any	26	2.99	10.72
Multi-lithic breccia	Outside	High silica	15	2.54	12.62
Sentinel Mountain Dolomite	Any	Any	35	2.63	12.19
Devils Gate Limestone	Outside	Outside	82	2.62	12.23
Devils Gate Limestone	Low barium	Any	50	2.61	12.28

Devils Gate Limestone	Low and high barium*	Any		2.81	11.42
Devils Gate Limestone	High barium	Any	1	3.00	10.68
Devils Gate Limestone	Outside	High silica	2	2.72	11.76
Webb Fm	Outside	Outside	57	2.46	13.03
Webb Fm	Low barium	Any	2	2.53	12.65
Webb Fm	Low- and high-barium*	Any		2.72	11.77
Webb Fm	High barium	Any	None	2.91	11.00
Webb Fm	Outside	High silica	None	2.56	12.53
Chainman Fm	Outside	Outside	113	2.46	13.03
Chainman Fm	Low barium	Any	6	2.49	12.87
Chainman Fm	Low and high barium*	Any		2.68	11.97
Chainman Fm	High barium	Any	None	2.86	11.19
Chainman Fm	Outside	High silica	None	2.56	12.53
Tripon Pass Fm	Outside	Outside	74	2.48	12.92
Tripon Pass Fm	Low barium	Any	38	2.54	12.62
Tripon Pass Fm	Low and high barium*	Any		2.73	11.74
Tripon Pass Fm	High barium	Any	None	2.92	10.97
Tripon Pass Fm	Outside	High silica	5	2.58	12.43
* Both barium domains present in same block					
Tonnage Factor = 2000 / (Density * 62.4)					

When the samples are parsed out by formation/rock unit, silicification zone and barite domains, the geologic features that most affect density, there are a reasonable number (in the tens) of samples representing each category with a few exceptions. The multi-lithic breccia, the primary host of gold at Pinion, is the best-represented unit with 189 density samples. For most combinations of formation, silicification domain and barite domain, there are least 15 density samples. Two categories, multi-lithic breccia outside barite domains and silicification solids, and Chainman Formation in the low-grade barium domain, are represented by the average of only 11 and six density measurements, respectively. Where five or fewer density samples were measured for a given category, the density values were evaluated and assigned using relationships of data from units with similar geological characteristics that are based on more density measurements.

14.3.10 Discussion of Pinion Estimated Mineral Resources and Supporting Models

Pinion has a long history of exploration drilling dating back to 1981 and there are many drill holes of varying quality and reliability. Consequently, the estimators spent much time auditing, evaluating QA/QC information and sample integrity, and comparing drill campaigns through explicit modeling of domains. Overall, drilling results produced by the twelve historical operators tend to be consistent and are generally corroborated by subsequent Gold Standard drilling. The consistency between drilling campaigns adds confidence to the project assay data. However, many of the TCX holes drilled by Amoco in 1981 were eliminated from use in estimation because assay results conflicted with surrounding data.

None of the historical drilling has supporting QA/QC information and not all have supporting assay certificates. This lower-confidence data set was taken into account by downgrading classification of blocks that were entirely dependent on the historical data. However, the downgrade was not severe because all historical data was mutually supportive, except for the 1981 Amoco drilling.

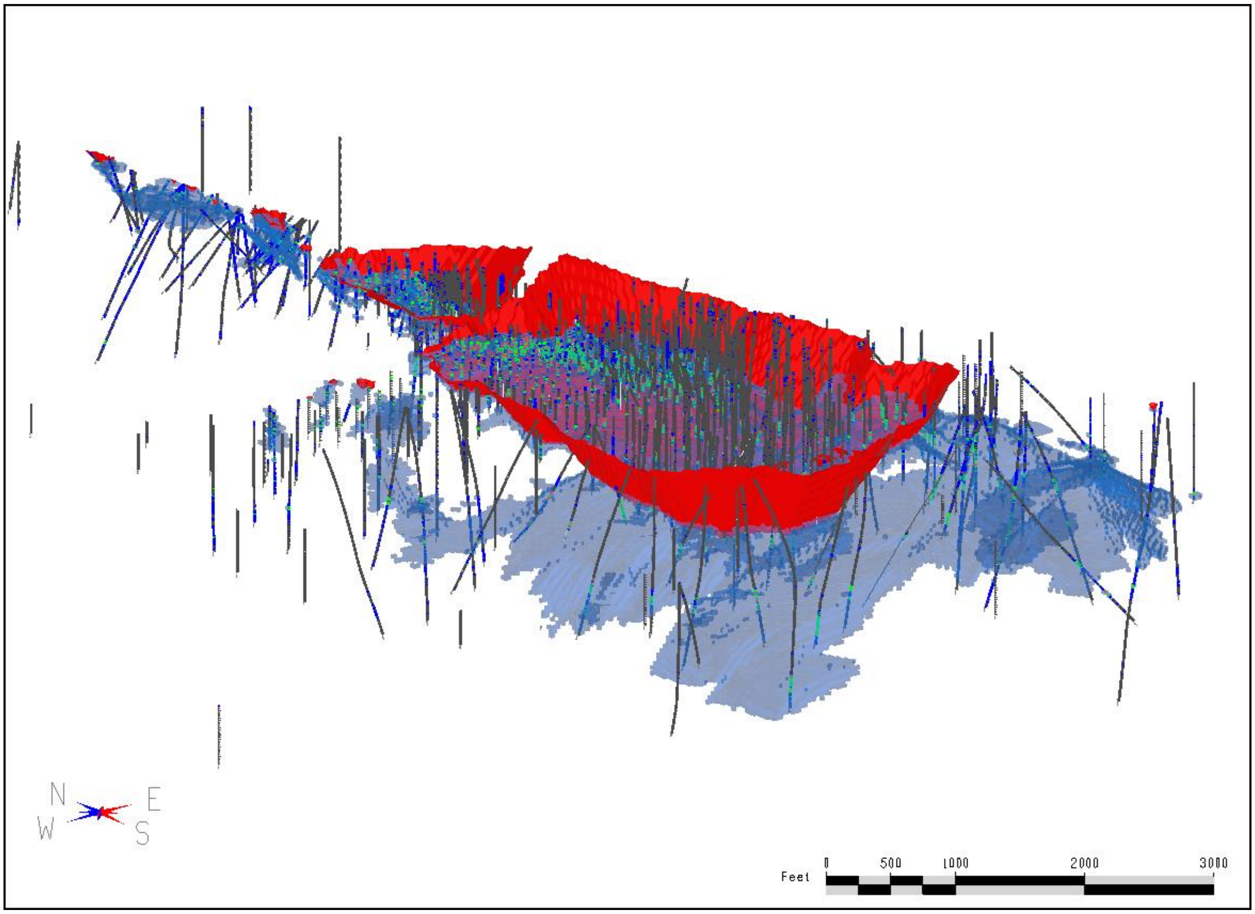
Some contamination was noted by both MDA and Gold Standard, and suspect samples were eliminated from estimation. Below the main mineralized multi-lithic breccia body, there are many low-grade samples that could also represent contamination or could be steeply-dipping extensions of grade along fracture zones below the deposit. The evidence for contamination was not deemed to be definitive, so these samples were used in modeling and used in estimation. However, these blocks were classified as Inferred.

Since the May 2019 effective date of the database for Pinion used in the 2020 PFS of Ibrado et al. (2020), 128 additional holes were drilled or added to the database and have been incorporated into the current resource model. Gold, silver and barium domains were updated with the newer information. Overall, the new holes added to the veracity of the 2019 gold domain model, and the lack of significant changes to the 2019 resource estimate where drilling was already dense adds to the level of confidence in the block model. Classification of material in the model was elevated to Indicated and Measured with the delineation drilling to the south. The addition of more reliable Gold Standard holes in these areas where historical drilling was predominant also helped increase classification.

Another 31 holes have been drilled since the effective date of the current database. Mr. Lindholm evaluated the potential changes these holes would cause to the gold, silver and barium domains. All but eight of the holes are either located outside the modeled domains, are monitor or water wells with no assays, or were infill or twin holes that would cause only localized, incremental changes to domains. Three were infill holes in areas with earlier, wide-spaced drilling that generally confirm current modeling, but would locally widen, narrow, and/or change the vertical location of domains. There are five step-out holes to the south and southeast well outside or below the current optimized pit limits. These could extend, widen and/or increase the grade of current resources, but would be unlikely to cause the pit dimensions to increase without further delineation drilling.

The Au_{CN}/Au_{FA} ratios were calculated using cyanide-shaker test assays, which lack QA/QC samples, and were relatively few in number compared to standard fire assay data. The cyanide-soluble gold estimate is likely reasonable in a global sense. However, the ability to predict Au_{CN}/Au_{FA} ratios locally is improbable. The Au_{CN}/Au_{FA} ratio block model is therefore lower in confidence than the gold and silver block models.

In addition to the mineral resources reported herein, there is mineralization that continues beyond, and is contiguous with the reported mineral resources. The reported mineral resource estimate is pit-constrained and consequently there is estimated mineralization outside the pit that is unreported. The unreported mineralization is shown graphically in Figure 14-21.



(gray lines are drill holes; blue solid is the 0.004 oz Au/ton grade shell; red is the $1750 optimized pit shell)

Figure 14-21: Pinion Optimized Pit and Additional Mineralization

Where silver was modeled, the ratio of silver grade to gold grade is around 7:1.

The Pinion deposit has clustered drill data, which can represent risk to the estimate. The clustered data lies within the open-pit limits where the highest-grade gold mineralization is present and mining will potentially take place. Inverse-distance and kriged estimation will have a tendency to project the clustered-sample distances into areas with lower sample densities. To reduce the effects of this data clustering, the inverse-distance power was increased to three and four for the low- and high-grade gold estimates, respectively. Still, the possibility remains that the estimated grades in areas of lower sample density, which were classified as Inferred, will be slightly lower in reality than what is presented herein.

For all classified material, MDA's mineral resource tons at 0.005 oz Au/ton were larger by ~21%, gold grade was lower by ~1%, and total gold ounces were higher by ~19% compared to the 2019 Pinion mineral resource estimate reported in the PFS update (Ibrado et al, 2020). The increase in tons and ounces is attributed to the new infill, delineation and step-out drilling conducted at the south end of the deposit since the 2020 PFS. Also, the gold price of the reported optimized pit was increased from $1,500 to the currently reported $1,750. There were small differences in the gold model and estimate resulting from the conversion from metric to Imperial units. For example, the block dimensions were increased slightly from 9 m x 9 m x 9 m to 30 ft x 30 ft x 30 ft. Additional dilution, albeit only a small amount, would be expected with the larger block sizes. MDA performed a bench-height study on composite data to evaluate the potential changes to the mineral resources attributed to the additional dilution with the changed bench height, and showed that, for resources above a 0.006 oz Au/ton cutoff, the gold grade would decrease by about 2% and tons would increase by about 6%. Also, there are incremental differences in the section and level plan locations causing changes to the modeled gold domains, and consequently to the gold resources. However, these differences due to conversion to Imperial units are insignificant compared to the increases in the resource resulting from expansion of the resources to the south.

There is the possibility of additional risk that has resulted from the conversion from metric to Imperial units of drill-hole collar coordinates. Gold Standard holes were surveyed in metric units, so the direct conversion of northings and eastings using a factor of 1 m = 3.280833333 ft maintained the spatial relationship between these drill-hole data and associated geology modeling, domains and block model, which were also converted using identical values. However, it is believed that some historical drill collars were originally surveyed in feet and later converted to metric. Comparisons of metric and Imperial coordinates in the collar tables received from Gold Standard indicate conversion factors were inconsistently applied. Because values of northings and eastings are so large, discrepancies up to 150 ft can result by application of conversion factors that differ in the fifth decimal place. The risks associated with such potential discrepancies have been accounted for in the reduced classification of mineral resources in areas relying predominantly on historical data.

14.4 JASPEROID WASH MINERAL RESOURCES

The Jasperoid Wash mineral resource estimate was completed on November 15, 2018, which is the effective date of the current mineral resources. The Jasperoid Wash mineral resource estimate is based on drilling through September 6, 2018. However, a minor number of drill holes were updated with new collar surveys and geology as late as October 6, 2018, which makes it effective date for the Jasperoid Wash database.

A total of 31 additional drill holes (24,816 ft) were drilled at Jasperoid Wash after the effective date of the mineral resource estimate. Three were core holes for 2,596 ft, and the remainder were RC for 22,220 ft. No auditing or QA/QC evaluations were done on this data set. Data for these holes were received in late 2018 and 2020 and evaluated for potential impacts on the reported mineral resource estimate; the results of the evaluation are described in Section 14.4.8. Although the gold estimate was completed as of November 15, 2018, the effective date of the Jasperoid Wash mineral resource estimate is January 31, 2022 when new optimized pit shells using more current mining costs were generated. Gold resources, as well as the Au_{CN}/Au_{FA} ratio model, are reported herein.

References to Tomera Formation equivalent stratigraphy have been noted historically. However, recent work suggests these units in the Railroad-Pinion property may not be of equivalent age, so all usage of Tomera Formation equivalent in this Technical Report refer to units that are Pennsylvanian-Permian undifferentiated.

Following the Pre-Feasibility study of Ibrado et al. (2020), Gold Standard made a decision to convert all project data from metric to Imperial units. MDA converted all length data, including collar northings and eastings, from meters to feet (1 m = 3.280833333 ft), and assay grades from g/tonne to oz/ton (1 oz/ton = 34.285714 g/tonne). Section plane spacing, block model block sizes, and other modeling dimensions were changed. Specifics and ramifications of the conversions are discussed in various sections below.

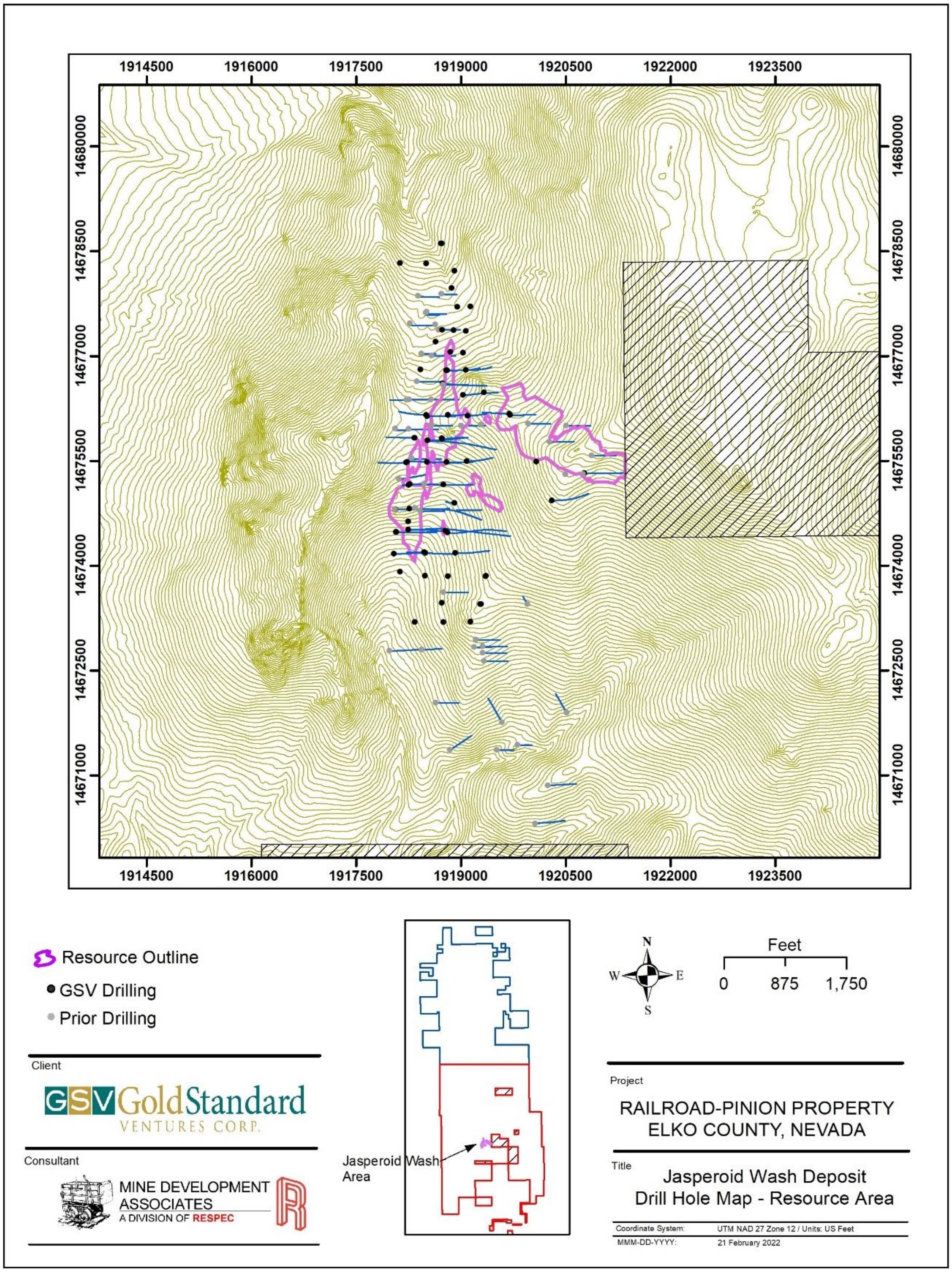
14.4.1 Jasperoid Wash Database

Since 1989, three companies have conducted exploration drilling at Jasperoid Wash. Gold Standard began drilling in 2017. In all, 91 RC holes (92% of footage) and 6 core holes (8% of footage) totaling 57,107.5 ft have been drilled (see Table 14.44 and Figure 14-22). There are no historical QA/QC data for the historical holes, which currently represent 46% (22,346.5 ft) of the holes in the mineral resource database.

Descriptive statistics of all Jasperoid Wash drill-hole analytical data audited and imported into MineSight by MDA are summarized in Table 14.44. There are no density measurements at Jasperoid Wash. Because there are so few core holes, core recovery and RQD data were not imported.

Table 14.44: Summary of Drilling at Jasperoid Wash

Company	Type	Number	Total Feet
Cameco	RC	7	4,035
	Total	*7*	*4,035*
Westmont	Core	3	966.5
	RC	47	21,345
	Total	*50*	*22,311.5*
Gold Standard	Core	3	3,511
	RC	37	27,250
	Total	*40*	*30,761*
Total	Core	6	4,477.5
	RC	91	52,630
Grand Total		**97**	**57,107.5**



Note: hachured area shows third-party inlier claims not controlled by Gold Standard.

Figure 14.22: Jasperoid Wash Deposit Drill-hole Map and Mineral Resource Outline

Table 14-45: Descriptive Statistics of Sample Assays in Jasperoid Wash Mineral Resource Database

	Valid	Median	Mean	Std Dev	CV	Minimum	Maximum	Units
From	10,510					0.0	1930.0	ft
To	10,510					5	1935.0	ft
Length	10,510	5.0	5.4			0.5	49.5	ft
TYPE	10,508					1	2	
AU	10,147	0.0013	0.0029	0.0052	1.7741	0.0001	0.0841	oz Au/ton
Au_{CN}	1,498	0.0038	0.0057	0.0070	1.2432	0.0004	0.0817	oz Au/ton
Au_{CN}/Au_{FA} ratio	1,497	74.0	63.5	30.6	0.5	1.0	110.0	%

The Jasperoid Wash database contains 10,147 gold assay records (Table 14-45). No explicit determination of sample reliability was made because Inferred mineral resources are reported, and there was no indication of serious issues regarding sample reliability. However, three holes have long intercepts of mineralization that are anomalous relative to adjacent holes. These samples were used in the mineral resource estimate, but evaluation of these assays and/or additional drilling should be done to ensure that the results are reliable. However, if the assays prove to be unreliable, the impact on the mineral resource estimate would be small.

Gold Standard's drill-hole collar locations, downhole survey data, and gold analyses were verified as described in Section 12. There are few supporting certificates for historical drilling. The database contains logged geology, including rock types, formations, faults, vein type, silicification, clay, dolomite, barite, limonite, hematite, carbonate, sulfide percent, and percent reduced, all of which were imported. The logged geology was reviewed and used in modeling but was not audited.

14.4.2 Jasperoid Wash Geologic Model

Gold Standard provided digital geologic interpretations as surfaces and 3D solids for faults, formation contacts, alteration and shapes defining areas of high Au_{CN}/Au_{FA} ratios. All geologic surfaces were interpreted on east-west cross-sections by use of surface maps and downhole drill data. The authors reviewed all sections and models provided by Gold Standard, and when problematic areas were encountered, the authors worked with Gold Standard geologists to produce a coherent, mutually acceptable geologic model.

The authors combined appropriate upper and lower geologic rock unit surfaces, fault surfaces, and intrusive cross-sectional interpretations to produce 3D geologic solids for coding the block model. Coded rock units include: the Mississippian Tonka Formation (a conglomerate), the Pennsylvanian-Permian undifferentiated units (from oldest to youngest - lower conglomerate, lower siltstone, middle conglomerate, and upper siltstone), and Tertiary intrusive bodies. The middle conglomerate of the undifferentiated Pennsylvanian-Permian units, which may correlate with units at Dark Star that are possibly Tomera Formation age equivalent rocks, is the primary host for mineralization. The Tertiary conglomerates and Elko Formation are recognized as secondary hosts, and the lower siltstone contains some less extensive gold mineralization. Limited mineralization is found in the lower conglomerate, and additional mineralization can be encountered within the intrusive bodies. MDA determined that Quaternary colluvium exists in insufficient quantities to impact mining and mineral resources, so it was not modeled. All geologic interpretations, in combination with assays and logged data, were used to guide metal domain modeling, to estimate cyanide solubility into the model, and to define clay zones.

14.4.3 Jasperoid Wash Gold Domains and Estimation

14.4.3.1 Gold Domain Model

Gold domains based on sample assay ranges were interpreted on sections spaced 98.5 ft apart, oriented east-west and looking north. The section spacing was originally 30 m. Domains were defined based on population breaks on the CPP for all gold data (Figure 14-23). The domain grade ranges were originally determined using assay data in g Au/t and converted to oz Au/ton. The CPP was remade to reflect Imperial units, however, some of the grade breaks apparent on the metric chart were not as readily apparent on the Imperial chart. The lower limit of the outer shell gold domains does not plot well on the CPP because the level of precision of the statistical package used is only three decimal places. Grade ranges converted from those originally determined in metric units were retained and used for modeling gold domains.

The lowest-grade domain limit is at about 0.0015 oz Au/ton, but its definition is unclear because of the high and variable gold-assay detection limits. A second domain was needed to control the higher-grade portion of the deposit that was evident in drilling on section. The low-grade/high-grade domain boundary is between ~0.0047 oz Au/ton to 0.0056 oz Au/ton, where a very subtle break occurs in the line on the CPP plot in Figure 14-23. There is also a higher-grade domain above ~0.0438 oz Au/ton, but these samples represent less than one percent of the data and there is no evidence of continuity.

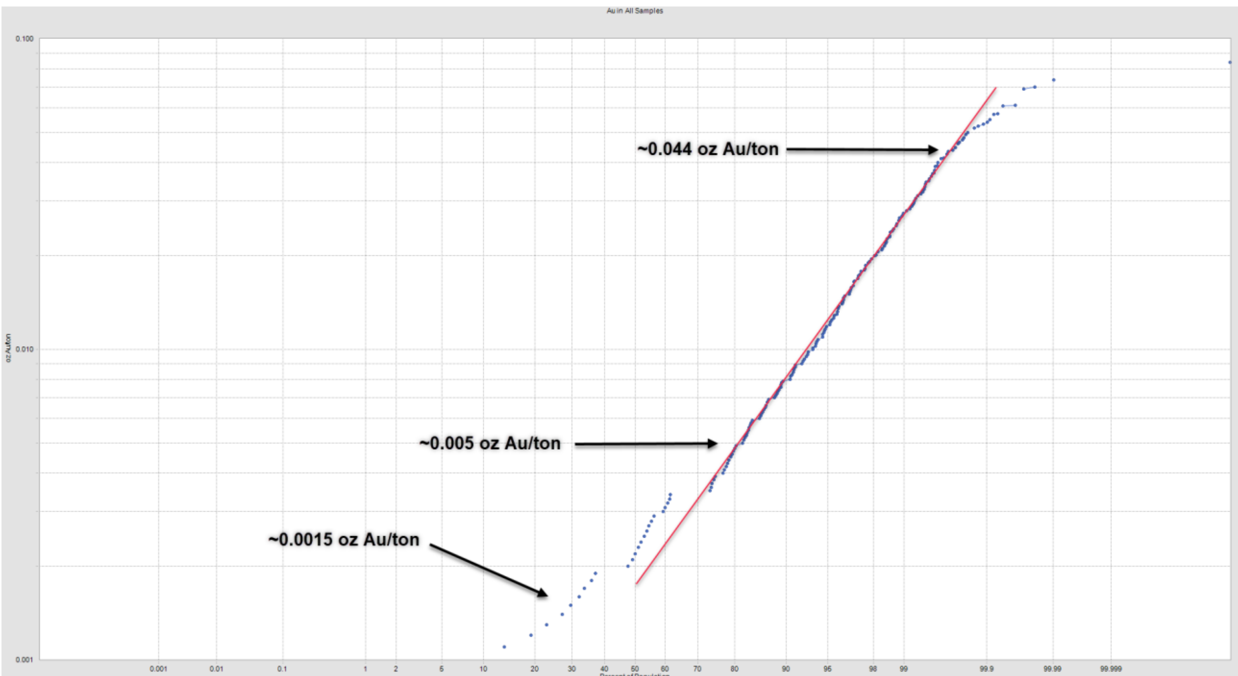


Figure 14-23: Cumulative Probability Plot of Jasperoid Wash Gold Assays

During a site visit in September 2018, Mr. Lindholm reviewed core from JW17-01 and JW18-01. Gold Standard staff geologists provided guidance and expertise with respect to the geology of the deposit and the nature of gold mineralization. As is common with Carlin-type, sedimentary-rock hosted epithermal gold deposits, the relationships between gold mineralization and rock, alteration and/or mineral assemblages can be subtle and inconsistent. However, the following characteristics were commonly observed with respect to gold mineralization:

1. In Carlin-type systems, higher porosity can be attributed to decarbonatization of calcareous sedimentary rocks and coarser-grained sedimentary units. At Jasperoid Wash, the middle conglomerate is typically more decalcified than other units above and below;
2. Gold mineralization is commonly confined between less permeable units, such as in argillized fault gouges or more clastic stratigraphic horizons;
3. Argillized areas often occur adjacent to felsic intrusive bodies and related zones of structural movement or weakness. No visible sulfides were observed in argillized areas; however, a distinct and strong sulfur smell was noted in these zones in JW17-01; and
4. Mineralized areas outside argillic zones are dominated by limonite in fractures and moderate hematization of host rock.

Descriptive statistics of assays by the modeled domains are presented in Table 14-46. No outlier grades in either domain were indicated in the data for Jasperoid Wash.

Table 14-46: Jasperoid Wash Descriptive Statistics by Gold Domain

Low-Grade Gold Domain								
	Valid	Median	Mean	Std. Dev.	CV	Min	Max	Units
From	2,036						1025	ft
To	2,036					5	1029	ft
Length	2,036	5.00	5.06			0.5	49.53	ft
TYPE	2,034					1	2	
AU	2,014	0.0030	0.0033	0.0020	0.6093	0.0001	0.0210	oz Au/ton
Capped Au	2,014	0.0030	0.0033	0.0020	0.6093	0.0001	0.0210	oz Au/ton
Au_{CN}	622	0.0029	0.0029	0.0018	0.6218	0.0004	0.0184	oz Au/ton
Au_{CN}/Au_{FA} ratio	622	70.0	64.1	28.5	0.4	5.0	110.0	%
High-Grade Gold Domain								
	Valid	Median	Mean	Std. Dev.	CV	Min	Max	Units
From	1,359						795	ft
To	1,359					5	800	ft
Length	1,359	5.00	4.95			0.5	24.23	ft
TYPE	1,359					1	2	0
AU	1,352	0.0085	0.0118	0.0096	0.8164	0.0003	0.0841	oz Au/ton
Capped Au	1,352	0.0085	0.0118	0.0096	0.8164	0.0003	0.0841	oz Au/ton
Au_{CN}	788	0.0058	0.0082	0.0088	1.0669	0.0004	0.0817	oz Au/ton
Au_{CN}/Au_{FA} ratio	788	78.0	65.3	31.9	0.5	1.0	110.0	%
Outside Gold Domains								
	Valid	Median	Mean	Std. Dev.	CV	Min	Max	Units
From	7,115					0	1930	ft
To	7,115					5	1935	ft
Length	7,115	5.00	5.63			1	49.5	ft
TYPE	7,115					1	2	
AU	6,781	0.0008	0.0011	0.0016	1.4676	0.0001	0.0450	oz Au/ton

Capped Au	6,781	0.0008	0.0008	0.0007	0.7693	0.0001	0.0018	oz Au/ton
Au_{CN}	88	0.0020	0.0025	0.0036	1.4083	0.0004	0.0318	oz Au/ton
Au_{CN}/Au_{FA} ratio	87	45.0	43.7	26.4	0.6	2.0	103.0	%

Geologic interpretations provided guidance for definition of gold domains. The mineralization in the eastern part of the deposit is stratiform and dips gently to the west. It becomes more steeply dipping to the west where faults down-drop the stratigraphy. This structural corridor, defined by surface mapping, also appears to control the emplacement of Tertiary intrusions. Mineralization is commonly found along the margins and within the intrusive bodies. Gold mineral domains were generally drawn parallel to stratigraphic contacts in the east and parallel to the intrusions to the west. Silver was not modeled. A cross section showing the interpreted gold domains is given in Figure 14-24.

The MT thrust fault bounds the deposit on the west side. The MT thrust fault dips about 60˚ to the west and is sub-parallel to the orientation of intrusive rocks and other faults.

After sectional interpretations were completed, gold domains were snapped to drill holes in three dimensions and sliced to 20 ft spaced mid-bench level plans for modeling. Because there were slight differences in section and level plan locations due to the conversion to Imperial units, modifications to gold domains were required.

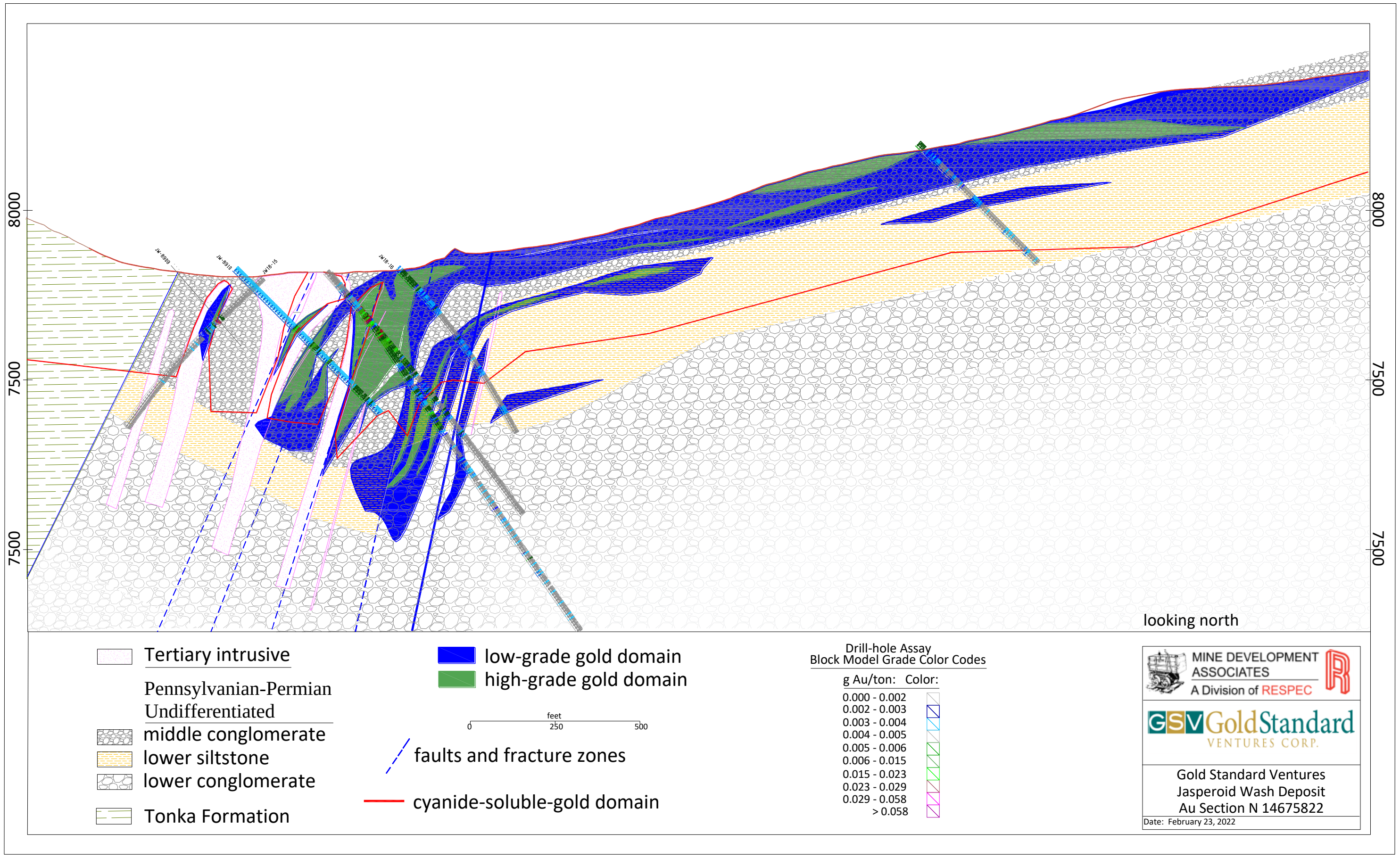


Figure 14-24: Jasperoid Wash Zone Gold Domains and Geology – Section N14675822

14.4.3.2 Gold Composites Statistics and Capping

Jasperoid Wash gold domains were defined and modeled on 98.5 ft spaced cross sections and each domain was used to code drill-hole samples. Cumulative probability plots were made of the coded assays, which were reviewed to determine appropriate capping limits. Capping values were determined for each of the gold domains separately and were determined by assessing the grade above which outliers occur and reviewing the outlier samples on screen with respect to grade and proximity of surrounding samples, geology, general location, and materiality. Assays in the Jasperoid Wash gold domains required no capping, but samples outside of modeled domains were capped to 0.0018 oz Au/ton.

After capping was completed, drill-hole samples were down-hole composited to 10 ft to respect the original 5 ft drilled intervals, which honors domain boundaries. Descriptive statistics were generated for all composites and were considered with respect to capping levels (Table 14.47).

Table 14.47: Descriptive Composite Statistics by Domain for Jasperoid Wash

Low-Grade Gold Domains								
	Valid	**Median**	**Mean**	**Std. Dev.**	**CV**	**Min**	**Max**	**Units**
To	1,106						1029	ft
Length	1,106					0	10	ft
AU	1,071	0.0030	0.0033	0.0016	0.4960	0.0003	0.0170	oz Au/ton
Capped Au	1,071	0.0030	0.0033	0.0016	0.4960	0.0003	0.0170	oz Au/ton
Au_{CN}/Au_{FA} ratio	432	70.0	63.6	28.2	0.4	6.0	110.0	%
High-Grade Gold Domains								
	Valid	**Median**	**Mean**	**Std. Dev.**	**CV**	**Min**	**Max**	**Units**
To	715						800	ft
Length	715					0	10	ft
AU	709	0.0085	0.0116	0.0087	0.7494	0.0017	0.0729	oz Au/ton
Capped Au	709	0.0085	0.0116	0.0087	0.7494	0.0017	0.0729	oz Au/ton
Au_{CN}/Au_{FA} ratio	424	78.0	65.4	30.9	0.5	2.0	107.0	%
Outside Gold Domains								
	Valid	**Median**	**Mean**	**Std. Dev.**	**CV**	**Min**	**Max**	**Units**
To	4,044						1935	ft
Length	4,044					0	10	ft
AU	3,403	0.0008	0.0011	0.0014	1.2787	0.0001	0.0335	oz Au/ton
Capped Au	3,403	0.0008	0.0009	0.0006	0.7265	0.0001	0.0018	oz Au/ton
Au_{CN}/Au_{FA} ratio	71	42.0	42.0	26.3	0.6	2.0	102.0	%

Correlograms were generated from the composited gold grades in order to evaluate grade continuity. Correlogram parameters provided guidance for classification of mineral resources, and were applied to the kriged estimate, which was used as a check on the reported inverse distance estimate. The correlograms for the mineralized domains have a nugget at 30% of the total sill. The first sill is 30% of the total sill with a range of 80 ft to 115 ft depending on directions. The second sill is 40% of the total sill with a range of 100 ft to 260 ft depending on directions.

14.4.3.3 Gold Estimation

The block model is not rotated, and the blocks are 20 ft north-south by 20 ft vertical by 20 ft east-west. The block dimensions are smaller than those for Pinion and Dark Star because the deposit is both smaller and more lenticular. Only gold was estimated and is being reported.

Multiple iterations of four types of estimates were completed: polygonal, nearest neighbor, inverse distance, and kriged with the inverse-distance estimate being reported. The nearest neighbor, inverse distance and kriged estimates were run several times in order to determine the optimum estimation parameters. ID^3 was used for the outside and low-grade domains. ID^2 was used for high-grade domains.

The model was divided into three estimation areas (Figure 14-25) to control search anisotropy, orientation, and distances according to the differing geometries of mineralization in each area. The search orientations for each estimation area and the maximum search distances for gold domains are summarized in Table 14.48. Figure 14-22 shows the spatial relationship of the estimation areas to drilling and gold domains.

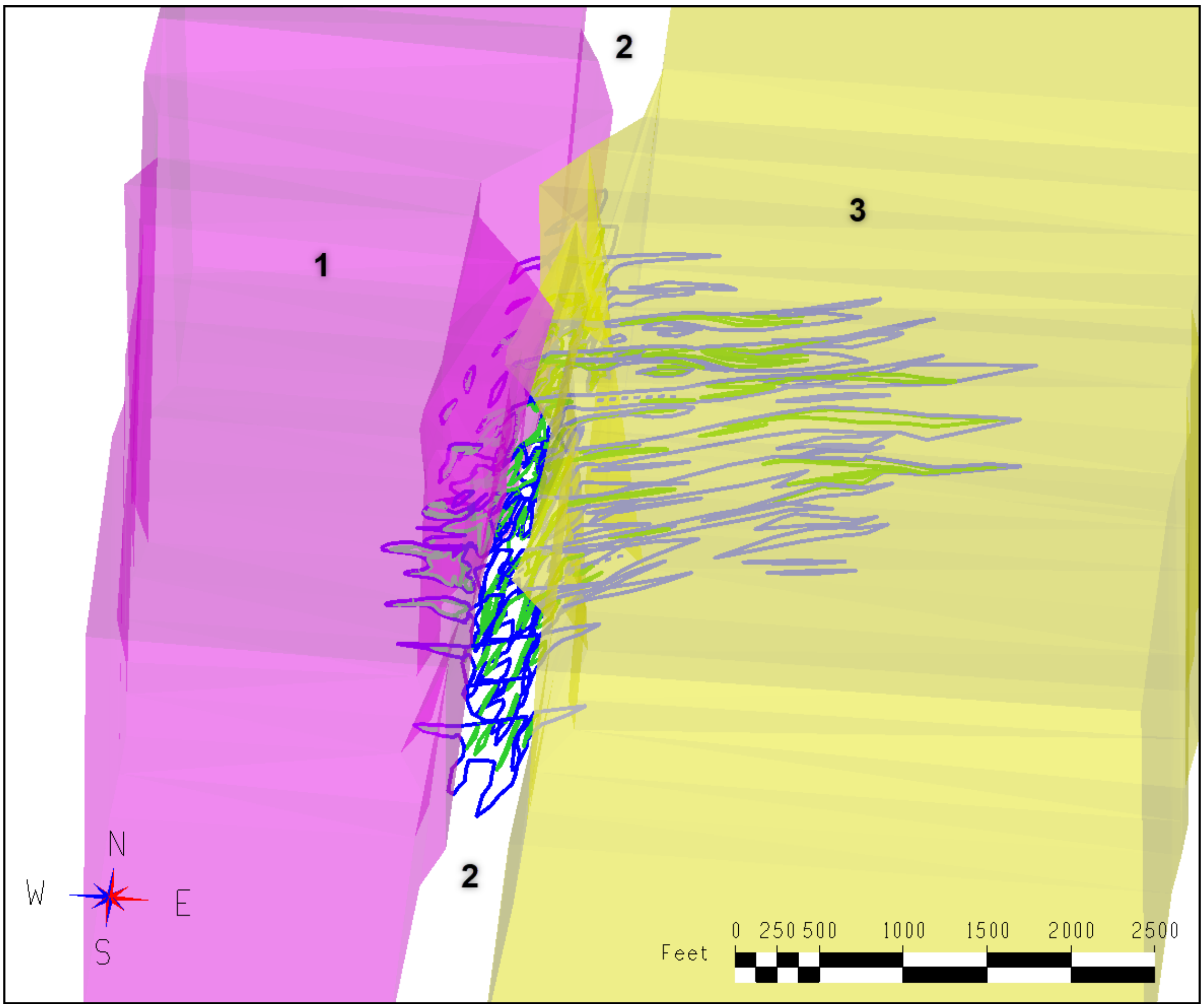


Figure 14-25: Jasperoid Wash Estimation Areas and Gold Domains in Cross Section

Table 14.48: Jasperoid Wash Search Ellipse Orientations and Maximum Search Distances by Estimation Area

Estimation Area	Search Ellipse Orientation			Maximum Search Distance (ft)		
	Azimuth (degrees)	Dip (degrees)	Rotation (degrees)	Low-Grade	Mid-Grade	Outside Domains
1	90	30	0	1,000	820	165
2	90	75	0	1,000	820	165
3	90	15	0	1,000	820	165
Note: Semi-major search distance = major search distance; vertical (or minor) search distance = major search distance ÷ 2 (ESTAR 1) and ÷ 4 (ESTAR's 2 and 3)						

One estimation pass of up to 1,000 ft was run for each domain. All estimation runs were weighted by the sample lengths. Estimation parameters are given in Table 14.49.

Table 14.49: Jasperoid Wash Estimation Parameters
(for search orientations and maximum distances, see Table 14-6)

Description	Parameter
Low-grade Gold Domain	
Samples: minimum/maximum/maximum per hole	1/12/2
Search anisotropies: major/semimajor/minor (vertical)	1 / 1 / varies 0.5 to 0.25
Inverse distance power	3
High-grade restrictions (grade in oz Au/ton, distance in ft)	N/A
High-grade Gold Domain	
Samples: minimum/maximum/maximum per hole	1/12/2
Search (m): major/semimajor/minor (vertical)	1 / 1 / varies 0.5 to 0.25
Inverse distance power	2
High-grade restrictions (grade in oz Au/ton, distance in ft)	N/A
Outside Modeled Gold Domains	
Samples: minimum/maximum/maximum per hole	1/12/3
Search (m): major/semimajor/minor (vertical)	1 / 1 / 0.33
Inverse distance power	3
High-grade restrictions (grade in oz Au/ton, distance in ft)	0.003 / 20

14.4.4 Jasperoid Wash Gold Mineral Resources

Mr. Lindholm reports mineral resources at cutoffs that are reasonable for Carlin-type deposits in Nevada, using expected mining and processing methods and current operating costs. Anticipated economic conditions are applied to satisfy regulatory requirements that a mineral resource exists "*in such form and quantity and of such a grade or quality that it has reasonable prospects for eventual economic extraction*." Although the author of this section is not an expert with respect to environmental, permitting, legal, title, taxation, socio-economic, marketing, or political matters, the author is not aware of any unusual factors relating to these matters that may materially affect the Jasperoid Wash mineral resources as of the date of this Technical Report.

Mr. Lindholm classified the Jasperoid Wash mineral resources giving consideration to the confidence in the underlying database, sample integrity, analytical precision/reliability, QA/QC results, and confidence in geologic interpretations.

Since there is a large amount of historical data, and because the geologic model is still evolving, all mineral resources at Jasperoid Wash were classified as Inferred.

For reporting, technical and economic factors likely to influence the "*reasonable prospects for eventual economic extraction*" were evaluated using the best judgement of the author responsible for this section of the report. For evaluating the open-pit potential, MDA modeled a series of optimized pits using variable gold prices, mining costs, processing costs, and anticipated metallurgical recoveries. MDA used costs appropriate for open-pit mining in Nevada, estimated processing costs and metallurgical recoveries related to heap leaching, and G&A costs. The cutoff grades are based on $1,750/oz Au.

The Jasperoid Wash reported mineral resource estimate is the block diluted ID estimate, comprised of ID^3 estimates for outside and low-grade domains, and by ID^2 for high-grade domains. The mineral resources are reported at a cutoff of 0.005 oz Au/ton for open-pit mining. Table 14-50 presents the estimate of the Inferred gold mineral resources at Jasperoid Wash. A representative cross section of the gold block model is shown in Figure 14-26.

Table 14-50: Jasperoid Wash Inferred Gold Mineral Resources

Cutoff			
oz/ton Au	**Tons**	**oz/ton Au**	**oz Au**
0.001	21,600,000	0.007	156,000
0.002	20,255,000	0.008	155,000
0.003	18,009,000	0.008	148,000
0.004	15,421,000	0.009	139,000
0.005	**13,160,000**	**0.010**	**130,000**
0.006	12,032,000	0.010	124,000
0.007	9,763,000	0.011	108,000
0.008	6,787,000	0.013	86,000
0.009	5,256,000	0.014	74,000
0.010	3,977,000	0.015	61,000
0.015	1,658,000	0.021	34,000
0.020	762,000	0.025	19,000
0.025	242,000	0.029	7,000
0.030	77,000	0.039	3,000
0.035	33,000	0.030	1,000
0.040	15,000	0.067	1,000
0.045	2,000	0.000	-
0.050	-	0.000	-

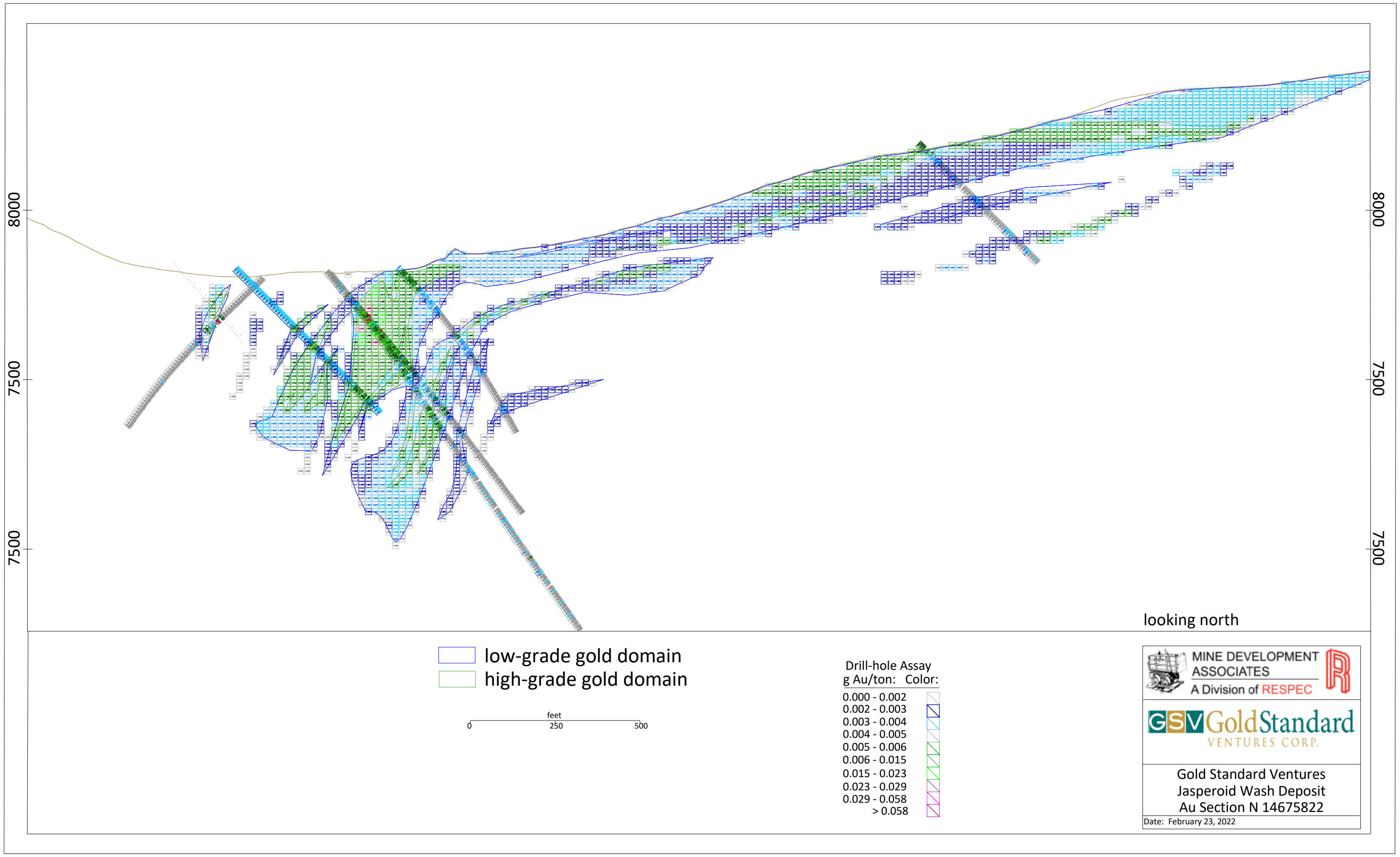


Figure 14-26 Jasperoid Wash Gold Domains and Block Model – Section N14675822

14.4.5 Jasperoid Wash Geo-Metallurgical Model

A cyanide-soluble gold block model was estimated using Au_{CN}/Au_{FA} ratios calculated from Au_{CN} shaker test and total fire-assay gold assays. The Au_{CN}/Au_{FA} ratios are plotted in the CCP shown in Figure 14-27. Cyanide-soluble gold domains were interpreted on east-west cross sections spaced at 98.5 ft intervals. The percent reduced attribute in logged drill-hole data was used when no Au_{CN} values were available. A cross section showing the cyanide-soluble gold domains is given in Figure 14-28.

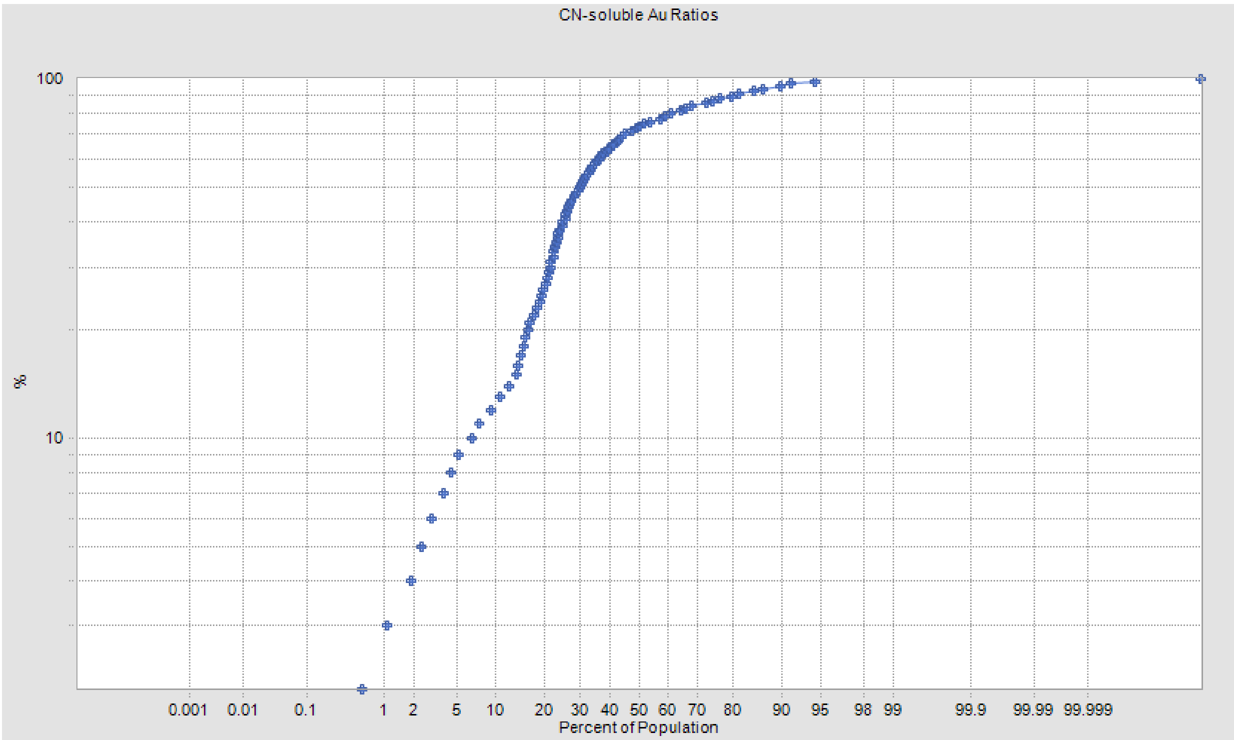


Figure 14-27: Cumulative Probability Plot of Jasperoid Wash Au_{CN}/Au_{FA} Ratios

Only about 15% of all fire-assay gold values in the database have corresponding Au_{CN} analyses. Of the samples with Au_{CN} assays inside modeled Au_{CN}/Au_{FA} ratio domains, approximately 23% have Au_{CN} analyses. Within the high-grade gold domain, which is a proxy for economic mineralization, 58% of the gold assays have corresponding Au_{CN} analyses.

ID^3 was used to estimate the ratios. Only Au_{CN}/Au_{FA} ratios for samples with fire-assay gold grades of ≥0.0015 oz Au/ton were used in the estimate. The Au_{CN}/Au_{FA} ratio block model is lower in confidence than the gold block model because no quality control or database auditing was done on the Au_{CN} analyses, and due to the relatively few cyanide-shaker assays.

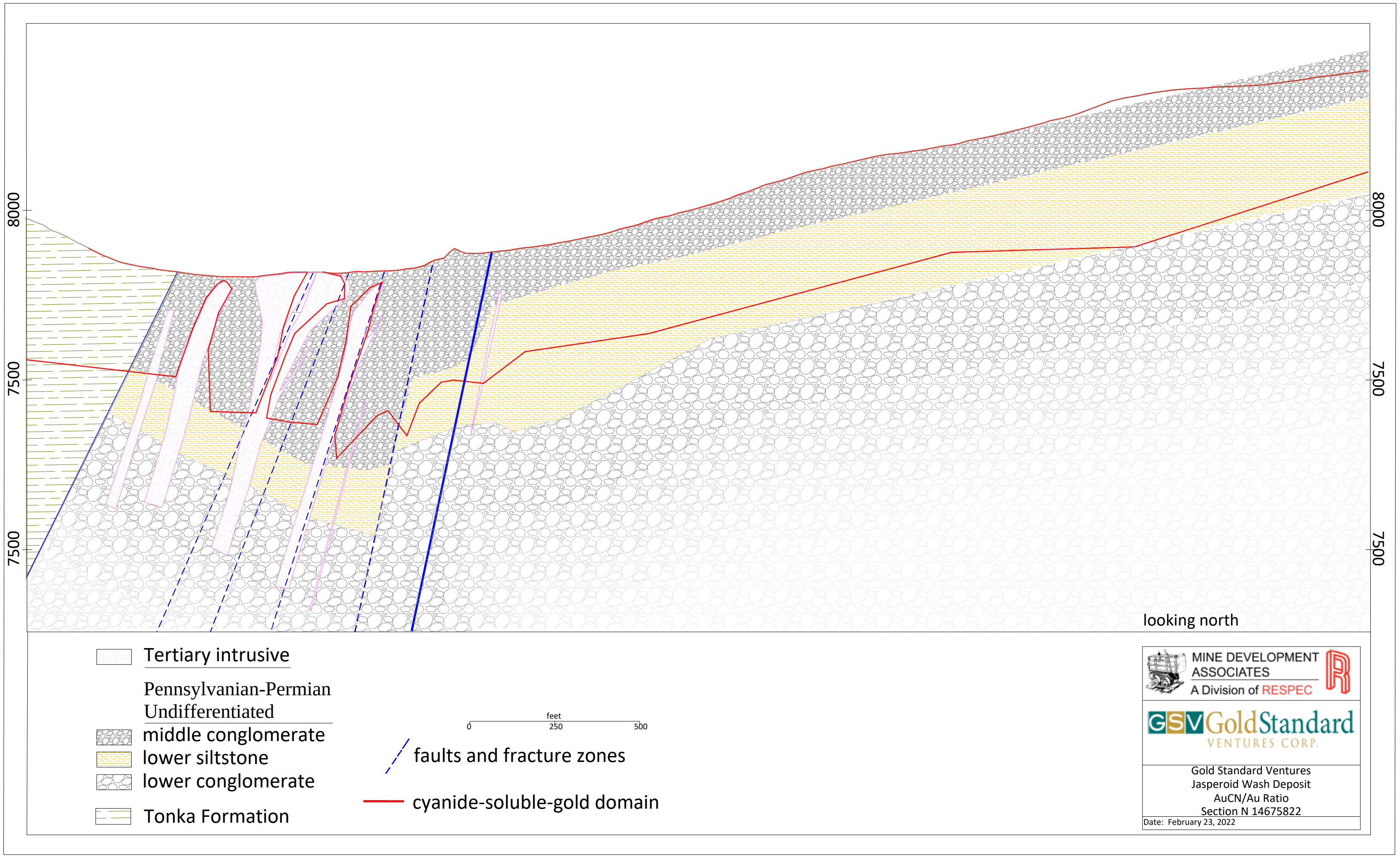


Figure 14-28: Jasperoid Wash Deposit Rock Type and Metallurgical Models – Section N14675822
(Note: clay zones tend to follow faults and intrusives)

Referencing criteria defined in Section 13, blocks with estimated Au_{CN}/Au_{FA} ratios of 70% or greater are considered to have relatively good recovery and are categorized as oxidized. Blocks with estimated Au_{CN}/Au_{FA} ratios of between 50 and 70% are categorized as transitional material and are considered to be moderately recoverable. Transitional and oxidized material are included in the reported mineral resources blocks, however, material with estimated Au_{CN}/Au_{FA} ratios of less than 50% are not sufficiently recoverable with cyanide processing to be reported.

Search ellipses, orientations, and distances similar to those used for the Jasperoid Wash gold block model were used to estimate the cyanide-soluble gold ratios. The geo-metallurgical model can only be considered preliminary and is not sufficiently reliable to be used for mineral reserves.

14.4.6 Jasperoid Wash Clay Model

Clay contents were logged in drill holes by Gold Standard and previous operators as intensities of 0 through 3, with 3 being the highest. Metallurgical test work indicates that material with high clay contents may require agglomeration. Gold Standard constructed a 3D solids model that delineates areas with a majority of samples with logged clay intensities of 2 and 3. The high-clay zones parallel the steeply dipping dikes and faults. Overall, this model is considered adequate for a geologically Inferred mineral resource, but confirmation of the clay geometries is needed for higher classification.

14.4.7 Jasperoid Wash Density

There were no density measurements available for Jasperoid Wash as of the effective date of the drill-hole database. Consequently, Mr. Lindholm assigned density values to the gold block model based on similar rock units with measurements at Dark Star. The values assigned to the units in the block model are presented in Table 14.51.

Table 14.51: Density Values Applied to the Jasperoid Wash Block Model

Formation	Au_{CN}/Au_{FA} Domain	Density (g/cm^3)
Tomera Fm eq. - Siltstone	In	2.45
	Out	2.55
Tomera Fm eq. – Conglomerate	In	2.5
	Out	2.55
Intrusive Rocks	In	2.4
	Out	2.5
Tonka Fm – Conglomerate	Out	2.5

Because clay alteration at Jasperoid Wash is locally strong and pervasive, the density values assigned according to Table 14.49 were reduced for blocks within the modeled high-clay zone solid. The densities of blocks at least 50% within the clay solid (Section 14.4.4) were modified by averaging the assigned value and a clay alteration density of 2.2 g/cm^3.

14.4.8 Discussion of Jasperoid Wash Estimated Mineral Resources

The Inferred mineral resource classification reflects the current level of geologic understanding and support for Jasperoid Wash. It is likely, however, that the estimated mineral resources are fairly estimated in the area of relatively dense drilling. The deposit is open to the south, north and east, so additional drilling could increase the resources as currently stated. Plan versus sectional volumes and cumulative-probability and quantile plots comparing polygonal, inverse-distance, kriged, and nearest neighbor estimates indicate that the mineral resource estimation is reliable.

There are a few risks in the mineral resource estimate that should be noted. The most significant involves the geologic model. The orientations and continuity of the dikes, and consequently clay alteration, are not well known. The ramification is that there could be additional costs associated with processing material with high clay contents. Other risks include the lack of density measurements and the low number of cyanide-soluble gold assays in the deposit.

There is the possibility of additional risk that has resulted from the conversion from metric to Imperial units of drill-hole collar coordinates. Gold Standard holes were surveyed in metric units, so the direct conversion of northings and eastings using a factor of 1 m = 3.280833333 ft maintained the spatial relationship between these drill-hole data and associated geology modeling, domains and block model, which were also converted using identical values. However, it is believed that some historical drill collars were originally surveyed in feet and later converted to metric. Comparisons of metric and Imperial coordinates in the collar tables received from Gold Standard indicate conversion factors were inconsistently applied. Because values of northings and eastings are so large, discrepancies up to 150 ft can result by application of conversion factors that differ in the fifth decimal place. The risks associated with such potential discrepancies have been accounted for in the classification all gold resources as Inferred. If higher classification is to be considered for future resource estimates at Jasperoid Wash, such potential discrepancies in areas relying predominantly on historical data should be considered.

Optimized pits increase in size incrementally with gold price, generally 1% to 8% for each $25 increase in price per ounce. A significant increase in contained ounces of gold occurs in the pit above a $1,725/oz gold price.

Figure 14-29 shows the pit surfaces within which mineral resources are reported and a grade shell of the Inferred mineral resources at a 0.004 oz Au/ton cutoff. The figure depicts the extent of mineralization below the optimized pits.

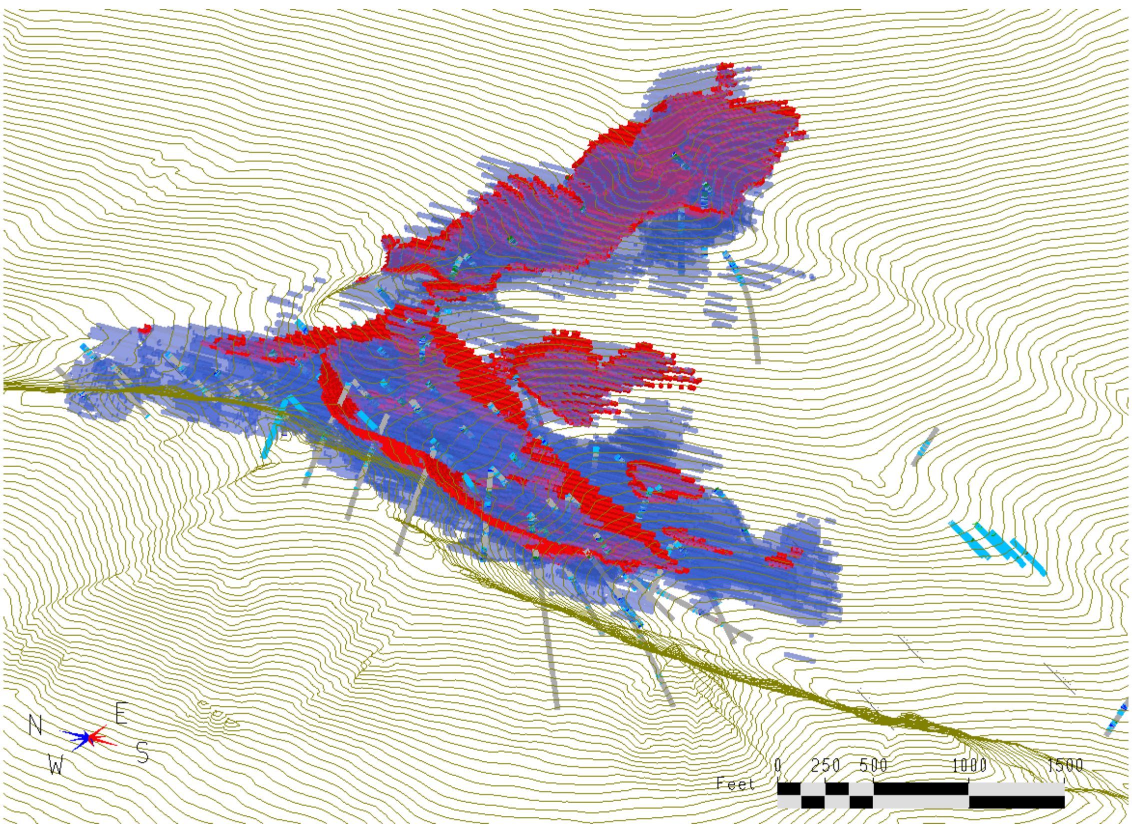


Figure 14-29: Jasperoid Wash Optimized Pits and Additional Mineralization
(gray and blue lines are drill holes; blue solid is the 0.004 oz Au/ton grade shell; orange surfaces are the reported mineral resource pit shells)

A total of 31 additional drill holes (24,816 ft) were drilled at Jasperoid Wash after the effective date of the Jasperoid Wash mineral resource estimate. Three were core holes for 2,596 ft, and the remainder were RC for 22,220 ft. No auditing or QA/QC evaluations were done on this data set, and these holes have not been used to update the mineral resource estimate. Data for these holes were received in late 2018 and 2020 and evaluated for potential impacts on the reported mineral resource estimate.

Some of the post-2018 model drill holes located north and south of the current mineral resources would extend mineralization by about 330 ft to the south, 650 ft southeast and 820 ft north. Post-2018 drilling internal to the current block model substantially confirmed the current model and estimate, although some localized changes in gold domains would occur. It is interesting to note that two of the post-2018 core twins returned higher grades than their corresponding RC holes. The defined area of mineralization would be slightly larger if the post-2018 drilling was incorporated, but the resources reported in the optimized pit in this Technical Report would not be materially different.

14.5 NORTH BULLION DEPOSITS MINERAL RESOURCES

The North Bullion mineral resources are located within the North Railroad project, which is an extensive area that consists of several gold deposits at various stages of exploration and drilling. The terms “North Bullion deposits” and “North Bullion resources” refer to gold mineralization in the South Lodes (AREA code = 1), Sweet Hollow (AREA = 2,3), Sweet Hollow North (AREA = 4), North Bullion (AREA 5), North Bullion North (AREA = 6) and POD (AREA = 7) zones. Due to similarities in geometry of mineralization and location, South Lodes is commonly combined with the Sweet Hollow deposits for general discussion and statistics.

The North Bullion mineral resource estimate is based on drilling through September 15, 2017. The author completed an audit of the data on August 21, 2020, which is the effective date of the drill-hole database. Although the gold estimate was completed as of August 20, 2021, the effective date of the North Bullion mineral resource estimates is January 31, 2022 when optimized pit shells using the most current mining costs were generated. Gold resources are reported herein.

A total of 40 additional drill holes (15,548.5 ft) were drilled at North Bullion in 2019 and 2020. However, because of industry-wide delays due to COVID, final assays were not received until March of 2021, after the gold domain model had been completed. No auditing or QA/QC evaluations were done on this data set. The 2019-2020 holes were evaluated with respect to the reported mineral resource estimate, the impacts of which are described in Section 14.5.4.

14.5.1 North Bullion Database

Since 1969, 13 companies have conducted exploration drilling at North Bullion (Table 14.52 and Figure 14.30). Gold Standard began drilling in 2010. Of the known drilling types in the drill-hole database, 28 are core holes (10% of footage), 41 are RC holes (13% of footage), and 27 are RC holes with core tails (11.5% of footage) totaling 96 holes and 146,736 ft (Table 14.52 and Figure 14.30). The drilling type for 419 holes (277,609.8 ft, 65.5% of total footage), including 61 Gold Standard holes, is unknown or not documented in the database. However, 22 of the holes of unknown type have density measurements at regular intervals, suggesting these are core. There are no QA/QC data for the historical, pre-GSV holes, which currently represent 41.5% (175,743 ft) of the holes in the mineral resource database. Prior to 2000, drilling types are unknown for all drill holes except the single hole drilled by Newmont in 1995.

Table 14.52: Summary of Drilling at North Bullion

Company	Year(s)	Type	Number	Total Feet
Selco	1969	Unknown	14	12,547.5
Placer Amex	1972	Unknown	1	1,200
El Paso/LLE	1973 - 1974	Unknown	5	2,864.5
AMAX	1977 - 1980	Unknown	15	6,221
Homestake	1980 - 1981	Unknown	22	5,788
Nicor	1983 - 1988	Unknown	110	44,812
Westmont	1989 - 1992	Unknown	73	27,943
Mirandor	1996 - 1997	Unknown	42	18,160
Ramrod	1994	Unknown	10	7,975
Newmont	1995	RC	1	1,395
Kinross	1998 - 1999	Unknown	65	42,465
Royal Standard	2005	RC	7	1,760
	2007 - 2008	Core	4	2,272
	2005 - 2008	*Total*	*11*	*4,032*
Gold Standard	2010 - 2017	Core	24	40,629
		RC	33	51,820.5
		RC/Core Tail	27	48,859.5
		Unknown	61	107,293.8
		Total	*145*	*248,602.8*
Unknown	Unknown	Unknown	*1*	*340*
Total by Type	1969 - 2017	Core	28	42,901
		RC	41	54,975.5
		RC/Core Tail	27	48,859.5
		Unknown	419	277,609.8
Grand Total	**1969 - 2017**	**All**	**515**	**424,345.8**

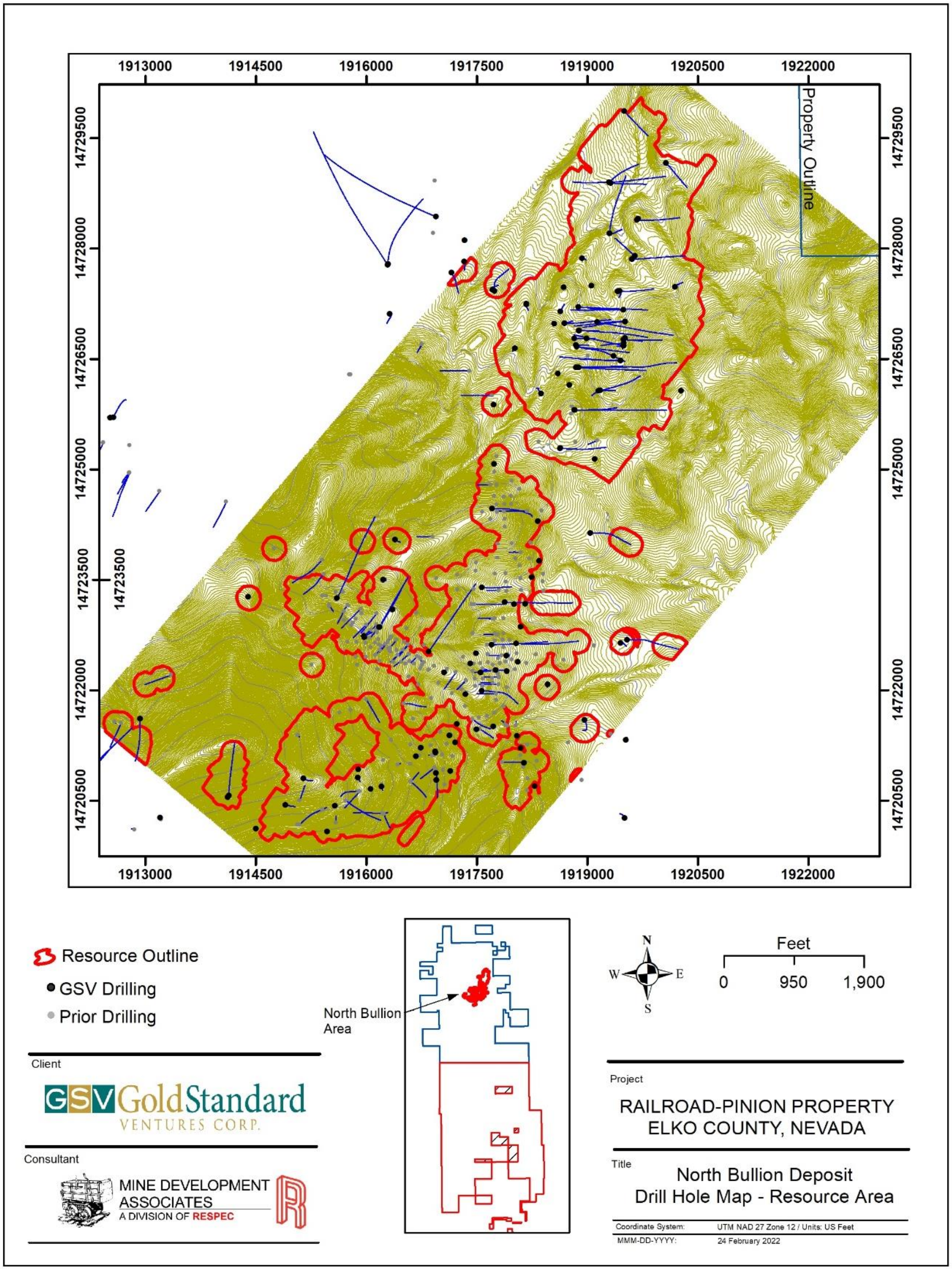


Figure 14.30: North Bullion Deposit Drill-hole Map and Mineral Resource Outline

Descriptive statistics of all North Railroad drill-hole analytical data audited and imported into MineSight by MDA are summarized in Table 14.53. In all, there are 38 drill holes with density data, which is ~7% of all drill holes. All but three of the holes are well distributed throughout the North Bullion deposit. Only two holes at Sweet Hollow and one at South Lodes have density data, and none at POD have density measurements. No core recovery and RQD data were received from GSV.

Table 14.53: Descriptive Statistics of Sample Assays in North Bullion Mineral Resource Database

	Valid	Median	Mean	Std Dev	CV	Minimum	Maximum	Units
FROM	82,157					0.0	3623.0	ft
To	82,157					2.0	3627.5	ft
Length	82,157	5.0	5.2			0.1	760.0	ft
TYPE	26992					1	7	
Au	74274	0.0002	0.0035	0.0198	5.7048	0	1.1523	oz Au/ton
Ag	69298	0.0102	0.0625	1.6063	25.7086	0	291.6900	oz Ag/ton
Au_{CN}	291	0.0010	0.0038	0.0154	4.0294	0	0.2240	oz Au/ton
Density	1049	2.65	2.6549	0.2541	0.0957	1.63	7.76	g/cm3

The North Bullion database contains 74,274 accepted gold assay records (Table 14.53). The total number of rejected gold assays is seven. These records from four holes drilled by Royal Standard were rejected because they are composited intervals with lengths up to 135 ft.

A total of 66,967 of the accepted gold assay samples in the database have silver values, but 19,246 of these are values of "0", which could be below detection limit assays. Subtracting these zero-value assays, only 47,721 (64%) have silver values that are above detection limits. Similarly, 291 sample intervals with gold analyses had values for Au_{CN}. Of these, 143 were values of zero, leaving only 148 (0.2 %) with values above detection in 12 holes.

Available collar locations, downhole survey data, and gold analyses, primarily for Gold Standard data, were audited for verification purposes as described in Section 12. The database also contains logged geologic features, including rock types, formations, faults, vein type, silicification, clay, dolomite, limonite, hematite, carbonate, sulfide percent, and percent reduced (unoxidized), all of which were imported. The logged geology was reviewed and used in modeling the geology and gold domains.

14.5.2 North Bullion Geologic Model

Gold Standard provided geologic interpretations and faults and formation contacts as surfaces, and a refractory solid. All geologic surfaces and solids were initially interpreted by Gold Standard on north-south cross-sections by use of surface maps and downhole drill data. MDA expanded the fault and formation surfaces into areas between deposits to cover the entire block model area. To accomplish this, Gold Standard's surfaces were sliced and modeled on northwest-oriented sections, then new surfaces were made. Because the sectional polygons were snapped to drill holes in three dimensions, the proper drill-hole intercepts were honored by the surfaces. Finally, MDA combined the new upper and lower geologic rock unit and fault surfaces to produce geologic formation solids for coding the block model. The new sections, surfaces and solids were provided to Gold Standard for review, and when areas of disagreement were encountered, MDA worked with Gold Standard geologists to produce a coherent, agreed upon geologic model.

Coded formation units include the Mississippian Chainman Formation and Webb/Tripon Pass Formations, which are predominantly clastic sediments (although the Tripon Pass Formation is a silty micrite). The solid representing the Devonian Devil's Gate Limestone includes Sentinel Mountain Dolomite and upper Nevada Group rocks. Similarly, the

Devonian Oxyoke Formation solid (calcareous sandstones) contains units form the lower Nevada Group. Tertiary units include the Elko Formation (conglomerate), Indian Well Formation (tuffaceous units), and Bullion stock intrusive body. Quaternary colluvium occurs locally in the model, and surfaces modeled by Gold Standard were snapped to drill holes and made into solids. The Webb and Tripon Pass Formations are the primary hosts for gold, although some mineralization extends upward into Chainman Formation, such as the POD deposit, and below into Devil's Gate Limestone. All geologic interpretations, in combination with assays and logged data, were used to guide gold domain modeling.

The refractory solid was reviewed on section with logged drill hole data, including limonite, hematite, redox percent and sulfide percent. In general, the modeled solid was determined to be a reasonable representation of refractory material, and correlates to redox percent ≥50%. Some internal predominantly oxide material was noted within the solid, and some predominantly reduced material was outside the solid, but the majority of the data is properly honored. Solid boundaries also appear to be properly snapped to respective drill-hole intercepts in three dimensions. The only modifications made by MDA were to repair self-intersecting polygons resulting from verification errors, and removal of internal spikes that Gold Standard determined were introduced during solid construction.

14.5.3 North Bullion Gold Domains and Estimation

14.5.3.1 Gold Domain Model

Gold domains based on sample assay ranges were interpreted on sections spaced 98.5 ft apart, oriented N40°E and looking northwest. The section orientation was chosen to be perpendicular to the overall strike of stratigraphy and mineralization, which are dipping ~15° to the northeast. Local dips can vary from moderately southwest to moderately northeast, however, stepped fault offsets keep the overall dip at about 15° to the northeast. The POD mineralization is on the same strike but dips ~70° northeast. Domains were defined based on population breaks on CPP's made for gold data by deposit (Figure 14.31, Figure 14.32 and Figure 14.33). The domain grade ranges were originally determined using assay data in g Au/t, and converted to oz Au/ton. The CPP's were remade to reflect Imperial units, but some of the grade breaks apparent on the metric chart were not as readily apparent on the Imperial chart. The lower limit of the low-grade gold domains does not plot on the CPP's because the level of precision of the statistical package used is only three decimal places. Grade ranges converted from those originally determined in metric units were retained (Table 14.54), and used for modeling gold domains. Descriptive statistics of assays by the modeled domains are presented in Table 14.55.

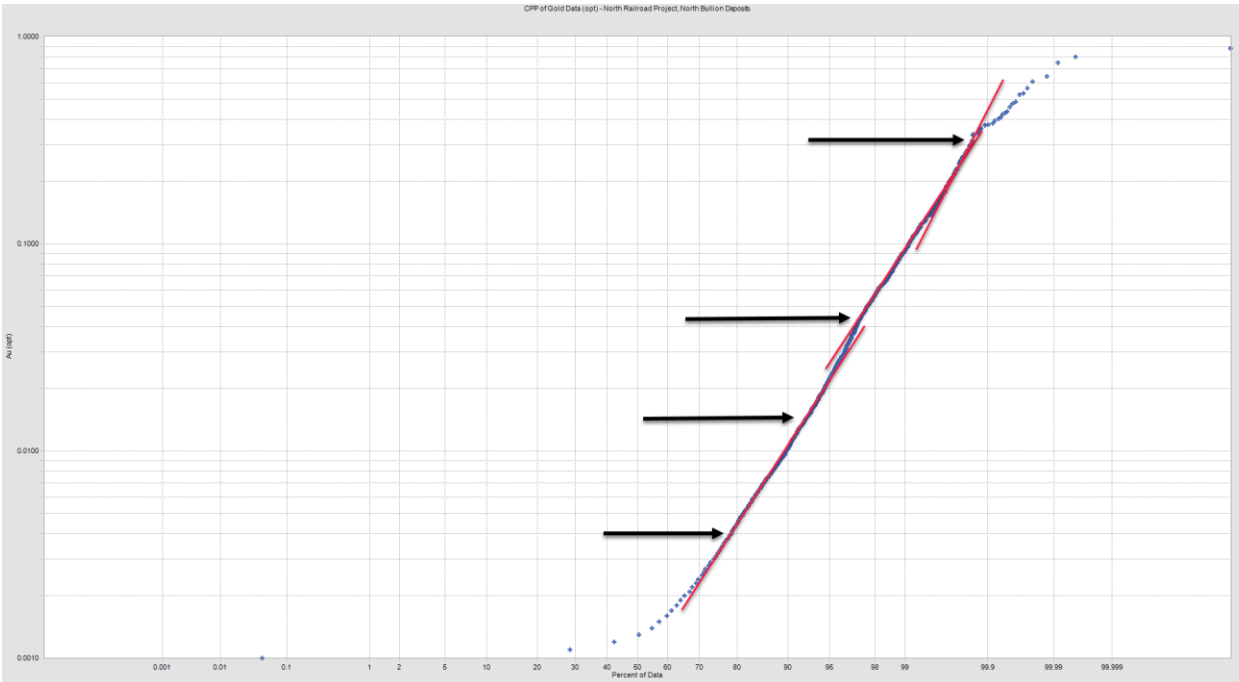


Figure 14.31: Cumulative Probability Plot of North Bullion Gold Assays

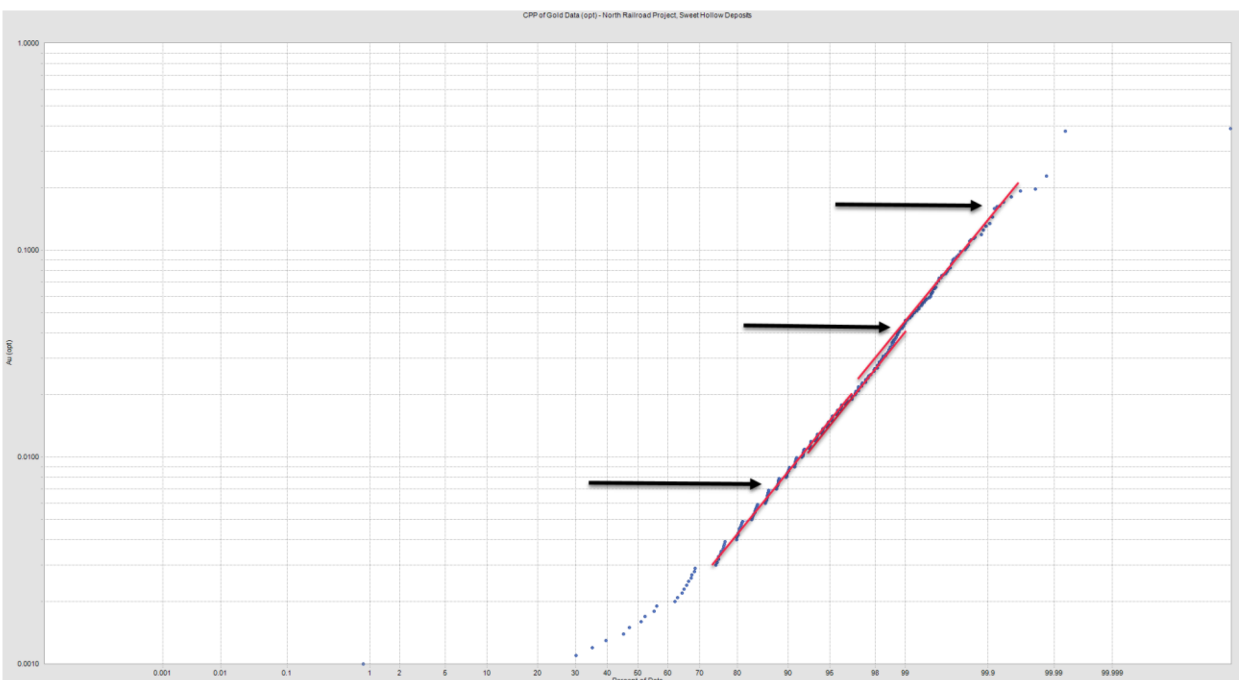


Figure 14.32: Cumulative Probability Plot of Sweet Hollow Gold Assays

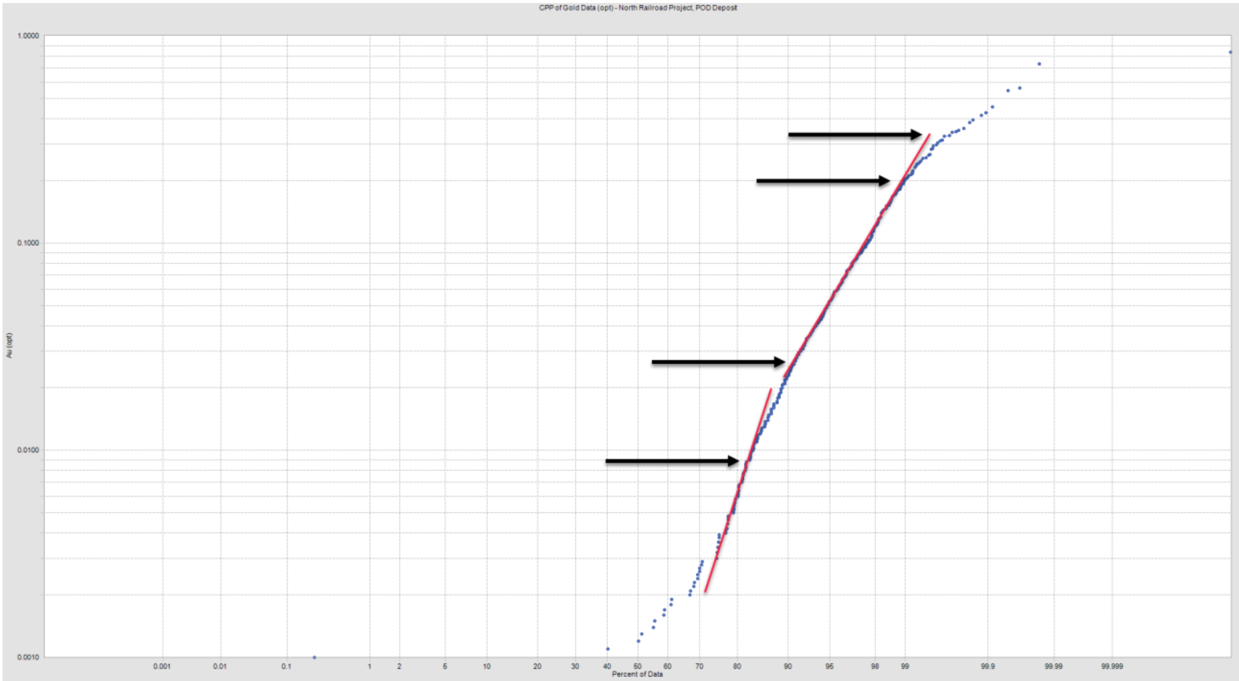


Figure 14.33: Cumulative Probability Plot of POD Gold Assays

Table 14.54: Modeled Gold Domain Grade Ranges, North Bullion Deposits

	Gold Domain		
Deposit	**Low-Grade**	**Mid-Grade**	**High-Grade**
North Bullion	0.0006 to 0.0044	0.0044 to 0.0437	>0.0437
Sweet Hollow, South Lodes	0.0006 to 0.0073	0.0073 to 0.0437	>0.0437
POD	0.001 to 0.0088	0.0088 to 0.0277	>0.0277
Grade ranges in oz Au/ton			

Table 14.55: North Bullion Descriptive Statistics by Gold Domain

Low-Grade Gold Domain								
	Valid	**Median**	**Mean**	**Std. Dev.**	**CV**	**Minimum**	**Maximum**	**Units**
From	11,385					0	2720.0	ft
To	11,385					5.0	2728.0	ft
Length	11,385	5.0	4.8			0.5	555.0	ft
TYPE	11,385					1	7	
Au	10,994	0.0016	0.0024	0.0032	1.3337	0	0.1803	oz Au/ton
Au capped	10,994	0.0016	0.0024	0.0025	1.0611	0	0.0384	oz Au/ton
Au_{CN}	85	0.0010	0.0017	0.0027	1.6011	0	0.0180	oz Au/ton
Au_{CN}/Au_{FA} ratio	52	50.0	47.6	20.5	0.4	11.0	83.0	%

Mid-Grade Gold Domain								
	Valid	Median	Mean	Std. Dev.	CV	Minimum	Maximum	Units
From	5,266					0	2232.0	ft
To	5,266					5.0	2237.5	ft
Length	5,266	5.0	4.6			0.5	11.0	ft
TYPE	1,831					1	0	%
Au	5,188	0.0100	0.0130	0.0106	0.8151	0	0.1301	oz Au/ton
Au capped	5,188	0.0100	0.0130	0.0106	0.8151	0	0.1301	oz Au/ton
Au_{CN}	16	0.0030	0.0080	0.0081	1.0093	0	0.0250	oz Au/ton
Au_{CN}/Au_{FA} ratio	16	32.0	52.6	33.3	0.6	11.0	107.0	%
High-Grade Gold Domain								
	Valid	Median	Mean	Std. Dev.	CV	Minimum	Maximum	Units
From	1,410					10	1950.0	ft
To	1,410					15.0	1952.0	ft
Length	1,410	5.0	4.7			0.4	11.0	ft
TYPE	547					1	7	0
Au	1,403	0.0604	0.0926	0.0974	1.0512	0	0.8806	oz Au/ton
Au capped	1,403	0.0604	0.0926	0.0974	1.0512	0	0.8806	oz Au/ton
Au_{CN}	0	0.0000	0.0000	0.0000	0.0000	0	0.0000	oz Au/ton
Au_{CN}/Au_{FA} ratio	0	0.0	0.0	0.0	0.0	0.0	0.0	%
Outside Modeled Gold Domains								
	Valid	Median	Mean	Std. Dev.	CV	Minimum	Maximum	Units
From	64,096					0	3623.0	ft
To	64,096					2.0	3627.5	ft
Length	64,096	5.0	5.3			0.1	760.0	ft
TYPE	20,753					1	7	0
Au	56,689	0.0002	0.0006	0.0074	12.1937	0	1.1523	oz Au/ton
Au capped	56,689	0.0002	0.0004	0.0010	2.2970	0	0.0180	oz Au/ton
Au_{CN}	190	0.0000	0.0044	0.0188	4.2393	0	0.2240	oz Au/ton
Au_{CN}/Au_{FA} ratio	80	74.0	109.1	91.7	0.8	1.0	253.0	%

During a site visit in July 2020, Mr. Lindholm reviewed core from RR12-01A and RR13-08 from the North Bullion deposit, and RR10-12 from POD. As with Gold Standard's more advanced projects, an effort was made to determine the geologic characteristics of each domain. Gold Standard staff geologists provided guidance and expertise with respect to the geology of the deposits and the nature of gold mineralization. The following characteristics were observed with respect to gold domains, and mineralization in general:

- The Mississippian-age Tripon Pass and Web formations are the primary hosts for mineralization. Overlying Mississippian Chainman Formation and underlying Devonian Devil's Gate Limestone are mineralized as well, but to a lesser degree.

- As with Carlin-Type deposits in general, the geologic characteristics associated with grade domains are not always readily apparent. Transitions between low-, mid- and high-grade domains can take place with no macroscopic change in alteration, veining or mineralogy.
- There is an association between higher gold grades and increased silicification, which is weak to moderate at best. Higher gold grades are also associated with carbonaceous material, decalcification, sooty and clotty sulfides, barite, quartz vein and breccia, crackle breccias, and especially multi-lithic breccia. Silica flooding and multi-lithic breccia development seem to be important.
- Gougy material and rubblized core often contain high to very high grades.
- Sulfides are not always visible, but their presence is indicated by iron sulfates in older core.
- In RR12-01A, mid-grade domain assays are associated with non-descript mudstone and sandstone, rubbly core, little silicification, but has locally abundant sooty and clotty pyrite in 0.5 to 2 ft intervals. Deeper mid-grade mineralization occurs with weak to moderate silicification in siltier and sandier rock that contains almost no calcite. Crackle breccia is ubiquitous, and there are only local concentrations of pyrite in breccias with quartz veins.
- In RR12-01A, the high-grade domain mineralization occurs as very soft black carbonaceous mudstone with slickensides in hydrothermal graphite. It also contains abundant realgar and orpiment with calcite in veins, and silicification is weak to absent.
- In the POD core hole, pyrite appears to be more abundant in higher-grade zones than in the North Bullion deposit.
- Mid-grade domain assays in the POD hole occur in carbonaceous, soft, rubbly core that contains some sooty pyrite. Higher grades are associated with black fine- to coarse-grained sandstone with weak and some moderate silicification. Sooty sulfides and barite are present.
- In carbonate units, black rock with no limestone textures can be mineralized. Vuggy carbonate rocks with calcite veins and more recognizable limestone colors and textures are generally unmineralized.

To summarize, gold mineralization increases with increasing sulfide content, breccia development and porosity. More favorable porosity is inherent in coarser-grained sedimentary lithologies or developed by structural preparation and/or decalcification. Structural preparation ranges from localized fractures to wider gouge zones, and to broad zones of fractures and stockwork breccias.

The overall geometry of the North Bullion deposit is stratiform mineralization bounded by horst faults. The horst block is defined on the northwest side by the northeast-striking Northeast fault, and on the southeast side by the north-striking North Bullion Corridor fault. Within the horst is the north-striking Massif fault, which has reverse offset at the north end and normal offset to the south. The relationship between gold mineralization and major faults mapped on the surface or interpreted on section is not well understood. As at Dark Star, the primary horst-bounding faults appear to define the boundaries between strongly mineralized and weak to unmineralized zones, but there is no indication that mineralization occurs within the faults. The only exception is the Massif fault, where high-grade mineralization appears to be centered on, as well as offset by the fault.

The mineralization in Sweet Hollow and South Lodes is stratiform, and offset by various faults. POD mineralization is more steeply dipping, and occurs within the Chainman Formation, unlike the other deposits, which are hosted primarily by the Tripon Pass and Webb Formations. The contrary orientation and host unit is not fully understood. However, Gold Standard has modeled the POD South fault in the footwall of mineralization as a possible explanation. No offset of stratigraphy was noted across this fault by MDA.

As noted in the previous section, geologic logging and interpretations, along with observations of core directly or in photos, were used to guide mineral-domain modeling. Mineral domains were generally drawn parallel to stratigraphic contacts, per guidance from Gold Standard. Gold domains were offset across faults according to sense-of-movement indicated by Gold Standard interpretations. Schematic cross sections in the North Bullion, Sweet Hollow and POD deposits are given in Figure 14.34, Figure 14.35 and Figure 14.36, respectively. After sectional interpretations were completed, gold domains were snapped to drill holes in three dimensions and modeled to 10 ft-spaced long sections located at each mid-block plane in the block model.

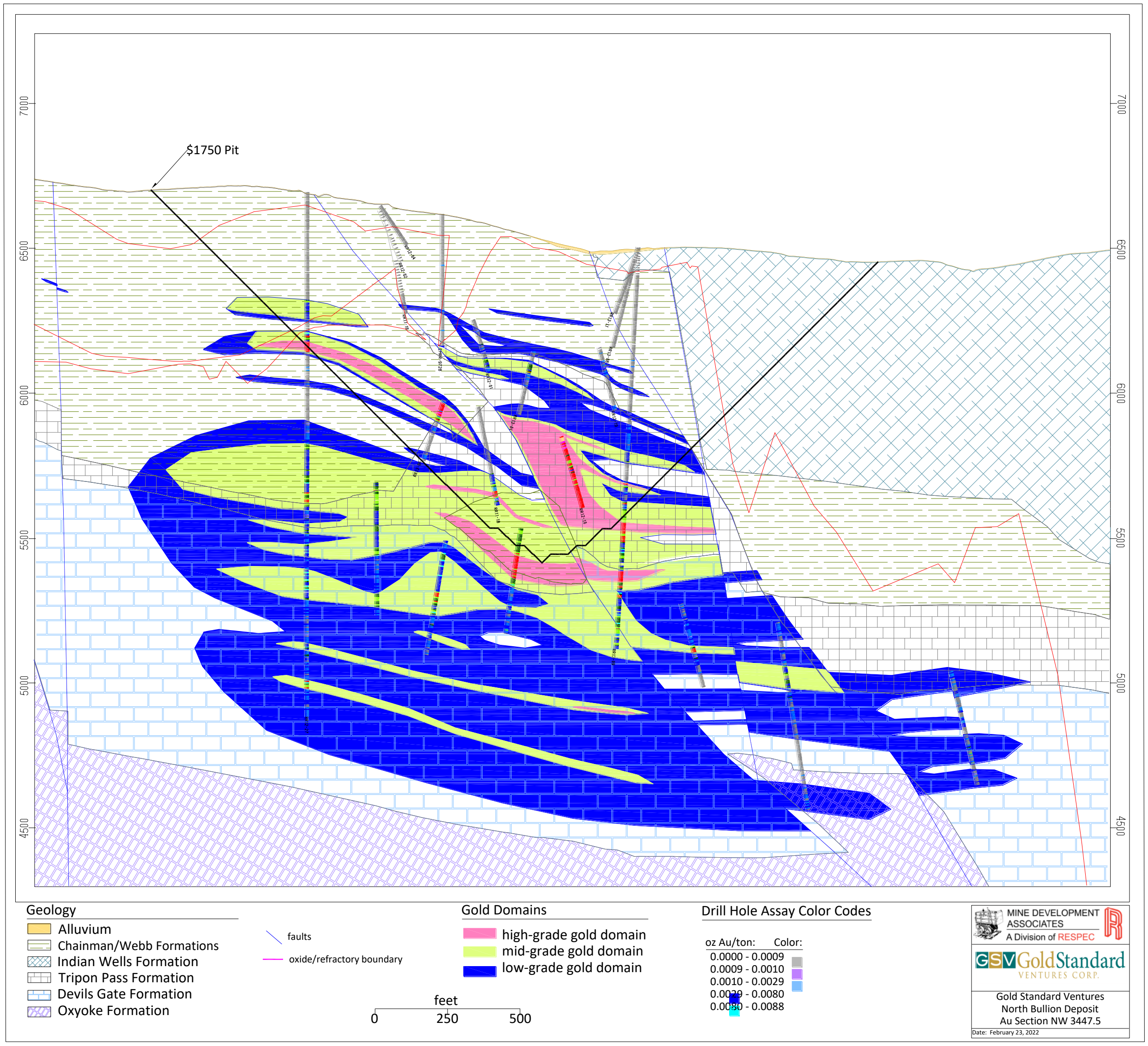


Figure 14.34: North Bullion Deposit Gold Domains and Geology – Section NW3447.5

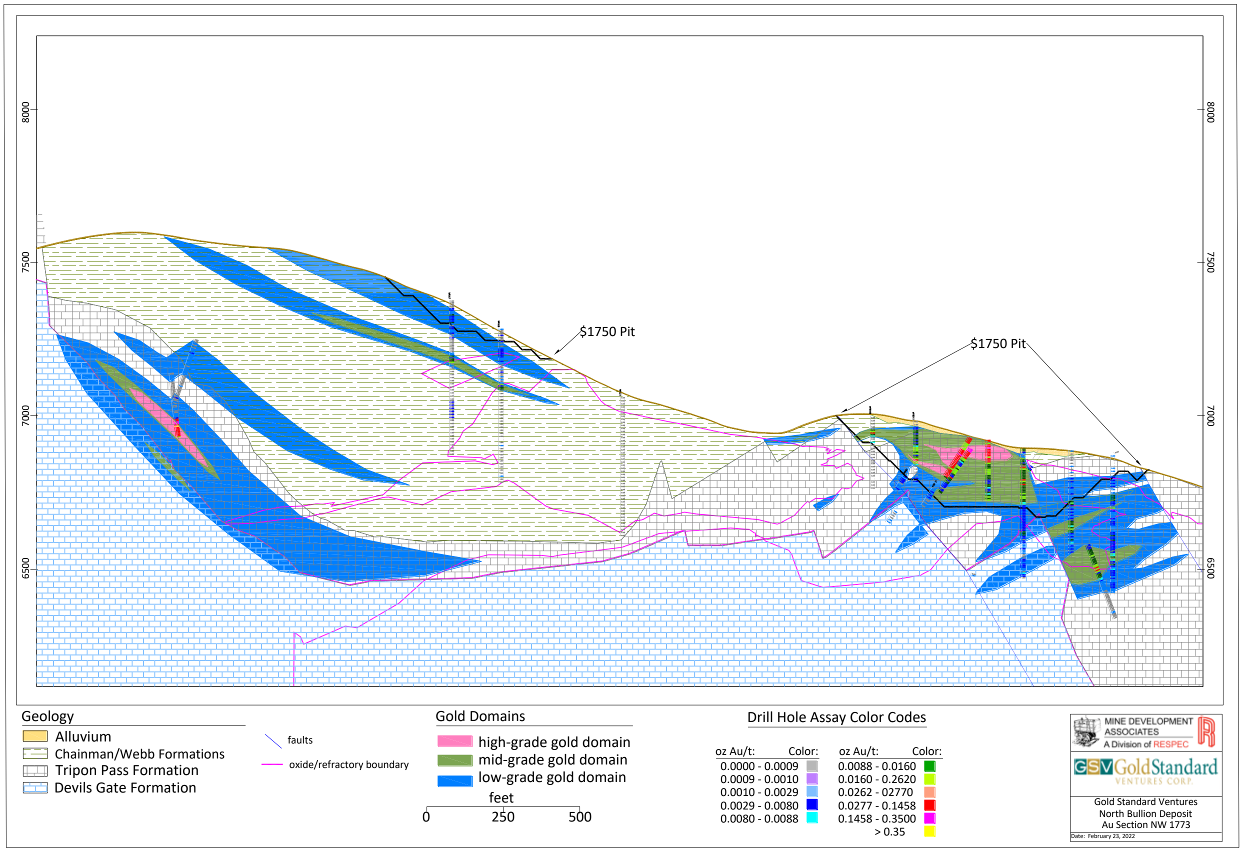


Figure 14.35: Sweet Hollow and South Lodes Deposits Gold Domains and Geology – Section NW1773.0

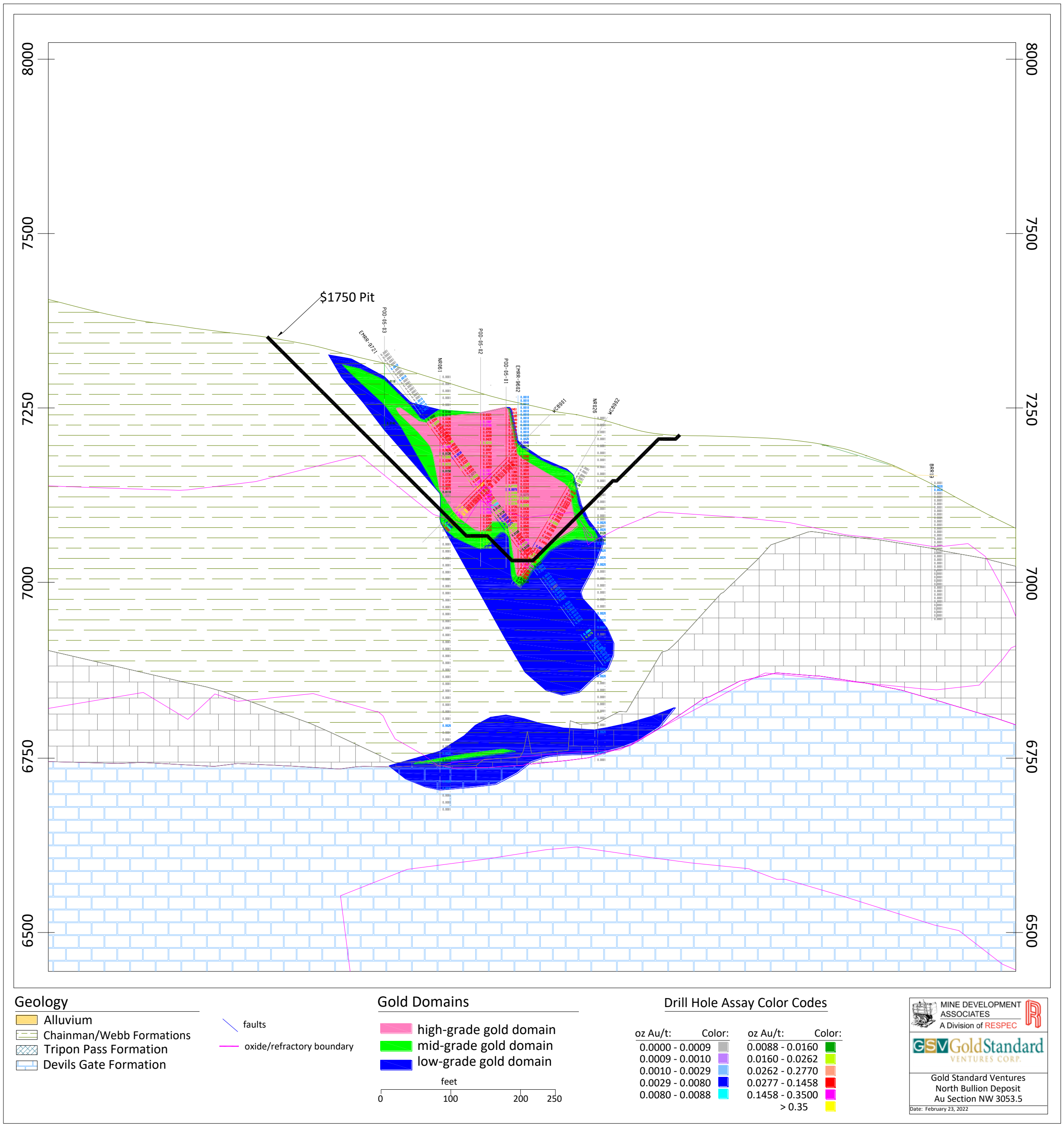


Figure 14.36: POD Deposit Gold Domains and Geology – Section NW3053.5

14.5.3.2 Gold Composites Statistics and Capping

The modeled gold mineral domains were used to assign codes to drill-hole samples. Quantile plots were made of the coded assays. Potential capping levels for each domain were assessed by identifying the grade above which outlier values occur. Applied capping grades (Table 14.56) were then determined after reviewing the outlier samples on screen with respect to grade and proximity of surrounding samples, geology, general location, and materiality. Descriptive statistics of sample assays by domain were also considered to evaluate the necessity for capping of assays (Table 14.53).

Table 14.56: North Bullion Capping Levels for Gold by Domain

		Gold Domain Capping Grade (oz Au/ton)		
Deposit	Low-Grade	Mid-Grade	High-Grade	Outside Modeled Gold Domains
North Bullion	0.050	N/A	N/A	0.010
Sweet Hollow, South Lodes	0.035	N/A	N/A	0.018
POD	N/A	N/A	N/A	0.010

Once the capping was completed, the drill holes were down-hole composited to 10 ft intervals honoring domain boundaries. The 10 ft length was chosen to avoid de-compositing small fractions of the original 5 ft drilled sample intervals, which represent the vast majority of the sample lengths. Descriptive statistics by domain of the composited database are given in Table 14.57.

Table 14.57: North Bullion Descriptive Composite Statistics by Domain

Low-Grade Gold Domain								
	Valid	Median	Mean	Std. Dev.	CV	Minimum	Maximum	Units
Length	5,768	10.00	9.05			0	10	ft
Au	5,710	0.0018	0.0024	0.0025	1.0311	0	0.0907	oz Au/ton
Au capped	5,710	0.0018	0.0024	0.0021	0.8688	0	0.0235	oz Au/ton
Au_{CN}	64	0.0010	0.0016	0.0024	1.4412	0	0.0140	oz Au/ton
Au_{CN}/Au_{FA} ratio	40	50.0	47.7	20.4	0.4	14.0	83.0	%
Mid-Grade Gold Domain								
	Valid	Median	Mean	Std. Dev.	CV	Minimum	Maximum	Units
Length	2,650	10.00	9.11	0	0	0	10	ft
Au	2,647	0.0105	0.0130	0.0087	0.6663	0	0.0716	oz Au/ton
Au capped	2,647	0.0105	0.0130	0.0087	0.6663	0	0.0716	oz Au/ton
Au_{CN}	10	0.0030	0.0073	0.0064	0.8797	0	0.0185	oz Au/ton
Au_{CN}/Au_{FA} ratio	10	31.0	51.9	34.1	0.7	11.0	96.0	%
High-Grade Gold Domain								
	Valid	Median	Mean	Std. Dev.	CV	Minimum	Maximum	Units
Length	709	10.00	9.24	0	0	1	10	ft
Au	709	0.0606	0.0908	0.0838	0.9228	0	0.6401	oz Au/ton
Au capped	709	0.0606	0.0908	0.0838	0.9228	0	0.6401	oz Au/ton
Au_{CN}	0	0.0000	0.0000	0.0000	0.0000	0	0.0000	oz Au/ton
Au_{CN}/Au_{FA} ratio	0	0.0	0.0	0.0	0.0	0.0	0.0	%
Outside Modeled Gold Domains								
	Valid	Median	Mean	Std. Dev.	CV	Minimum	Maximum	Units
Length	33,803	10.00	8.53	0	0	0	10	ft
Au	31,354	0.0002	0.0006	0.0057	9.9995	0	0.5827	oz Au/ton
Au capped	31,354	0.0002	0.0004	0.0009	2.0633	0	0.0180	oz Au/ton
Au_{CN}	163	0.0000	0.0037	0.0188	5.1069	0	0.2240	oz Au/ton
Au_{CN}/Au_{FA} ratio	63	78.0	124.3	96.2	0.8	2.0	253.0	%

Correlograms were generated from the composited gold grades to evaluate grade continuity. Correlogram parameters were determined and applied to the kriged estimate, against which the reported inverse distance estimate was compared. The evaluated continuity of grade also contributed to classification of mineral resources. The correlogram results by domain are summarized as in Table 14.58.

Table 14.58: North Bullion Kriging Parameters by Domain

	North Bullion			Sweet Hollow			POD		
Kriging Parameter	LG	MG	HG	LG	MG	HG	LG	MG	HG
Nugget	0.5	0.6	0.7	0.6	0.5	0.3	0.5	0.9	0.7
First Sill	0.4	0.2	0.2	0.4	0.4	0.2	0.1	0.1	0.2
First major range (ft)	100	30	40	70	50	40	120	20	40
First semi-major range (ft)	80	20	30	50	20	20	130	50	70
First minor range (ft)	130	110	70	55	75	45	200	50	50
Second sill	0.2	0.3	0.2	0.1	0.2	0.5	0.4	0.1	0.2
Second major range (ft)	1,000	125	95	270	170	240	200	130	80
Second semi-major range (ft)	1,000	95	115	240	250	220	240	160	130
Second minor range (ft)	1,000	120	70	180	85	80	210	170	80
Gold Domains: LG - Low-grade; MG - Mid-grade; HG - High-grade									

14.5.3.3 Gold Estimator

The mineral resource block model is rotated to 310°, and the block dimensions are 10 ft by 10 ft by 10 ft. The small block size was utilized in order to evaluate underground-mineable potential of the resources. For open pit evaluation, the model was re-blocked using MineSight's MSDART software to 30 ft by 30 ft by 30 ft blocks. Four gold estimates were completed for each of the three deposit areas: a polygonal, nearest neighbor, inverse distance, and kriged, with the inverse-distance estimate being reported. All the estimates, excluding the polygonal, were run several times in order to determine sensitivity to estimation parameters, and to evaluate and optimize results. The inverse distance power was three ("ID^3") in modeled domains. The model was divided into eight estimation areas ("ESTAR") to control search anisotropy, orientation, and distances according to the differing geometries of mineralization in each area during estimation. Table 14.59 summarizes the estimation areas associated search orientations and maximum search distances by domain. Figure 14.37 depicts the spatial relationship of the estimation areas to the deposit areas, gold domains and drilling. ESTAR 4 is the background estimation area and is not shown as a solid.

Table 14.59: North Bullion Estimation Areas, Search-Ellipse Orientations and Maximum Search Distances by Domain

	Search Ellipse Orientation			Maximum Search Distance (ft)			
Estimation Area	Azimuth (degrees)	Dip (degrees)	Rotation (degrees)	Low-Grade	Mid-Grade	High-Grade	Outside Domains
1	5	0	30	810	600	400	160
2	0	0	10	810	600	400	160
3	45	0	10	810	600	400	160
4	5	0	-10	810	600	600	160
5	5	0	-30	810	600	400	160
6	-30	0	-40	810	600	400	160

7	10	0	-50	810	600	400	160
8	-5	0	-55	810	600	400	160
Notes: ESTAR 4 is background. Semi-major search distance = major search distance. The vertical search distance in the low-grade domain = major search distance ÷ 3. The vertical search distance in the mid- and high-grade domains = major search distance ÷ 4.							

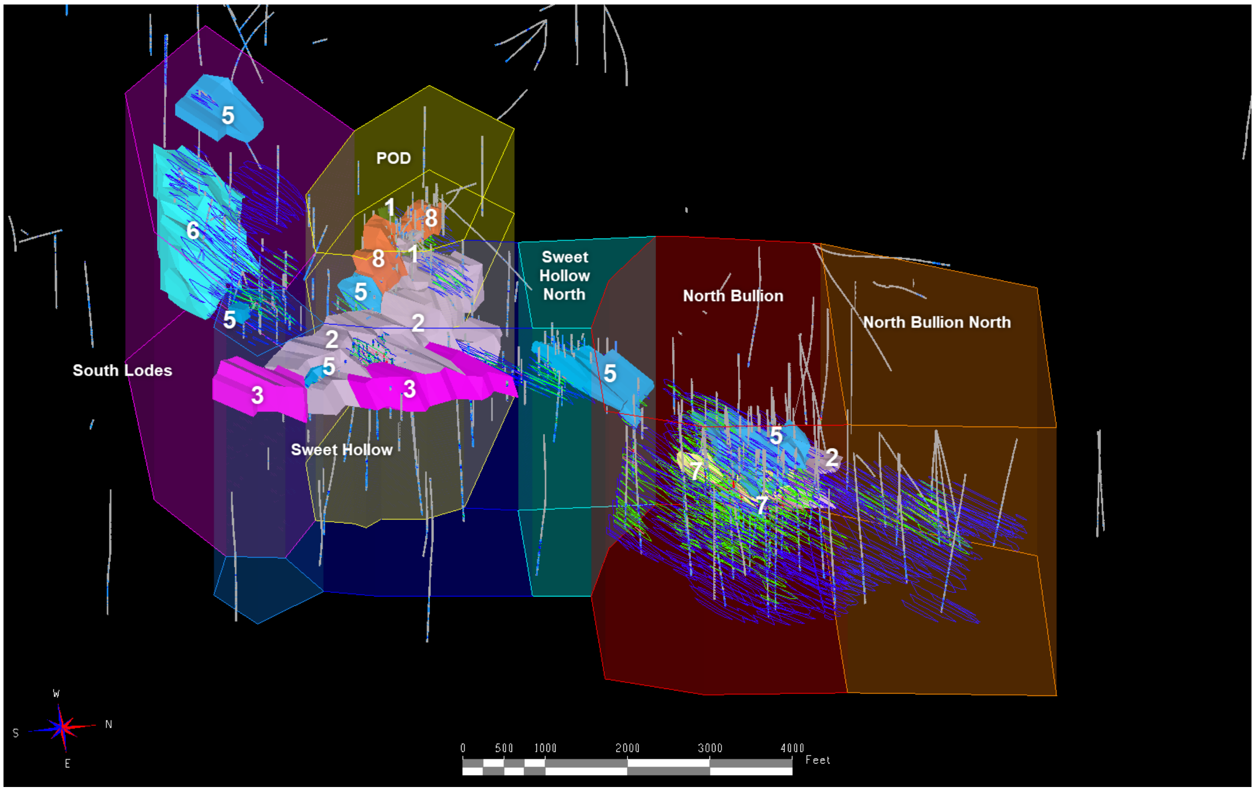


Figure 14.37: Spatial Relationship Between North Bullion Deposits, Estimation Areas, Gold Domains and Drill Holes

(Non-transparent solids are estimation areas labeled with white numbers, transparent solids denote deposit areas)

One estimation pass was run for each domain, up to a maximum anisotropic search distance of 810 ft along the major axis. Search ellipse anisotropy varies from 1:1:4 to 1:2:4 (major versus semi-major versus minor axes). Composite-length weighting was applied to all estimation runs. Estimation parameters for each domain are given in Table 14.60.

Table 14.60: North Bullion Estimation Parameters
(for search orientations and maximum distances, see Table 14.59)

Description	Parameter
Low-Grade Gold Domain	
Samples: minimum/maximum/maximum per hole	1 / 12 / 3
Search anisotropies (ft): major/semimajor/minor (vertical)	1 / 1 / 0.33
Inverse distance power	3

High-grade restrictions (grade in oz Au/ton, distance in ft)	AREA 5, ESTAR 7 only - 0.007 / 405
Mid-Grade Gold Domain	
Samples: minimum/maximum/maximum per hole	1 / 12 / 3
Search anisotropies (ft): major/semimajor/minor (vertical)	1 / 1 / 0.25
Inverse distance power	3
High-grade restrictions (grade in oz Au/ton, distance in ft)	Sweet Hollow, South Lodes - 0.080 / 50 North Bullion Main and North - 0.040 / 450 POD - 0.050 / 100
High-Grade Gold Domain	
Samples: minimum/maximum/maximum per hole	1 / 9 / 3
Search anisotropies (ft): major/semimajor/minor (vertical)	1 / 1 / 0.25*
Inverse distance power	3
High-grade restrictions (grade in oz Au/ton, distance in ft)	Sweet Hollow, South Lodes - 0.060 / 0.75 * max distance North Bullion Main and North - 0.400 / 0.5 * max distance
Outside Modeled Gold Domains	
Samples: minimum/maximum/maximum per hole	2 / 12 / 3
Search anisotropies (ft): major/semimajor/minor (vertical)	1 / 1 / 0.25
Inverse distance power	2
High-grade restrictions (grade in oz Au/ton, distance in ft)	0.004 / 40
** - Exception: AREA 5, ESTAR 4 major to vertical axis search anisotropy is 0.33*	

14.5.4 North Bullion Gold Mineral Resources

The North Bullion mineral resources are classified entirely as Inferred by Mr. Lindholm. The limited metallurgical studies and cyanide-leach assays, and the predominantly refractory nature of the majority of the deposits precluded higher classification. Also taken into consideration were confidence in the underlying database, sample integrity, analytical precision/reliability, QA/QC results, and confidence in geologic interpretations. Classification parameters are given in Table 14.61.

Table 14.61: North Bullion Classification Parameters

Inferred
In modeled domain; Or
All estimated blocks outside modeled domains, and isotropic distance ≤ 60 ft*
**A strong search restriction on composites ≥0.004 oz Au/ton within 40 ft was applied*

Although adequate paper copy certificates were available to successfully audit the historical drill-hole data, there is insufficient information that would allow an evaluation of historical QA/QC data. This poses a moderate level of risk for the historical assays. Consequently, the reliability of pre-Gold Standard data, and therefore model block grades derived predominantly from historical data, is diminished and would support a modest reduction in classification, if higher classification is warranted in the future. This reduction would be applied primarily to the Sweet Hollow, POD and South Lodes deposits, where the majority of drilling is historical. North Bullion drilling was predominantly done by Gold Standard.

Forty drill holes (15,548.5 ft) were drilled at North Bullion in 2019-2020. However, because of industry-wide delays due to COVID, final assays were not received until March of 2021, after the gold domain model had been completed. No auditing or QA/QC evaluations were done on this data set. The 2019-2020 holes were evaluated with respect to the reported mineral resource estimate, and potential impacts are summarized as follows:

- All 2019-2020 holes are located in Sweet Hollow, the South Lodes, or out of modeled areas.
- None would decrease the amount of gold ounces in the resource, or cause contractions in optimized pits.
- Ten of the 2019-2020 holes were outside modeled domain areas.
- Twenty-five 2019-2020 holes would cause no significant changes, which would manifest as minor changes in length and/or widths of domains. Only small, incremental localized changes to resources would potentially occur.
- Five of the 2019-2020 holes could cause moderate changes to gold estimates locally, but would not likely cause expansions to optimized pits.
- Three of the five holes are in the South Lodes area near surface, and would widen low-, mid- and/or high-grade domains near surface, and/or increase grade locally. These are tempered by nearby drill holes, so increases of resources within a possible pit would be limited. Pit limits would not be affected.
- The other two of the five holes are in Sweet Hollow Main. One would extend and widen low- and mid-grade domains, and the other might add two high grade pods. Intercepts are 100ft to 200ft deep, and would not likely deepen a potential pit. One is tempered by surrounding drill holes that would limit the increase in grade and ounces.

There were inconsistencies between logged formation in the drill-hole database and 3D solids received from GSV. Also, data in adjacent drill holes was commonly conflicting. Many faults as received from Gold Standard did not demonstrate offset that could be determined in geologic modeling. The ramifications of these discrepancies to the gold resources are minor and would only affect grades and calculated tons locally.

Mr. Lindholm reports the North Bullion mineral resources at cutoffs that are reasonable for Carlin-type deposits of comparable size and grade. Technical and economic factors likely to influence the requirement "*in such form and quantity and of such a grade or quality that it has reasonable prospects for eventual economic extraction*" were evaluated using the best judgement of the author responsible for this section of the report. For evaluating the open-pit and underground potential, MDA modeled a series of optimizations using variable gold prices, mining costs, processing costs, and anticipated metallurgical recoveries. MDA used costs appropriate for open-pit and underground mining in Nevada, estimated processing costs and metallurgical recoveries related to heap leaching and milling, and G&A costs. The factors used in defining cutoff grades are based on a gold price of $1,750/oz.

The North Bullion mineral resource estimate is the fully block diluted ID^3 estimate and is reported at variable cutoffs for open-pit and underground mining. The cutoff for oxidized and transitional material in open pits is 0.005 oz Au/ton, whereas the cutoff for sulfide material is 0.045 oz Au/ton. Underground resources were reported at a cutoff grade of 0.1 oz Au/ton for refractory material. Table 14.62 through Table 14.66 present the estimates of the Inferred gold mineral resources within the $1,750/oz Au pit and underground shells. The breakdown of mineral resources by oxidation state is given in Appendix C. Representative cross sections of the gold block model in the North Bullion, Sweet Hollow/South Lodes and POD deposits are given in Figure 14.38, Figure 14.39 and Figure 14.40, respectively. Mineral resources that are not mineral reserves do not have demonstrated economic viability.

Table 14.62: North Bullion Inferred Gold Mineral Resources – Open Pit

Cutoff			
oz Au/ton	Tons	oz Au/ton	oz Au
0.001	20,230,000	0.024	483,000
0.002	15,955,000	0.030	477,000
0.003	13,563,000	0.035	472,000
0.004	12,712,000	0.037	469,000
0.005	12,139,000	0.038	465,000
0.006	11,482,000	0.040	462,000
0.007	10,723,000	0.043	457,000
0.008	9,915,000	0.045	451,000
0.009	9,023,000	0.049	443,000
0.010	8,148,000	0.054	436,000
0.015	5,675,000	0.071	405,000
0.020	4,529,000	0.085	386,000
0.025	4,050,000	0.093	375,000
0.030	3,780,000	0.097	368,000
0.035	3,547,000	0.101	360,000
0.040	3,350,000	0.105	353,000
variable	**3,214,000**	**0.107**	**345,000**
0.045	3,140,000	0.110	344,000
0.050	2,936,000	0.114	334,000
0.100	1,100,000	0.187	206,000

Table 14.63: North Bullion Inferred Gold Mineral Resources – Underground

Cutoff			
oz Au/ton	Tons	oz Au/ton	oz Au
0.010	504,000	0.131	66,000
0.020	504,000	0.131	66,000
0.030	504,000	0.131	66,000
0.040	504,000	0.131	66,000
0.050	504,000	0.131	66,000
0.060	504,000	0.131	66,000
0.070	504,000	0.131	66,000
0.080	504,000	0.131	66,000
0.090	504,000	0.131	66,000
0.100	**504,000**	**0.131**	**66,000**
0.140	130,000	0.179	23,000
0.190	38,000	0.228	9,000
0.240	10,000	0.284	3,000
0.290	4,000	0.319	1,000
0.340	1,000	0.356	-
0.000	-	0.000	-
0.000	-	0.000	-
0.000	-	0.000	-
0.000	-	0.000	-
0.000	-	0.000	-

Table 14.64: Sweet Hollow Inferred Gold Mineral Resources – Open Pit

Cutoff			
oz/ton Au	Tons	oz/ton Au	oz Au
0.001	5,273,000	0.010	52,000
0.002	4,593,000	0.011	51,000
0.003	4,074,000	0.012	50,000
0.004	3,433,000	0.014	48,000
0.005	2,951,000	0.016	46,000
variable	**2,884,000**	**0.016**	**45,000**
0.006	2,673,000	0.016	44,000
0.007	2,504,000	0.017	43,000
0.008	2,318,000	0.018	42,000
0.009	2,121,000	0.019	40,000
0.010	1,901,000	0.020	38,000
0.015	922,000	0.028	26,000
0.020	502,000	0.036	18,000
0.025	313,000	0.045	14,000
0.030	212,000	0.057	12,000
0.035	157,000	0.064	10,000
0.040	126,000	0.071	9,000
0.045	106,000	0.075	8,000
0.050	89,000	0.079	7,000
0.100	14,000	0.143	2,000

Table 14.65: POD Inferred Gold Mineral Resources – Open Pit

Cutoff			
oz Au/ton	Tons	oz Au/ton	oz Au
0.001	2,287,000	0.041	94,000
0.002	2,035,000	0.046	94,000
0.003	1,890,000	0.049	93,000
0.004	1,790,000	0.052	93,000
0.005	1,716,000	0.054	93,000
0.006	1,657,000	0.056	93,000
0.007	1,610,000	0.058	93,000
0.008	1,569,000	0.059	92,000
0.009	1,520,000	0.061	92,000
0.010	1,478,000	0.062	91,000
0.015	1,164,000	0.075	87,000
variable	**1,459,000**	**0.060**	**87,000**
0.020	973,000	0.086	84,000
0.025	888,000	0.091	81,000
0.030	852,000	0.095	81,000
0.035	809,000	0.099	80,000
0.040	744,000	0.103	77,000
0.045	677,000	0.109	74,000
0.050	624,000	0.115	72,000
0.100	292,000	0.164	48,000

Table 14.66: South Lodes Inferred Gold Mineral Resources – Open Pit

Cutoff			
oz/ton Au	Tons	oz/ton Au	oz Au
0.001	1,352,000	0.011	15,000
0.002	1,211,000	0.012	14,000
0.003	1,074,000	0.013	14,000
0.004	925,000	0.015	14,000
0.005	**800,000**	**0.016**	**13,000**
0.006	720,000	0.018	13,000
0.007	677,000	0.018	12,000
0.008	649,000	0.018	12,000
0.009	621,000	0.019	12,000
0.010	590,000	0.020	12,000
0.015	358,000	0.025	9,000
0.020	206,000	0.029	6,000
0.025	105,000	0.038	4,000
0.030	68,000	0.044	3,000
0.035	49,000	0.041	2,000
0.040	35,000	0.057	2,000
0.045	24,000	0.042	1,000
0.050	15,000	0.067	1,000
0.000	-	-	-

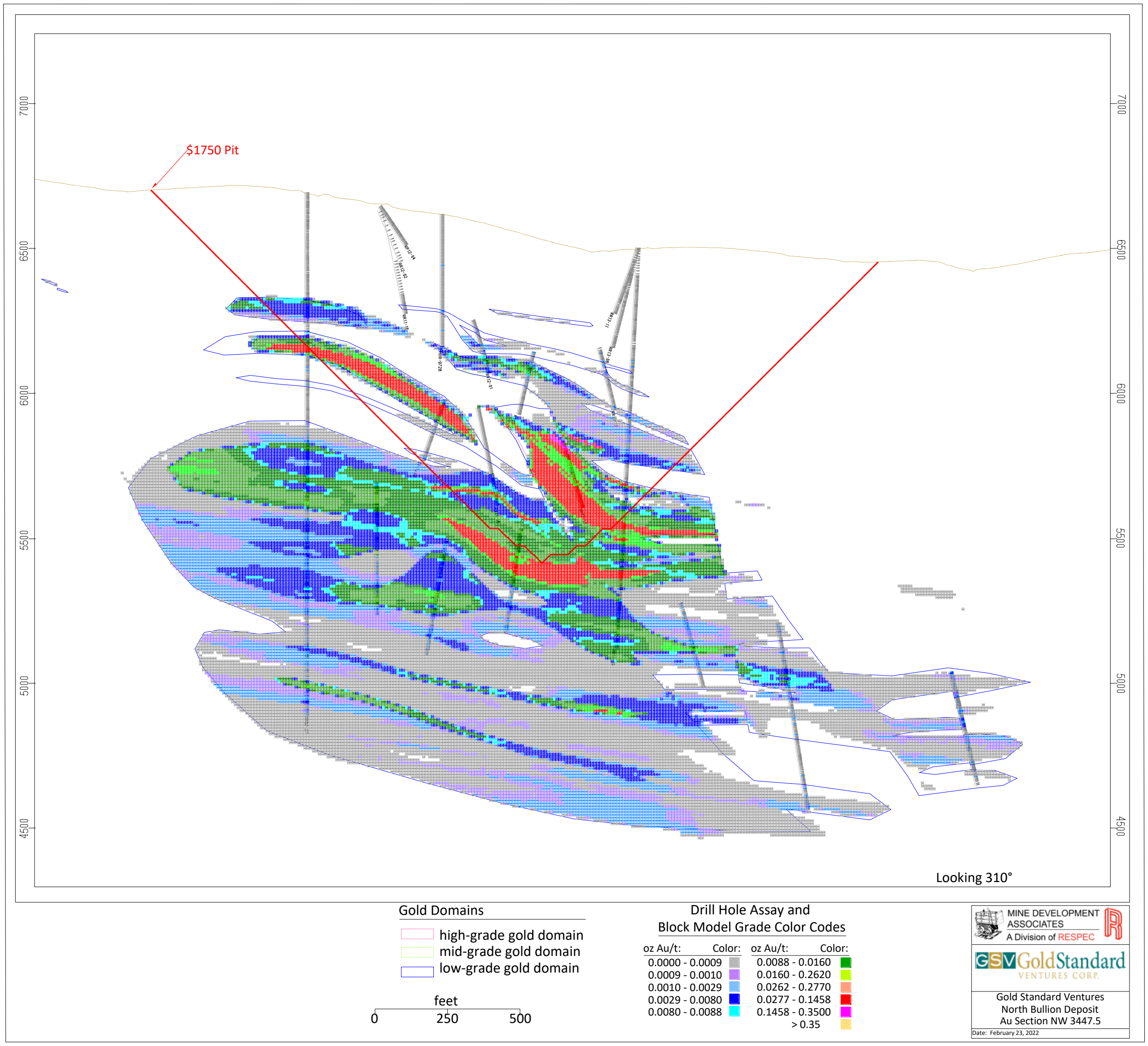


Figure 14.38: North Bullion Deposit Gold Domains and Block Model – Section NW3447.5

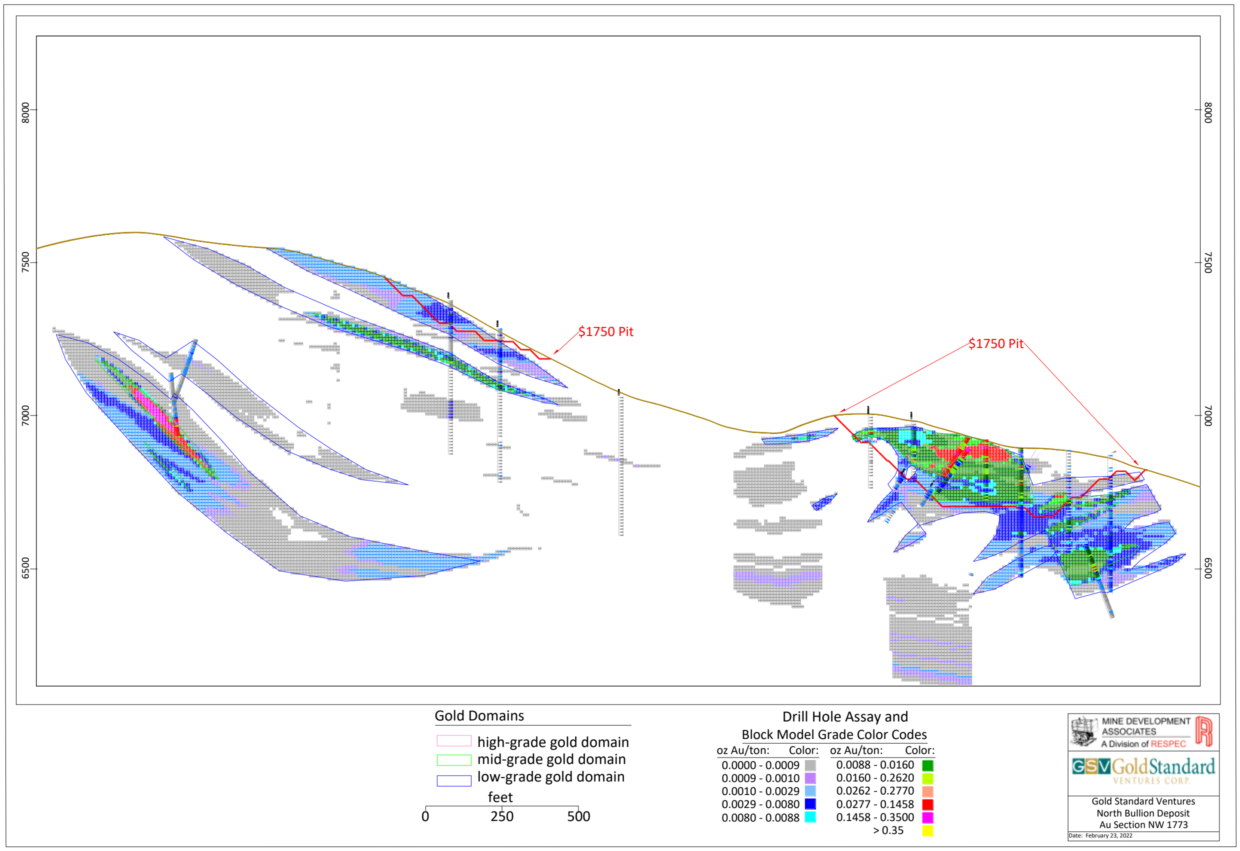


Figure 14.39: Sweet Hollow and South Lodes Deposits Gold Domains and Block Model – Section NW1773.0

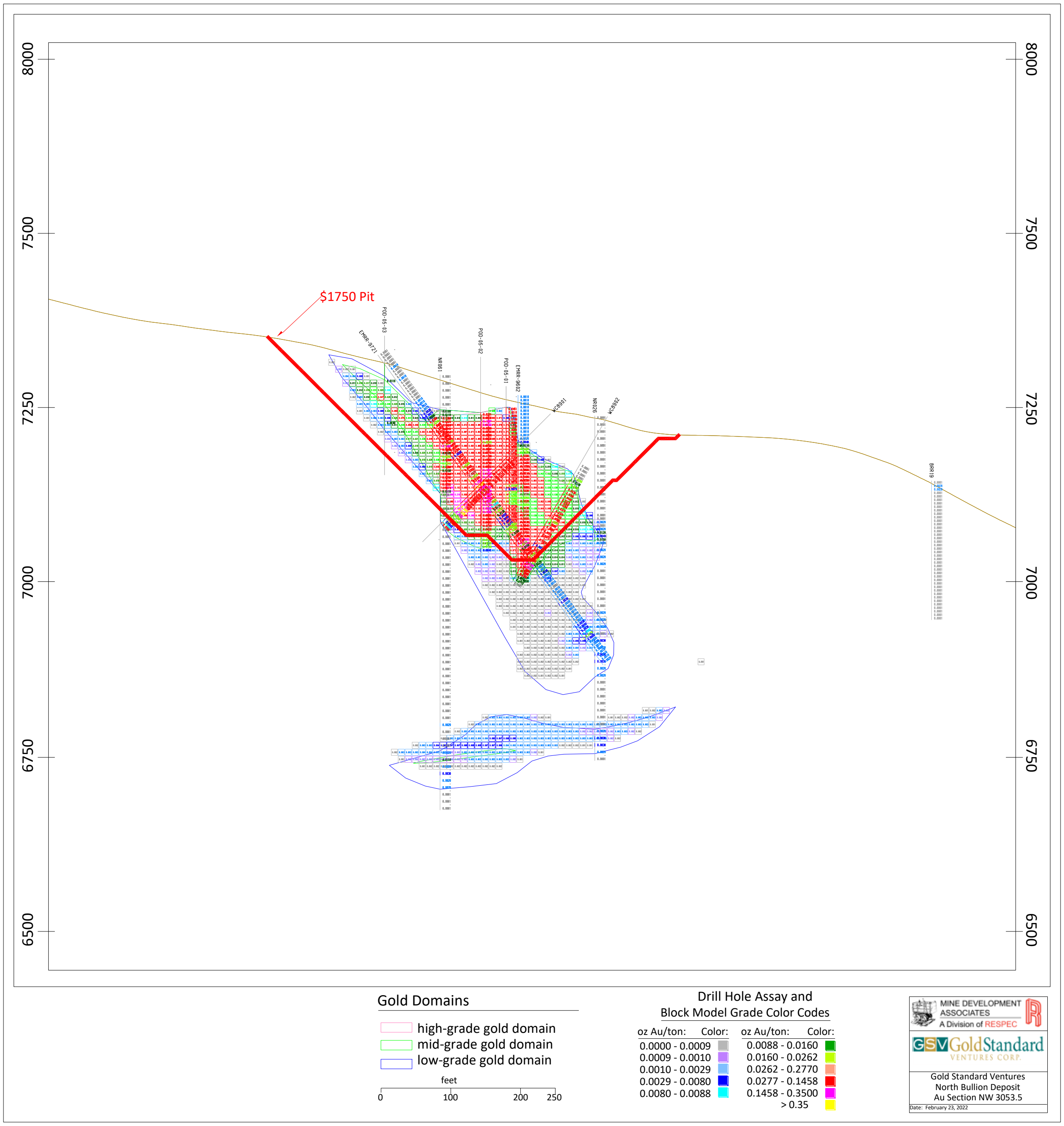


Figure 14.40: POD Deposit Gold Domains and Block Model – Section NW3053.5

14.5.5 North Bullion Density

Application of density values to the block model is dependent on numerous modeled criteria that have been discussed in various prior sections. There are 1,048 density measurements in the North Bullion database. All samples were measured using the immersion method by an independent laboratory. The values assigned to the model, by rock unit (Section 14.5.2), gold domains (Section 14.5.3.1), and refractory zone (Section 14.5.2), are summarized in Table 14.67. Spatially, the North Bullion deposit is well represented. However, there is density data from only two core holes at Sweet Hollow and one core hole at South Lodes. There is no density data from the POD deposit.

Table 14.67: Density and Tonnage Factor Values Applied to the North Bullion Block Model

Formation	Gold Domain	Refractory Zone	Sample count	Density applied to model (g/cm³)	Tonnage Factor (ft³/ton)
Dox - Oxyoke Fm	All	All	34	2.71	11.83
Ddg - Devils Gate Limestone	LG, MG and HG	All	352	2.73	11.74
Ddg - Devils Gate Limestone	OD	All	55	2.80	11.45
Mtp - Tripon Pass and Mw - Webb Fm	All	oxide	32	2.45	13.08
Mtp - Tripon Pass and Mw - Webb Fm	All	refractory	272	2.64	12.14
Mc - Chainman Shale	OD and LG	All	193	2.57	12.47
Mc - Chainman Shale	MG and HG	All	66	2.65	12.09
Tiw - Indian Wells Tuffs and Sediments	All	All	32	2.34	13.70
Te - Elko Fm	All	All	12	2.42	13.23
Bullion Stock	N/A	N/A	0	2.7	11.87
Qc - Colluvium	N/A	N/A	0	1.9	16.87
Gold Domain acronyms: LG - low-grade, MG - mid-grade, HG - high-grade, OD - outside modeled domains					
*Tonnage Factor = 2000 / (density * 62.4)*					

In general, most formations that exist are well represented by density data. One exception is the Tertiary Elko Formation, for which there are only 12 measurements. There is no density data from the Tertiary Bullion Stock, so Gold Standard and MDA mutually agreed to apply a generalized average value for granodiorite. Quaternary colluvium also lacks density measurements at North Bullion, so the value used for the Pinion and Dark Star models was applied. As noted in Section 14.2.2, the Mississippian Tripon Pass Formation, which is primarily a micrite, and the Webb Formation, which consists of clastic sedimentary rocks, were modeled as a single unit. Because there are inherent differences in density for the two lithologic types, and these units are the primary host for mineralization at the North Bullion and Sweet Hollow deposits, there will be some risk associated with calculated tonnages for the units. Similarly, the Devonian Sentinel Mountain Dolomite and Upper Nevada Group rocks (also dolomite) are modeled with Devonian Devil's Gate Limestone. However, these units are below nearly all gold mineralization, and therefore pose no risk to the estimation of the resources.

14.5.6 Discussion of North Bullion Estimated Mineral Resources

The North Bullion mineral resources are classified entirely as Inferred by Mr. Lindholm. The Inferred mineral resource classification reflects the current level of metallurgical testwork, density and geotechnical data, and QA/QC support for the North Bullion resources. It is likely, however, that the estimated mineral resources are reasonably estimated in the area of drilling. All checks, including volume comparisons, cumulative probability plots of inverse distance, kriged, and nearest neighbor estimates, indicate that the mineral resource is reliable. Optimized pits increase in size incrementally with gold price, generally 1% to 4% for each $25 increase in price per ounce. A significant increase in contained ounces of gold occurs at a $1,750/oz Au price, where the North Bullion deposit becomes viable via open pit at the applied parameters.

One of the most significant risks in this estimate is the lack of metallurgical testwork of the predominantly refractory mineralization. There is also little testwork characterizing the potential economic extractability of gold from oxide material. There are a few gold cyanide leach assays from a handful of drill holes, providing sparse data to suggest potential recovery rates for any of the North Bullion deposits.

Another risk is the absence of QA/QC data for historical drilling. Although most of the drilling in the North Bullion deposit was done by Gold Standard, the bulk of the drilling for Sweet Hollow, POD and South Lodes was done prior to Gold

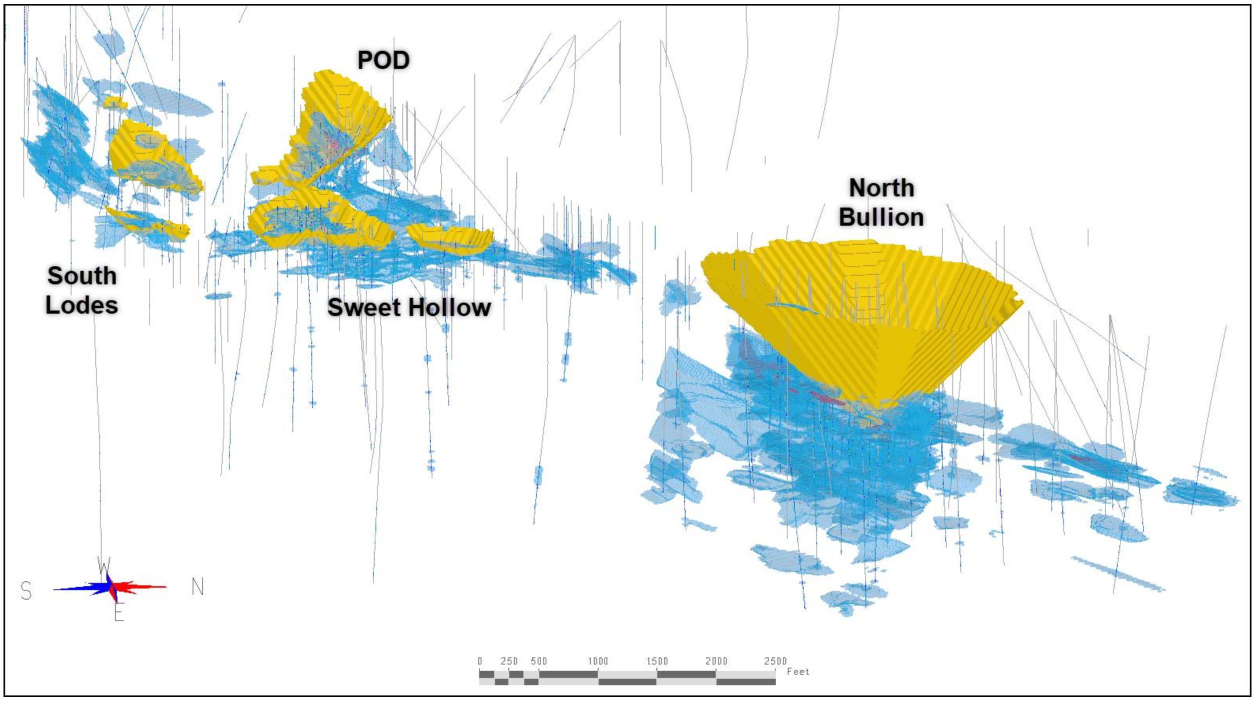
Standard. Additionally, no geotechnical data was received from Gold Standard, and the drill type for 419 of 515 drill holes in the database is unknown or not given.

There is the possibility of additional risk that has resulted from the conversion from metric to Imperial units of drill-hole collar coordinates. Direct conversion of northings and eastings using a factor of 1 m = 3.280833333 ft was applied to all collar coordinates. Gold Standard holes were surveyed in metric units; however, it is believed that some historical drill collars were originally surveyed in feet and later converted to metric. Comparisons of metric and Imperial coordinates in the collar tables received from Gold Standard indicate conversion factors were inconsistently applied. Because values of northings and eastings are so large, discrepancies up to 150 ft can result by application of conversion factors that differ in the fifth decimal place. The risks associated with such potential discrepancies have been accounted for in the classification all gold resources as Inferred. If higher classification is to be considered for future resource estimates at North Bullion, such potential discrepancies in areas relying predominantly on historical data should be considered.

Although the North Bullion deposit is well represented, there is a minimal amount of density data in the Sweet Hollow, POD and South Lodes deposits. Most formations that exist in the block model are well represented by density data, however, only 12 measurements are available to characterize the Tertiary Elko Formation, and there is no density data from the Tertiary Bullion Stock and Quaternary colluvium. One potential risk exists because the Mississippian Tripon Pass and Webb Formations, which consist of micrite and clastic rocks, respectively, were modeled as a single unit. Because there are inherent differences in density for the two lithologic types, and these units are the primary host for mineralization at the North Bullion and Sweet Hollow deposits, there will be some risk associated with calculated tonnages for the units.

Forty drill holes (15,548 ft) were drilled at North Bullion in 2019-2020, but complete assays were not received until March of 2021, after the gold domain model had been completed. These holes were later compared to the 2021 domains. Thirty-five of these holes are likely to cause only minimal changes to gold domains. Of the remaining five, three the South Lodes area would widen low-, mid- and/or high-grade domains near surface, and/or increase grade locally. The other two holes are in Sweet Hollow, and might extend and widen low- and mid-grade domains, and possibly add two high grade pods. These intercepts, however, are 100ft to 200ft deep, and would not likely deepen a potential pit. It is important to note that any changes that would be caused by the 2019-2020 drilling would most likely manifest as local increases to the reported resource, and optimized pit limits are unlikely to be affected.

In addition to the mineral resources reported herein, there is mineralization that continues beyond, and is contiguous with the reported mineral resources. The reported mineral resource estimate is constrained by pit and underground shells, and consequently there is estimated mineralization outside the pit that is unreported. The unreported mineralization is shown graphically in Figure 14.41.



Note: dark lines are drill holes; blue solid is the 0.004 oz Au/ton grade shell; yellow are the mineral resource pit shells; red shapes within 0.004 oz Au/ton grade shell at North Bullion are underground shells at 0.1 oz Au/ton.

Figure 14.41 : North Bullion Optimized Pits, Underground Shells and Additional Mineralization

To advance the North Bullion deposits, MDA's recommendations include, but are not limited to, the following:

- Acquire more density data, particularly in deposit areas where it is sparse or lacking altogether,
- Update the drill-hole database where drilling is lacking, *e.g.,* determine drilling methods for GSV and historic drilling where not documented in the database,
- Compile core recovery and RQD data,
- Perform metallurgical test work, especially in deep refractory material.

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15 MINERAL RESERVE ESTIMATES

15.1 INTRODUCTION

Jordan Anderson and Thomas L. Dyer, PE, both Qualified Persons by the meaning of 43-101, are the authors of this section. To determine the South Railroad mineral reserves. the authors classify mineral 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 NI 43-101. Mineral reserves for the Pinion and Dark Star deposits were developed by applying relevant economic criteria to define the economically extractable portions of the current mineral resources. CIM standards require that modifying factors be used to convert mineral resources to mineral reserves. The standards define modifying factors and Proven and Probable mineral 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 preliminary 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 preliminary 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, mineral 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, mineral 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 mineral resources, 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 preliminary 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 preliminary 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.

The authors of this section have used Measured and Indicated mineral resources as the basis to define mineral reserves for both the Dark Star and Pinion deposit based on open-pit mining with cyanide heap-leach processing. Mineral 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. The authors then considered mining, processing, metallurgical, infrastructure, economic, marketing, legal, environmental, social, and governmental factors for defining the estimated mineral reserves.

Mineral reserves in this feasibility study have been modified based on updated, current mineral resources and modified pit designs in comparison to the 2020 PFS. Dark Star mining has been designed using four pit phases. The modifications were applied to the Dark Star pit designs and include:

- Updated geotechnical feasibility findings; and
- Updated haul road parameters

Pinion mining has been designed using five pit phases. The phased pit designs for both the Dark Star and Pinion deposits to define the project production schedule, which was then used for cash-flow analysis for the feasibility study. The final cash-flow model was produced by M3 Engineering and demonstrates that the deposits make a positive cash flow and are reasonable with respect to statement of mineral reserves for those deposits.

15.2 PIT OPTIMIZATION

Pit optimizations were completed by first identifying economic and geometrical parameters. This was followed by evaluating cutoff grades, and then running pit optimizations and economic analysis within various optimized pit shells.

15.2.1 Economic Parameters

Economic parameters were used to generate optimized pits using a Lerchs-Grossman algorithm within Whittle™ software (Version 4.7). The economic parameters include estimated mining costs, processing costs, general and administrative costs ("G&A"), refining costs, royalties, and metal recoveries. Mine planning is an iterative process, and initial costs and recoveries were assumed to determine how large pits would be. The economic parameters were refined as concepts were developed on how material would be processed from the different deposits. The method for processing that was determined was:

- Use of run-of-mine ("ROM" no crushing) for oxide and transition material from Dark Star and Pinion

The economic parameters used are shown in Table 15-1. The overall process rate is assumed to be 33,000 tons per day or 12,045,000 tons per year. The assumption here is only used to convert the fixed G&A component to a cost per ton for the purpose of pit optimization. The G&A cost is later applied as a fixed cost in the cash-flow model.

Table 15-1: South Railroad Economic Parameters

	Dark Star	Pinion	
	ROM	ROM	Units
Mining - Waste	$ 1.80	$ 1.80	$/ton Mined
Incremental Ore Mining Cost	$ 0.20	$ 0.20	$/ton Processed
Leaching	$ 1.90	$ 1.90	$/ton Processed
G&A Cost per Ton	$ 0.37	$ 0.37	$/ton Processed
Refining - Au	$ 5.00	$ 5.00	$/oz Produced
Refining - Ag	NA	$ 0.50	$/oz Produced
Royalty	By Area	By Area	

Royalties were applied by royalty area or region as provided by Gold Standard. These are described in Section 4.2.

Recoveries were applied in detail based on recommendations by Mr. Gary Simmons, the Qualified Person for Section 13 of this Technical Report. Most of the recoveries used are based on grade-dependent equations. To simplify the equations, they were separated into various ROM equations for the different deposits and material types.

Pit optimizations and pit designs, metal prices of $1,450 per ounce Au and $18.76 per ounce Ag were used. These are lower than the final economic analysis prices used of $1,650 and $21.00 per ounce of gold and silver respectively. This leaves a bit of upside potential and the final ultimate pits are reasonable with respect to reporting of reserves.

15.2.1.1 Dark Star Recoveries

Dark Star recovery equations were provided based on mineral resource model blocks classified as low- and high- silica in the deposit. Separate equations were provided for both Dark Star North and Dark Star Main and were also varied for oxide and transition material. Thus, there are eight separate gold recovery equations for Dark Star material referred to as ROM1, ROM2, etc.

The definitions follow those of the ROM for the material shown below.

The resulting ROM equations are shown in Table 15-2. “HG” in the equations to follow equals “head grade”.

Table 15-2: Dark Star ROM Recovery Equations for Gold

North Dark Star	Oxidation	Lith/Material	Equation
ROM1	Oxide	Low Silc	IF(HG*34.2857<0.4,5.1422*LN(HG*34.2857)+88.295,0.7864*LN(HG*34.2857)+84.371)
ROM2	Oxide	High Silc	IF(HG*34.2857<0.4,5.667*LN(HG*34.2857)+81.503,0.8666*LN(HG*34.2857)+77.178)
ROM3	Transition	Low Silc	IF(HG*34.2857<0.4,5.9294*LN(HG*34.2857)+69.158,0.9067*LN(HG*34.2857)+64.633)
ROM4	Transition	High Silc	IF(HG*34.2857<0.4,6.1918*LN(HG*34.2857)+58.948,0.9468*LN(HG*34.2857)+54.222)
Dark Star Main			
ROM5	Oxide	Low Silc	IF(HG*34.2857<0.4,3.6204*LN(HG*34.2857)+89.475,0.5536*LN(HG*34.2857)+86.712)
ROM6	Oxide	High Silc	IF(HG*34.2857<0.4,2.5183*LN(HG*34.2857)+77.163,0.3851*LN(HG*34.2857)+75.241)
ROM7	Transition	Low Silc	IF(HG*34.2857<0.4,4.6651*LN(HG*34.2857)+70.373,0.7134*LN(HG*34.2857)+66.812)
ROM8	Transition	High Silc	IF(HG*34.2857<0.4,8.7639*LN(HG*34.2857)+66.188,5.8232*LN(HG*34.2857)+63.941)

15.2.1.2 Pinion Recoveries

Pinion recoveries are based on block model rock types, estimated barium content, modeled silica zones, and oxidation types. All Pinion sulfide materials are considered as waste. Block model rock type codes used to define the various recovery equations include MLBX, Devil’s Gate (“DgD”), MTP, and Other (not MLBX, DgD, or MTP). For Pinion ROM material, a total of four oxide equations and four transition equations were used. Table 15-3 shows the recovery equation names and a description of the material they are applied to, along with the equations used.

Table 15-3: Pinion ROM Recovery Equations for Gold

Equation	Oxidation	Lith/Material	Equation
ROM1	Oxide	DgD	IF(HG*34.2857<0.4,5.6671*LN(HG*34.2857)+63.160,1.0819*ln(HG*34.2857)+58.880)
ROM2	Oxide	MlBx Lo Si	IF(HG*34.2857<0.4,7.6257*LN(HG*34.2857)+66.776,5.4756*ln(HG*34.2857)+64.985)
ROM3	Oxide	MlBx Hi Si	IF(HG*34.2857<0.4,7.7255*LN(HG*34.2857)+46.504,4.6417*ln(HG*34.2857)+45.591)
ROM4	Oxide	MTP	IF(HG*34.2857<0.4,11.354*LN(HG*34.2857)+74.905,6.9619*ln(HG*34.2857)+71.223)
ROM5	Transition	DgD	(.1979*LN(HG*34.2857)+25.5780)
ROM6	Transition	MlBx Lo Si	(.1979*LN(HG*34.2857)+25.5780)
ROM7	Transition	MlBx Hi Si	(.1979*LN(HG*34.2857)+25.5780)
ROM8	Transition	MTP	(.1979*LN(HG*34.2857)+25.5780)

15.2.2 Geometric Parameters

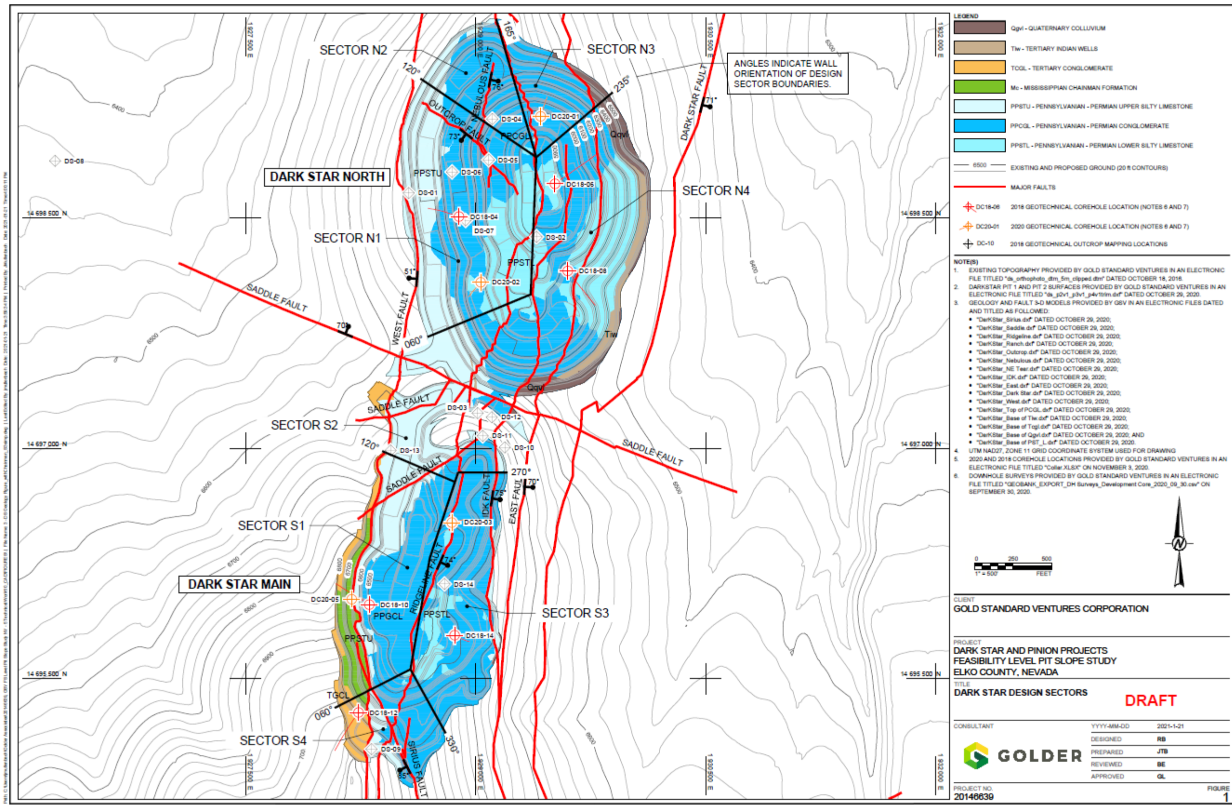
Geometric parameters include land constraints and slope parameters. No land boundaries were used other than royalty areas as required to apply NSR royalties to the economics.

Slope recommendations were provided by Golder Associates (“Golder”) (Golder, 2021). These were given using different sectors for both the Dark Star and Pinion deposits. Golder provided two sets of recommendations for each deposit based on whether best-case blasting practices are used. RESPEC has applied the recommendations assuming best blasting practices will be used to protect high walls from damage.

15.2.2.1 Dark Star Slope Recommendations

Dark Star slope sectors provided by Golder (2021) are shown in Figure 15-1. Recommended bench heights, catch bench widths, bench face angles (“BFA”), and inner-ramp slope angles (“IRA”) are shown in Table 15-4.

The slope sectors were flagged into the mineral resource block model and exported to Whittle. For pit optimizations, the slopes in Dark Star Main were flattened by 5° while Dark Star North slopes were flattened by 7°- 9° to provide a more accurate representation of the flattening due to inclusion of ramps in the preliminary pit designs.



(From Golder, January 2021)

Figure 15-1: Dark Star Slope Sectors

Table 15-4: Dark Star Slope Recommendations by Sector

Dark Star Golder Recommendations in Feet

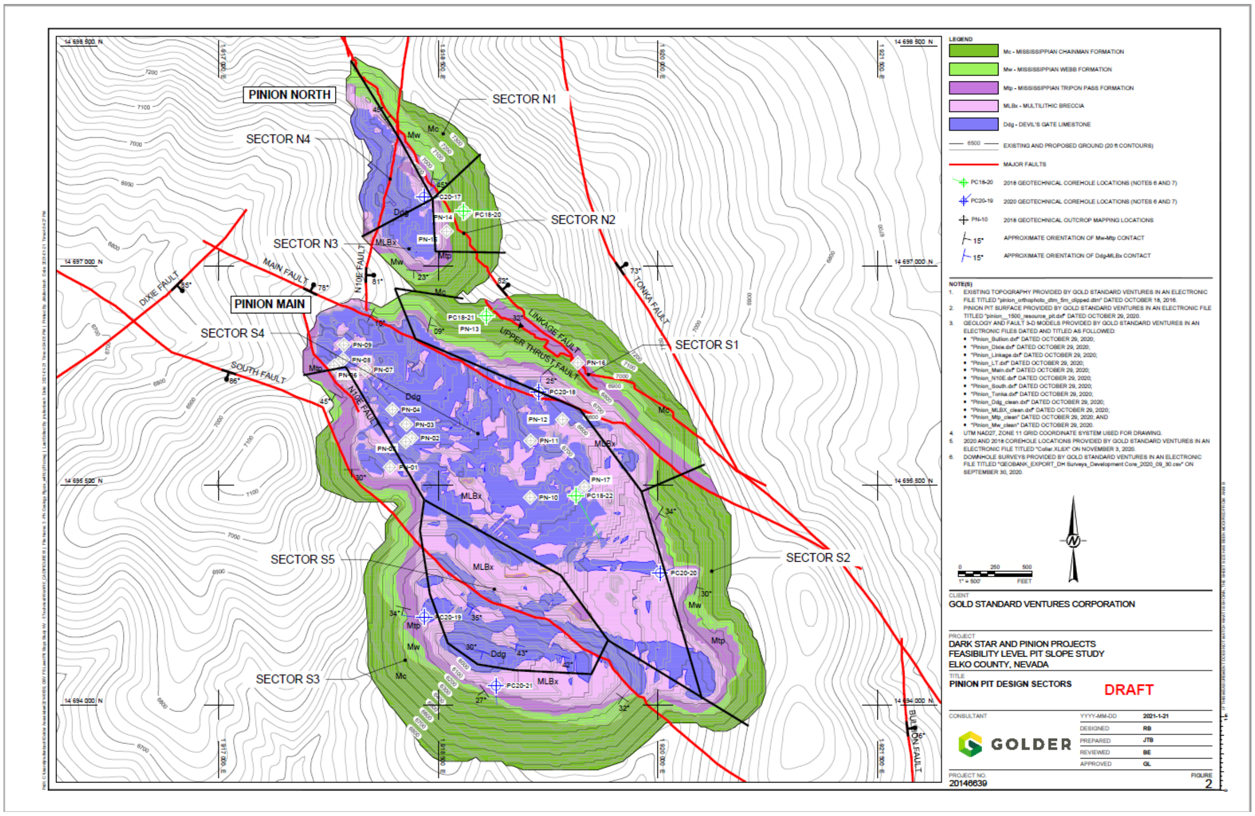
Sector	Bench Height *	Bench Width *	BFA (°)	IRA (°)
N1	60	27	69	50
N2	60	27	72	52
N3	60	27	67	48
N4	60	27	72	52
S1	60	27	71	51
S2	60	27	72	52
S3	60	27	67	48
S4	60	27	72	52
Ovgl, Twi	30	25	60	35
Tcgl	30	21	65	40

**** Bench height and widths were provided in feet***

15.2.2.2 Pinion Slope Recommendations

Pinion slope sectors provided by Golder are shown in Figure 15-2 and the recommended bench heights, catch bench widths, BFA, and IRA are shown in Table 15-5. For Whittle pit optimizations, sections 4 and 5 were flattened by 1° to account for ramps while the IRA was applied to the remaining sections. Unlike Dark Star North, the final designs for

Pinion were completed leaving minimal ramps in the high wall. The exception being Pinion North section 4 which contains most of that pit's ramps and was flattened by 9° to account for this.



(from Golder, January 2021)

Figure 15-2: Pinion Slope Sectors

Table 15-5: Pinion Slope Recommendations by Sector

Pinion Golder Recommendations in Feet

Sector	Bench Height	Bench Width	BFA	IRA
S1	60	27	72	52
S2	60	27	70	50
S3	60	27	72	52
S4	30	21	65	40
S5	30	21	65	40
N1	60	27	72	52
N2	60	27	62	45
N3	60	27	72	52
N4	30	21	65	40
MLBx	30	21	65	40

**** Bench height and widths were provided in feet***

(From Golder and Associates, January 2021)

15.2.3 Cutoff Grades for Pit Optimization

Cutoff grades were calculated based on the economic parameters shown in Table 15-1. Cutoff grades were calculated for the different deposits and material types for the various potential processing methods. ROM processing cutoff grades were calculated as internal break-even cutoffs. The internal cutoff grade calculation eliminates the mining cost in the calculation. The pit designs are based on economical pits and the materials inside of the pits are assumed to be mined whether the material is waste or ore. The decision on whether to process the material is made at the point where the truck needs to turn either to the waste dump or the process facility. Thus, the mining cost is a sunk cost. The basic equation for the cutoff grade calculation is shown in Equation 1.

Equation 1 Breakeven Cutoff Grade Calculation (oz Au/ton)

$$\frac{Costs}{\left(\frac{Au\$}{oz} - RefCst\right) * (1 - Roy\%) * Rec\%}$$

Where costs are all processing costs plus G&A costs in $/ton, RefCst is the refining cost in $/oz gold produced, Roy% is the NSR royalty, and Rec% is the calculated recovery at the cutoff grade.

Of note, when calculating the breakeven cutoff grades for ROM material, the cutoff grade can be very low and approach assay detection limits. Processing material with grades at the detection limits runs the risk that material may be sent to the leach pad that will incur more costs than the value it creates. Due to this lack of confidence in assays for such lower grades, the feasibility study uses a minimum grade of 0.005 oz Au/ton.

The calculated ROM breakeven cutoff grades range between 0.002 and 0.004 oz Au/ton. As such, the reporting cutoff grades used are 0.005 oz Au/ton for all Dark Star ROM material processed. Table 15-6 shows the crossover cutoff grades for Dark Star.

Table 15-6: Dark Star Cutoff Grades

North Dark Star	**Oxidation**	**Lith/Material**	**COG oz Au/ton**
ROM1	Oxide	Low Silc	0.005
ROM2	Oxide	High Silc	0.005
ROM3	Transition	Low Silc	0.005
ROM4	Transition	High Silc	0.005
Dark Star Main			
ROM5	Oxide	Low Silc	0.005
ROM6	Oxide	High Silc	0.005
ROM7	Transition	Low Silc	0.005
ROM8	Transition	High Silc	0.005

The Pinion cutoff grades are shown in Table 15-7 by oxidation, rock type, barite content, and silica reference. ROM cutoff grades are shown as either the breakeven cutoff grades or the 0.005 oz Au/ton minimum cutoff, whichever is greater.

Table 15-7: Pinon Breakeven Cutoff Grades

			COG (oz Au/ton)
ROM Eq	Oxidation	Lith/Material	ROM
ROM1	Oxide	DgD	0.005
ROM2	Oxide	MlBx Lo Si	0.005
ROM3	Oxide	MlBx Hi Si	0.005
ROM4	Oxide	MTP	0.005
ROM5	Transition	DgD	0.007
ROM6	Transition	MlBx Lo Si	0.007
ROM7	Transition	MlBx Hi Si	0.007
ROM8	Transition	MTP	0.007

The ROM cutoff grades described above were used for minimum values in the Whittle optimizations. The ROM cutoff grades above were used for final mineral reserve definition.

15.2.4 Pit Optimization Methods and Results

Pit optimizations were run using Whittle™ software (version 4.7). Inputs into Whittle included the mineral resource block model along with the economic and geometric parameters previously discussed. Pit optimizations used for mineral reserve definition used only Measured and Indicated mineral resources for processing and all Inferred material is considered as waste. Each deposit was run separately, and ultimate pit shells were selected from the Whittle results for final design. For Dark Star and Pinion, additional pit shells were considered for guidance of interior pit phases.

The selections 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. This was done in Whittle using a Lerchs-Grossman algorithm. The revenue factor was multiplied by the recovered ounces and the metal prices, creating a nested set of pit shells based on different metal prices. Revenue factors for each of the deposits were varied from 0.30 to 2.5 in increments of 0.025. With a base price of $1,000 per ounce of gold, the resulting pit shells represent gold prices from $300 to $2,500 per ounce in increments of $25.00. This has the potential of generating up to 89 different pit shells that can be used for analysis.

Silver prices were adjusted to maintain a constant silver ratio for each revenue factor. This is done by setting a silver reference price equivalent to the reference gold price by multiplying the base silver price times $1,000 divided by the base gold price or $18.76 * $1,000 / $1,450 = $12.94 per ounce of silver.

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 analysis is done using the base price of metal ($1,600 per ounce of gold and $20.70 per ounce of silver). This uses a rough scheduling 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 provide the advantage of mining more valuable material sooner, and 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 Dark Star Pit Optimization

The previously discussed parameters were used along with gold prices varying from $300 to $2,500 per ounce to create the pit optimization results. These results are shown in Table 15-8 using $100 gold price increments with the addition of the $1,450 pit shell which is highlighted as the base price used for pit designs. The pit optimization used the IRA slopes provided by Golder and Associates and select flattening to account for roads as described previously.

Table 15-9 lists the PbP results and these are also shown graphically in Figure 15-3. Pit 52 is highlighted as having the best discounted operating cash flow for the specified case and pit 47 is highlighted as the $1,450 gold price pit shell which was chosen as the basis for pit designs. The final design was done using four pit phases, two for Dark Star North, which has the higher value, and two for Dark Star Main.

Table 15-8: Dark Star Pit Optimization Results

	Price	Material Processed			Waste	Total	Strip
Pit	$/oz Au	K Tons	oz Au/ton	K Ozs Au	K Tons	K Tons	Ratio
1	$ 300	7,931	0.046	363	26,529	34,461	3.34
5	$ 400	10,595	0.041	435	30,425	41,020	2.87
9	$ 500	15,119	0.038	571	46,114	61,233	3.05
13	$ 600	19,099	0.034	650	53,838	72,936	2.82
17	$ 700	23,414	0.031	716	60,360	83,774	2.58
21	$ 800	25,817	0.029	752	65,395	91,213	2.53
25	$ 900	26,870	0.029	768	68,007	94,876	2.53
29	$ 1,000	30,909	0.027	822	78,763	109,672	2.55
33	$ 1,100	31,790	0.026	834	81,851	113,642	2.57
37	$ 1,200	32,073	0.026	838	82,553	114,626	2.57
41	$ 1,300	32,584	0.026	844	84,209	116,792	2.58
45	$ 1,400	33,179	0.026	854	87,825	121,004	2.65
47	$ 1,450	33,670	0.026	865	92,844	126,515	2.76
49	$ 1,500	33,834	0.026	867	93,397	127,230	2.76
53	$ 1,600	34,293	0.026	875	96,642	130,935	2.82
57	$ 1,700	34,584	0.025	879	98,741	133,325	2.86
61	$ 1,800	34,693	0.025	880	99,112	133,805	2.86
65	$ 1,900	34,944	0.025	883	100,469	135,413	2.88
69	$ 2,000	35,194	0.025	886	102,417	137,611	2.91
73	$ 2,100	35,226	0.025	887	102,614	137,840	2.91
77	$ 2,200	35,358	0.025	890	104,832	140,189	2.96
81	$ 2,300	35,606	0.025	893	106,980	142,586	3.00
85	$ 2,400	35,688	0.025	894	107,736	143,425	3.02
89	$ 2,500	35,786	0.025	895	108,499	144,285	3.03

Table 15-9: Dark Star Pit by Pit Results

	Material Processed			Waste	Total	Strip	Disc Op Cash Flow (M USD)		
Pit	K Tons	oz Au/ton	K Ozs Au	K Tons	K Tons	Ratio	Best	Specified	Worst
37	32,073	0.026	838	82,553	114,626	2.57	$ 679.69	$ 670.11	$ 647.92
38	32,164	0.026	839	82,778	114,942	2.57	$ 679.87	$ 670.25	$ 647.90
39	32,341	0.026	841	83,289	115,629	2.58	$ 680.23	$ 670.53	$ 647.80
40	32,567	0.026	844	84,169	116,736	2.58	$ 680.80	$ 671.07	$ 648.12
41	32,584	0.026	844	84,209	116,792	2.58	$ 680.82	$ 671.10	$ 648.14
42	32,590	0.026	844	84,215	116,805	2.58	$ 680.83	$ 671.11	$ 648.14
43	32,815	0.026	846	84,925	117,740	2.59	$ 681.22	$ 671.48	$ 648.40
44	33,095	0.026	853	87,554	120,649	2.65	$ 682.13	$ 672.36	$ 649.04
45	33,179	0.026	854	87,825	121,004	2.65	$ 682.24	$ 672.46	$ 649.05
46	33,324	0.026	857	89,335	122,659	2.68	$ 682.60	$ 672.81	$ 649.26
47	33,670	0.026	865	92,844	126,515	2.76	$ 683.33	$ 673.49	$ 649.55
48	33,821	0.026	867	93,331	127,152	2.76	$ 683.46	$ 673.59	$ 649.46
49	33,834	0.026	867	93,397	127,230	2.76	$ 683.47	$ 673.60	$ 649.45
50	33,928	0.026	868	93,774	127,702	2.76	$ 683.53	$ 673.65	$ 649.40
51	34,096	0.026	870	94,528	128,624	2.77	$ 683.61	$ 673.71	$ 649.24
52	34,239	0.026	874	96,189	130,428	2.81	$ 683.68	$ 673.76	$ 649.13
53	34,293	0.026	875	96,642	130,935	2.82	$ 683.69	$ 673.75	$ 649.05
54	34,406	0.025	876	97,372	131,778	2.83	$ 683.67	$ 673.71	$ 648.88
55	34,464	0.025	878	98,290	132,755	2.85	$ 683.64	$ 673.67	$ 648.75
56	34,481	0.025	878	98,352	132,833	2.85	$ 683.63	$ 673.66	$ 648.72
57	34,584	0.025	879	98,741	133,325	2.86	$ 683.57	$ 673.59	$ 648.51

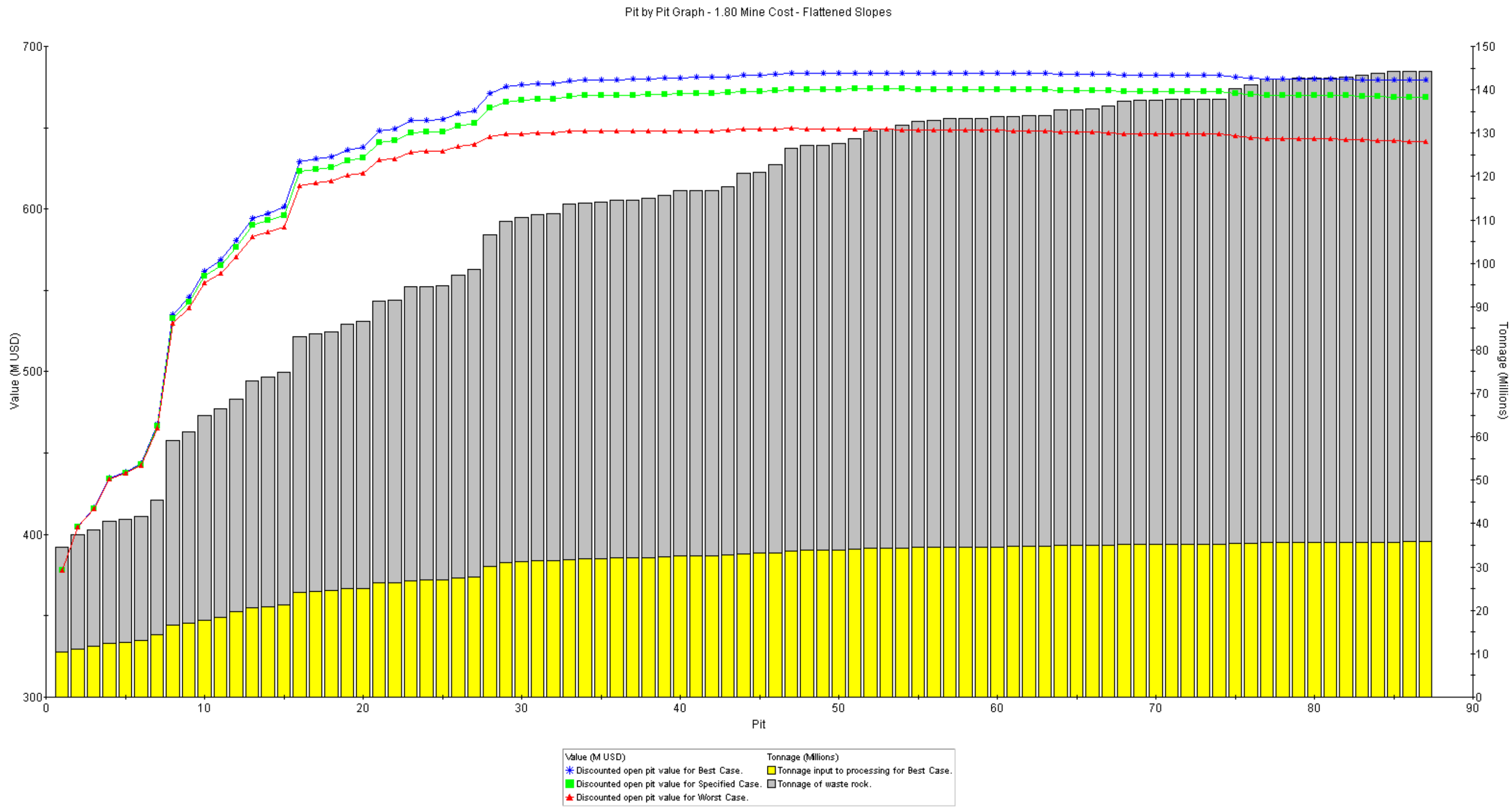


Figure 15-3: Dark Star Pit by Pit Graph

15.2.4.2 Pinion Pit Optimization

The Pinion optimization parameters were used along with variable gold prices to create the pit optimization results. These results are shown in Table 15-10 using $100 gold price increments with the addition of the $1,450 pit shell, which is highlighted as the base price used to determine the ultimate pit limits. Pit optimizations used the previously discussed Golder IRA slope criteria.

Table 15-11 shows the PbP results and these are also shown graphically in Figure 15-4. This shows the material processing type as selected by Whittle. Pit 48 is highlighted as having the best discounted operating cash flow for the specified case and pit 47 is highlighted as the $1,450 gold price pit shell which was chosen as the basis for pit designs.

It is worth noting the various steps in Figure 15-4 which illustrates the difficulty in overcoming stripping at certain metal prices. One of the larger jumps is between pit shells 46 and 47. The incremental change in contained ounces of gold between those pits is approximately 345,500 ounces.

Table 15-10: Pinion Pit Optimization Results

			Material Processed					Waste	Total	Strip
Pit	Au Price	Ag Price	K Tons	oz Au/ton	K Ozs Au	oz Ag/ton	K Ozs Ag	K Tons	K Tons	Ratio
1	$ 300	$ 3.88	648	0.038	24	0.191	124	635	1,283	0.98
5	$ 400	$ 5.18	1,379	0.031	42	0.175	242	1,026	2,405	0.74
9	$ 500	$ 6.47	2,235	0.028	62	0.186	415	1,843	4,079	0.82
13	$ 600	$ 7.76	3,214	0.025	81	0.183	588	3,019	6,233	0.94
17	$ 700	$ 9.06	3,945	0.024	94	0.174	687	3,957	7,902	1.00
21	$ 800	$ 10.35	5,074	0.022	113	0.167	846	5,815	10,889	1.15
25	$ 900	$ 11.64	6,270	0.021	135	0.157	984	8,820	15,090	1.41
29	$ 1,000	$ 12.94	6,963	0.021	145	0.152	1,057	10,625	17,588	1.53
33	$ 1,100	$ 14.23	8,080	0.021	166	0.146	1,183	14,981	23,061	1.85
37	$ 1,200	$ 15.53	8,638	0.020	174	0.143	1,234	17,000	25,638	1.97
41	$ 1,300	$ 16.82	20,457	0.019	398	0.144	2,938	68,971	89,428	3.37
45	$ 1,400	$ 18.11	21,808	0.019	418	0.141	3,071	73,328	95,136	3.36
47	$ 1,450	$ 18.76	39,437	0.019	764	0.156	6,142	187,333	226,770	4.75
49	$ 1,500	$ 19.41	40,015	0.019	772	0.155	6,203	188,827	228,842	4.72
53	$ 1,600	$ 20.70	41,387	0.019	788	0.153	6,330	193,190	234,577	4.67
57	$ 1,700	$ 21.99	42,522	0.019	804	0.153	6,515	198,564	241,085	4.67
61	$ 1,800	$ 23.29	43,207	0.019	812	0.152	6,582	200,644	243,852	4.64
65	$ 1,900	$ 24.58	43,738	0.019	818	0.152	6,642	202,728	246,467	4.64
69	$ 2,000	$ 25.88	45,998	0.018	851	0.153	7,032	216,385	262,383	4.70
73	$ 2,100	$ 27.17	46,559	0.018	857	0.152	7,086	219,106	265,666	4.71
77	$ 2,200	$ 28.46	47,205	0.018	867	0.152	7,166	223,182	270,387	4.73
81	$ 2,300	$ 29.76	47,688	0.018	872	0.152	7,228	225,723	273,411	4.73
85	$ 2,400	$ 31.05	48,193	0.018	879	0.151	7,287	228,885	277,078	4.75
89	$ 2,500	$ 32.34	49,009	0.018	888	0.150	7,374	232,833	281,842	4.75

Table 15-11: Pinion Pit by Pit Results

	Total Material Processed					Waste	Total	Strip	Disc. Op Cash Flow (M USD)		
Pit	K Tons	oz Au/ton	K Ozs Au	oz Ag/ton	K Ozs Ag	K Tons	K Tons	Ratio	Best	Specified	Worst
37	8,644	0.020	174	0.143	1,234	16,993	25,638	1.97	$ 95.29	$ 95.29	$ 95.29
38	8,746	0.020	175	0.142	1,241	17,200	25,945	1.97	$ 95.49	$ 95.49	$ 95.49
39	8,877	0.020	177	0.141	1,255	17,570	26,446	1.98	$ 95.78	$ 95.78	$ 95.78
40	20,484	0.019	397	0.143	2,939	68,672	89,156	3.35	$ 128.20	$ 128.20	$ 127.97
41	20,660	0.019	399	0.143	2,951	68,768	89,428	3.33	$ 128.32	$ 128.31	$ 128.07
42	20,876	0.019	401	0.142	2,965	69,049	89,925	3.31	$ 128.52	$ 128.49	$ 128.24
43	21,445	0.019	410	0.142	3,038	71,423	92,868	3.33	$ 129.52	$ 129.38	$ 129.11
44	21,622	0.019	413	0.141	3,051	72,064	93,686	3.33	$ 129.76	$ 129.58	$ 129.30
45	21,940	0.019	418	0.140	3,079	73,196	95,136	3.34	$ 130.23	$ 129.97	$ 129.68
46	22,054	0.019	420	0.140	3,089	73,372	95,426	3.33	$ 130.32	$ 130.06	$ 129.76
47	39,594	0.019	765	0.155	6,152	187,177	226,770	4.73	$ 153.44	$ 153.01	$ 145.31
48	40,010	0.019	772	0.155	6,203	188,672	228,681	4.72	$ 153.63	$ 153.16	$ 145.33
49	40,093	0.019	772	0.155	6,209	188,749	228,842	4.71	$ 153.62	$ 153.15	$ 145.32
50	40,464	0.019	778	0.154	6,251	190,569	231,033	4.71	$ 153.69	$ 153.16	$ 145.24
51	40,926	0.019	784	0.154	6,293	192,284	233,211	4.70	$ 153.65	$ 153.02	$ 145.04
52	41,172	0.019	786	0.153	6,314	192,625	233,797	4.68	$ 153.59	$ 152.90	$ 144.87
53	41,387	0.019	788	0.153	6,330	193,190	234,577	4.67	$ 153.51	$ 152.76	$ 144.68
54	41,596	0.019	791	0.153	6,361	193,942	235,539	4.66	$ 153.42	$ 152.61	$ 144.51
55	41,809	0.019	794	0.153	6,390	194,901	236,710	4.66	$ 153.27	$ 152.41	$ 144.26
56	42,214	0.019	800	0.153	6,469	197,447	239,660	4.68	$ 152.88	$ 151.90	$ 143.66
57	42,458	0.019	804	0.153	6,511	198,627	241,085	4.68	$ 152.65	$ 151.58	$ 143.29

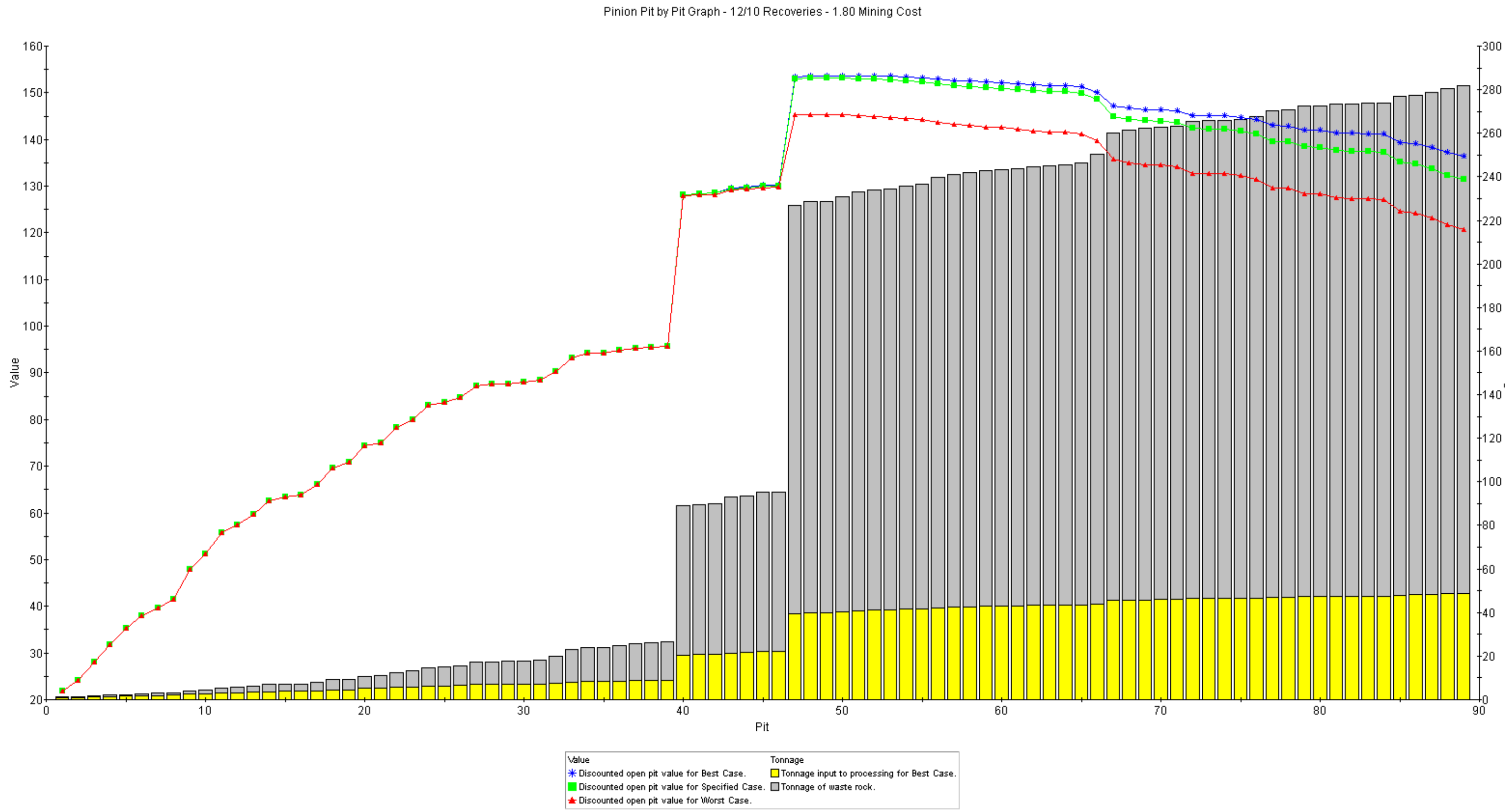


Figure 15-4: Pinion Pit by Pit Graph

15.3 PIT DESIGNS

Detailed pit designs were completed for Dark Star and Pinion using Surpac™ software (version 6.7). Each of the designs utilize both 30 ft benches with a catch bench installed every bench or every other bench (60 ft). Catch benches were designed with a width of 21 ft for 30 ft benches or 27 ft for 60 ft and the BFA's used are shown in Table 15-4 and Table 15-5.

15.3.1 Road and Ramp Design

Road designs have been completed for the feasibility study to allow primary access for people, equipment, and consumables to the site. This includes haul roads between the designed pits, dumps, and proposed leach facility. Within the pit designs, ramps have been established for haul truck and equipment access. The in-pit ramps will only require a single berm. Ramps outside of the pit will require two safety berms. The design parameters for ramps and roads are shown in Table 15-12. Note that these also show parameters for one-lane traffic. One-lane traffic would be used near the bottom of pits where the strip ratio is minimal, and the traffic requirements are low.

The ramps and haul roads assume the use of 200-ton capacity haul trucks with an operating width of 25.08 ft. For two-way access the goal of the road design is to allow a running width of near 3.5 times the width of the trucks. Mine Safety and Health Administration ("MSHA") regulations specify that safety berms be maintained with heights at least ½ of the diameter of the tires of the haul trucks that will travel on roads. The ½ height of the 200-ton haul trucks tires is 5.61 ft. An extra 10% was added to berm height design to ensure that all berms are a sufficient height.

Safety berms assume a slope of 1.5 horizontal to 1.0 vertical. Considering that ramps in the pit only need one berm, the road width of 105 ft was determined for two-lane traffic, which allows for 3.42 times the operating width of the haul trucks. Single-lane traffic roads are estimated to require 70 ft which allows 2.02 times the operating width of haul trucks.

Roads outside of the pit will require two berms and widths are estimated to be 125 ft allowing 3.45 times the width of haul trucks.

Road designs are intended to have a maximum of 10% gradient, though some may exceed this for short distances around inside turns. Where switchbacks are utilized, the centerline gradient is reduced to about 8%. This keeps the inside gradient approximately 12%. Switchback designs have not added the detail for super elevation through the curves, but is it assumed that this will be done when they are constructed.

Table 15-12: Road and Ramp Design Parameters

	Two-Lane In-Pit Feet	Two-Lane Ex-Pit Feet	One-Lane In-Pit Feet
Truck Width	25.08	25.08	25.08
Running / Truck Width Ratio	3.50	3.50	2.00
Road Running Width	87.79	87.79	50.17
Tire Size	37.00R57	37.00R57	37.00R57
Tire 1/2 Height	5.61	5.61	5.61
Berm Height	6.17	6.17	6.17
Berm Top Width	0.75	0.75	0.75
Berm Slope	1.50	1.50	1.50
Berm Bottom Width	19.27	19.27	19.27
# Berms	1.00	2.00	1.00
Total Berm Width	19.27	38.54	19.27
Overall Width	107.06	126.33	69.44
Design Width	***105.00***	***125.00***	***70.00***
Running Width After Berms	85.73	86.46	50.73
Running Width / Truck Width	3.42	3.45	2.02

15.3.2 Dark Star Pit Designs

Dark Star pit designs were completed using four pit phases. Phase 1 mines an initial pit in Dark Star North and phase 2 mines an initial pit in Dark Star Main. Ultimate pits are mined in Phase 3 (Dark Star North) and Phase 4 (Dark Star Main). Dark Star North has generally higher grades and better value, however it also has a higher strip ratio.

Figure 15-5 shows the ultimate Dark Star pit designs (phases 3 and 4). Figure 15-6 shows the initial Dark Star pit designs (phases 1 and 2).

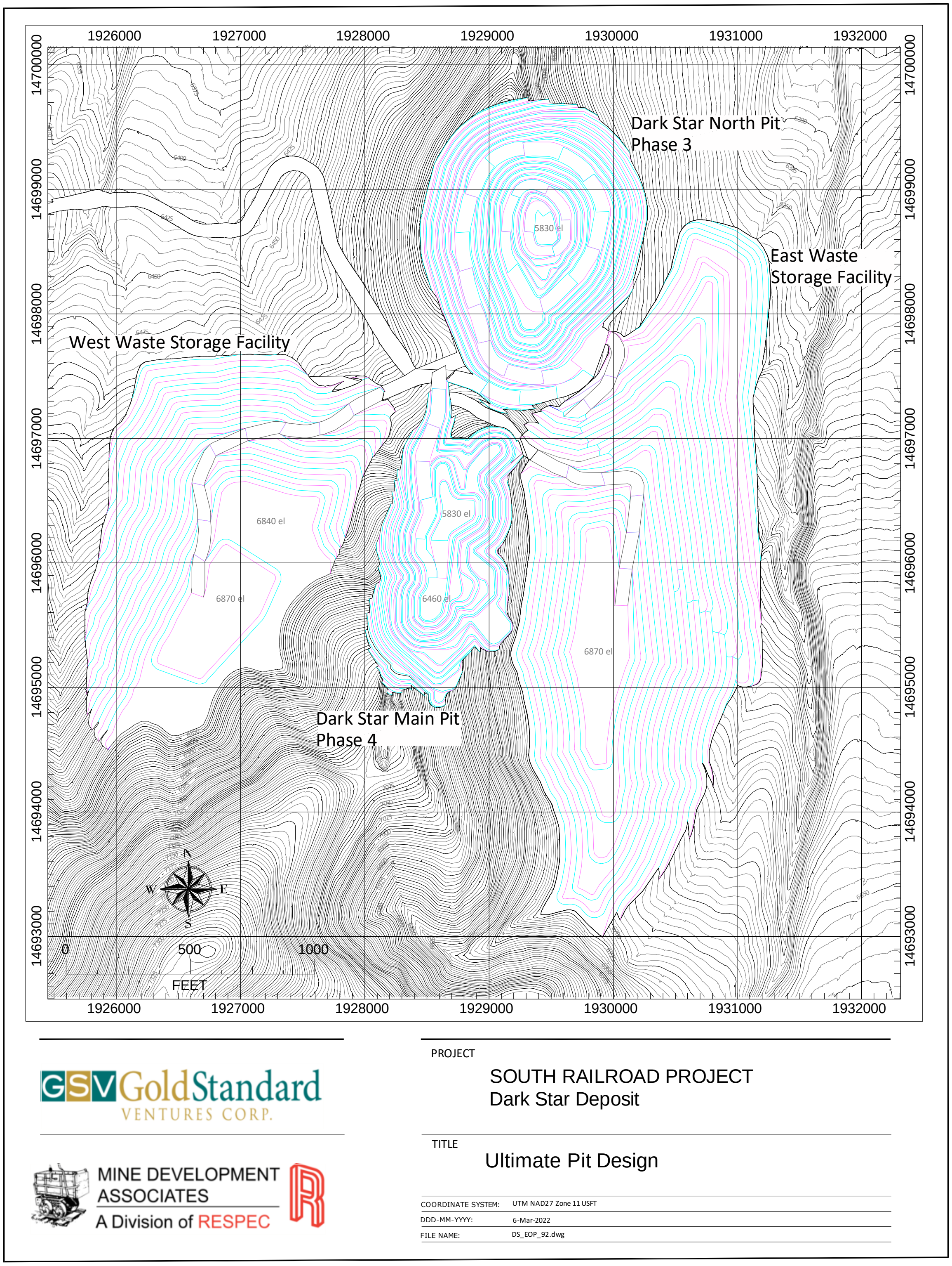


Figure 15-5: Dark Star Ultimate Pit Design

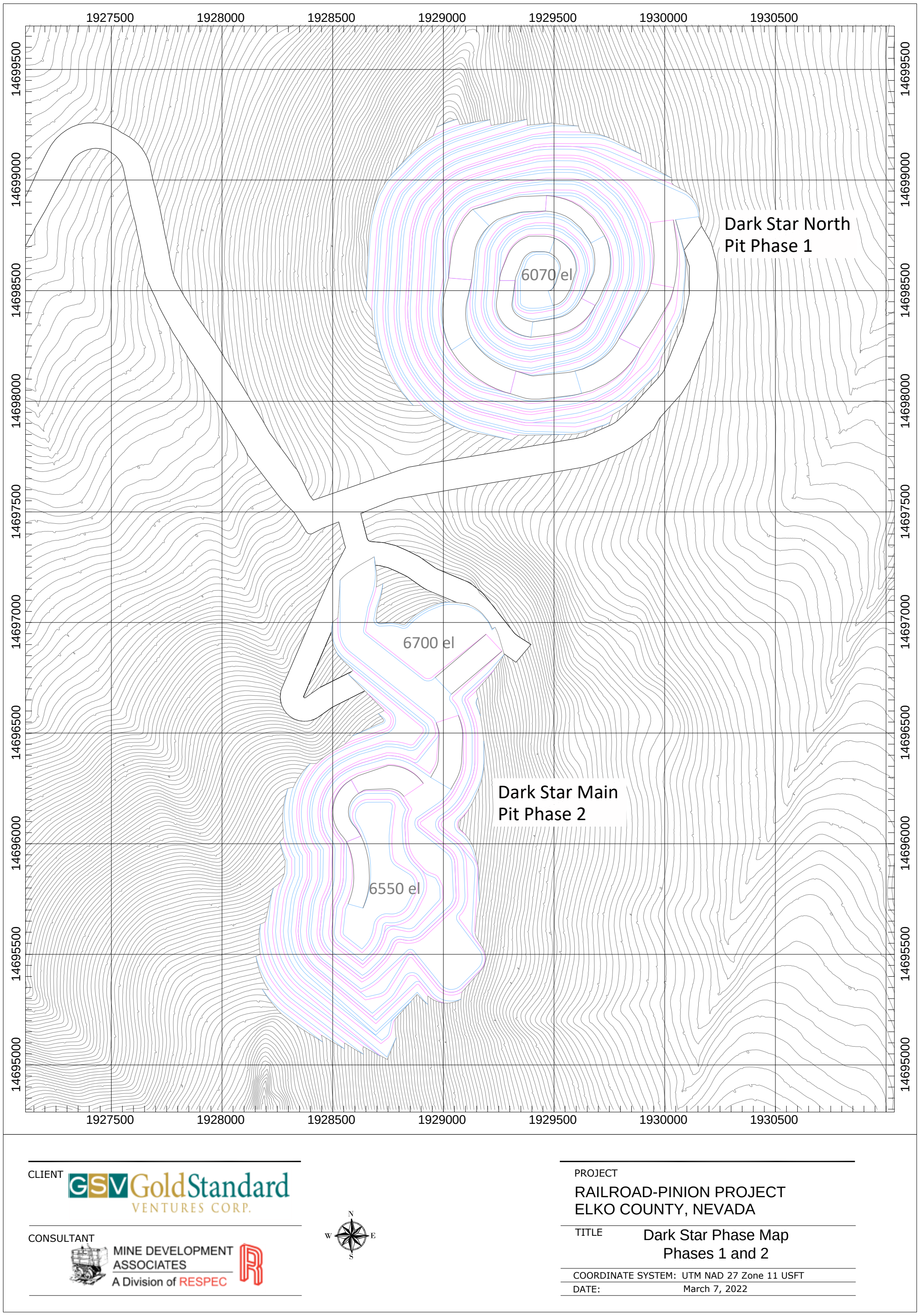


Figure 15-6: Dark Star North (Phase 1) and Main (Phase 2) Initial Pits

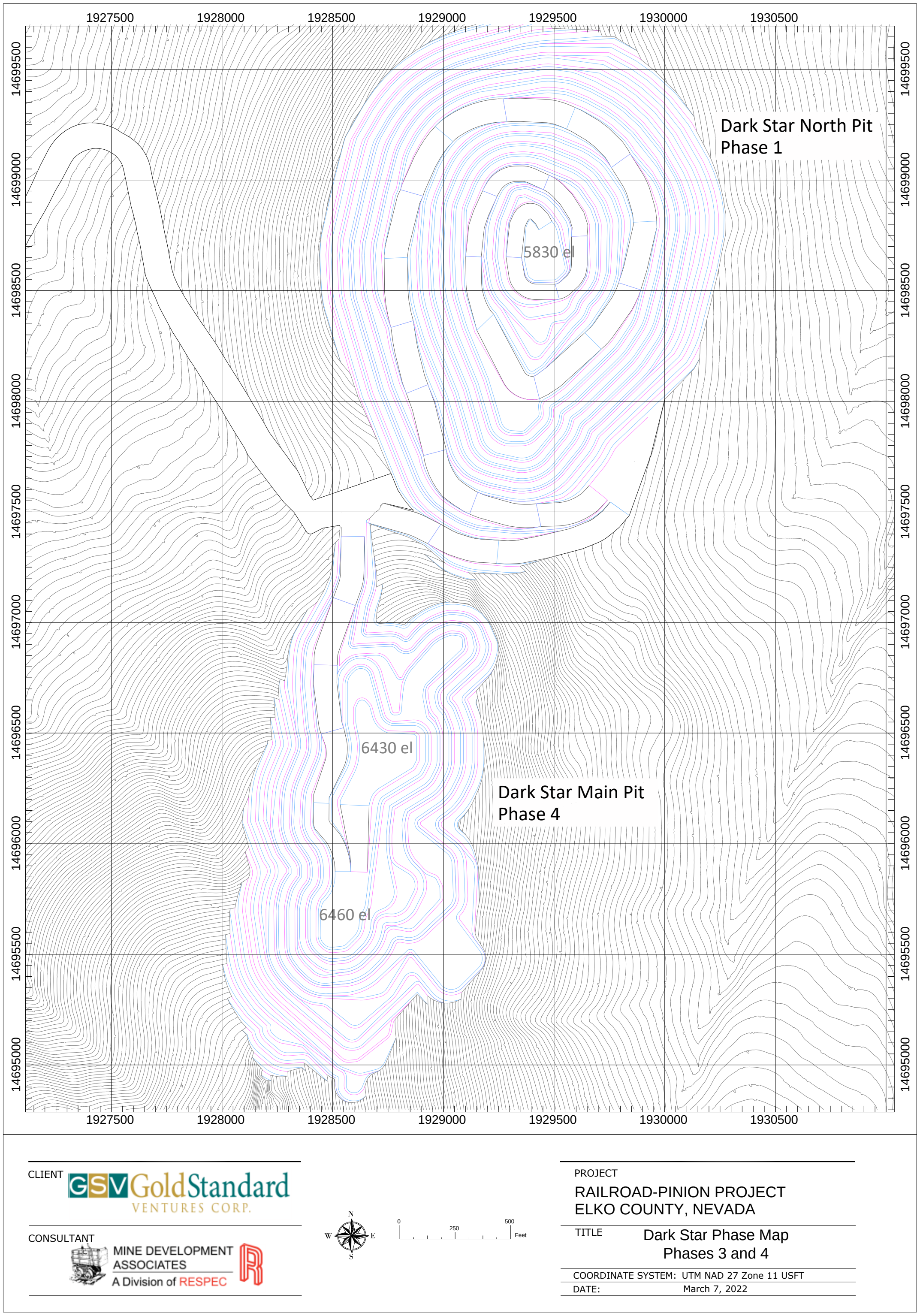


Figure 15-7: Dark Star North (Phase 3) and Main (Phase 4)

15.3.3 Pinion Pit Designs

The Pinion ultimate pit design was achieved using five pit phases. The ultimate pit design is shown in Figure 15-8. The Pinion Phase 1 pit is in the north part of the deposit and mines near surface oxide materials. Due to the lower strip ratio in this area, the Phase 1 pit provides good initial value from the deposit. The Pinion Phase 1 pit design is shown in Figure 15-9.

The Pinion Phase 2 and 3 pits are located just south of Phase 1 and mines into the major portion of the upper part of the deposit from north to south. These pits were roughly designed based on the optimized pit shell number 40. The Pinion Phase 2 and 3 designs shown in Figure 15-9 and Figure 15-10.

The Pinion 4 and 5 pits are an expansion to the south of Phase 3. Phase 4 (Figure 15-11) is designed to maximize the in pit dumping available by mining the extent of the deposit in the east. Phase 5 (Figure 15-12) completes the extent of the pit.

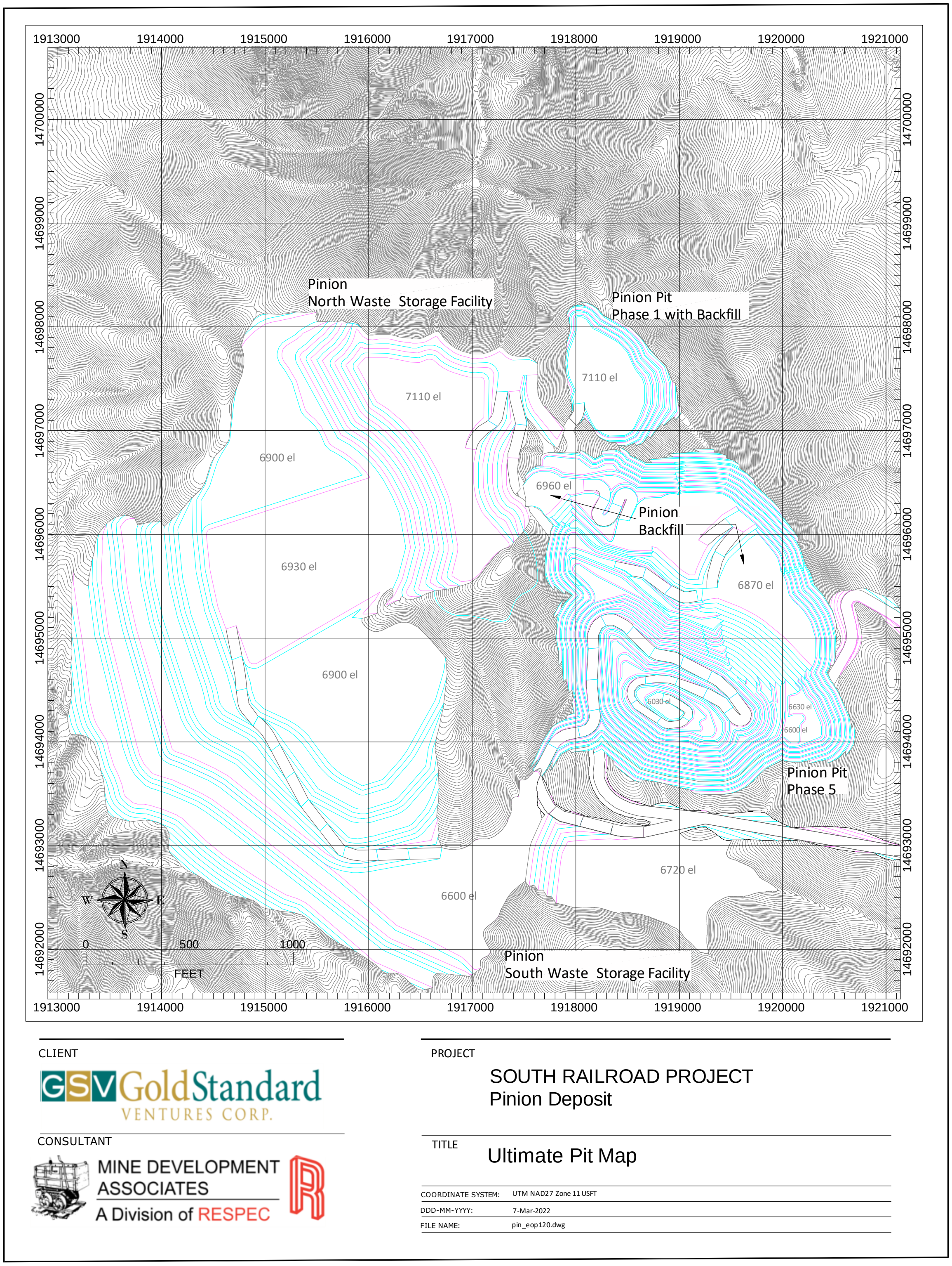


Figure 15-8: Pinion Ultimate Pit Design

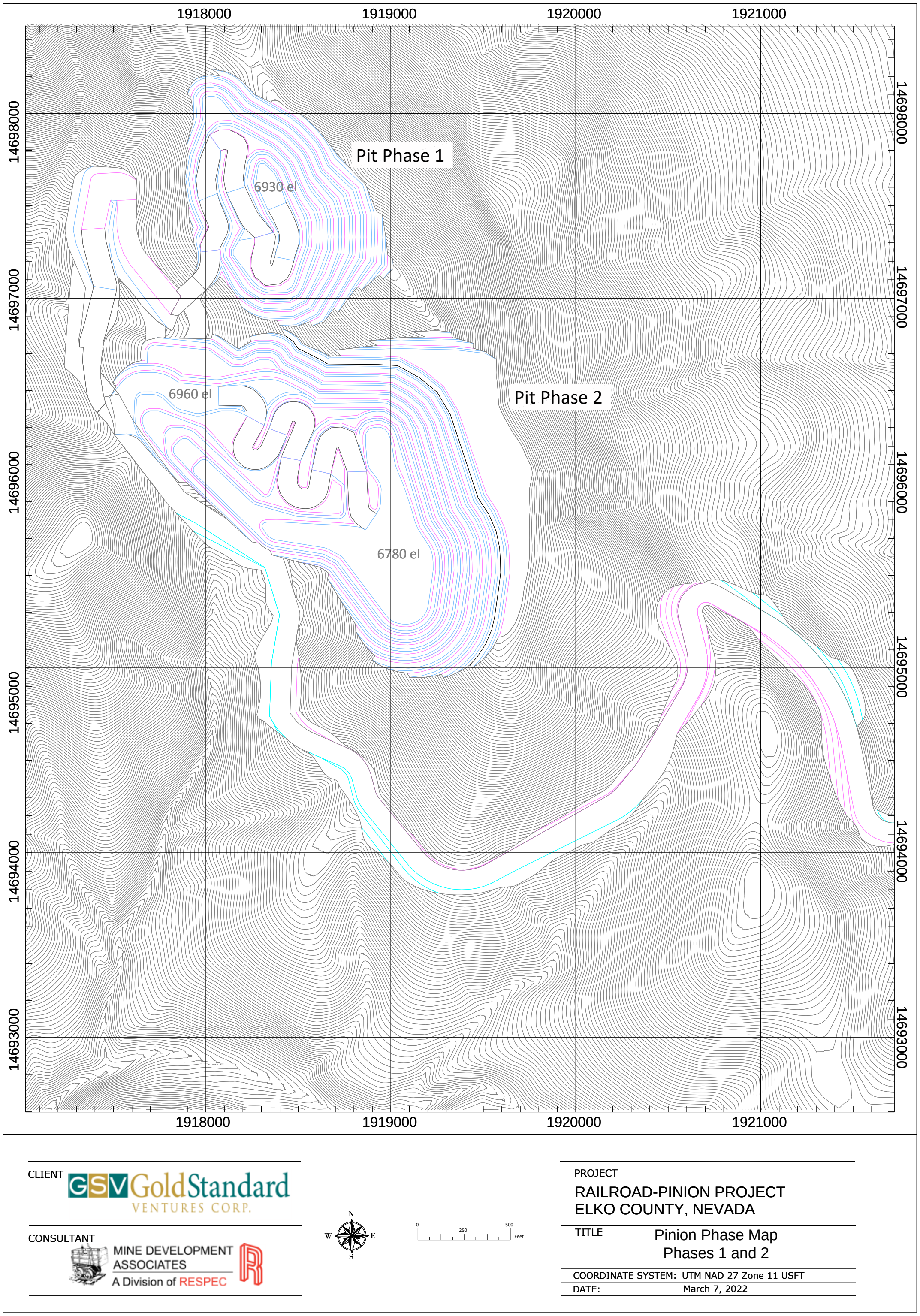


Figure 15-9: Pinion Phase 1 and Phase 2 Pit Design

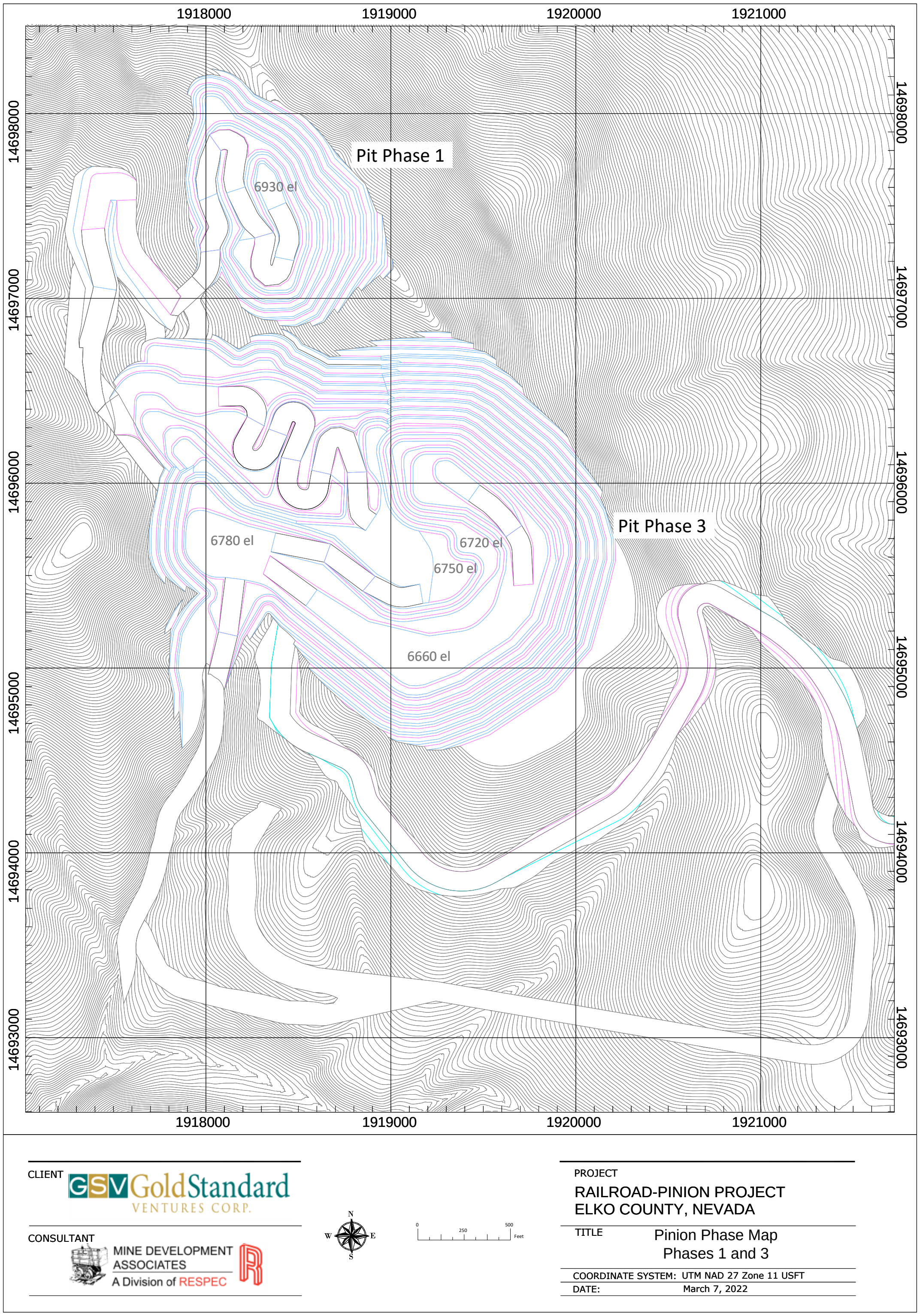


Figure 15-10: Pinion Phase 2 and Phase 3 Pit Design

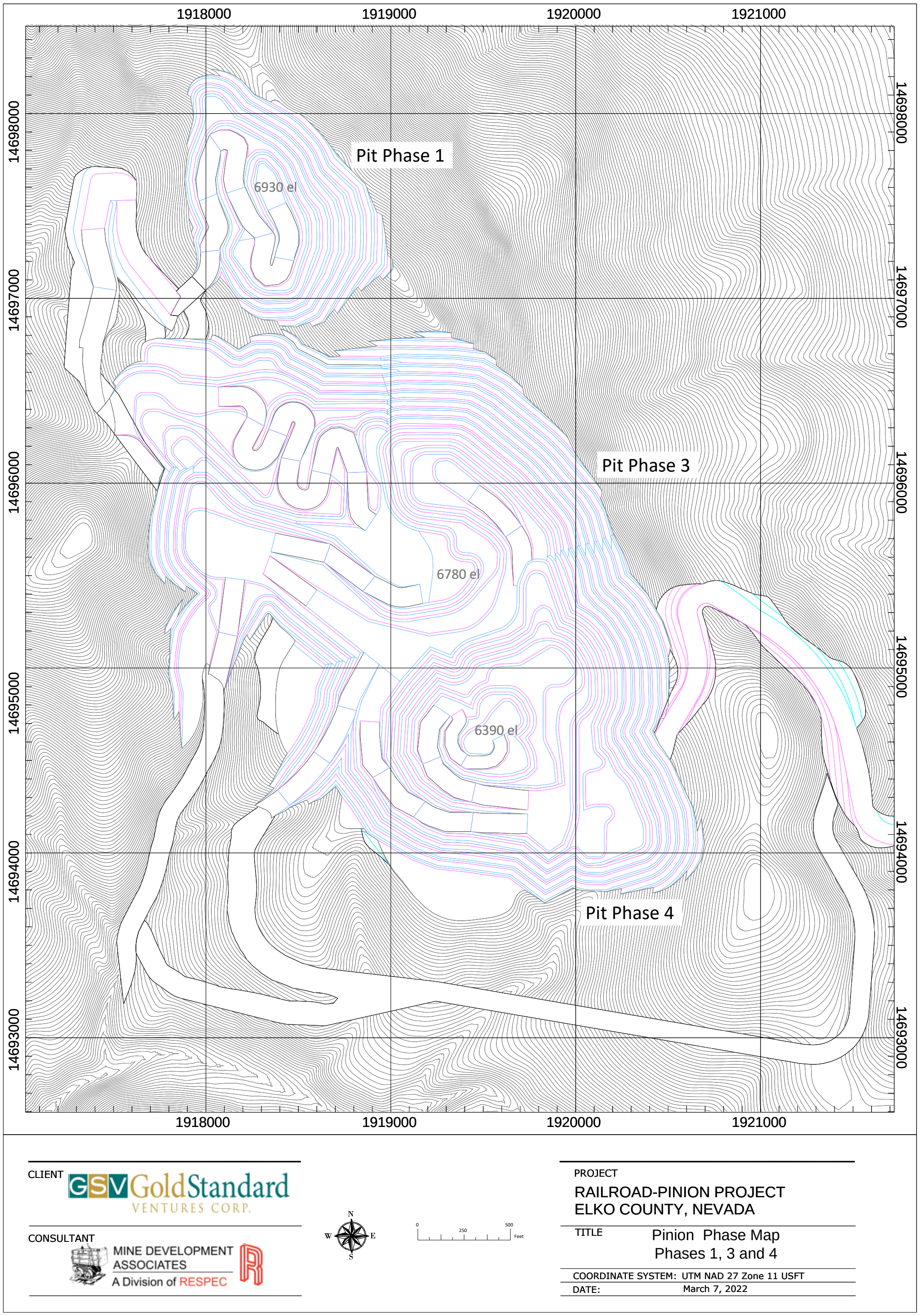


Figure 15-11: Pinion Phase 1, Phase 3, and Phase 4 Pit Design

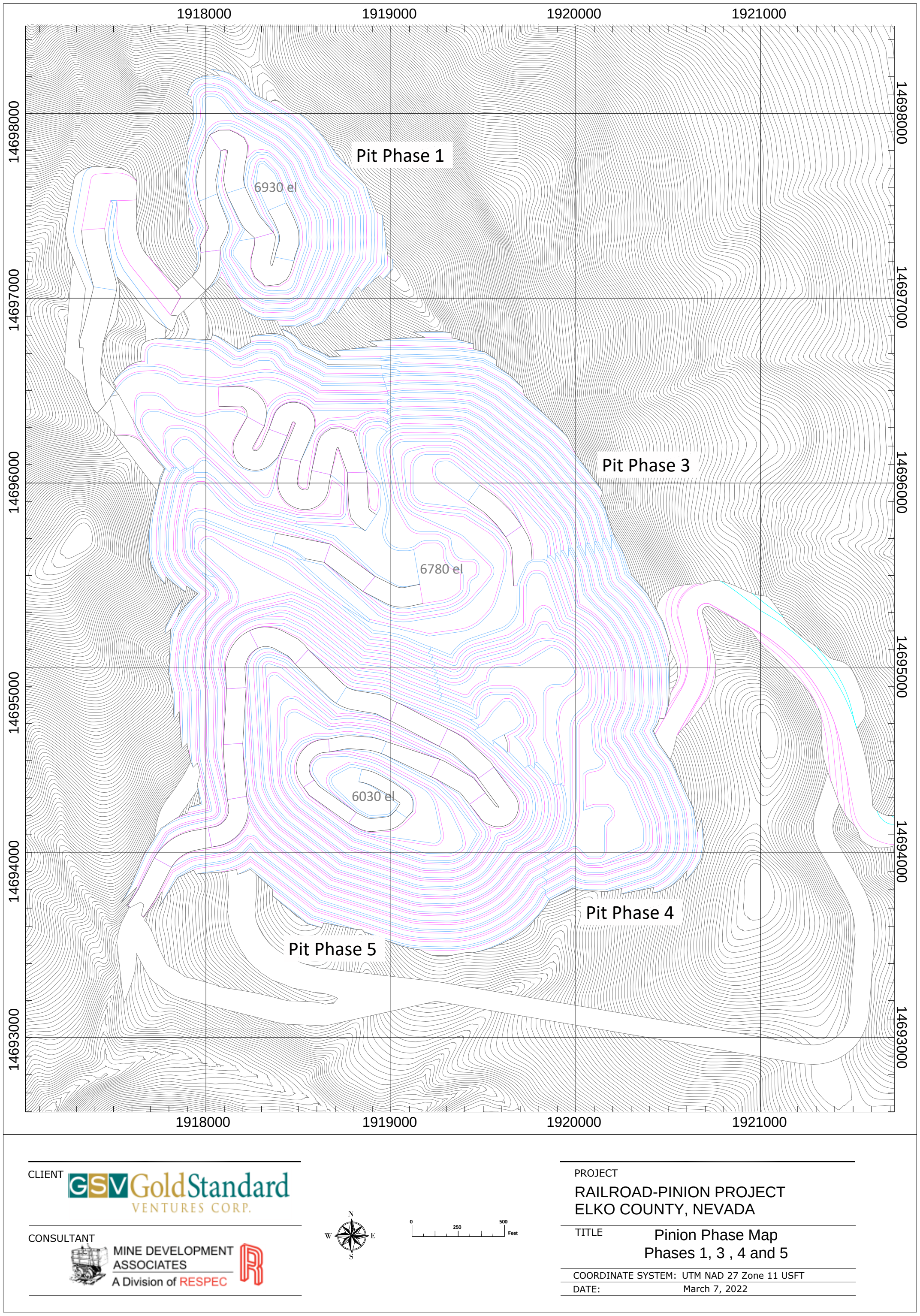


Figure 15-12: Pinion Phase 1, Phase 3, Phase 4, and Phase 5 Pit Design

15.4 DILUTION

The mineral resource block models were completed for both deposits using 30 ft x 30 ft x 30 ft block sizes which is appropriate for use as a selective mining unit. The estimates for gold (and silver at Pinion) have been block diluted to the mineral resource block size. The authors believes that this dilution is appropriate to represent the dilution and ore loss that will be experienced when the deposits are mined.

15.5 PROVEN AND PROBABLE MINERAL RESERVES FOR DARK STAR AND PINION

In-pit Measured and Indicated mineral resources above the cutoff grades used were converted to Proven and Probable mineral reserves respectively. Dark Star Proven and Probable mineral reserves are shown in Table 15-13. The Dark Star pits have a total of 89.9 million tons of waste associated with the mineral reserves, and thus have an overall strip ratio of 2.80 tons of waste per ton processed. The in-pit oxide and transition mineral reserves are reported using the 0.005 oz Au/ton cutoff grade.

For the Dark Star Proven and Probable mineral reserves the reference point is at the process facility, and the mineral reserves are entirely within the current Measured and Indicated Dark Star mineral resources.

Table 15-13: Dark Star In-Pit Proven and Probable Mineral Reserves

	Oxide Material			Transition Material			Total Proven & Probable		
Phase	K Tons	oz Au/ton	K Ozs Au	K Tons	oz Au/ton	K Ozs Au	K Tons	oz Au/ton	K Ozs Au
Phase 1	6,475	0.039	253	2,498	0.024	61	8,972	0.035	314
Phase 2	4,178	0.018	74	4,991	0.014	69	9,169	0.016	144
Phase 3	5,438	0.038	207	3,163	0.032	102	8,601	0.036	310
Phase 4	2,386	0.014	35	3,014	0.013	38	5,400	0.013	73
Total	18,476	0.031	569	13,666	0.020	270	32,142	0.026	840

Pinion Proven and Probable mineral reserves are shown in Table 15-14. The Pinion mineral reserves are associated with a total of 204.6 million tons of waste, resulting in a stripping ratio of 5.15 waste tons to processed tons. Cutoff grades used for reporting are variable based on the material type, oxidation, barite, and silica content. The in-pit oxide mineral reserves are reported using the 0.005 oz Au/ton cutoff grade while the transition mineral reserves are reported using a 0.007 oz Au/ton cutoff grade.

For the Pinion Proven and Probable mineral reserves the reference point is at the process facility, and the mineral reserves are entirely within the current Measured and Indicated Pinion mineral resources.

Table 15-14: Pinion In-Pit Proven and Probable Mineral Reserves

	Oxide Material					Transition Material					Total Processed				
Phase	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
Pin_Ph_1	3,222	0.019	62	0.110	356	22	0.010	0	0.049	1	3,244	0.019	62	0.110	357
Pin_Ph_2	8,402	0.020	167	0.149	1,255	339	0.019	6	0.183	62	8,741	0.020	174	0.151	1,317
Pin_Ph_3	10,458	0.018	187	0.137	1,435	447	0.016	7	0.144	65	10,905	0.018	194	0.137	1,499
Pin_Ph_4	6,373	0.017	111	0.123	786	196	0.015	3	0.159	31	6,570	0.017	113	0.124	817
Pin_Ph_5	9,771	0.022	211	0.214	2,091	497	0.021	10	0.112	56	10,268	0.022	221	0.209	2,147
Total	38,227	0.019	737	0.155	5,922	1,501	0.018	27	0.143	215	39,728	0.019	764	0.154	6,137

The total Proven and Probable mineral reserves reported for the feasibility study are shown in Table 15-15. Within the designed pits there are a total of 294.5 million tons of waste associated with the in-pit mineral reserves. This results in an overall project strip ratio of 4.10 tons of waste for each ton of material processed.

Table 15-15: Total Dark Star and Pinion Proven and Probable Mineral Reserves

Dark Star	K Tons	oz Au/ton	K Ozs Au
Proven	7,618	0.037	282
Probable	24,524	0.023	557
P&P	32,142	0.026	840

Pinion	K Tons	oz Au/ton	K Ozs Au	oz Ag/ton	K Ozs Ag
Proven	2,258	0.022	50	0.194	437
Probable	37,469	0.019	714	0.152	5,700
P&P	39,728	0.019	764	0.154	6,137

Consolidated Gold Reserves

Dark Star & Pinion	K Tons	oz Au/ton	K Ozs Au
Proven	9,877	0.034	333
Probable	61,993	0.021	1,271
P&P	71,870	0.022	1,604

Note: cutoff grades are applied by material type as described in Section 15.2.3
Proven and Probable mineral reserves for Pinion include silver as reported above; and
Due to lack of silver at Dark Star, consolidated gold reserves are reported without silver to avoid reporting erroneous average silver grade.

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16 MINING METHODS

The feasibility study for the Railroad-Pinion project includes eight years of mining at the Dark Star and Pinion deposits. These operations, collectively termed the South Railroad mine, are planned to use open-pit, truck and shovel methods that will feed ore to a single, shared process facility for both deposits. The truck and shovel method provides reasonable costs and selectivity for these deposits.

The methodology used for mine planning to define the economics for the feasibility study includes:

- Define assumptions for the economic parameters;
- Define geometric parameters and constraints;
- Run pit optimizations;
- Define road and ramp parameters;
- Create pit designs;
- Create dump designs;
- Produce mine and process production schedules;
- Define personnel and equipment requirements;
- Estimate mining costs; and
- Perform an economic analysis.

Parameters, pit optimizations, and pit designs are discussed in Section 15.

16.1 WASTE ROCK STORAGE AREAS

Waste storage facility ("WSF") designs were created for the feasibility study to contain mined material that is not processed. RESPEC has defined Non-acid generating (NAG) and potentially acid generating (PAG) waste, and coded it into the mineral resource block models, based on definitions provided by Stantec. PAG waste material has been handled separately to avoid storage issues with potential acid drainage. A 1.3 swell factor was assumed which provides for both swell when mined and compaction when placed into the facility. The total requirements for containment of waste and leach material are shown in Table 16-1. Due to estimation criteria for PAG and NAG material, a small portion of material does not get sulphur estimations. This material is listed as Unknown in Table 16-1.

Table 16-1: Waste Containment Requirements (Thousands, Cubic Yards)

Dark Star	PAG	NAG	Unknown	Total	% PAG	% NAG
Phase 1	10,229	3,878	-	14,107	73%	27%
Phase 2	4,943	164	-	5,107	97%	3%
Phase 3	15,223	5,917	72	21,212	72%	28%
Phase 4	4,375	135	0	4,510	97%	3%
Total	34,770	10,093	72	44,936	77%	22%
Pinion						
Phase 1	1,463	4,387	-	5,851	25%	75%
Phase 2	5,580	6,831	1	12,412	45%	55%
Phase 3	13,428	10,464	1	23,893	56%	44%
Phase 4	8,949	18,720	10	27,679	32%	68%
Phase 5	2,184	25,771	240	28,194	8%	91%
Total Pinion	31,604	66,173	252	98,029	32%	68%
Total Project						
Dark Star	34,770	10,093	72	44,936	77%	22%
Pinion	31,604	66,173	252	98,029	32%	68%
Total	66,374	76,267	324	142,965	46%	53%

WSF designs were completed for both Dark Star and Pinion.

For Dark Star, it is assumed that two waste WSF's will be constructed, one on the east side and one on the west side of the deposit. These are shown in Figure 16-7 along with the ultimate pit designs. Pinion will have a single exterior WSF and will also incorporate some minimal storage as backfill in Phase 1 and the north side of the main pit. The WSF design for Pinion is shown in Figure 16-15 along with the Pinion ultimate pit.

For production scheduling each WSF design was sequenced to reduce haulage requirements. The Dark Star West WSF was sequenced into two phases. The first phase will be placed in a single lift, dumping from the 6540 elevation with a maximum height of 51 ft. This allows for a flat haulage profile from the pit exits to the WSF. Once placed, concurrent reclamation of the dumping face can be completed. The second phase will continue in 30 ft lifts to the 6870 elevation.

The Dark Star East WSF will be placed in 4 different phases. The first phase is initially dumped in from the 6510 elevation and establishes a 145 ft high dump phase. The second phase continues in 30 ft lifts to the 6600 elevation. The third phase continues up the valley filling up to the 6720 elevation. Phase 4 completes the dump up to the 6870 elevation.

The Pinion WSF was sequenced using 7 Phases. Phase 1 of the Pinion WSF is to be placed in multiple 90 ft high lifts starting at the 6660 elevation going up to the 6930. After the 6930 elevation dump lifts are designed at 30 ft high in Phase 2 up to the 7050 elevation and Phase 3 completes this area of the dump up to the 7110 elevation. Phase 4 is a valley fill to the south of Phases 1 through 3 at the 6480 elevation with a maximum height of 230 ft. The fifth phase is a 90 ft lift that levels the dump at the 6570 elevation. Phase 6 increases the dump in the west up to the 6930 elevation and Phase 7 raises the dump to 6720 ft in the east area of the dump.

The Pinion backfill WSFs were sequenced in 5 phases to help limit haulage requirements through the life-of-mine ("LOM"). The first phase fills a portion of the Phase 1 pit. Phase 2 fills in an area at the 6960 elevation near the pit exit.

Phase 3 dumps over the bottom of the Phase 3 pit in a single lift at the 6780 elevation. Phase 4 continues above Phase 3 dump up to the 6870 elevation. Phase 5 completes the backfill WSF filling in the bottom of the Phase 4 pit once it is complete.

16.2 STOCKPILES

All ROM material will be dumped in place directly on the ROM leach pad. No stockpiles are anticipated to be created.

16.3 MINE-PRODUCTION SCHEDULE

Production scheduling was completed using Geovia's MineSched™ (version 2020.1) software. Proven and Probable mineral reserves were scheduled for haulage to the process facility or stockpiles, while waste material was scheduled for WSF's or backfill locations.

The production schedule considers the processing of material by ROM. Monthly periods were used to create the production schedule with pre-stripping starting in Dark Star at month -6. Start of ROM processing is assumed to be month 2. The maximum rate for ROM processing will be 33,000 tons per day or 12 million tons per year on a 365-day basis. This represents the maximum assumed rate that material can be sprayed and processed. Note that the maximum ore mined is 12.6 million tons in the fifth year. In other years, the maximum spray capacity is not met mostly due to the lack of available ROM material mined.

The total Dark Star mining rate would ramp up from 20,000 tons per day to about 80,000 tons per day over a period of 6 months during pre-production. A maximum of 109,000 tons per day is used in the production schedule during the mining of deeper portions of North Dark Star. The maximum mining rate required in Pinion is 126,000 tons per day.

The mining production for Dark Star and Pinion is summarized yearly in Table 16-2 and Table 16-3 respectively. Table 16-4 summarizes the yearly total mine production schedule. Yearly pit and WSF position maps are presented in Figure 16-1 through Figure 16-15.

Table 16-2: Dark Star Mine Production Schedule

	Units	Yr -1	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Total
Rom Mined	K Tons	1,150	5,037	5,552	6,211	5,097	4,072	5,023	-	-	32,142
	Oz Au/t	0.019	0.026	0.040	0.041	0.016	0.016	0.013	-	-	0.026
	K Ozs Au	22	129	222	257	80	65	66	-	-	840
	Oz Ag/t	-	-	-	-	-	-	-	-	-	-
	K Ozs Ag	-	-	-	-	-	-	-	-	-	-
PAG to Dumps	K Tons	8,627	11,081	23,951	8,543	6,854	2,723	7,622	-	-	69,400
NAG to Dumps	K Tons	2,500	4,927	10,108	2,210	309	28	276	-	-	20,357
Un to Dumps	K Tons	-	-	147	-	-	-	0	-	-	147
Total to Dumps	K Tons	11,127	16,008	34,205	10,753	7,162	2,751	7,898	-	-	89,903
Total Mined	K Tons	12,277	21,045	39,756	16,964	12,259	6,823	12,921	-	-	122,045
Strip Ratio	K Tons	9.68	3.18	6.16	1.73	1.41	0.68	1.57			2.80

Table 16-3: Pinion Mine Production Schedule

	Units	Yr -1	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Total
Rom Mined	K Tons	-	1,108	2,136	4,666	5,222	8,491	4,524	7,367	6,214	39,728
	Oz Au/t	-	0.018	0.020	0.019	0.019	0.018	0.017	0.019	0.023	0.019
	K Ozs Au	-	20	42	90	101	154	75	137	145	764
	Oz Ag/t	-	0.110	0.110	0.147	0.159	0.134	0.131	0.171	0.204	0.154
	K Ozs Ag	-	122	235	687	828	1,141	594	1,259	1,270	6,137
PAG to Dumps	K Tons	-	2,807	2,407	21,109	23,207	10,322	3,221	1,883	611	65,568
NAG to Dumps	K Tons	-	6,601	2,892	10,672	15,584	27,250	32,159	35,904	7,456	138,518
Un to Dumps	K Tons	-	-	-	2	-	2	61	454	6	525
Total to Dumps	K Tons	-	9,409	5,299	31,783	38,791	37,574	35,441	38,241	8,073	204,611
Total Mined	K Tons	-	10,516	7,435	36,449	44,013	46,065	39,965	45,608	14,287	244,338
Strip Ratio	K Tons		8.49	2.48	6.81	7.43	4.43	7.83	5.19	1.30	5.15

Table 16-4: Total Project Mine Production Schedule

	Units	Yr -1	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Total
Rom Mined	K Tons	1,150	6,145	7,688	10,877	10,319	12,563	9,547	7,367	6,214	71,870
	Oz Au/t	0.019	0.024	0.034	0.032	0.017	0.017	0.015	0.019	0.023	0.022
	K Ozs Au	22	149	264	347	180	218	141	137	145	1,604
	Oz Ag/t	-	0.020	0.031	0.063	0.080	0.091	0.062	0.171	0.204	0.085
	K Ozs Ag	-	122	235	687	828	1,141	594	1,259	1,270	6,137
PAG to Dumps	K Tons	8,627	13,888	26,358	29,653	30,060	13,045	10,843	1,883	611	134,967
NAG to Dumps	K Tons	2,500	11,528	12,999	12,882	15,893	27,278	32,435	35,904	7,456	158,875
Un to Dumps	K Tons	-	-	147	2	-	2	61	454	6	672
Total to Dumps	K Tons	11,127	25,416	39,504	42,536	45,953	40,325	43,339	38,241	8,073	294,514
Total Mined	K Tons	12,277	31,561	47,192	53,413	56,272	52,888	52,886	45,608	14,287	366,384
Strip Ratio	K Tons	9.68	4.14	5.14	3.91	4.45	3.21	4.54	5.19	1.30	4.10

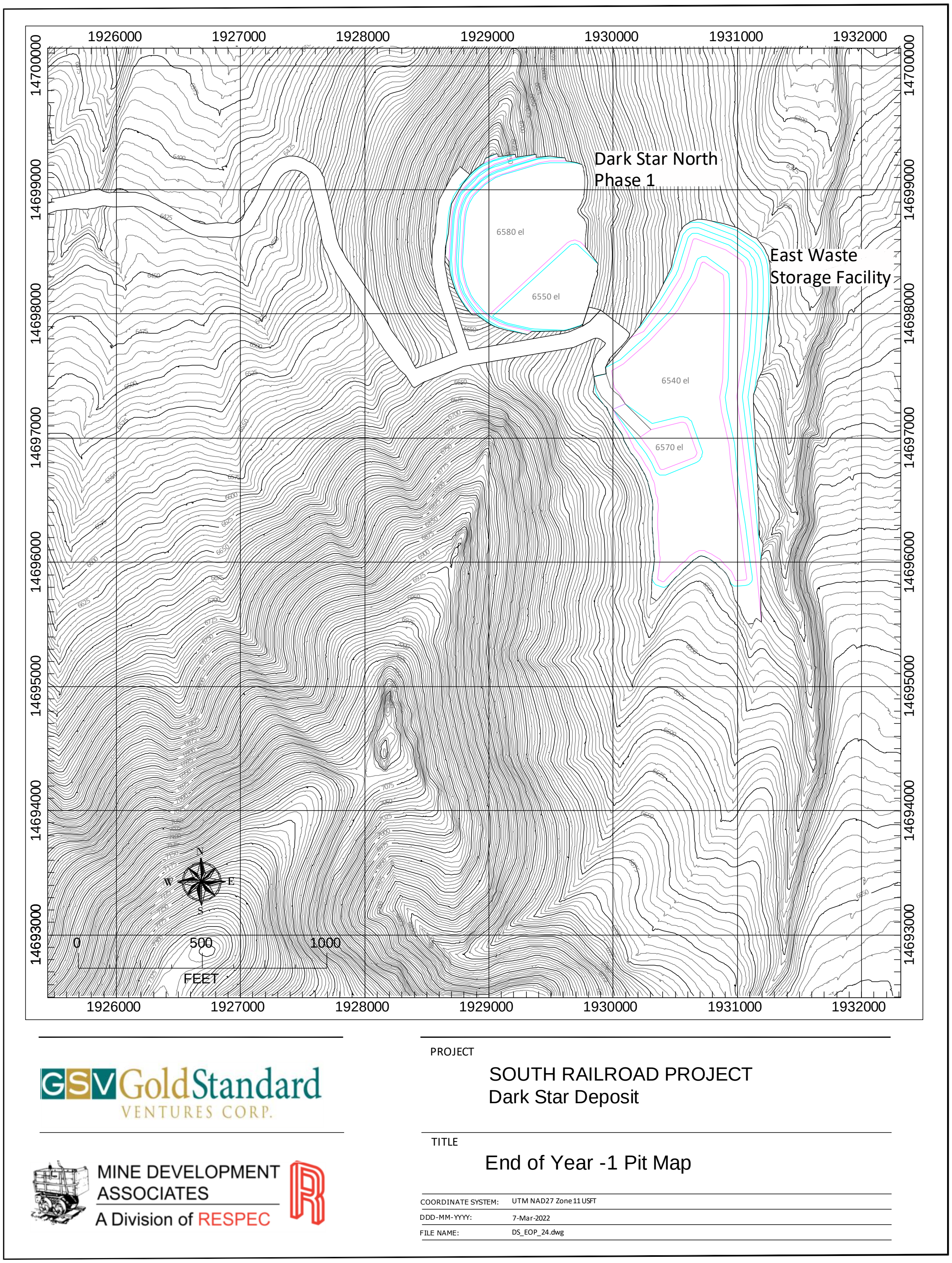


Figure 16-1: Dark Star Pit Design, Year -1

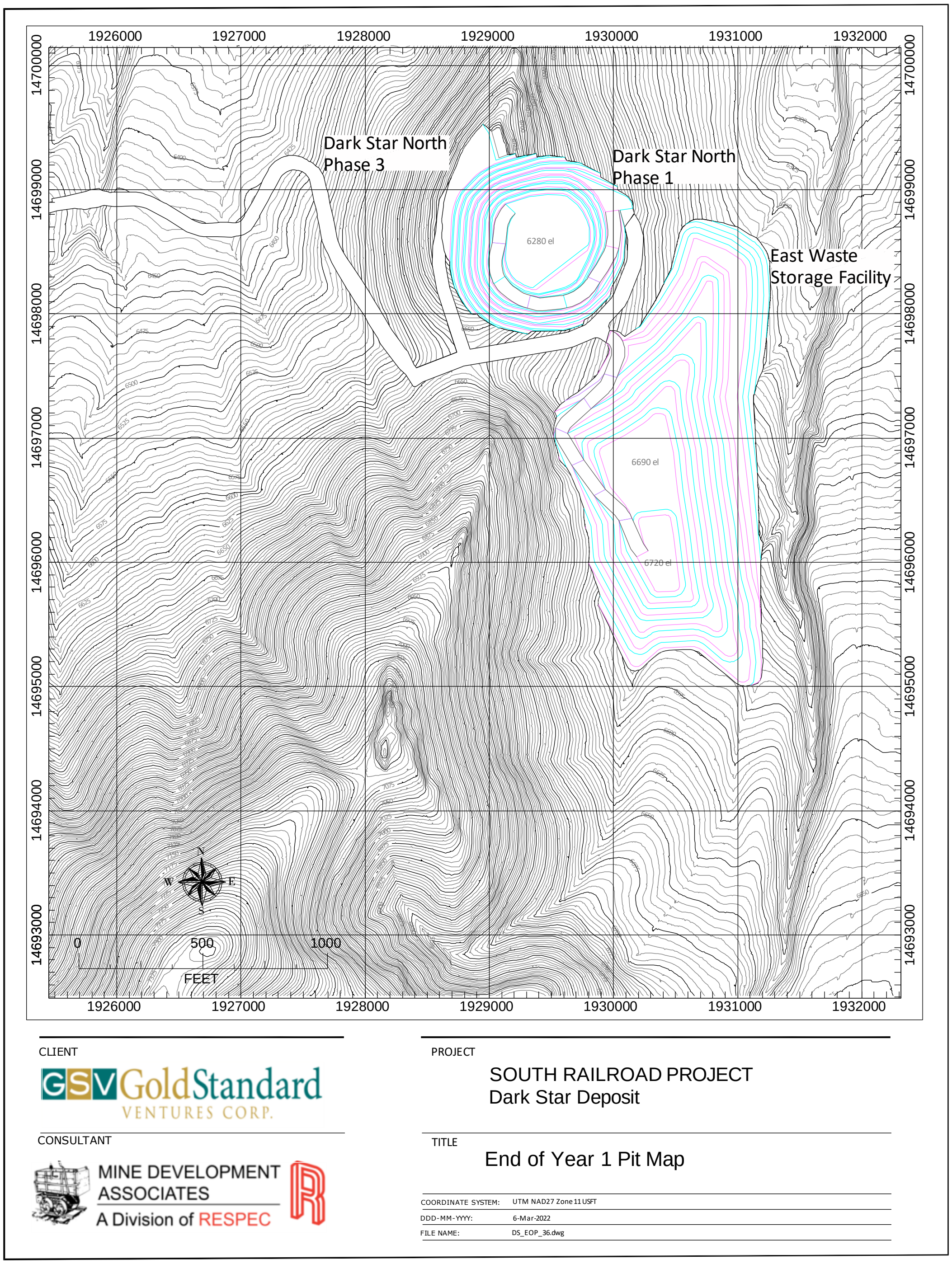


Figure 16-2: Dark Star Pit Design, Year 1

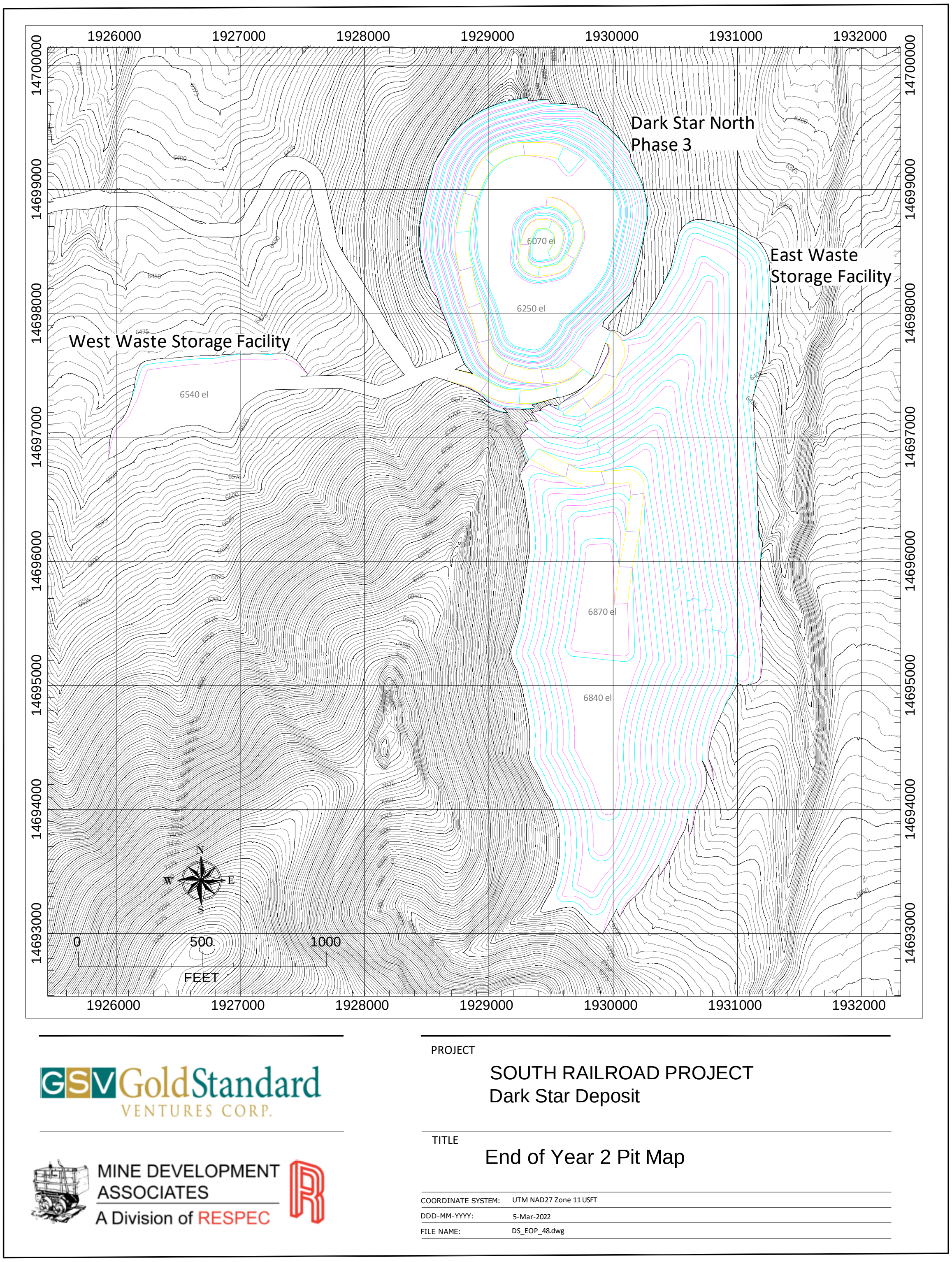


Figure 16-3: Dark Star Pit Design, Year 2

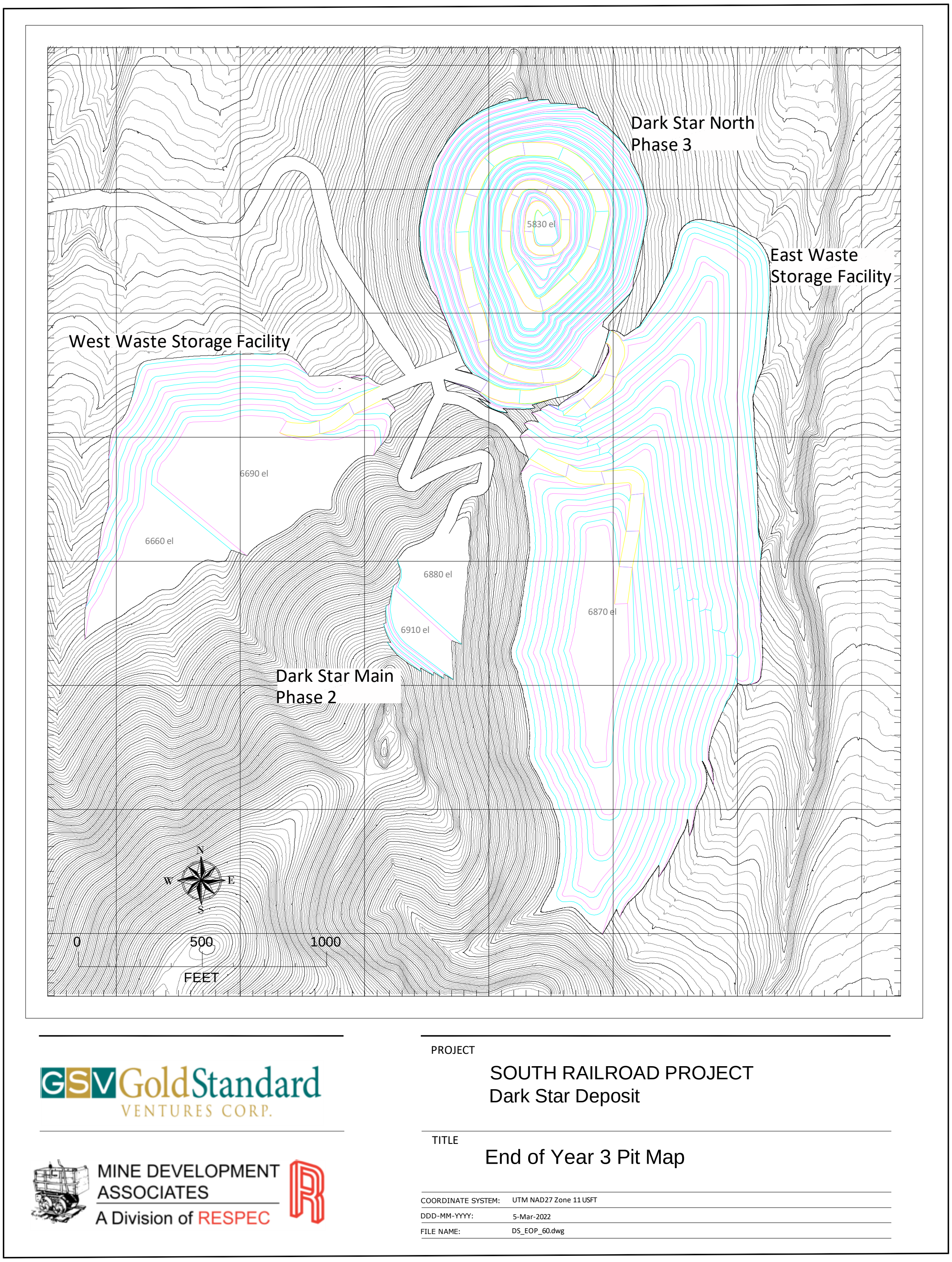


Figure 16-4: Dark Star Pit Design, Year 3

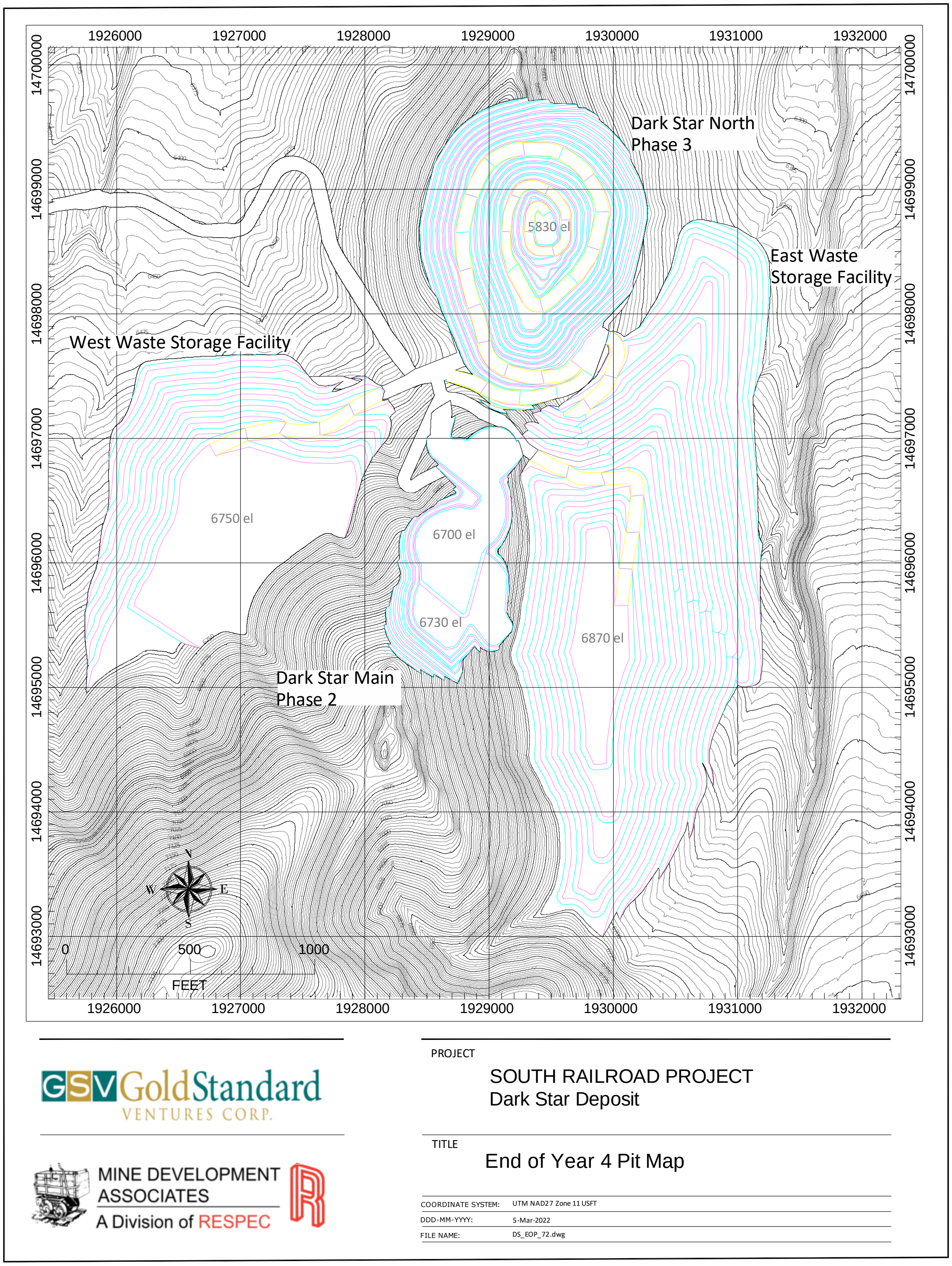


Figure 16-5: Dark Star Pit Design, Year 4

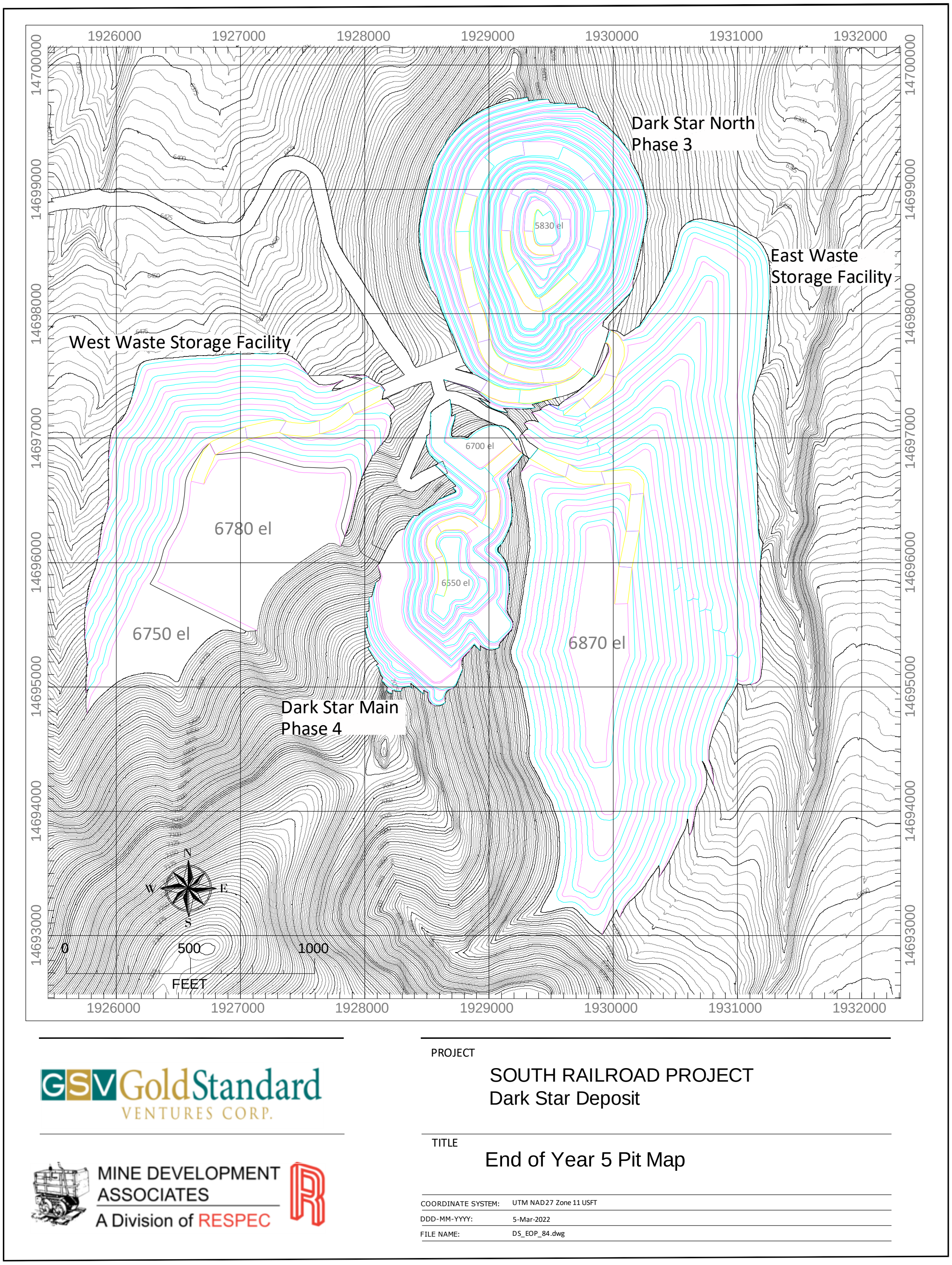


Figure 16-6: Dark Star Pit Design, Year 5

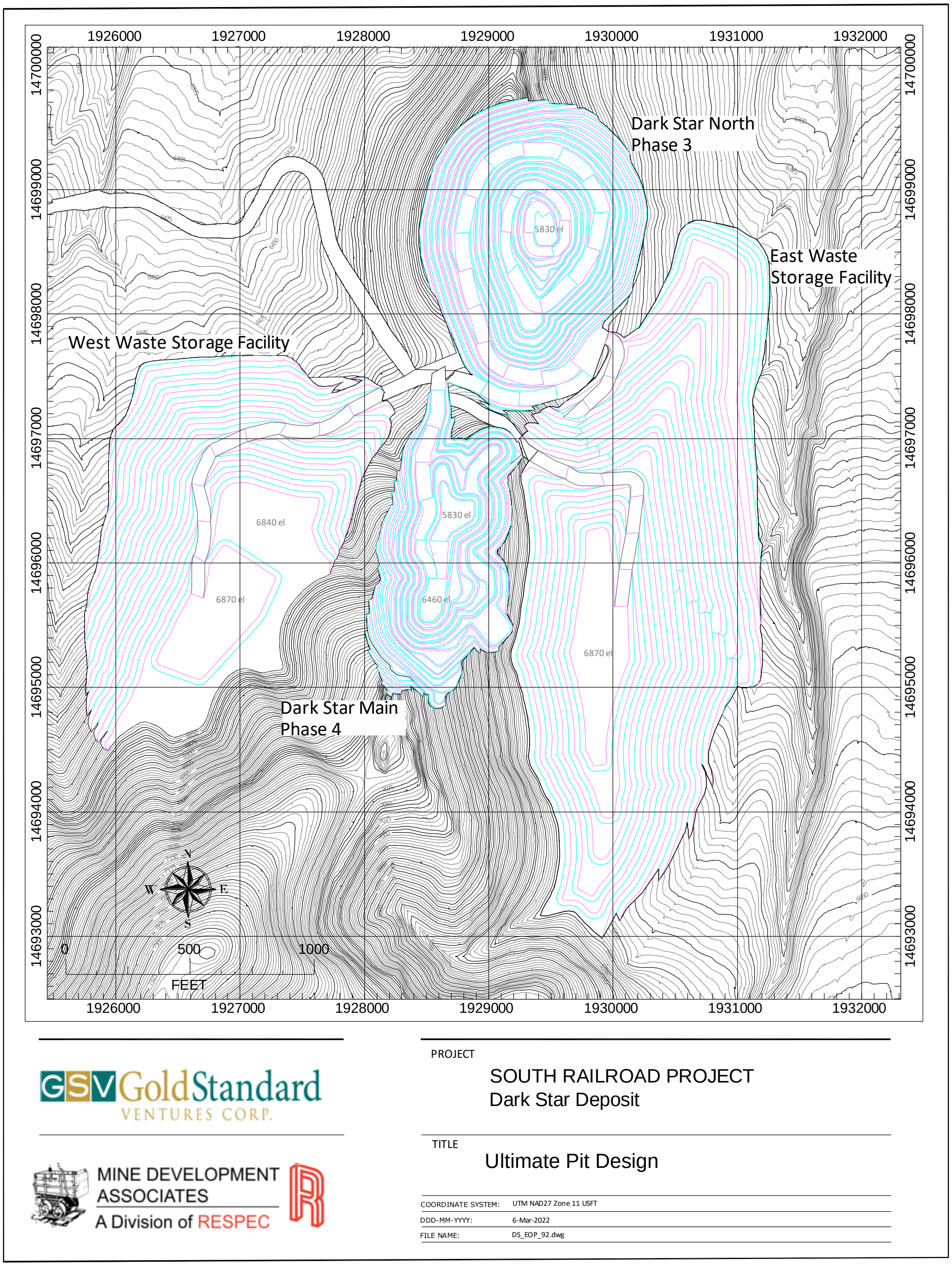


Figure 16-7: Dark Star Pit Design, Year 6

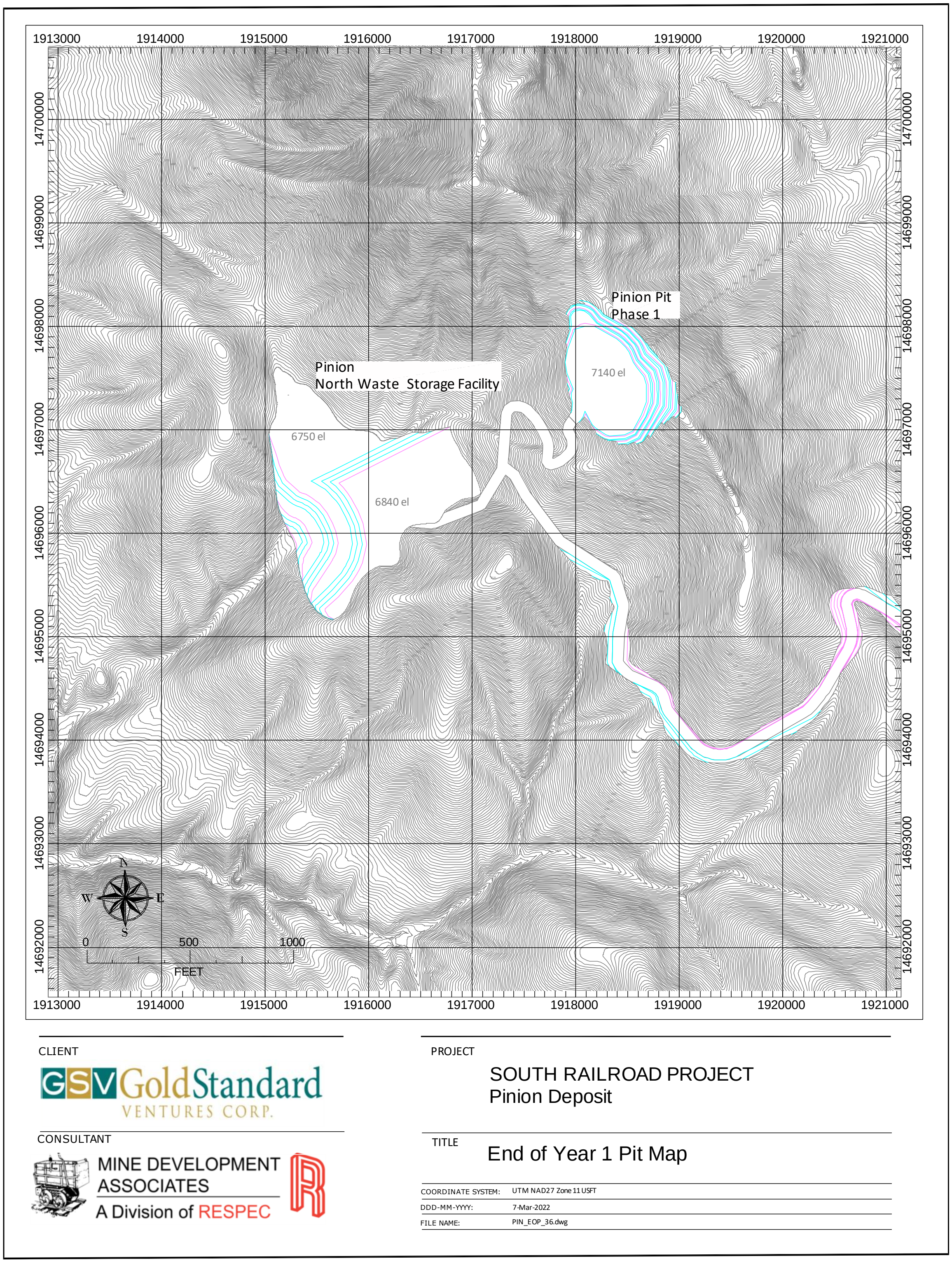


Figure 16-8: Pinion Pit Design, Year 1

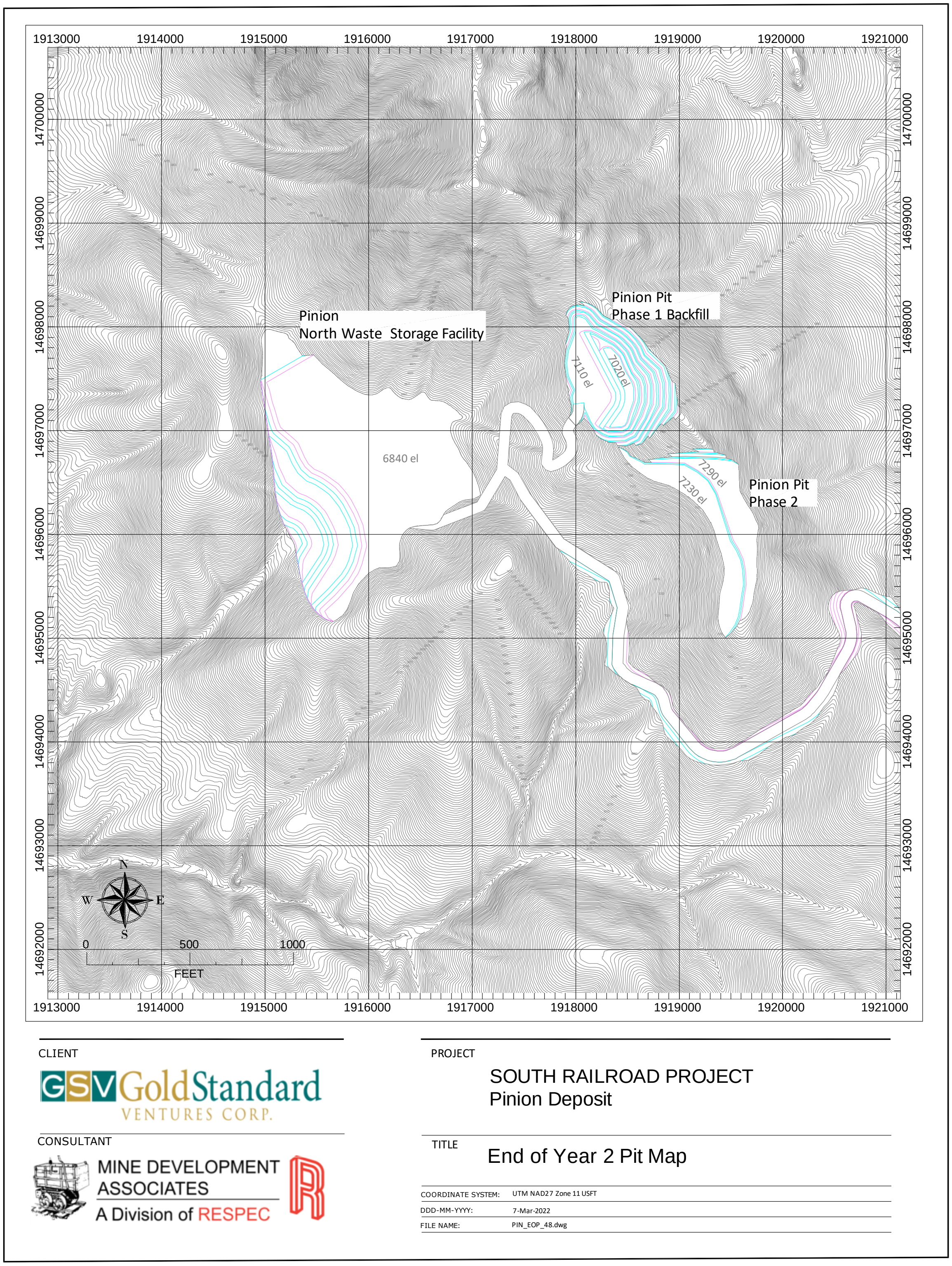


Figure 16-9: Pinion Pit Design, Year 2

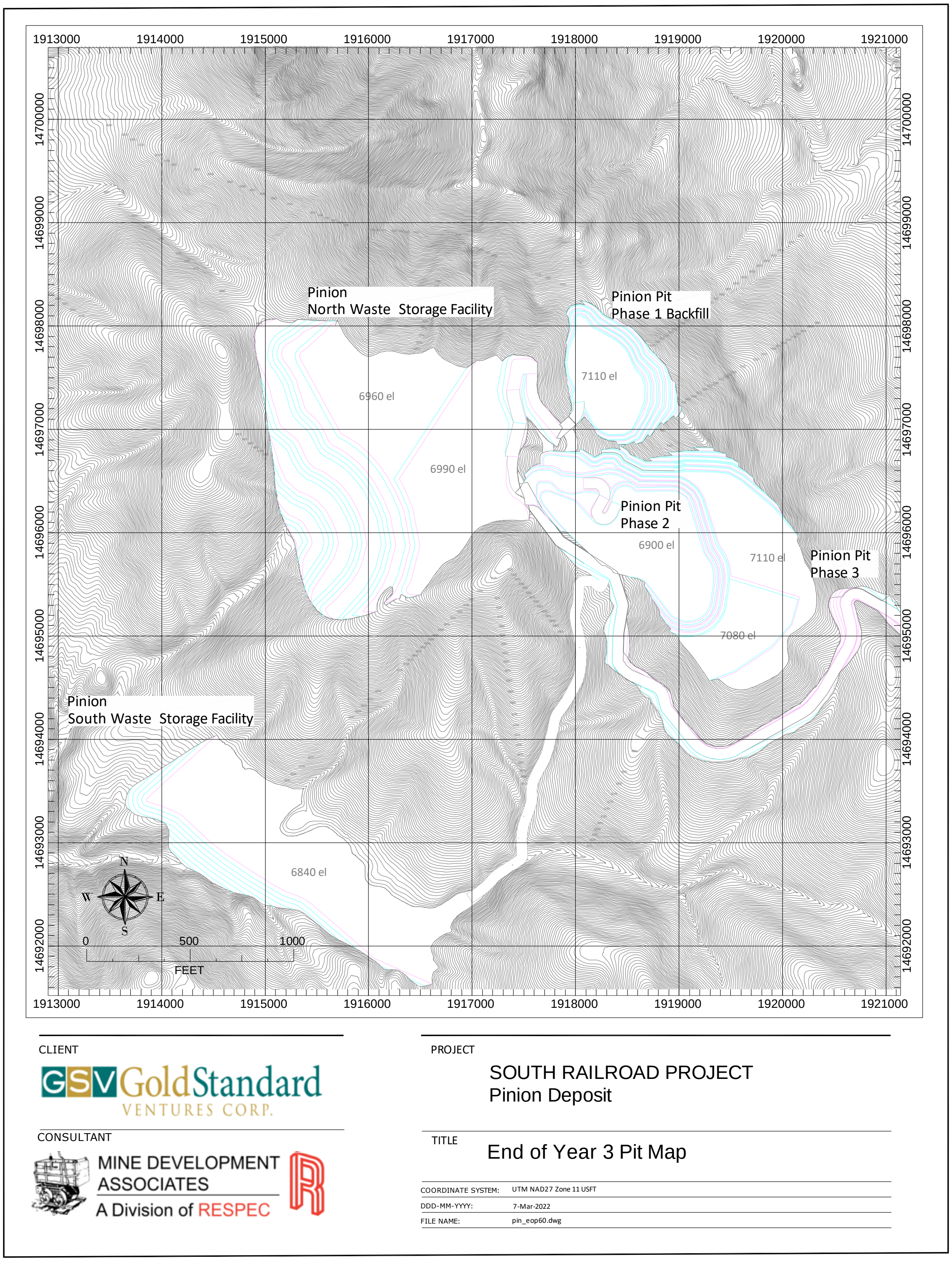
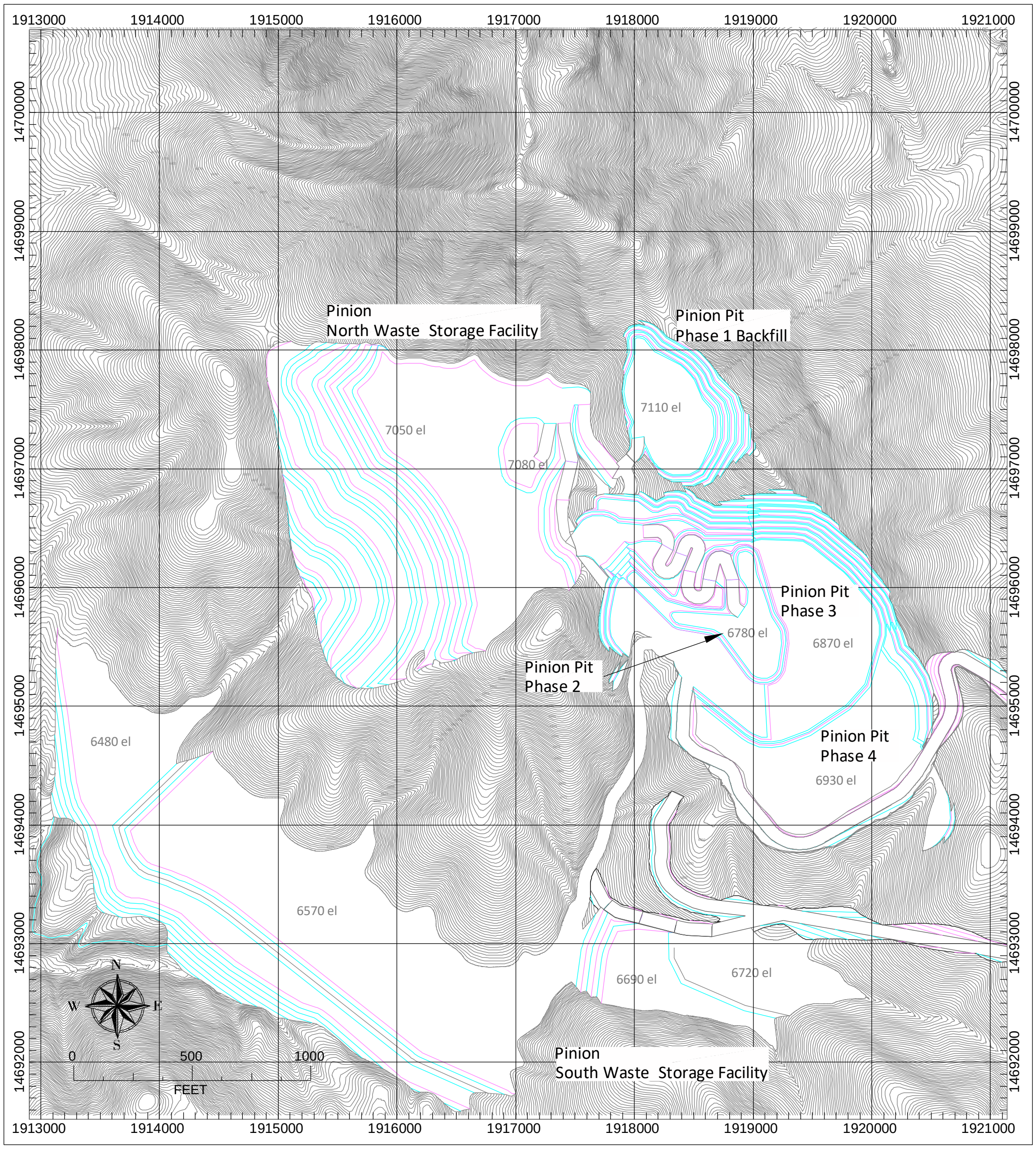


Figure 16-10: Pinion Pit Design, Year 3



CLIENT

GSV Gold Standard VENTURES CORP.

CONSULTANT

MINE DEVELOPMENT ASSOCIATES
A Division of RESPEC

PROJECT

SOUTH RAILROAD PROJECT
Pinion Deposit

TITLE

End of Year 4 Pit Map

COORDINATE SYSTEM:	UTM NAD27 Zone 11 USFT
DDD-MM-YYYY:	7-Mar-2022
FILE NAME:	pin_eop72.dwg

Figure 16-11: Pinion Pit Design, Year 4

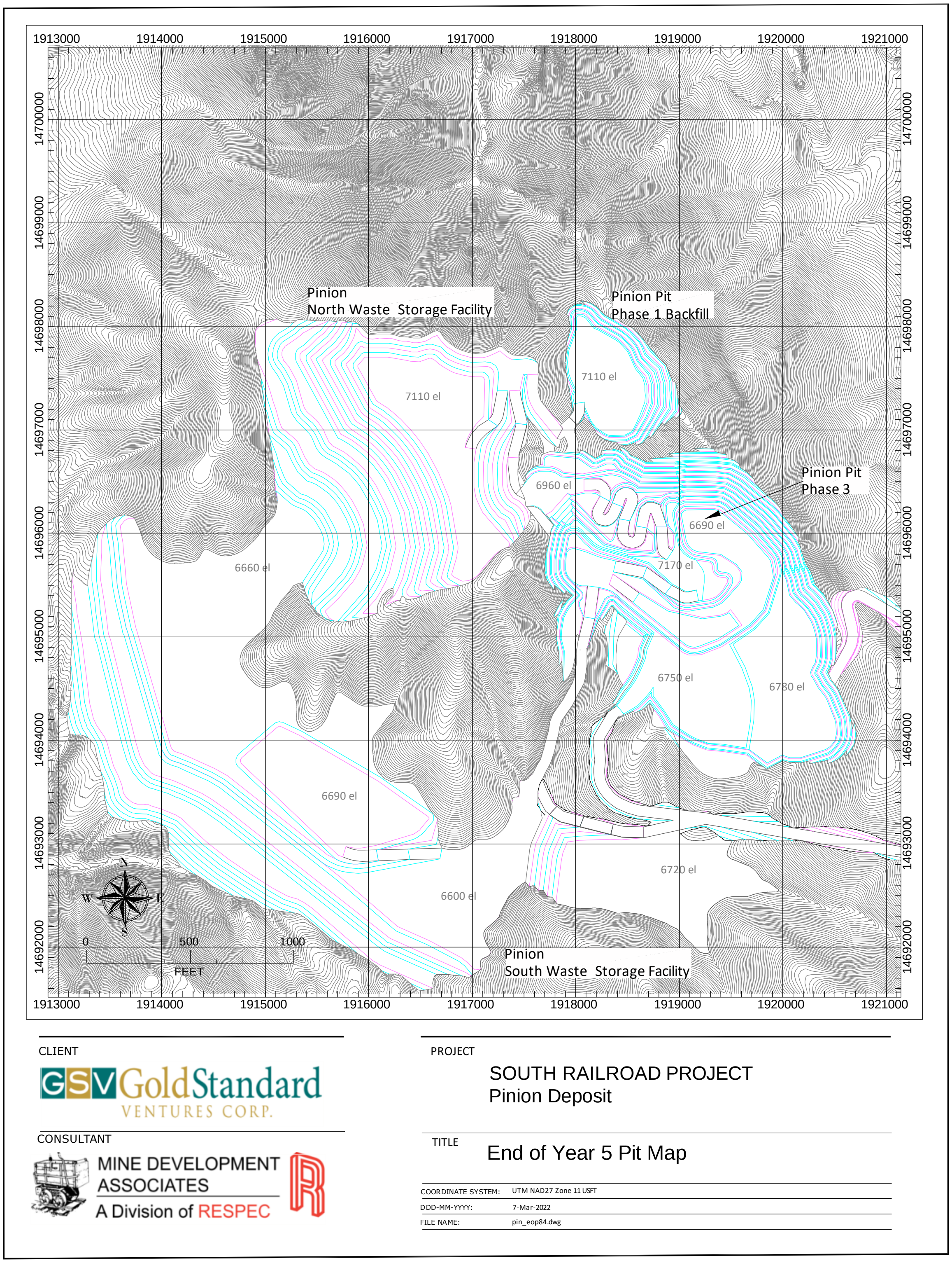


Figure 16-12: Pinion Pit Design, Year 5

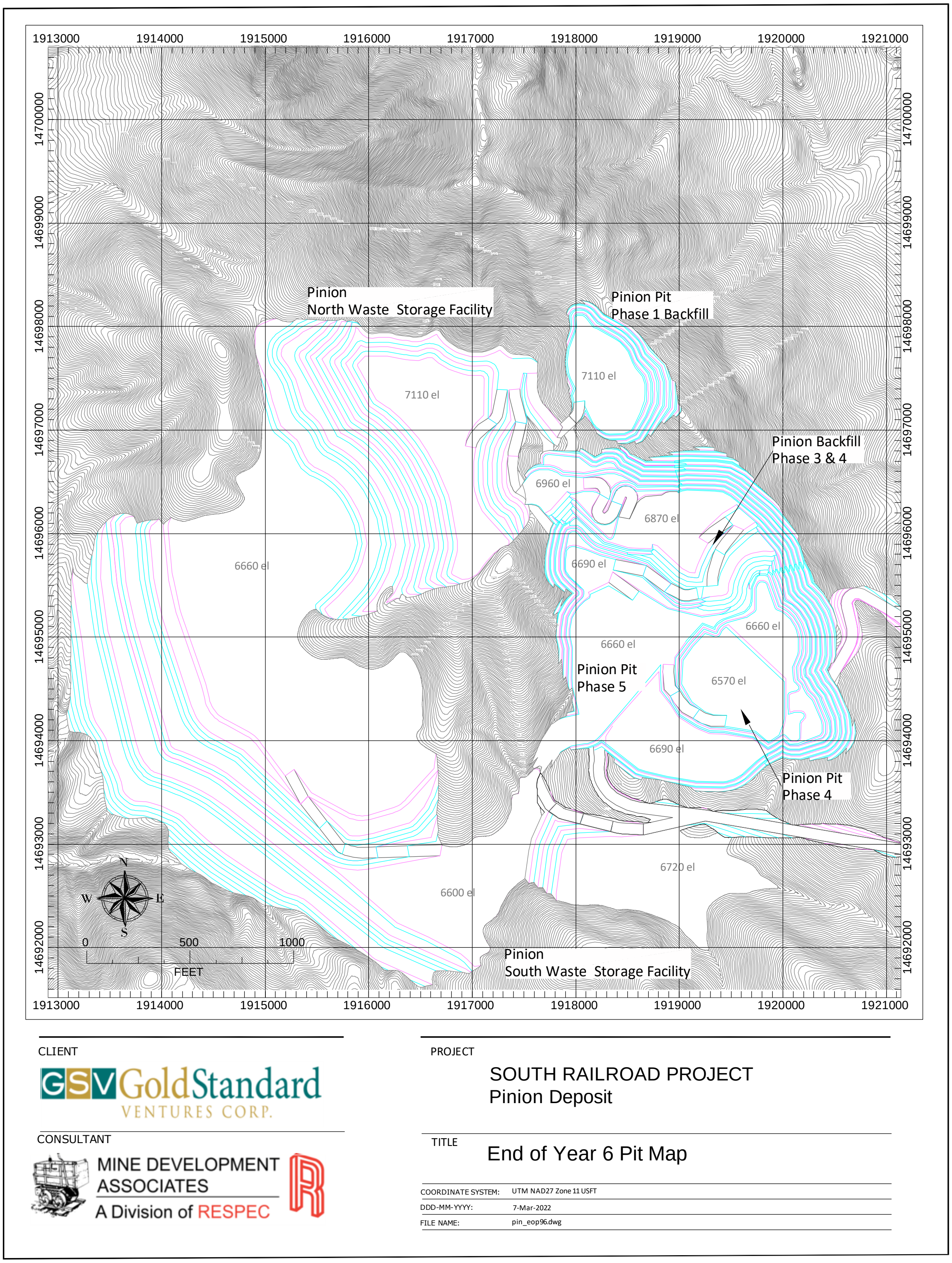


Figure 16-13: Pinion Pit Design, Year 6

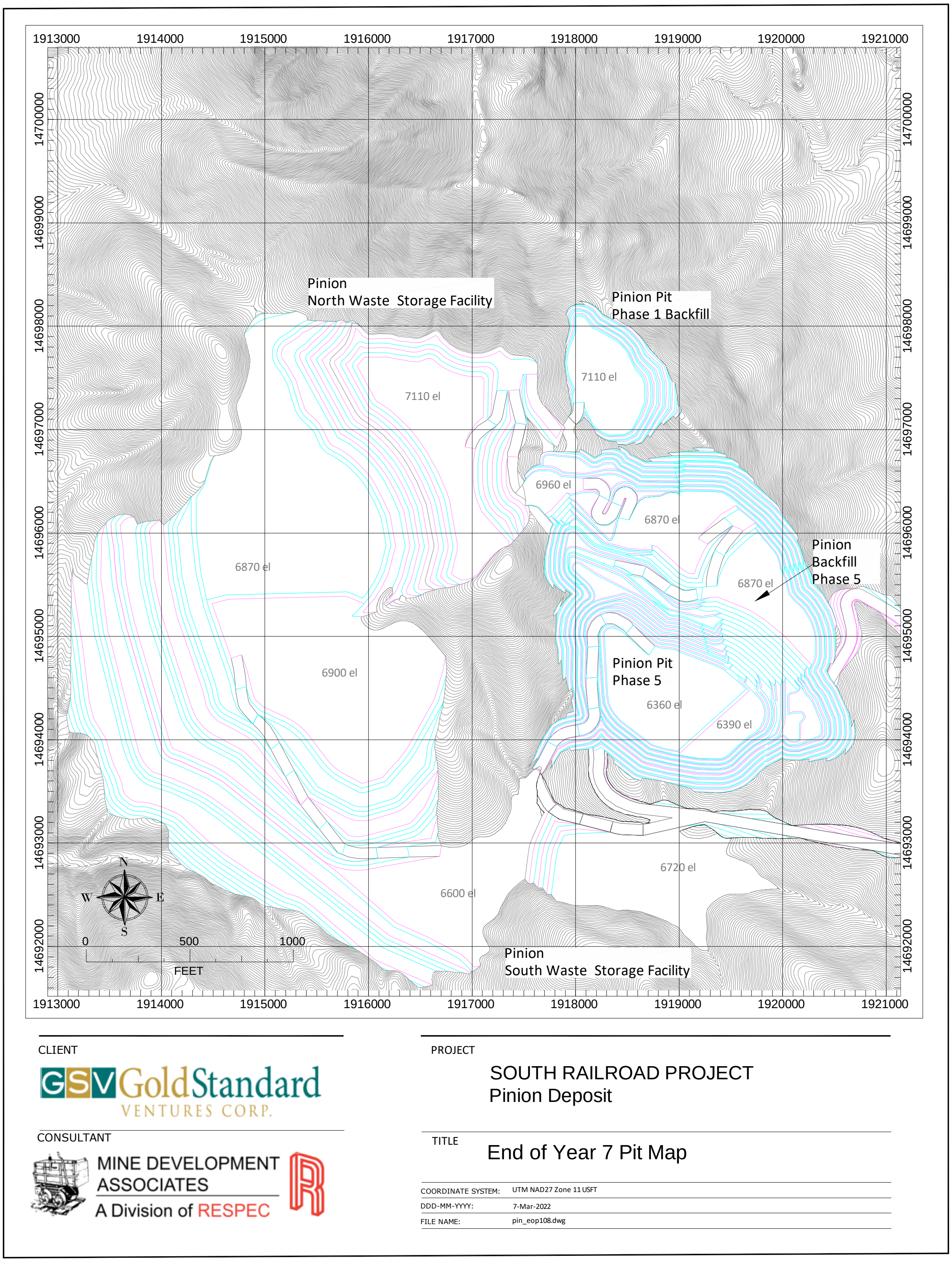


Figure 16-14: Pinion Pit Design, Year 7

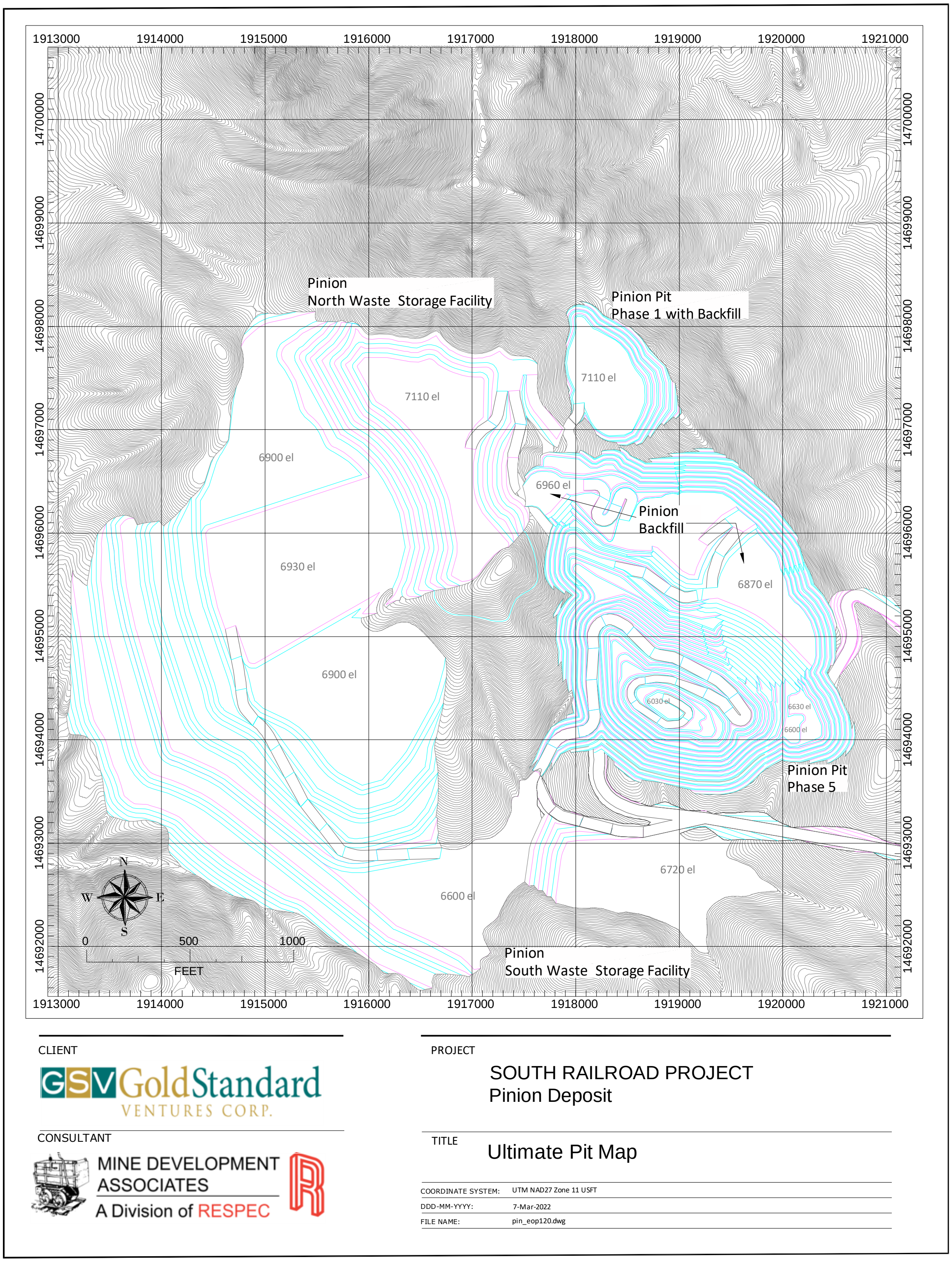


Figure 16-15: Pinion Pit Design, End of Mine Life

16.4 RELEVANT GEOTECHNICAL AND HYDROLOGICAL PARAMETERS

Pit designs for the mining production schedule have considered the geotechnical parameters and slope recommendations from Golder (2021) as summarized in Section 15.2.2. Mining of the Pinion and Dark Star open pits will require dewatering based on the studies summarized by Stantec (2022).

16.5 MINE PROCESS SCHEDULE

Forte Dynamics Inc. (Forte) utilized a dynamic heap leach model for the GSV heap leach facility (HLF) for forecasting recoveries for the Feasibility Study for use in financial and NPV analysis by GSV. A stacking plan for the selected mine plan was developed and recovery modeling of both gold and silver was completed.

The model Forte is capable of evaluating various stacking configurations, mine plans, application rates, barren flow rates, leach cycles, and lift heights. GSV used the recovery and total flow information in their financial analysis and NPV calculations.

RESPEC and GSV provided Forte with the ROM mine plan for loading the model with planned ore tons, contained ounces, and recoverable ounces by ore type as specified by Simmons Consulting. The recoverable gold was calculated within the mine plan, utilizing a head grade to recoverable grade relationship, and was provided in the mine plan from RESPEC with equations for the recoverable gold developed by Simmons Consulting.

Using the information provided, the extraction rate was then generated, by Forte, by estimating the rate of gold extraction on a daily basis using first principles of gold extraction and kinetics. The provided column leach testing data was analyzed, by ore type, as described by Simmons Consulting, and curve fit to produce kinetic extraction curves versus time. The parameters of these kinetic extraction curves were combined with GSV's predicted ultimate recoverable gold estimates, as provided in the mine plan from RESPEC. This was then input to the recovery model to generate the gold and silver recovery profile over the life of the HLF for the ROM mine plan. The equation below describes the curve fit utilized for extraction within the model by ore type:

$$Ext(t) = \frac{1}{1 + (A * t)^B} \qquad (Equation\ 1)$$

Where Ext(t) is the calculated percent gold extracted as a function of time, t is time in days, and A and B are constants that are used to fit extraction to the indicated column extraction by ore type. Table 16-5 contains the calculated parameters broken down by ore type, and Figure 16-16 shows the corresponding curves.

Table 16-5: Column Fit Gold Recovery Kinetics Parameters

Material Type	Pit	A-Value ROM	B-Value ROM
Type 1: Oxide – Low Silica	Dark Star North	0.975	-0.860
Type 2: Oxide – High Silica	Dark Star North	0.481	-0.860
Type 3: Transitional – Low Silica	Dark Star North	0.975	-0.860
Type 4: Transitional – High Silica	Dark Star North	0.481	-0.860
Type 5: Oxide – Low Silica	Dark Star Main	0.494	-0.960
Type 6: Oxide – High Silica	Dark Star Main	0.286	-0.960
Type 7: Transitional – Low Silica	Dark Star Main	0.494	-0.960
Type 8: Transitional – High Silica	Dark Star Main	0.286	-0.960
Type 9: Oxide	Pinion DDG	0.520	-0.970
Type 10: Oxide	Pinion West	0.208	-0.970
Type 11: Oxide	Pinion East	0.260	-0.970
Type 12: Oxide	Pinion MTP	0.332	-0.970
Type 13: Transitional	Pinion DDG	0.458	-0.970
Type 14: Transitional	Pinion West	0.183	-0.970
Type 15: Transitional	Pinion East	0.229	-0.970
Type 16: Transitional	Pinion MTP	0.292	-0.970

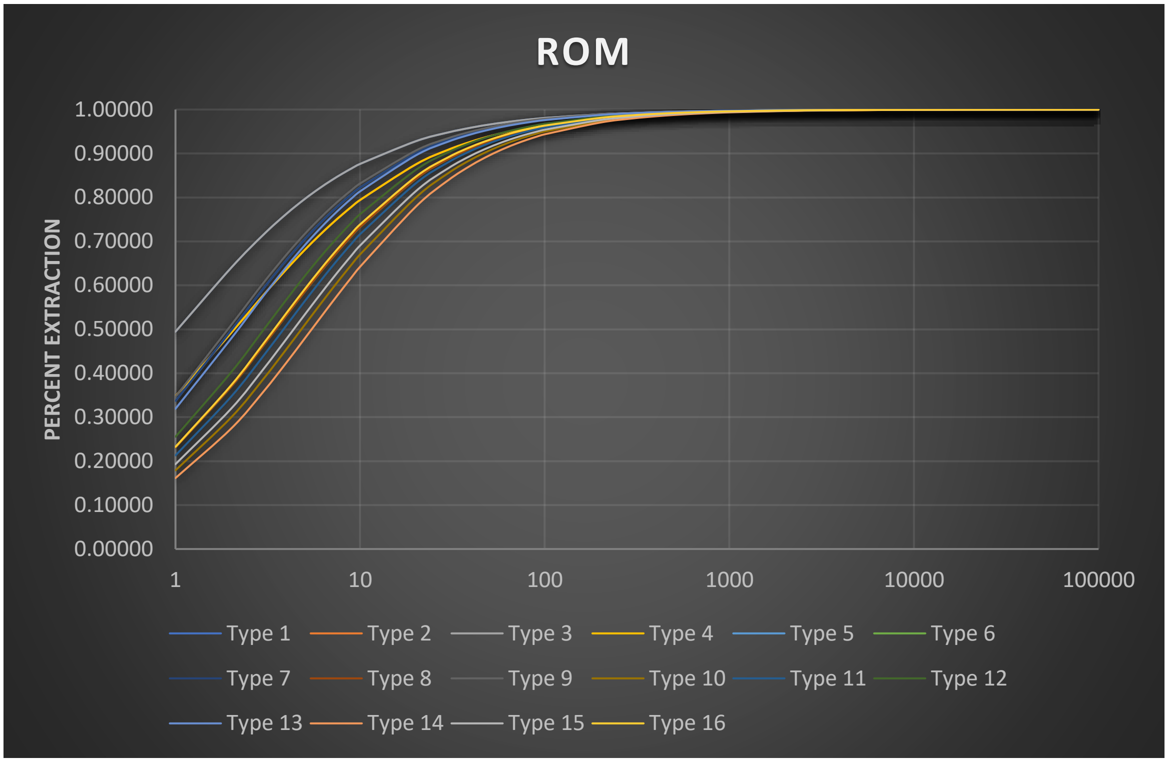


Figure 16-16 - ROM Fraction Extraction Curves

Forte was provided with the various ore properties. Forte also analyzed various data sets provided by the Project TeamListed here are the key input parameters used for the HLF recovery model, for ROM ore properties:

- Initial Gravimetric Moisture Content – 5.80%
- Residual Moisture Content – 7.53%
- Uncompacted Ore Density – 110.0 lbs/ft3
- Compacted Ore Density – 114.8 lbs/ft3
- Specific Gravity – 2.45
- Saturated Hydraulic Conductivity – 0.107 cm/sec
- Leaching Application Rate – 0.0033 gpm/ft2
- Target Initial Leach Cycle – 100 days
- Lift Height – 30 ft ROM

Forte generated stacking plans for the mine plan provided, working within existing boundaries for the HLF.

While generating the stacking plans, the following constraints and parameters were assessed, including input from the GSV Project Team:

- Feasibility of solely using the primary HLF footprint and staying under the 300 foot limit
- Feasibility of using both the primary and alternate HLF footprints

- ROM only mine plan
- Stack planning and impact on haul distances, operational parameters (such as leach cycle), and recovery
- Liner expansion on primary HLF
- Operational access points and ramp variations

The ROM only stacking plan was divided into a north and south side for the first 11 lifts. The north side is for the Dark Star pit, and the south side is for the Pinon pit. This division helps keep the haulage for each pit as short as possible. Doing this required the pad to have three different access points. The first is on the north side at the 6625 elevation and ramps down to the first lifts on the 6570. The first lifts on the north side have a minimal area that yield a lower initial leaching cycle. The second access point is on the south side at 6687 for the Pinion pit. This access point will ramp down to its first lifts and then eventually ramp up to the top of the pad. The third access point is on the north side when the first access point no longer allows for ramping up. The access point is at the 6750 elevation. After lift 11, there is only one ramp to the top of the pad coming from the south at access point two. Figure 16-17 shows the final stacking configurations for the ROM mine plan.

Figure 16-17: ROM Final Stacking Design

The recovery model utilizes first principles of hydrodynamics and kinetics to simulate recovery through time for the GSV HLF. The model utilizes discretized blocks to track tons and recoverable ounces placed, flow rate, leach cycle, application rate, extracted ounces, moisture content, solution tenor, and recovery from the HLF.

The model was developed to allow for flexibility in scenario analysis to change various input parameters to understand the overall impacts on recovery of gold. The specified flowrate within each model run reflects the targeted flowrate to the HLF and is limited based on the available leach area and only reaches the targeted barren solution flow when adequate area is available based on the associated application rate. The parameters are also separated by ore designation as ROM as required by the mine plan.

The model utilizes the Brooks-Corey methodology, Equation 2, for representing the flow through the pad based on leaching application rate and ore properties:

$$q = k_{sat}\left[\frac{\Theta_t - \Theta_r}{\Theta_{sat} - \Theta_r}\right]^{\varepsilon} \qquad (Equation\ 2)$$

This methodology captures micropore and macropore flow within heap leach facilities. Additionally, the model captures the impact of changes in the application rate and the effect on the degree of saturation within the pad. Equation 3 describes how this is captured in the recovery model.

$$SSA = \frac{Total\ Surface\ Area}{Mass\ of\ Sample} \qquad (Equation\ 3)$$

The results of the recovery model for the ROM mine plan resulted in 991,134 recovered gold ounces and 579,993 recovered silver ounces by the end of stacking. With residual leaching operations post stacking through the end of year 2038, the end gold recovery was 1,033,067 ounces and the end silver recovery was 660,896 ounces. This equated to an overall 99.6% recovery of recoverable gold ounces placed and 99.8% recovery of recoverable silver ounces placed. The ending remaining extractable ounces were 1,443 and 2,140 for gold and silver respectively. Additionally, the ounces in solution inventory were 250 and 574 for gold and silver respectively. The below accounts for a 7 day lag between placement and leaching operations, accounting for material placement, ripping as required, and placement of irrigation lines to supply barren leach solution to the fresh ore.

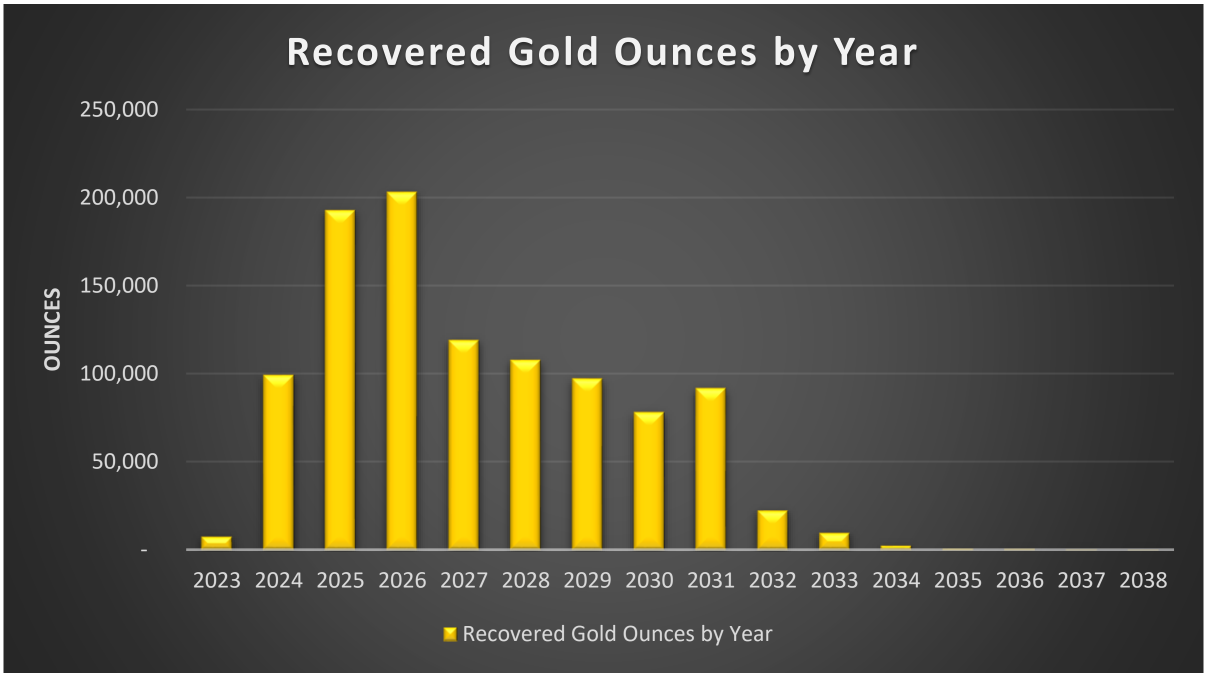


Figure 16-18: Recovered Gold Ounces by Year

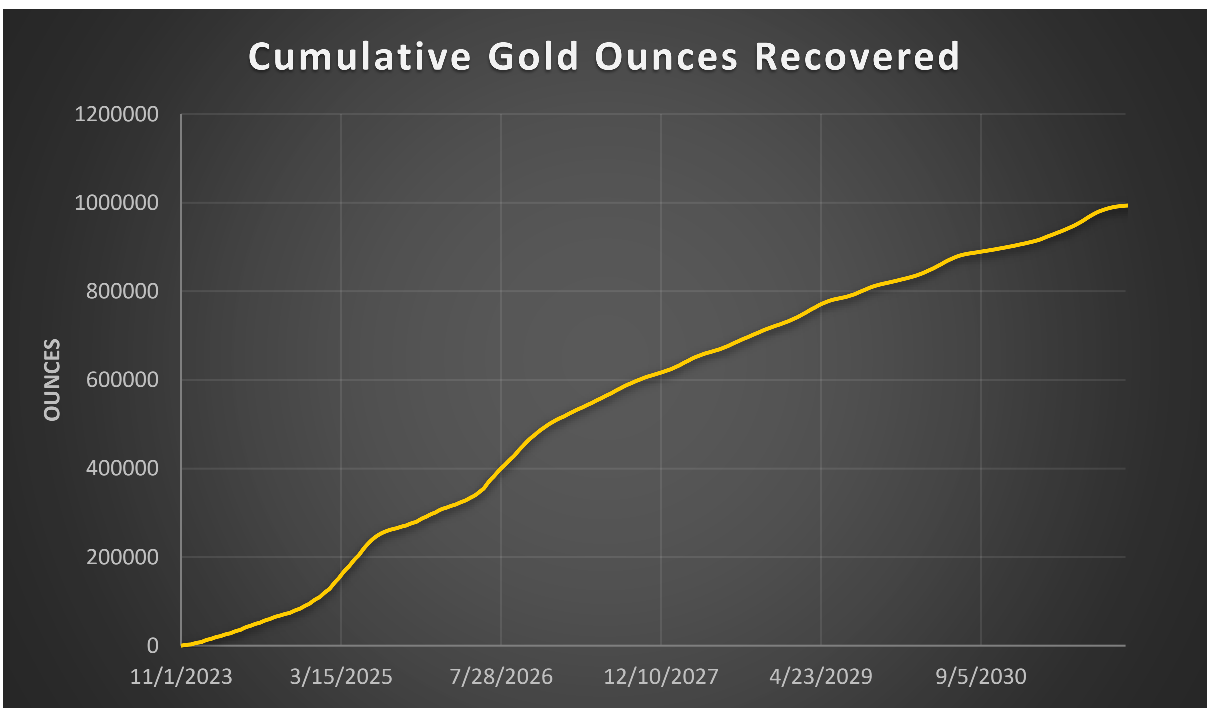


Figure 16-19: Recovered Gold Ounces Cumulative

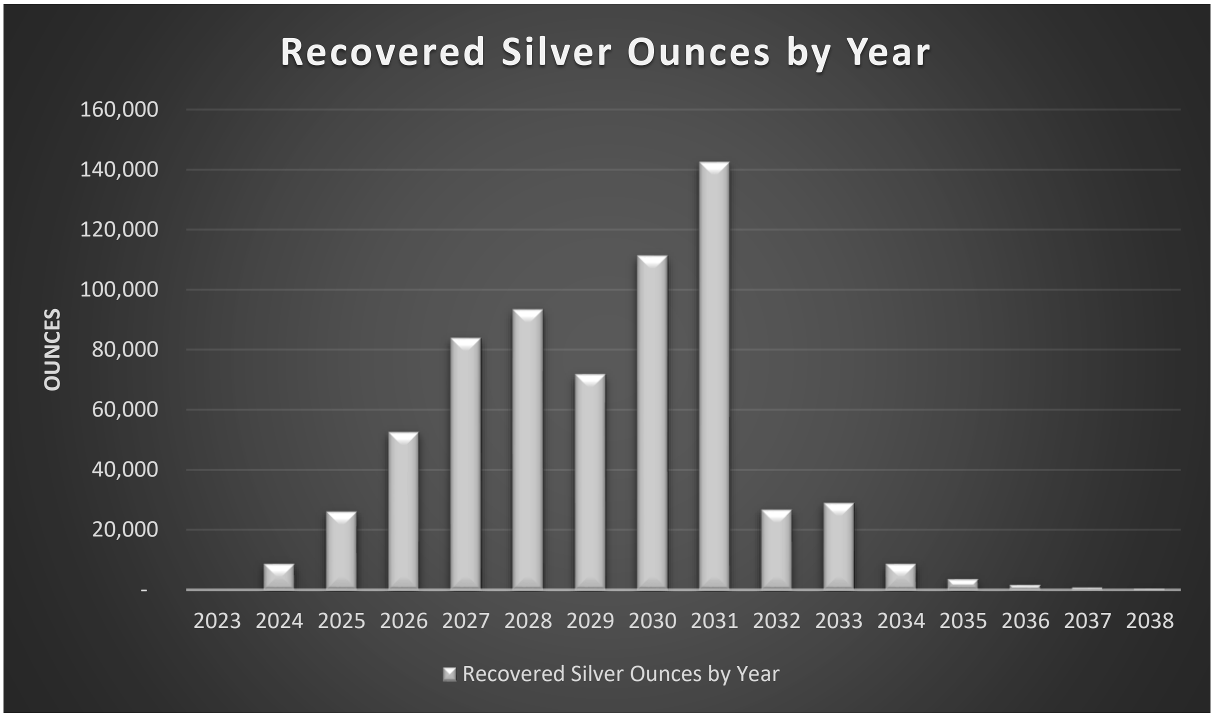


Figure 16-20: Recovered Silver Ounces by Year

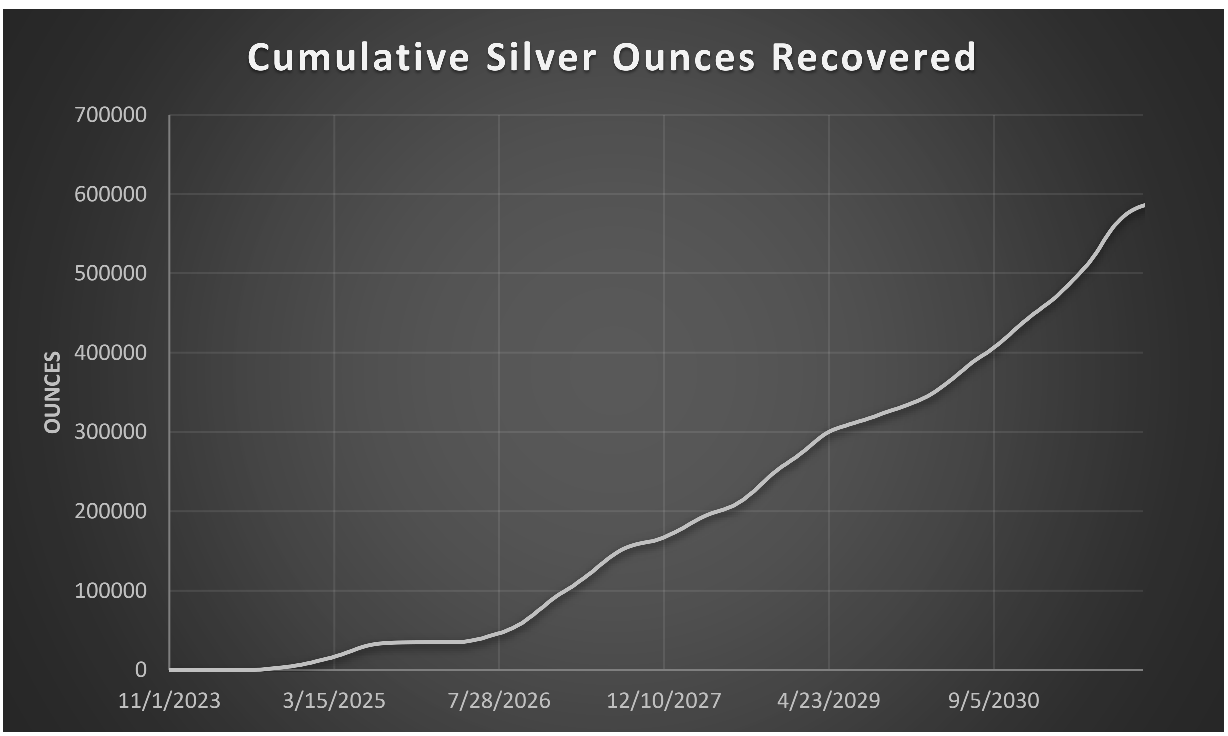


Figure 16-21: Recovered Silver Ounces Cumulative

Table 16-5 shows the recovery through time of the recoverable ounces by month for the ROM mine plan. Table 16-6 shows the yearly process production summary by process type. The rows labeled "K Au Rec" shows the thousands of recoverable ounces of gold and the rows labeled "K Au Prod" are the thousands of ounces of gold produced. Forte has put together the resulting estimated gold production plan, but ultimately the metallurgical and processing consultants are responsible for the final production numbers with regards to plant efficiency, which may result in differences in final production values from what is in the cash-flow model.

Table 16-6: Railroad-Pinion Process Production Schedule

ROM	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	YR 12	YR 13	YR 14	YR 15	YR 16	**Total**
	kTons	0	765	6,530	7,688	10,800	10,396	11,940	10,170	7,367	6,214	-	-	-	-	-	-	-	**71,870**
	Oz Au/t	0	0.019	0.024	0.034	0.032	0.017	0.017	0.015	0.019	0.023	-	-	-	-	-	-	-	**0.022**
	K Oz Au	0	14.5	156.3	263.8	345.7	181.7	205.4	154.2	137.1	145.4	-	-	-	-	-	-	-	**1,604**
	K Oz Au Rec	0	9.8	111.8	192.7	233.2	108.2	119.6	92.6	77.3	89.5	-	-	-	-	-	-	-	**1,035**
	K Oz Au Prod	0	7.6	99.3	192.7	203.2	119.0	107.8	97.3	78.2	91.9	22.4	9.8	2.5	0.6	0.4	0.2	0.2	**1,033**
	Oz Ag/t	0	-	0.019	0.031	0.063	0.080	0.090	0.066	0.171	0.204	-	-	-	-	-	-	-	**0.080**
	K Oz Ag	0	-	121.7	235.0	679.1	835.9	1,068.9	666.8	1,259.1	1,270.3	-	-	-	-	-	-	-	**6,137**
	K Oz Ag Rec	0	-	13.2	24.6	78.0	87.9	110.8	67.5	138.9	142.9	-	-	-	-	-	-	-	**664**
	K Oz Ag Prod	0	-	8.7	26.0	52.6	83.8	93.4	71.8	111.2	142.4	26.8	28.9	8.7	3.6	1.6	0.8	0.4	**661**

16.6 EQUIPMENT SELECTION AND PRODUCTIVITIES

The feasibility study has assumed owner mining to keep the mining cost lower than it would be with contract mining, though the costs reflect a leasing option for primary mining equipment. The production schedule was used along with additional efficiency factors, cycle times, and productivity rates to develop the first principal hours required for primary mining equipment to achieve the production schedule. Primary mining equipment includes drills, loader, hydraulic shovels, and 200-ton capacity haul trucks.

The South Railroad mine is anticipated to operate 24 hours per day utilizing four crews of workers, each working four days on and four days off. It is anticipated that these crews would rotate between day shift and night shift. The daily shift schedule would be 12 hours per day, reduced to account for standby time including startup/shutdown, lunch, breaks, and operational delays totaling 3.0 hours per day. This allows for 21 work hours in each day or an 87.5% schedule efficiency. The estimated schedule efficiency is shown in Table 16-7.

Table 16-7: Schedule Efficiency

	Units	Value
Shifts per Day	shift/day	2
Hours per Shift	hr/shift	12
Theoretical Hours per Day	hrs/day	24
Shift Startup / Shutdown	hrs/shift	0.5
Lunch	hrs/shift	0.5
Breaks	hrs/shift	0.25
Operational Standby	hrs/shift	0.25
Total Standby / shift	hrs/shift	1.50
Total Standby / day	hrs/day	3.00
Available Work Hours	hrs/day	21.00
Schedule Efficiency	%	87.5%

16.7 EQUIPMENT REQUIREMENTS

Mine equipment is planned to be put into service over a period of three years (pre-production through Year 2). This equipment is to be used through the LOM. Table 16-8 shows the yearly schedule for mining equipment to be put into service.

To reduce capital requirements, the equipment is assumed to be acquired through a combination of leasing for most production and support equipment, rentals for pioneering drills, and purchase of some equipment.

Table 16-8: Mine Equipment Placed into Service

Primary Mining Equipment	Units	Yr -1	Yr 1	Yr 2	Total
Pioneer Drill	#	-	-	-	-
Production Drill	#	3	-	1	4
25-yd Loader	#	1	-	-	1
30 cu yd Hyd. Shovel	#	1	-	1	2
200 ton Haul Trucks	#	5	3	5	13
Support Equipment					
600 HP Dozer	#	2	-	2	4
900 HP RTD	#	1	-	-	1
18' Motor Grader	#	2	-	-	2
Water Truck - 20,000 Gallon	#	2	-	-	2
Truck and Lowboy	#	1	-	-	1
6 cu yd backhoe	#	1	-	-	1
Pit Pumps (1450 gpm)	#	2	-	-	2
132 ton Crane	#	1	-	-	1
Flatbed	#	2	-	-	2
Blasting					
Skid Loader	#	1	-	-	1
Mine Maintenance					
Lube/Fuel Truck	#	1	-	-	1
Mechanics Truck	#	2	-	-	2
Tire Truck	#	1	-	-	1

16.7.1 Drilling Equipment

Pioneer drills would be smaller air-track drills with contained cabs and the production drills are anticipated to be 45,000lb-pulldown, track-mounted, rotary blast-hole drills. An 83% efficiency factor was used for pioneer drilling, production, and controlled blast hole drilling. Penetration rates of 135.31, 135.31, 157.87, and 124.25 feet per hour were used along with 2.8, 2.8, 3.0, and 4.0 minutes per hole of non-drilling times for waste production, ore production, trim-rows, and pioneer drilling, respectively.

Based on the parameters used, only one pioneer drill would be required during startup of each phase. Due to the short duration of the pioneer requirements these drills are assumed to be rented during the periods they are needed. Four production drills are estimated to be needed. It is assumed that these drills will last through the LOM with an availability that is assumed to be 85% for the life of the drill.

Drilling patterns were adjusted by material. The adjustments were made based on studies by Blast Dynamics (2021) to create a nominal size distribution with a P80 of -6 inches. Based on that work, blast patterns where ore is anticipated are estimated to use 17 ft spacing and 15 ft burden with 3 ft sub drill. With 7.875 inch diameter drill holes and stemming of 10 ft, this results in a powder factor of 0.697 lbs of explosive per ton of material blasted. This was determined to be beneficial for gold recovery.

Waste patterns are assumed to have 19 ft hole spacing and 17 ft burden and 0.512 lbs of explosive per ton of material blasted. Because waste is not processed, the additional breakage in the patterns is not needed. The increase in spacing and burden and the decrease in powder factors for the shot patterns reduces the overall cost of drilling and blasting while remaining reasonable for material handling with shovels, loaders, and trucks.

During pioneering operations at the start of each deposit, a smaller drill will be used due to uneven terrain. At the start of Dark Star, it is assumed that 20% of blasting will be done as pioneering for the first two months. At the start of Pinion Phases 1 through 3, 10% of the blasting for the first two months is assumed to be done with pioneer drilling.

Trim row shot patterns are to be used with lower powder factors and tighter spacing of drill holes near pit high walls to minimize damage to the walls. The feasibility study assumes that 5% of the waste blasted will be in the form of trim row blasting. Trim row patterns are to be drilled using the production drills.

16.7.2 Loading Equipment

Loading equipment is anticipated to include one 25 cubic yard type loader and two 30 cubic yard type hydraulic shovels. The theoretical productivity for the loader was estimated to be 2,937 tons per hour, or 2,438 tons per hour after an operating efficiency of 83%. The assumed availability starts at 90% and is reduced 1% per year until it reaches 85%, and then is held constant through the life of the loader. No replacement loaders were assumed. The overall use of available hours is 74%.

Two hydraulic shovels will be used as the primary loading tool. The initial shovel starts operating in month -6 and the second shovel starts working in month 13. The theoretical productivity was estimated to be 3,792 tons per hour or 3,147 tons per hour after applying 83% efficiency. As with the loader, the assumed availability starts at 90% and declines at 1% per year to a low of 85% and then remains the same through the LOM. The overall use of operating hours is 98%.

16.7.3 Haulage Productivity

Haul trucks are assumed to be 200-ton capacity, rigid frame trucks. Haulage profiles were used inside of MineSched based on effective haulage gradients for empty and full routes. A rolling resistance of 3% was also used for the haulage speed calculations. In addition, bench haulage strings were created which depict the planned haulage routes on each bench where mining occurs.

Hydraulic shovel loading time of 2.95 minutes was used, plus 0.5 minutes and a spot and dump time of 1.5 minutes was added. Loading time was adjusted in spreadsheets to 3.93 minutes plus 0.5 minutes for spotting at the loader for trucks that would be loaded using a loader.

A capacity of 188 tons per load was used as dry tonnage to reflect the dry densities in the mineral resource block model. The number of trucks was calculated to increase over time due to farther haulage with some pit phases. A total of 13 haul trucks are put into service to maintain the production schedule. This assumes a 1% per year declining availability from 90% down to 85%.

Out of the 13 life of mine trucks, five would be purchased through a lease option during pre-production with three additional trucks in year 1, and five additional trucks in year 2 with the purchase of the additional shovel.

16.7.4 Support and Maintenance Equipment

Support equipment is used to maintain the roads, pits, and dumps to enable mining equipment to operate in an efficient manner. The maintenance equipment is used on site to maintain the mining equipment. The total number of equipment to be put into service on the site is shown in Table 16-8.

16.8 MINING PERSONNEL AND STAFFING

Table 16-9 shows the estimated personnel requirements. This is based on the number of people that will be required to operate, supervise, maintain, and plan for operations to achieve the production schedule.

Table 16-9: Personnel Requirements

Mining General Personnel	Units	Yr -1	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Max
Mine Superintendent	#	1	1	1	1	1	1	1	1	1	1
Mine General Foreman	#	1	1	1	1	1	1	1	1	1	1
Mine Foremen	#	4	4	4	4	4	4	4	4	4	4
Chief Mine Engineer	#	1	1	1	1	1	1	1	1	1	1
Mine Engineer	#	2	2	2	2	2	2	2	2	2	2
Chief Surveyor	#	1	1	1	1	1	1	1	1	1	1
Surveyor	#	3	3	3	3	3	3	3	3	3	3
Chief Geologist	#	1	1	1	1	1	1	1	1	1	1
Ore Control Geologist	#	2	2	2	2	2	2	2	2	2	2
Samplers	#	2	2	2	2	2	2	2	2	2	2
Total Mine General	#	18	18	18	18	18	18	18	18	18	18
Mine Operations Hourly Personnel											
Operators											
Blasters	#	2	2	2	2	2	2	2	2	2	2
Blaster's Helpers	#	2	2	2	2	2	2	2	2	2	2
Drill Operators	#	12	12	16	16	16	16	16	16	12	16
Loader Operators	#	10	10	15	15	15	15	15	15	13	15
Haul Truck Operators	#	20	32	52	52	52	52	52	52	52	52
Support Equipment Operators	#	26	26	33	33	33	33	33	33	33	33
General Mine Labors	#	-	-	-	-	-	-	-	-	-	-
Total Operators	#	72	84	120	120	120	120	120	120	114	120
Mechanics											
Mechanics - Drilling	#	6	6	8	8	8	8	8	8	6	8
Mechanics - Loading	#	5	5	8	8	8	8	8	8	7	8
Mechanics - Haulage	#	10	16	26	26	26	26	26	26	26	26
Mechanics - Support	#	13	13	17	17	17	17	17	17	17	17
Total Mechanics	#	34	40	59	59	59	59	59	59	56	59
Maintenance											
Maintenance Superintendent	#	1	1	1	1	1	1	1	1	1	1
Maintenance Foreman	#	4	4	4	4	4	4	4	4	4	4
Maintenance Planners	#	2	2	2	2	2	2	2	2	2	2
Light Vehicle Mechanic	#	2	2	2	2	2	2	2	2	2	2
Welder	#	4	4	4	4	4	4	4	4	4	4
Servicemen	#	4	4	4	4	4	4	4	4	4	4
Tireman	#	2	2	2	2	2	2	2	2	2	2
Maintenance Labor	#	4	4	4	4	4	4	4	4	4	4
Total Maintenance	#	23	23	23	23	23	23	23	23	23	23
Total Personnel - Mining Personnel	#	147	165	220	220	220	220	220	220	211	220

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17 RECOVERY METHODS

The process selected for recovery of gold and silver from the Pinion and Dark Star ore is a conventional heap-leach recovery circuit. The ore will be mined by standard open pit mining methods from two separate pits. Pinion and Dark Star ore will be truck-stacked on the heap as Run-of-Mine (ROM) ore directly, without crushing.

Oxide and transition material types will be leached with a dilute cyanide solution. The leached gold and silver will be recovered from solution using a carbon adsorption circuit. Gold and silver will be stripped from carbon using a desorption process, followed by electrowinning to produce a precipitate sludge. The precipitate sludge will be processed using a retort oven for drying and mercury separation and recovery, and then refined in a melting furnace to produce gold and silver doré bars.

The Pinion and Dark Star deposits have a total estimated mineral reserve of 71.9 million tons. The total estimated mine life is 8 years; solution application on the heap leach pad will continue for an additional 2.5 years after mining operations have ceased to recover additional solubilized metal ounces. The nominal ore placement rate on the pad is an average of 9 million tons per annum, equivalent to 24,700 tons per day.

17.1 GOLD AND SILVER RECOVERIES

The gold and silver recoveries for heap leaching of the Pinion and Dark Star ore have been taken from the recommendations detailed in Section 13 of this Technical Report.

For the Pinion and Dark Star mineral resources, the overall life-of-mine average gold recovery for the ore is estimated at 64.5 percent. For the Pinion and Dark Star mineral resources, the overall life-of-mine average silver recovery for the ore is estimated at 11 percent.

17.2 REAGENTS AND CONSUMPTIONS

The major reagent consumptions for heap leaching of Pinion and Dark Star ore have been taken from available metallurgical test results from column leach tests on crushed material. No test data exists at the ROM particle size, so the selected reagent consumptions have been estimated based on test results on the coarsest samples tests, minus 1.5 inch (-37 mm).

17.2.1 Sodium Cyanide

Sodium cyanide (NaCN) will be used in the leaching process and will be delivered in tanker trucks as a liquid at 30% concentration by weight (1.15 SG). Sodium cyanide will be stored in a 25,000 gallon steel tank at the ADR area within concrete containment and will be distributed to the process by a distribution pump with individual control valve stations at each point of use.

All cyanide distribution lines will be double-containment, either by “pipe-within-pipe” or “pipe-overliner” containment systems. Cyanide consumptions have been estimated as follows:

- Pinion ROM – 0.44 lb/ton (0.22 kg/tonne) ore
- Dark Star ROM – 0.46 lb/ton (0.23 kg/tonne) ore

17.2.2 Lime

Pebble quicklime (CaO) will be used to treat the ROM ore prior to cyanide leaching to maintain the alkaline pH. Lime will be delivered in bulk by 20-ton trucks, which will be off-loaded pneumatically into a 100-ton storage silo with a variable speed feeder that will meter lime directly onto the ore being carried by haul trucks to the heap leach pad and will be added in proportion to the tonnage of ore in each truck.

Lime will be consumed at an estimated rate of 2.0 lb/ton (1.0 kg/tonne) ore for the Pinion and Dark Star ROM ore.

17.2.3 Activated Carbon

Activated carbon will be used to adsorb precious metals from the leach solution in the adsorption columns. Make-up carbon will be 6 x 12 mesh and will be delivered in 2,200 lb supersacks. It is estimated that approximately 3-4% of the carbon stripped will have to be replaced due to carbon fines losses.

17.2.4 Sodium Hydroxide (Caustic)

Sodium hydroxide (caustic) will be delivered to site as a liquid at 50% caustic by weight (1.53 SG). Liquid caustic will be stored in a 15,000 gallon steel tank and metered to the strip solution tank and acid wash circuits by a distribution pump with individual control valve stations at each point of use.

17.2.5 Nitric Acid

Nitric acid (7%) will be used in the acid wash section of the elution circuit prior to desorption. Nitric acid will be delivered to site as a liquid at 57% solution strength and diluted to 7% in the dilute acid tank. Acid washing consists of circulating a dilute acid solution through the bed of carbon to dissolve and remove scale from the carbon. Carbon acid washing will be done before each desorption cycle, or as required to maintain carbon activity level.

17.2.6 Fluxes

Various fluxes will be used in the smelting process to remove impurities from the bullion in the form of a glass slag. The normal flux components are a mix of silica sand, borax, and sodium carbonate (soda ash). The flux mix composition is variable and will be adjusted to meet individual project smelting needs: fluorspar and/or potassium nitrate (niter) are sometimes added to the mix. Dry fluxes will be delivered in 50 lb bags. Average consumption of fluxes has been estimated to be 2 lb per lb of gold and silver produced.

17.2.7 Antiscalant

Antiscalant will be used to prevent the build-up of scale in the process solutions and heap irrigation lines. Antiscalant will be added directly into pipelines or tanks, and consumption will vary depending on the concentration of scale-forming species in the process stream. Delivery will be in liquid form in 264 gallon (1 m^3) totes.

Antiscalant will be added directly from the supplier tote bins into the pregnant, barren, and desorption pumping systems using variable speed chemical-metering pumps. On average, antiscalant consumption is expected to be about 6 ppm for leach solutions and 10 ppm for strip solutions to be treated.

17.3 PROCESS FLOWSHEET

An overall process flowsheet for the project is presented in Figure 17-1.

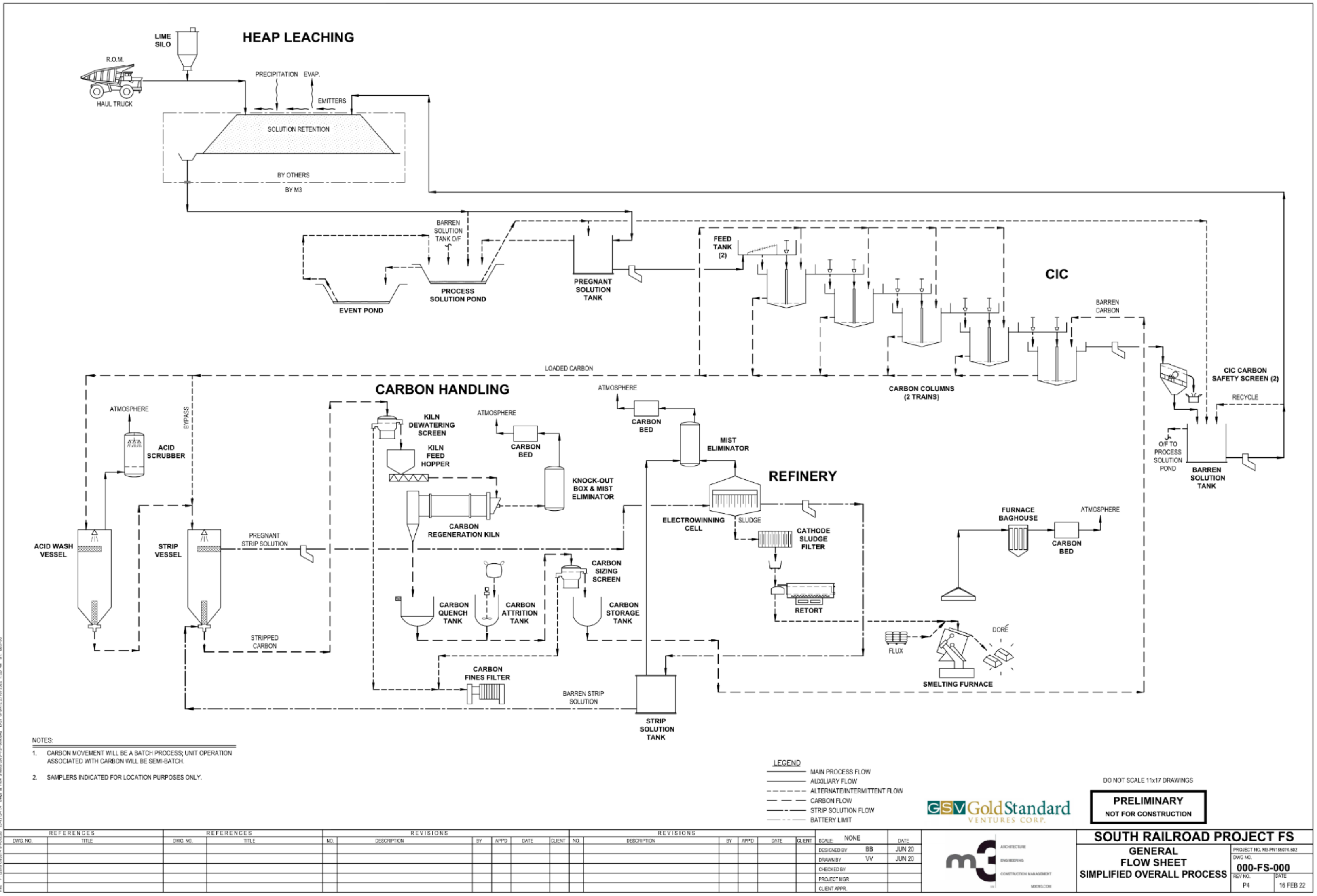

Figure 17-1: Process Flowsheet for the South Railroad Project

17.4 ROM TRUCK STACKING

Excavation, loading, hauling, and dumping of ROM material will be conducted by the mining fleet. ROM ore will be loaded into 200-ton haul trucks and transported to the active stacking face at an average rate of 24,700 tons/day. ROM production and stacking will vary based on the ore availability from the mine pits.

Quicklime (CaO) will be used for pH control of the process with an estimated consumption of 2.0 lb/ton for both Pinion and Dark Star based on metallurgical test work. Pebble quicklime will be stored in a 100-ton silo which will be equipped with a variable speed feed system that will feed a clam gate for lime addition to the trucks. Once the haul trucks have been loaded, the lime will be metered directly into the loaded trucks which will then deliver the ore to the active stacking area. One lime silo will be installed at the haul road for both the Pinion and Dark Star mine pits. Lime will be added in proportion to the tonnage of ore being hauled.

The ore haul trucks will operate on top of the lift being constructed. A ramp, or ramps, will be constructed to reach the top of each current lift. The trucks will direct-dump the ore on the current lift and a dozer will push the ore over the edge of the lift to form the expanding heap. The stacked ore will be deep-shank cross-ripped with the dozer prior to leaching. Ore will be stacked in 30 ft high lifts with a maximum ore heap height of 300 ft.

Prior to stacking a new lift over the top of an old one, the top of the old lift will be cross-ripped to break up any cemented/compacted sections and to redistribute any fines that may have been stratified by the irrigation solution or rainfall.

Following stacking, the ore will be drip irrigated with dilute cyanide leach solution and the resulting gold-bearing solutions collected in the pregnant solution tank. The leach pad will be a multiple-lift, single-use type pad.

17.5 LEACHING AND SOLUTION HANDLING

After each leach cell has been stacked and dozer ripped, the irrigation system will be installed. Dripline emitters will be used to apply a dilute cyanide solution at an application rate of 0.0033 gpm/ft^2 for ROM ore. A leach cycle of 100 days has been selected for ROM, based on a review of the leach curves.

Barren leach pH solution will be maintained at a minimum value of 10 and will be controlled by the addition of lime on the fresh ore. Barren solution will be delivered from a barren tank located at the recovery plant, by high-flow high-head pumps at a nominal flow rate of 5,000 gpm. This solution will be carried by a steel pipeline to the base of the heap and then to a network of sub-headers and risers to the top of the heap where it is finally applied to the material by drip emitters.

Solution passing through the heap will dissolve the values contained therein and be collect in a network of perforated solution collection pipes, which feed to a common discharge point at the base of the heap. The solution will then be carried by gravity to a pregnant solution tank. Excess solution from the heap will overflow from the pregnant tank to a lined process pond. Pregnant solution is pumped from the pregnant tank to the adsorption carbon column circuit at the recovery plant.

The carbon adsorption circuit consists of two trains of cascade-style columns. Pregnant solution flows through the columns to load the soluble gold onto the carbon. Barren solution exiting the columns is directed to the barren tank where make up cyanide is added, and the solution returned to the heap for further leaching. Overflow from the barren tank is directed to a process solution pond, which overflows to the event pond.

17.6 LEACH PAD PHASING AND CONSTRUCTION

It is assumed the leach pad will be constructed in four phases. The estimated lined areas for Phase 1, Phase 2, Phase 3, and Phase 4 are approximately 3,560,000 ft^2, 3,180,000 ft^2, 2,130,000 ft^2, and 1,110,000 ft^2 respectively, and will contain approximately 71.9 million tons of material.

For the initial the first year ROM ore will be stacked with trucks in nominal 30 ft thick lifts across the entire eastern toe are of Phase 1 leach pad. Barren solution containing cyanide will be irrigated onto the ore using drip irrigation. Pregnant solution will be collected at the base of the heap by the leach pad liner and collection system, which will route the pregnant solution to the process plant for gold recovery and reagent reconditioning. Once an area has been leached for the target time or metal recovery, the next lift will be placed on top of the already leached ore and the process repeated. This will be continued until the heap is stacked to the design elevation of 6989 ft for the 71.9 million ton capacity.

An overliner layer will be provided to protect the geomembrane primary liner from mechanical damage during ore stacking as well as weather conditions before the geomembrane is covered with ore. The overliner will also provide drainage of leach solutions and storm water entering the system both through the permeability of the drainage gravel and a network of drainage pipes installed within the overliner. The overliner material will be 18-inch thick and consist of select, durable crushed ore screened to a P_{100} of 1.5-inch.

The primary geosynthetic liner will be a composite liner system constructed using a robust, 80-mil thick HDPE material with the bottom side textured to provide an intimate bond with the underlying low permeability soil layer. This configuration is used on the majority of the operating leach pads in the industry. The installation specifications include a robust Quality Assurance/Quality Control program to provide assurance of a leak-free installation.

The low permeability soil layer will utilize an on-site clay source to produce a compacted clay liner with identified properties to have a maximum permeability of 10^{-6} cm/sec.

The leak detection system for the leach pad will consist of gravel fill trenches with perforated collection pipes installed directly underneath the primary collection pipes beneath the composite liner system in each of cells for the leach pad. These leak detection pipes will be extended to and are booted through the perimeter solution collection trench liner system to discharge into the lined solution collection trench 3-feet above the trench bottom. This will enable visual monitoring and sampling of the leak detection ports as necessary.

17.6.1 Solution Ponds

Two storage ponds, the process pond and event pond, are planned for the management of solutions. The process pond will collect overflow from the pregnant solution tank and is sized to additionally contain 24 hours of pregnant solution working volume, essentially 24 hours of heap solution drain down in the event of barren pump failure or power loss. The event pond will collect overflow from the pregnant solution pond and is sized to additionally handle storm water collection from a 100 yr., 24-hr storm event, plus the accumulation from a wet year snowpack over the ultimate pad lined area. Based on preliminary assumptions and data, the process and event ponds are sized at approximately 9,600,000 gallons and 25,500,000 gallons respectively for a total storage capacity of 35,100,000 gallons including free board.

The pond lining system for the pregnant solution pond will consist of two HDPE geomembrane liners separated by an HDPE geonet for leak detection and recovery. The pond lining system for the stormwater event pond will consist of a single HDPE geomembrane liner. Solutions collected in these ponds will be pumped back to the corresponding barren or pregnant solution tanks using submersible pond pumps for distribution either to the recovery plant or to the heap.

17.7 ADR PLANT

The recovery plant at South Railroad has been designed to recover gold and silver values using an adsorption-desorption-recovery (ADR) process. Pregnant leach solution from the heap leach will be pumped to the carbon in column circuit (CIC) and adsorbed onto activated carbon (adsorption). Two trains of carbon columns are included in the design, primarily to allow the diameter of the columns to be maintained within the transportation shipping envelope. Loaded carbon from the CIC circuit will be desorbed in a high-temperature elution process coupled to an electrowinning circuit (desorption), followed by retorting to remove mercury and smelting of the resulting sludge to produce doré bullion (recovery). Before elution, each batch of carbon will be acid washed to remove any scale and other inorganic contaminants that might inhibit gold adsorption on carbon. All or a portion of the carbon will be thermally reactivated using a rotary kiln.

The ADR plant General Arrangement is presented in Figure 17-2.

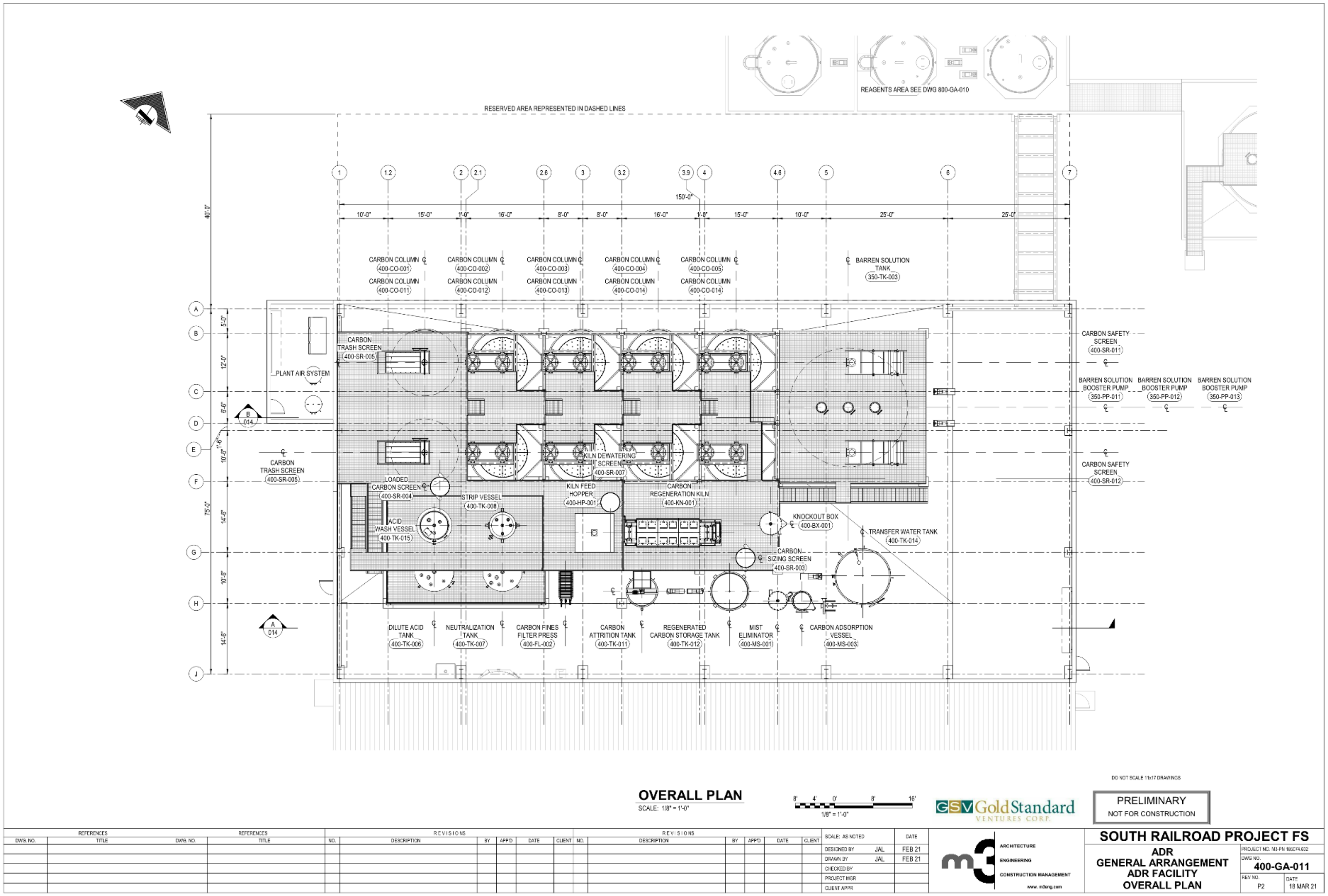

Figure 17-2: ADR Recovery Plant General Arrangement

17.7.1 Adsorption

Adsorption of gold and silver onto carbon will occur in the carbon adsorption circuit. The adsorption circuit will consist of two trains of five, cascade type open-top up-flow mild-steel CICs each. Each of the carbon columns are nominally 10.5 feet in diameter by 11.8 feet high and are sized to hold 6 tons of activated carbon.

The nominal flow to the adsorption circuit will be 4,500 gpm. Barren solution exiting the last carbon adsorption column in the train will flow through a vibrating screen to separate any floating carbon from the solution, then flow by gravity into the barren tank.

Antiscalant will be added at the pregnant solution tank to prevent scaling of carbon and reduction of the carbon loading capability. Magnetic flowmeters equipped with totalizers will measure solution flow to the adsorption circuit. Pregnant solution will flow by gravity through each set of five columns in series, exiting the lowest column as barren solution. Pregnant and barren solution continuous samplers will be installed at the feed and discharge end of each carbon column train, respectively. Solution samples will be used to measure pregnant and barren solution gold and silver concentrations.

Adsorption of gold and silver from pregnant leach solutions from the heap circuit will be a continuous process. Once the carbon in the lead column achieves the desired precious metal load it will be advanced to the elution (desorption) circuit using screw type or recessed impellor centrifugal pumps. Carbon in the remaining columns will be advanced counter current to the solution flow to the next column in series. New or acid washed/regenerated carbon will be added to the last column in the train.

The stripping of carbon will occur once per day, on average, once sufficient soluble metal is present on the incoming pregnant solution.

17.7.2 Carbon Acid Wash

Loaded carbon transferred from the CIC circuit will pass through a circular, vibrating screen, which allows for the majority of the elevated pH, cyanide-bearing solution to return to the CIC circuit during carbon transfer. Dewatered carbon reports to the acid wash column. A dilute acid solution will then be prepared in the mix tank, and circulation established between the acid wash vessel and the acid mix tank. Completion of the cycle will be indicated when the pH stabilizes between 1.0 and 2.0 without acid addition for a minimum of thirty minutes of circulation.

The carbon will then be rinsed with raw water followed by rinsing with dilute caustic solution to remove any residual acid. Total time required for acid washing a batch of carbon will be approximately four hours. After acid washing has been completed, a carbon transfer pump will transfer the carbon to the desorption circuit.

17.7.3 Desorption

A pressure Zadra hot caustic desorption circuit for the stripping of metal values from carbon has been selected for South Railroad, which requires 12 hours or less to complete a cycle. During the elution cycle, gold and silver are continuously extracted by electrowinning from the pregnant eluate concurrently with desorption.

The desorption circuit is sized to strip gold and silver from carbon in 6-ton batches and will be equipped with a strip solution tank, strip solution pump, primary (heat up), secondary (heat recovery), and tertiary (cooling) heat exchangers, hot water heater, elution column, and elution column drain pump. After carbon has been transferred to the elution column, barren strip solution (eluant) containing sodium hydroxide and sodium cyanide will be pumped through the heat recovery and primary heat exchangers and introduced to the elution vessel at a nominal temperature of 300°F and a nominal operating pressure of approximately 100 psig for ten hours.

Under normal operating conditions, barren eluant solution from the solution storage tank will pass through the heat recovery exchanger to be preheated by hot pregnant eluate leaving the elution column. The barren eluant solution then passes through the primary heat exchanger to raise the temperature up to 300°F using pressurized hot water (~330°F) from the hot water heater system.

The elution column will contain internal stainless-steel inlet screens to hold carbon in the column and to distribute incoming stripping solution evenly in the column. Pregnant eluate leaving the elution column will pass through two external stainless-steel screens before passing through the heat recovery exchanger and the cooling heat exchanger to reduce the temperature to about 175°F (to prevent boiling). The cooled pregnant eluate solution will flow to the electrowinning cell.

After desorption is complete, the stripped carbon will be transferred to the carbon regeneration circuit by a carbon transfer pump.

17.7.4 Electrowinning

The electrowinning circuit will be operated in series with the elution circuit. Solution will be pumped continuously from the barren strip solution tank through the elution column, then through the electrowinning cell, and back to the strip solution tank in a continuous closed loop process.

The electrowinning circuit will include one electrowinning cell equipped with a rectifier. Gold and silver will be won from the eluate in the electrowinning cell using stainless steel cathodes using a current density of approximately 4.5 amperes per square foot of anode surface. Caustic soda (sodium hydroxide) in the eluate solution will act as an electrolyte to encourage free flow of electrons and promote the precious metal winning from solution. To keep the electrical resistance of the solution low during desorption and the electrowinning cycle, make-up caustic soda may sometimes be added to the strip solution tank. Barren eluant solution leaving the electrolytic cell will discharge to the barren eluate tank from which it will be pumped back to the strip solution tank for recycle through the elution column.

Periodically, all or part of the barren eluant will be dumped to the barren solution tank. Typically, about one-third of the barren eluant will be discarded after each elution or strip cycle. Sodium hydroxide and sodium cyanide will be added as required from the reagent handling systems to the barren eluant tank during fresh strip solution make-up.

The precious metal-laden cathodes in the electrolytic cells will be removed about once per week and processed to produce the final doré product. Loaded cathodes will be transferred to a cathode wash box where precipitated precious metals will be removed from the cathodes with a pressure washer. The resulting sludge will be pumped to a plate-and-frame filter press to remove water and the filter cake will be loaded into pans for retorting.

17.7.5 Carbon Handling & Thermal Regeneration

The carbon preparation and storage system will include a 1 ton agitated carbon attrition tank, a 6 ton carbon storage tank, carbon dewatering screen, carbon fines storage tank, carbon fines filter press, and carbon transfer pumps. New and acid washed/regenerated carbon will be stored in the carbon storage tank to be returned to the CIC circuit as makeup carbon. Carbon being transferred to the carbon storage tank will pass to a carbon fines/dewatering screen in order to remove any carbon fines from the system. Carbon fines will be stored in a carbon fines storage tank, which will be periodically pumped through the carbon fines filter press; carbon fines from the filter press will be stored in bulk bags for removal from the system.

Fresh carbon being added to the system will first be attritioned in the carbon attrition tank before being pumped to the carbon dewatering screen to remove carbon fines and is then transferred to the carbon storage tank.

Thermal regeneration will consist of drying the carbon thoroughly and heating it to approximately 1300ºF for ten minutes in order to maintain carbon activity levels. The carbon regeneration circuit has been designed to regenerate 100% of the carbon.

Carbon from the elution circuit to be thermally reactivated will be dewatered on a vibrating circular screen, transferred to the regeneration kiln feed hopper and fed to the regeneration kiln by a screw feeder. Hot, regenerated carbon leaving the kiln will pass into a water-filled quench tank for cooling before being transferred to the carbon dewatering screen and carbon storage tank.

17.7.6 Refining & Smelting

Cathode sludge from the electrolytic sludge filter press will be dried and treated in a mercury retort to remove and recover any mercury that may be present. The sludge will be placed into pans and heated in the retort for a minimum of 6 hours at 1,100ºF to volatilize mercury. A vacuum system will remove mercury vapor from the retort and pass the vapor through a series of water-cooled condensers. Condensed mercury will be collected in a trap, and then transferred and stored in flasks. Cooled, mercury-depleted vapor leaving the trap will be passed through a sulfur-impregnated carbon scrubber to remove any residual mercury.

After mercury removal, fluxes will be mixed with the cathode sludge and then fed to an electric induction furnace. The furnace will be heated to approximately 2,200ºF. When the furnace charge is fully molten, it separates into two distinct layers: the slag (on the top) and metal (on the bottom). The slag layer, containing fused fluxes and impurities, will be poured first into conical pots. Once slag has been removed, the melted gold and silver (metal layer) will be poured into cascading molds to form Doré bars.

17.7.6.1 Mercury Abatement System

In addition to the mercury retort, the ADR facility will be fitted with an exhaust gas handling system to treat mercury emissions from the various pieces of equipment. The exhaust system will be designed to combine mercury-containing exhaust streams and treat them in two separate sulfur-impregnated carbon beds prior to discharge to the atmosphere.

The first carbon bed will be dedicated to treat fumes from the smelting furnace. The smelting furnace will be fitted with a hood which will collect fumes and direct them to a scrubber, which will remove suspended particles from the gas and cool the gas before passing through the carbon bed. The carbon bed will collect traces of mercury vapor before exhausting the gas to atmosphere.

The second carbon bed will treat the combined exhaust gas streams from the electrowinning cells, eluant solution storage tank, elution vessel, and carbon regeneration kiln. The kiln exhaust gas will be first treated through a wet scrubber to remove particulates and cool the gas, which will then be combined with the remaining exhaust gas streams and pass through the carbon bed.

17.8 ADR REAGENTS AND UTILITIES

Recovery plant reagents will include cyanide, caustic, nitric acid, antiscalant, activated carbon, and various furnace fluxes. Natural gas will be used to fuel thermal equipment in the plant.

17.9 LABORATORY FACILITIES

Analytical support, including fire assays and metallurgical testing required to support the project operations, will be conducted on-site using a dedicated laboratory. It is assumed that approximately 100 samples per day will be delivered from the mine for fire assay. A small number of fire assays, solutions, and carbon assays will be required for metallurgical control for processing. A metallurgical lab area is also included for running bottle roll and column tests.

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18 PROJECT INFRASTRUCTURE

The infrastructure for South Railroad has been developed to support mining and heap leaching operations. This includes the access road to the facility, power supply, communication, heap leach pad, process plant and ancillary buildings. Water supply to the site including tanks, pipelines, ponds, and diversions are described in Section 18.5. Haul roads within the mining area as well as the mine waste storage facility are described in Section 16. The infrastructure envisioned is shown in Figure 18-1.

18.1 ACCESS ROAD

The primary site access for South Railroad will be from Elko, NV using the 41.7-mile route shown in Figure 18-1. This 41.7-mile route begins from its intersection with 12th Street in Elko, NV and continues approximately 5.5 miles along the existing paved State Route (SR) 227 (i.e., Lamoille Highway) to the intersection with SR 228 (i.e., Jiggs Highway). The route continues south along paved SR 228 for another 5.5 miles to the paved Elko County Road 715 (i.e., South Fork Road). The route follows southward along County Road 715 approximately 5.7 miles to the intersection with County Road 715B (i.e., Lucky Nugget Road/Grant Avenue). From this intersection, the route follows County Road 715B approximately 3.1 miles along the west shore of South Fork Reservoir through a semi-rural residential area to the intersection with BLM Road 1119, which continues southwest approximately 6 miles to its intersection with Elko County Road 720 (i.e., Bullion Road). The route follows the Bullion Road southwest approximately 10 miles to the intersection with the un-improved BLM Road 1053, then continues southward following the approximate alignment of BLM Road 1053 along the eastern flank of the Pinion Range approximately 6 miles to the South Railroad Project.

Beginning at BLM Road 1119 and continuing to the site approximately 22 miles, the main access road will be improved to a standard two-way road consisting of a 4-meter wide lane and 2-meter wide shoulder in each direction. The shoulders will provide area for any safety and drainage structures that will be needed along the route.

The last 6 miles to the site will encounter mountainous grades and winding alignment of the existing dirt road (BLM Road 1053). This road will be improved to straighten the alignment, where possible, and reduce grades to a maximum of 8-10 percent to allow for easier access to the site and promote safety. As the access road approaches the site, all traffic will be required to check in at the security office before heading past Administration and to the site facilities located between the Pinion and Dark Star pits. Delivery of all personnel, operating equipment, consumables, and construction equipment will be along this primary access road.

18.2 POWER SUPPLY

Utility electrical service at the site is not currently available. Power will be supplied by an on-site power generation facility. For the electrical demand of the project, four natural gas generators will be included. Each generator has a capacity of 1970 kW and the design considers operation with three generators. The fourth generator provides (N+1) reliability, which minimizes operating restraints. Natural gas will be delivered to site via truck in the form of liquified natural gas (“LNG”). LNG will be stored in a double-walled tank and vaporized for use in the generators. Synchronizing switchgear is included for load-sharing between operating generators.

An evaluation to arrive at the selected design for the power supply was conducted in January 2020 in a report by M3 titled “South Railroad Mine Project Electric Study”. This study investigated meeting the demand by extending electric utility service to the site, as well as installing and operating on-site generation with either reciprocating engine generators or gas turbine generators. Fuel sources considered for the on-site generation included trucked diesel, a utility natural gas pipeline for gas service, and trucked Liquified Natural Gas (LNG) with on-site vaporizers. Additional factors considered in this evaluation included fuel cost including delivery, system efficiencies, air quality impacts and emissions treatment, maintenance costs, and salvage value. The capital and operating costs for six (6) suitable configurations were compared, establishing rates of return and break-even durations for each configuration pair.

The study concluded that, when considering all these factors, on-site generation utilizing reciprocating engine generators fueled by LNG delivered to the site provided the greatest value and operational flexibility to the project. This configuration produces lower emissions than diesel options with lower operating costs and lower effective cost per kWh than other on-site options. By installing multiple units operated in parallel, the system can be implementing with a unitized approach controlling initial capital costs - making infrastructure investments only when needed and avoiding the large capital investment of a utility connection. Equipment salvage value can also be realized, a savings not available by selecting a utility approach.

The costs associated with this recommendation have been captured in the Capital and Operating Cost Estimates.

18.3 PROJECT BUILDINGS

The proposed heap-leach facility will be located just Northeast of the Pinion pit on the west side of the valley. Pregnant Leach Solution (PLS) will flow by gravity to the PLS Pond directly east of the Heap Leach Pad. An event pond will be located adjacent to the PLS Pond to allow for passive overflow if an excessive runoff event occurs. Road access is provided just along the west edge of the heap leach facility which will allow access onto the leach pad for ROM material. An access point is also provided at the base of the pad to allow for haul truck ingress for the initial ore placement on the pad.

A truck shop is planned northwest of the Dark Star waste dump. A fuel island will be constructed just west of the truck shop. Safety and training areas will be provided within the shop building. In addition, Mine Services offices are integral to the truck shop and a laydown yard is proposed directly east of the facility. The Pinion and Dark Star pits are tied to their respective waste dumps and the leach pad by haul roads.

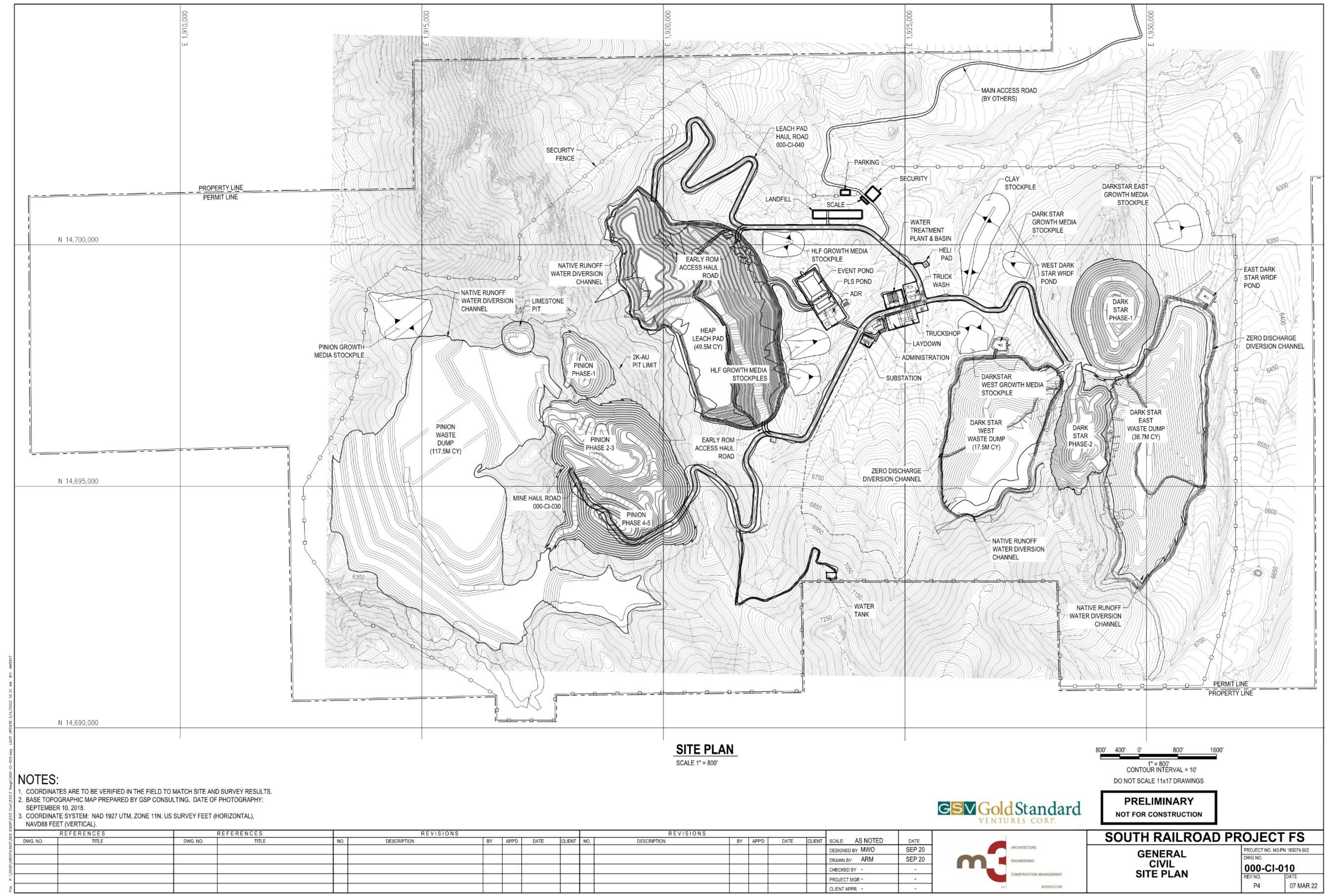


Figure 18-1 Site Plan Drawing

18.3.1 Security Building at Access Gate

The site Security Building is located at the top of a hill for optimal visibility, approximately 4 miles along the main access road from the west property line. The Security Building includes an entry access gate that will control all site ingress egress. From the entry gate a continuous security fence surrounds the active facilities on site.

18.3.2 Administration Building

The site Administration Building is just past the Security Building also on the main road. The building will be comprised of (12) 12' x 60' mobile units that will be assembled into a single unit divided for the variety of use. Ten of these units will be used for the Administration Building, while the remaining two will be used to house the Change House Facilities.

18.3.3 Truck Shop Building

As the road continues from the Administration Building to the northeast the Truck shop is located just past the Primary Mine Substation and Fueling Station. The Truck shop is a 260' x 100' facility that has 6 bays with 2 of them embedded rail to receive tracked vehicles or loaders with tire chains. The Mine Warehouse Facility is included within the footprint of the Truck Shop at the ground floor at the opposite of the bay side. The Mine Services Office and Training Space is designed to be included above the warehouse space.

18.3.4 ADR Plant

The ADR Plant is located directly to the north and west of the Truck Shop. PLS from the Heap Leach Pad will be processed in an ADR (adsorption, desorption and recovery) plant where gold and silver will be adsorbed onto activated carbon and recovered by stripping the carbon and eventually recovering the precipitate by electrowinning. The ADR facility includes an open CIC circuit consisting of two carbon column trains operated in parallel as well as 9000 ft^2 insulated, engineered steel walled building with an overall height of 45 feet. The building will contain the desorption, acid wash, and carbon handling and regeneration circuits, as well an office, break/lunch room, and men's and women's locker/bathroom facilities. The ADR facility also includes an attached refinery building which will be a 5000 ft^2 insulated, engineered steel walled building with an overall height of 25 feet and will contain the electrowinning, mercury recovery, and smelting furnace. The ADR building includes two roll-up doors for forklift and maintenance vehicle access as well as man doors around building. The Refinery includes a secure man-door access as well as access for armored trucks via a roll-up door. The facility will include all necessary eyewash/safety shower water and fire protection systems.

18.3.5 Laboratory

The Laboratory building will be comprised of a series of mobile buildings that will be assembled into a single unit to allow for a more conventional layout. The layout will include (6) 12' x 72' buildings (60' x72' building footprint) and accommodate proper scrubbers, acid containment system, dust collection, and necessary sample processing equipment. Offices, restrooms, and change facilities for the Lab are incorporated into the layout.

18.4 SITEWIDE WATER MANAGEMENT STRATEGY

This section presents the overall strategy for managing the water produced from the mine as well as meet the demands of mine processes and supporting facilities. A process flow diagram illustrating how water will be managed at the site is presented in Figure 18-2 and locations of water management infrastructure, excluding stormwater controls, is shown in Figure 18-3. Further details, as well as the supporting studies and model results used to develop the strategy and cost estimate presented herein can be found in the *Feasibility Study Mine Water Management Plan South Railroad Project* (in progress; Stantec, 2022).

18.4.1 Source of Mine Water

18.4.1.1 Groundwater Dewatering System

The main source of water generated from the mine will be from the groundwater dewatering systems required to support the mining operation of the Dark Star North Pit, followed by groundwater dewatering systems required to support mining at Pinion Phase 4/5. At Dark Star North, this system will consist of nine dewatering wells, each pumping between 100 and 300 gallons per minute (gpm) and will produce a total peak and sustained flow rate of approximately 2,300 gpm. At Pinion Phase 4/5, this system will consist of two dewatering wells, each pumping 225 gpm. Refer to Table 18-1 below for pumping rates by year. Note that the required pumping rate for Years 1 – 3 (2023 – 2026) is determined by the pit dewatering schedule at Dark Star North. Year 3 also includes the use of in-pit sumps removing water to provide the final required drawdown at Dark Star North as some of the pumping wells may reduce in flow toward the end of the dewatering period. Pumping during Years 4 – 8 will be conducted to meet mine processes needs and dewatering at the Pinion Phase 4/5 area. Following Year 8, pumping would continue for several years at an estimated average rate of approximately 310 gpm to support heap leaching operations.

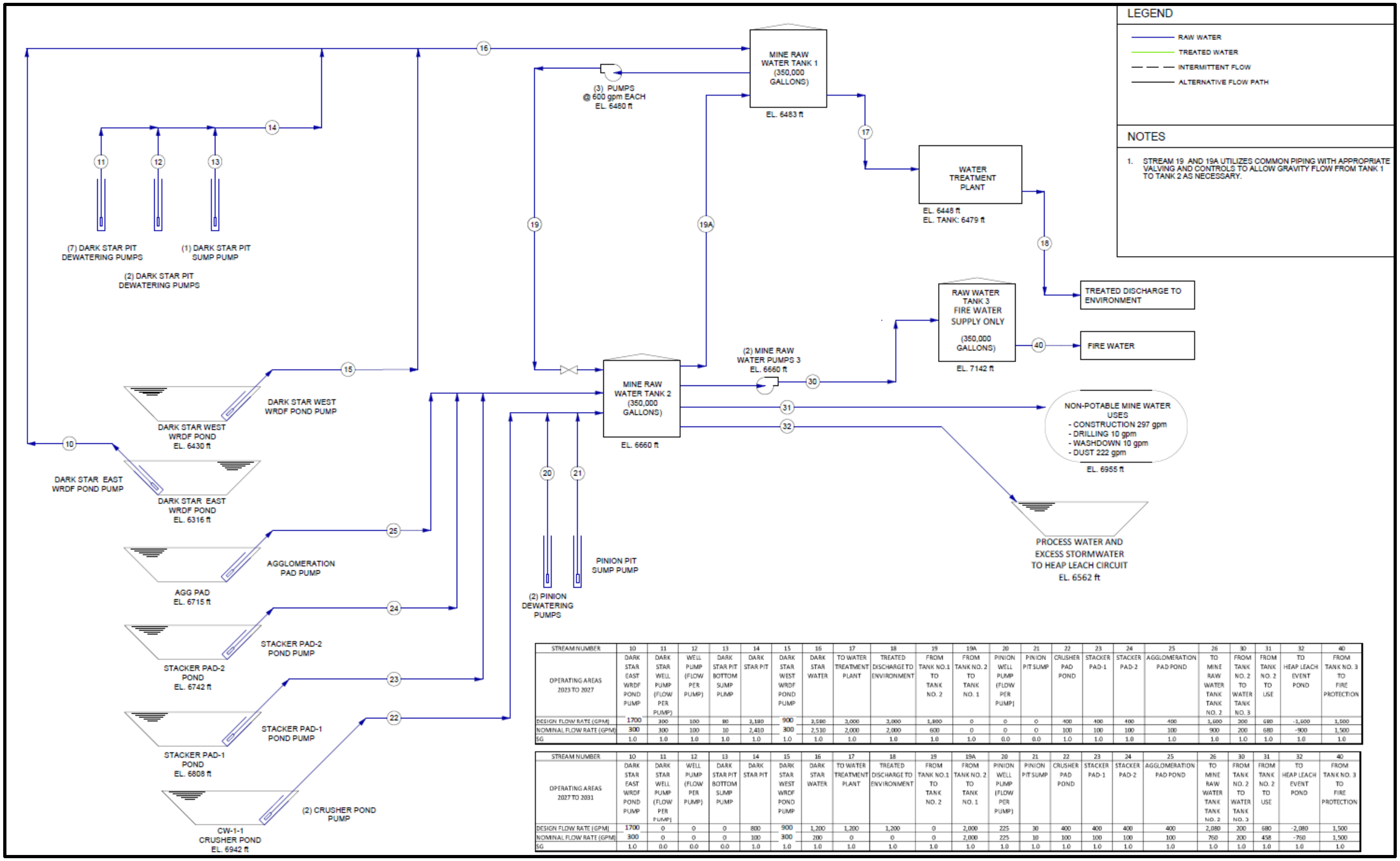
Water generated from the groundwater dewatering system will be beneficially used in operations. Based on the groundwater modeling conducted and water demands that have been identified, the mine should have enough water to meet all water demands throughout the life cycle of the mine.

Pit dewatering wells located around the Dark Star North Pit will be conveyed to a 350,000-gallon Mine Raw Water Tank (Tank 1). Tank 1 will be located adjacent to the Water Treatment Plant (WTP). Water will be pumped from Tank 1 to either the WTP or to another 350,000-gallon Mine Raw Water Tank (Tank 2), which will be used to supply water for consumptive uses. Tank 1 and Tank 2 will also be interconnected to allow transfer between the tanks, which allows additional water to be sent to the WTP as necessary. Water from the Pinion Phase 4/5 dewatering wells will be conveyed directly to Tank 2. Tank 2 will also be connected to Mine Raw Water Tank 3 (Tank 3), which will store and supply fire water. Tank 3 is only connected to Tank 2.

All tanks will be fitted with a level sensor that will control the flow to the tanks.

Table 18-1: Current Modeled Pumping Rates for Dark Star North and Pinion Phase 4/5 Dewatering System

Well	Pumping Rates (gallons per minute)								
	2023	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**
DSPW-1	300	300	300	300	0	0	0	0	0
DSPW-2	300	300	300	300	0	0	0	0	0
DSPW-3	300	300	300	300	0	0	0	0	0
DSPW-4	100	100	100	100	0	0	0	0	0
DSPW-5.2	300	300	300	300	0	0	0	0	0
DSPW-6	300	300	300	300	0	0	0	0	0
DSPW-7	100	100	100	100	0	0	0	0	0
DSPW-8	300	300	300	300	0	0	0	0	0
DSPW-9	300	300	300	300	0	0	0	0	0
DSE – in-pit sump pumping	0	0	0	80 – 150	0	0	0	0	0
PPW-1	0	0	0	0	225	225	225	225	225
PPW-3	0	0	0	0	225	225	225	225	225



STREAM NUMBER	10	11	12	13	14	15	16	17	18	19	19A	20	21	22	23	24	25	26	30	31	32	40
OPERATING AREAS 2023 TO 2027	DARK STAR EAST WRDF POND PUMP	DARK STAR WELL PUMP (FLOW PER PUMP)	WELL PUMP (FLOW PER PUMP)	DARK STAR PIT BOTTOM SUMP PUMP	DARK STAR PIT	DARK STAR WEST WRDF POND PUMP	DARK STAR WATER	TO WATER TREATMENT PLANT	TREATED DISCHARGE TO ENVIRONMENT	FROM TANK NO.1 TO TANK NO. 2	FROM TANK NO. 2 TO TANK NO. 1	PINION WELL PUMP (FLOW PER PUMP)	PINION PIT SUMP	CRUSHER PAD POND	STACKER PAD-1	STACKER PAD-2	AGGLOMERATION PAD POND	TO MINE RAW WATER TANK TANK NO. 2	FROM TANK NO. 2 TO WATER TANK NO. 3	FROM TANK NO. 2 TO USE	TO HEAP LEACH EVENT POND	FROM TANK NO. 3 TO FIRE PROTECTION
DESIGN FLOW RATE (GPM)	1700	300	100	80	3,190	900	3,590	2,000	3,000	1,800	0	0	0	400	400	400	400	1,600	200	680	-1,600	1,500
NOMINAL FLOW RATE (GPM)	300	300	100	10	2,410	300	2,510	2,000	2,000	600	0	0	0	100	100	100	100	900	200	680	-900	1,500
SG	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

STREAM NUMBER	10	11	12	13	14	15	16	17	18	19	19A	20	21	22	23	24	25	26	30	31	32	40
OPERATING AREAS 2027 TO 2031	DARK STAR EAST WRDF POND PUMP	DARK STAR WELL PUMP (FLOW PER PUMP)	WELL PUMP (FLOW PER PUMP)	DARK STAR PIT BOTTOM SUMP PUMP	DARK STAR PIT	DARK STAR WEST WRDF POND PUMP	DARK STAR WATER	TO WATER TREATMENT PLANT	TREATED DISCHARGE TO ENVIRONMENT	FROM TANK NO.1 TO TANK NO. 2	FROM TANK NO. 2 TO TANK NO. 1	PINION WELL PUMP (FLOW PER PUMP)	PINION PIT SUMP	CRUSHER PAD POND	STACKER PAD-1	STACKER PAD-2	AGGLOMERATION PAD POND	TO MINE RAW WATER TANK TANK NO. 2	FROM TANK NO. 2 TO WATER TANK NO. 3	FROM TANK NO. 2 TO USE	TO HEAP LEACH EVENT POND	FROM TANK NO. 3 TO FIRE PROTECTION
DESIGN FLOW RATE (GPM)	1700	0	0	0	800	900	1,200	1,200	1,200	0	2,000	225	30	400	400	400	400	2,080	200	680	-2,080	1,500
NOMINAL FLOW RATE (GPM)	300	0	0	0	100	300	200	0	0	0	2,000	225	10	100	100	100	100	760	200	458	-760	1,500
SG	1.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Figure 18-2: Water Management Process Flow Diagram

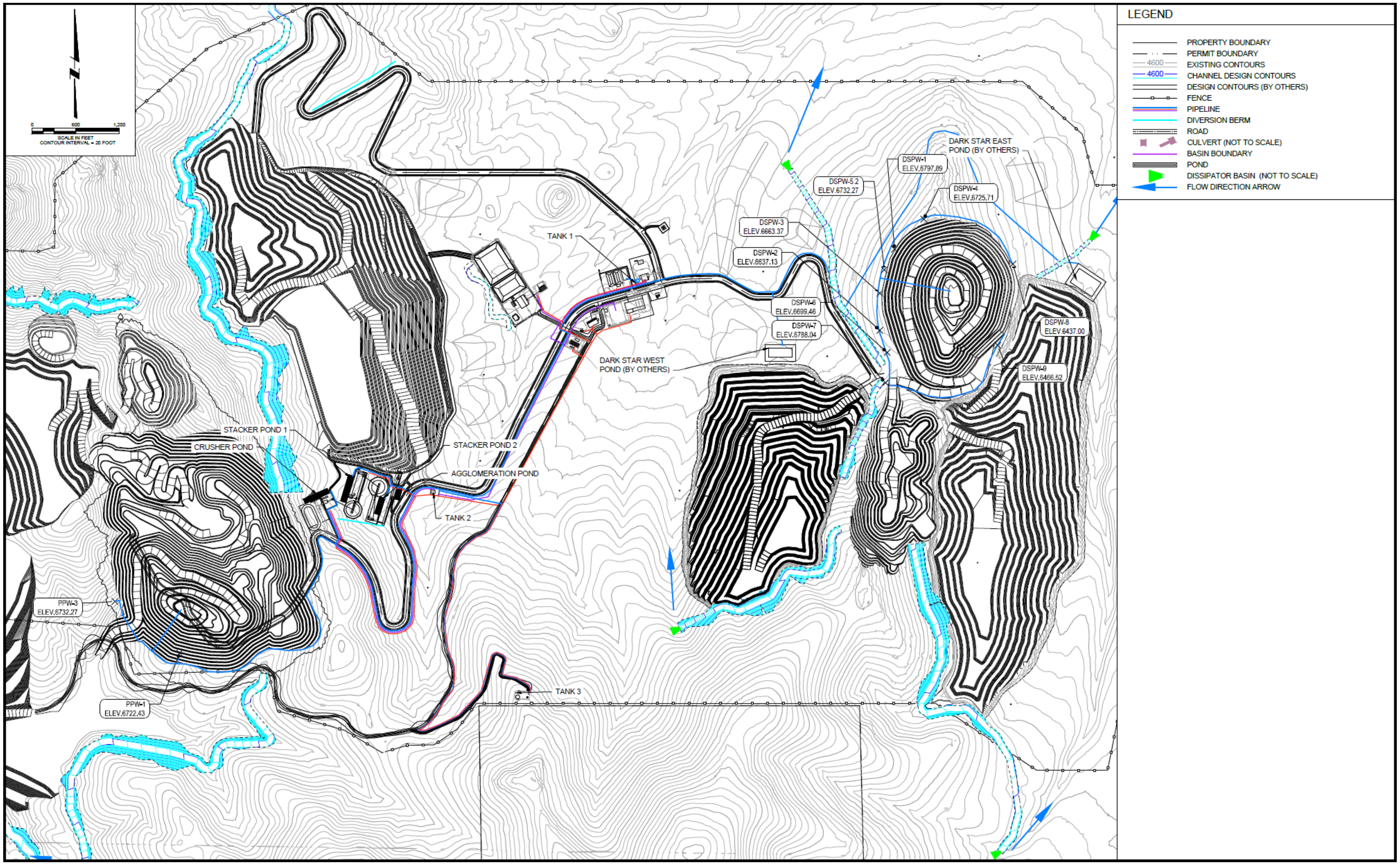


Figure 18-3: Pipeline Plan General Arrangement

18.4.1.2 Stormwater Conveyance Facilities

Stormwater from the site will be managed as contact and non-contact stormwater. Non-contact stormwater are the flows that do not come in contact with ore or mine processing facilities. Non-contact flows will be collected and conveyed around the site and directly discharged to existing stream channels. Contact stormwater will be routed to the WRDF seepage ponds, the process facility ponds (east of the heap leach pad near the plant), and the ponds located near the material handling of the crusher pad, stacker pads 1 and 2, and the agglomeration pad. These last four ponds are referred to as the beneficiation ponds. Excluding the process facility ponds, contact water will be pumped and blended with other water sources in Tank 2. The operation of the WRDF collection ponds and the beneficiation ponds are discussed in the following section. The HLP operations and process facility ponds are discussed in Section 18.6.

The collection and conveyance of non-contact stormwater runoff will be managed by the construction of stormwater channels, culverts, and energy dissipation structures. Stormwater controls during operations are designed to meet the 100-year, 24-hour storm event, and stormwater controls after closure are designed to meet the 500-year, 24-hour event. The non-contact water stormwater conveyance systems and collection ponds are shown on Figure 18-4**.** Contact stormwater is primarily controlled through surface grading and use of liners to prevent off-site releases. Graded areas will route water towards collection ponds via overland flow. Contact water will be managed through closed-conduit piping systems to facilitate the transfer of water to downstream uses or towards the WTP.

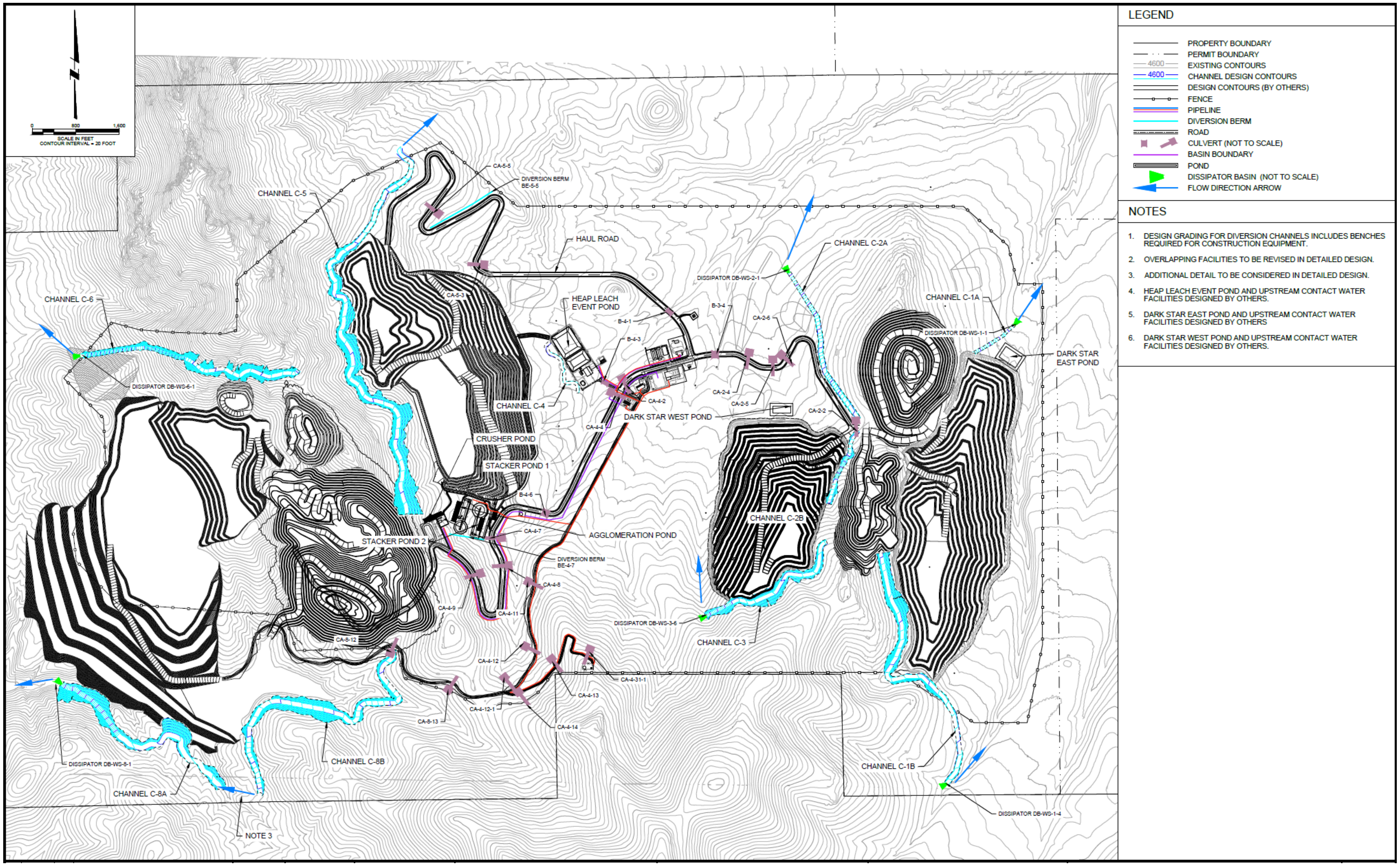


Figure 18-4: Stormwater Controls General Arrangement

18.4.1.3 Seepage and Stormwater Collection Facilities

During operation, the WRDFs at Pinion and Dark Star will generate a small amount of seepage water from precipitation migrating through the waste rock. Waste rock geochemical modeling indicates that seepage from Pinion will meet Nevada Division of Environmental Protection (NDEP) Profile I water quality standards, and thus will not require seepage containment facilities. The small amount of seepage from the Dark Star WRDFs along with stormwater that falls within the facility footprints will need to be contained and managed with stormwater collection ponds. Based on the water balance modeling conducted to date, average annual seepage/stormwater rates reporting to the Dark Star West and Dark Star East WRDFs ponds are of 79 and 120 gpm respectively. The estimated seepage and stormwater rates are influenced by the timing of the waste rock development and the anticipated concurrent reclamation of the facilities. Due to the space limitations at the site, management of the WRDF seepage/stormwater during operations by simple storage and evaporation alone is not practical. Therefore, the water collected from the ponds during operations will be blended with the groundwater in Tank 1 or Tank 2.

In addition, potential runoff from the HLP as well as the HLP-W1, HLP-W2, HLP-W3, and HLP-W4 areas will also be collected in stormwater ponds as part the zero-discharge operating requirement. The combined 100-year, 24-hour stormwater volume reporting to the four ponds is 8.9 acre-feet with individual pond sizes ranging from 1.4 to 5.1 acre-feet. Stormwater from these four ponds is routed to Tank 2 and recirculated in mine operations. The HLP water handling is discussed separately and is largely confined to the HLP and mineral processing areas in a self-contained system.

Based on feasibility level site-wide water balance modeling, there will be select periods when the combination of dewatering operations and water collected in the stormwater control ponds exceeds the combination of the WTP capacity plus consumptive use demands. These excess water periods of several days would typically occur during spring runoff and when operation water requirements are low. The projected excess water rate is dependent on several conditions during the period of operation including the actual weather conditions at the site, the closure and construction of WRDFs, and the timing of mine water needs at the HLP and other facilities. Excess water would be recirculated in the HLP during these periods with an option to temporarily reduce dewatering rates to offset the higher stormwater contributions.

18.4.2 Beneficial Reuse

The main water demands at the site are associated with heap leach make-up water demands and mine facilities such as water for dust suppression, operational drilling water/pad construction, and the truck wash.

Water from Tank 1 will be transferred at a peak rate of 1,800 gpm to Tank 2 to provide enough water for the mine facilities. Water in Tank 2 will either be conveyed to the mine facilities or pumped to Tank 3 for fire water for the ADR. A description of the principal beneficial reuses for the site are presented below.

18.4.2.1 Heap Leach Make-up Demands

Based on water balance modeling for the HLP as provided by Forte, water demands for the HLP will fluctuate significantly. For average site climate conditions, makeup rates may be on the order of 400 gpm during summer months while it is possible that no makeup water would be required during seasonal spring melt periods. The overall average makeup rate for average climate conditions is expected to be approximately 120 gpm.

18.4.2.2 Mine Facilities

The mine facilities non-potable water demands will consist of the following:

- Dust Suppression – 139 gpm in the winter and 222 gpm in the summer with an average of 181 gpm;
- Drilling and Construction – 57 gpm; and

- Vehicle Washdown – 10 gpm.

A series of distribution piping from Tank 2 will supply water to the mine facilities.

18.4.3 Water Disposal and Large Storm Events

Excess water generated from the dewatering system will be pumped from Tank 1 and then the WTP.

In the event of significant storm events that exceed the capacity of the WTP, water will be pumped and recirculated in the heap leach facility to attenuate flows to manage peaks. This additional water will be delivered from Tank 2 to the heap leach circuit.

18.5 WATER MANAGEMENT INFRASTRUCTURE

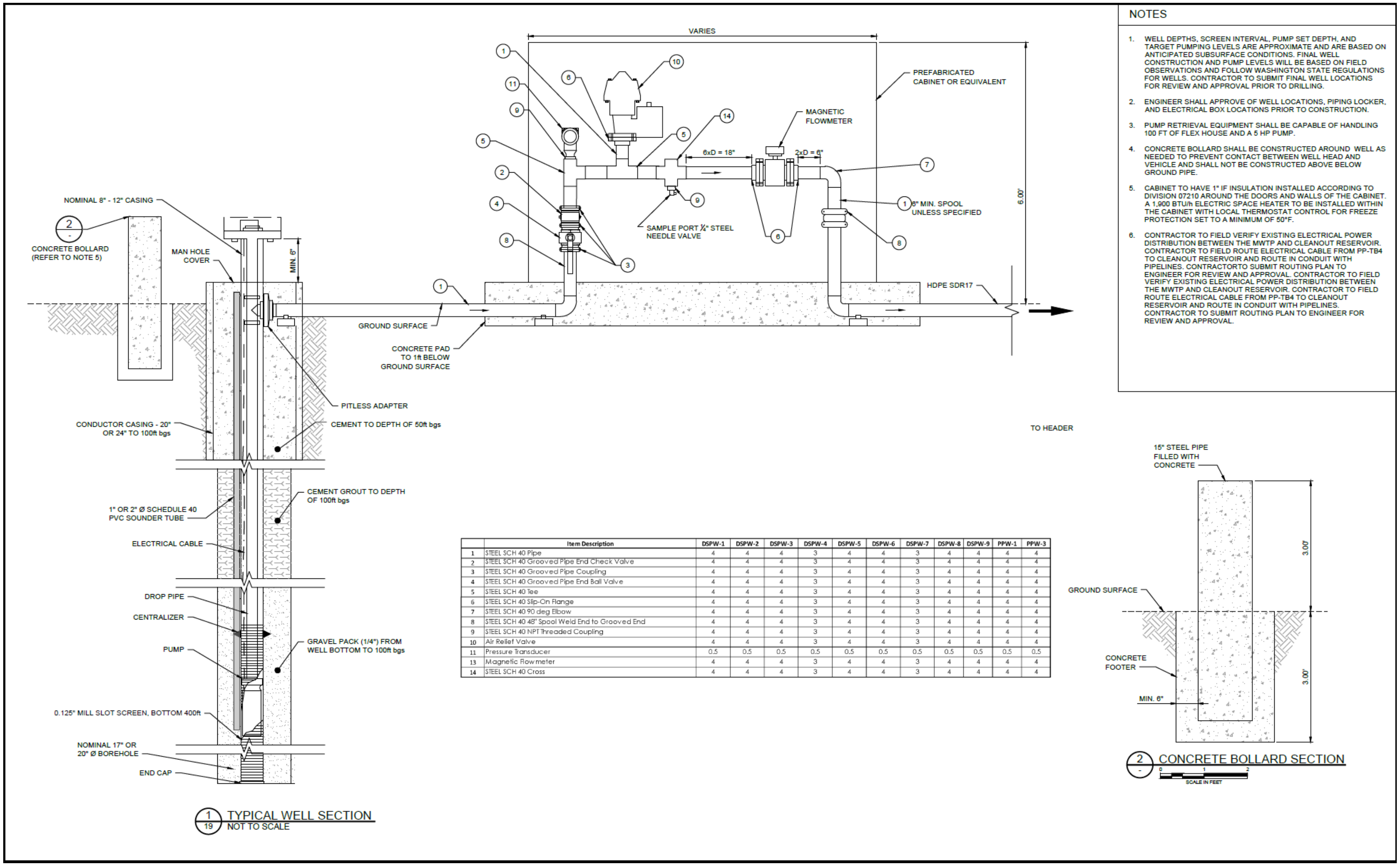
This section discusses the infrastructure required to manage mine water at the site.

18.5.1 Dark Star Groundwater Dewatering System

Infrastructure associated with the Dark Star dewatering system is described in the below section.

18.5.1.1 Wells

Groundwater modeling has indicated that nine wells installed to varying depths between 900 ft to 1,100 ft will be required to provide sufficient dewatering capacity. Well locations are shown on Figure 18-3. Typical well construction details are shown on Figure 18-5.



	Item Description	DSPW-1	DSPW-2	DSPW-3	DSPW-4	DSPW-5	DSPW-6	DSPW-7	DSPW-8	DSPW-9	PPW-1	PPW-3
1	STEEL SCH 40 Pipe	4	4	4	3	4	4	3	4	4	4	4
2	STEEL SCH 40 Grooved Pipe End Check Valve	4	4	4	3	4	4	3	4	4	4	4
3	STEEL SCH 40 Grooved Pipe Coupling	4	4	4	3	4	4	3	4	4	4	4
4	STEEL SCH 40 Grooved Pipe End Ball Valve	4	4	4	3	4	4	3	4	4	4	4
5	STEEL SCH 40 Tee	4	4	4	3	4	4	3	4	4	4	4
6	STEEL SCH 40 Slip-On Flange	4	4	4	3	4	4	3	4	4	4	4
7	STEEL SCH 40 90 deg Elbow	4	4	4	3	4	4	3	4	4	4	4
8	STEEL SCH 40 48" Spool Weld End to Grooved End	4	4	4	3	4	4	3	4	4	4	4
9	STEEL SCH 40 NPT Threaded Coupling	4	4	4	3	4	4	3	4	4	4	4
10	Air Relief Valve	4	4	4	3	4	4	3	4	4	4	4
11	Pressure Transducer	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
13	Magnetic Flowmeter	4	4	4	3	4	4	3	4	4	4	4
14	STEEL SCH 40 Cross	4	4	4	3	4	4	3	4	4	4	4

Figure 18-5: Typical Dewatering Well Construction Details

18.5.1.2 Well Pumps and In-Pit Sumps

A total of nine well pumps will be procured for the project. Based on the maximum flow rate, each well pump will be required to pump at a maximum rate between 100 to 300 gpm and will be installed to depths between 700 and 1,000 ft bgs. Additional in-pit sumps with flow rates of 80 – 150 gpm will be installed at Dark Star North in Year 3.

18.5.1.3 Pipelines

Each well at Dark Star North will be connected to an HDPE header. The header network will be divided into sections and will connect with a 12- to 18-inch pipeline that will supply water to Tank 1. Water from Tank 1 will be pumped to Tank 2 via a 14-inch pipeline for further use and the remaining water will be pumped to WTP for disposal.

18.5.1.4 Tanks

Tank 1 will serve as a buffer tank. Water from Tank 1 will be pumped to Tank 2 for further use at the mine. Tank 1 will be a carbon steel tank having capacity of 350,000 gallons.

18.5.1.5 Distribution Pump

There will be one distribution pump installed at Tank 1 that will be used to transfer water to Tank 2. The pump has been sized to provide adequate pumping capacity to meet the expected peak flow rate to Tank 2.

18.5.1.6 Instrumentation and Controls

Each well will have a level sensor installed to control the pumps that will operate the pump between high and low level to maintain the groundwater level below the bottom of the pit.

Tank 1 will be installed with a level sensor that will control the flow and operate the pumps. The pumps will maintain designated operating levels in the tank by adjusting the flow rate to the WTP with a variable frequency drive (VFD) motor on the pump. The distribution pump transferring water to the Tank 2 will be turned off at low water level in Tank 1.

18.5.1.7 Electrical

Electricity will be supplied by local transformers and consist of power distribution to the pumphouse and pumps.

18.5.2 Seepage and Stormwater Management System

Infrastructure associated with the seepage and stormwater management system is described in the below section.

18.5.2.1 Ponds

Six ponds will be used to manage contact stormwater and seepage from the two Dark Star WRDFs and the four beneficiation ponds during operations. Pumping systems will be installed in each pond to pump water when the pond levels reach a predetermined level. During operations, the water pumped from the beneficiation ponds will be discharged to the Tank 2. Water captured at the two Dark Star WRDF ponds would be initially sent to Tank 1 and mixed with dewatering water.

18.5.2.2 Pipelines

A series of 6-inch HDPE pipelines will be used to transfer water from each of the four beneficiation ponds to Tank 2 or, in the case of the Crusher Area, first to a common 8-inch HDPE pipeline and then to Tank 2. Water collected in the Dark Star East and West WRDFs would be routed via 10-inch and 6-inch HDPE pipelines, respectively.

18.5.2.3 Pumps

Each pumping system will include one submersible pumps. The expected nominal and maximum flow rate for each system is shown in Table 18-2. Except for Dark Star East, all other pumping rates will be achieved with VFDs that will control the speeds of the pumps. The pumps were standardized to reduce the number of spares and parts required. The high maximum pumping rate at Dark Star East will require a separate dedicated pump that would only be needed during significant storm events.

Table 18-2: Expected Pumping Rates for Contact Water Ponds

Pond	*Nominal (gpm)*	*Maximum (gpm)*
Dark Star East Pond	300	1700
Dark Star West Pond	300	900
HLP-W1 Pond	100	400
HLP-W2 Pond	100	400
HLP-W3 Pond	100	400
HLP-W4 Pond	100	400

18.5.2.4 Instrumentation and Controls

The pond pumping system will be controlled using level sensors that will be used to turn on and off the pumps at preset high and low levels.

18.5.2.5 Electrical

Electricity will be supplied by local transformers and consist of power distribution to the pumphouse and pumps.

18.5.3 Beneficial Reuse System

Infrastructure associated with the beneficial reuse system is described in the below section.

18.5.3.1 Pipelines

The following water distribution pipelines will be required to convey water for mining process and facilities:

- A 14-inch pipeline to convey water from Tank 1 to Tank 2;
- An 8-inch pipeline from Tank 2 to Tank 3;
- An 8-inch pipeline to convey water from Tank 2 to the mine facilities; and
- Ancillary smaller diameter distribution pipelines for the various mine facility uses.

18.5.3.2 Tanks

Three tanks makeup the mine water management for non-potable uses. Each tank has a 350,000-gallon capacity and is made of carbon steel tank.

18.5.3.3 Pumps

One pump will be used to pump water from Tank 2 to Tank 3 at a maximum rate of 200 gpm. A second pump will be used to pump water form Tank 2 to the other mine facilities requiring make-up water.

18.5.3.4 Instrumentation and Controls

All tanks will include low-level, high-level, and high-high level sensors. These sensors will be used to control pumps and valves downstream of the various tanks feeding each system.

18.5.3.5 Electrical

Electricity will be supplied by local transformers and consist of power distribution to the pumphouse and pumps.

18.6 HEAP LEACH PAD FACILITY

The heap leach facility (HLF) consists of a conventional lined leach pad to support a multi-lift, free-draining heap, event pond, pregnant solution pond, access roads, solution distribution piping (barren solution to the heap) and heap drainage solution collection piping (pregnant solution to the ponds and plant). The HLF will be constructed in four phases, with the process ponds, plant, and access roads constructed as part of the initial phase.

ROM ore will be stacked on the heap with trucks in nominal 30 foot thick lifts. Barren solution containing cyanide will be irrigated onto the ore using drip irrigation. Pregnant solution will be collected at the base of the heap by the leach pad liner and drainage collection system, which will route the pregnant solution to the process plant for gold recovery and reagent reconditioning. Once an area has been leached for the target time or metal recovery, the next lift will be placed on top of the already leached ore and the process repeated. This will be continued until the heap is stacked to the design elevation of 6989 ft above mean sea level (AMSL) for a total capacity of 72 million tons.

The leach pad will consist of a graded area to the west of the ADR process plant and northwest of the Dark Star open pit. The leach pad will be constructed in four phases, with each phase large enough to provide ore leaching capacity for 1 to 2 years. For each phase, topsoil will be removed and stockpiled for use in reclamation.

After removal of topsoil, the site will be graded by cutting and filling to achieve targeted slopes, elevations and grades. The HLF liner system is designed to restrict infiltration of flows through the base of the pad by providing a composite liner system consisting of a low-permeability compacted soil layer overlain with a high-density polyethylene (HDPE) geomembrane layer. A system for monitoring seepage within the HLF in areas of concentrated flow will be constructed beneath the primary liner. This system will be located beneath the solution collection headers and will utilize gravel filled trenches with perforated pipes to capture any leaks through the liner layers.

A network of drainage pipes and drainage gravel will be placed on top of the primary HDPE liner to protect the liner and piping from damage, to limit the maximum hydraulic head over the liner system to an average of 12 inches, and to collect the pregnant solution and direct it to ADR facility for processing.

The process ponds will be located near and adjacent to the ADR process plant. A total of two ponds are planned for the HLF. The pregnant solution pond will be double lined with, from top to bottom, 80-mil HDPE primary geomembrane liner, a geonet leak detection layer, and 80-mil geomembrane secondary liner. A leak detection sump will be installed in the low corner of the pregnant pond. The stormwater event pond will be single lined with the primary liner consisting of 80-mil HDPE geomembrane.

Operational solution will be routed via tanks located at the process plant. There will be two tanks for pregnant solution, and one for the barren solution. The second pregnant tank is for maintenance which can also be used for maintenance of the barren tank. The solution tank sizes are included in process plant design report. The pregnant pond is designed to have the storage capacity for 24 hours of drain-down from the leach pad in the event of any issues with processing of operational solutions .The event pond will be sized for storage of the runoff from the 100-year, 24-hour storm event as well as the larger of the associated storm surge or the pond inflow from the wettest month timestep as determined from the high level deterministic water balance model for the leach pad (which would include snowmelt runoff). The ponds will have a dedicated generator and pump back system for moving solutions as needed during a "power outage."

18.7 HEAP LEACH FACILITY WATER BALANCE ANALYSIS

Heap leaching involves the dissolving of precious metals contained in a low-grade ore using the application and circulation of a weak cyanide solution through the ore. An operational water balance model has been developed for the proposed HLF at the project site. The model provides output to evaluate meteoric (weather) impacts on the facility design and to predict the freshwater demand during operations and subsequent post mining freshwater circulation. The water balance model for a heap leach pad operation is essentially a water budget that tracks all of the water entering and leaving the lined containment system. Sources of water entering the system include pore water delivered with the ore, precipitation falling as rain or snow, and any fresh water (makeup water) added to the system from outside the lined limits of the pad. System losses are a bit more complicated and include three basic categories of loss.

- Evaporative losses
- Losses due to surface tension
- Extraction losses

In the case of an operating heap leach pad, the area under active leach is assumed to be continuously wetted by sprinklers or emitters with a limitless supply of water. Therefore, the full potential depth of evapotranspiration is applied to that area. Outside of the area under active leach, the ore surface is assumed to be dry, except for that fraction of the month's rainfall events that coated the soil particles or infiltrated into the soil and did not run off. This volume of water is assumed to be available during that month for evapotranspiration. Any portion of the infiltrated water volume that is not lost to evapotranspiration during the same month it falls is assumed to be beyond the reach of evapotranspiration in the following month and is routed into the solution collection system along with the other applied solution. Therefore, during months where evaporation/evapotranspiration greatly exceeds rainfall, rain events add nothing to the water volume stored in the system. However, during months where rainfall greatly exceeds evaporation/ evapotranspiration, a significant volume of water may be added to storage.

Environments like the SRR Project site where snowfall is a substantial part of the precipitation regime create a special case. During much of the year, a snowpack will exist on the surface of the HLF which will significantly hinder evaporative loss but create a new opportunity for "sublimation" loss (which is a phase change where water goes directly from the solid phase to the gas phase without passing through a liquid state).

Losses to surface tension involve changes in the water content of the ore during operations. The ore is not delivered to the heap leach pad in a truly dry condition, but rather contains some relatively small amount of moisture in the pore spaces that is held in place by surface tension. This delivered water content is typically less than the "specific retention" of the ore. The specific retention is a threshold moisture content that marks the position on the soil water characteristic curve where the soil begins refusing to release its water to gravity (i.e., below that moisture content it simply will not readily drain). Therefore, for ore to release the applied solution carrying the dissolved precious metals to the solution collection system, it is necessary to raise the moisture content of the soil to a level above the specific retention. The moisture content of the ore must be increased to a level that allows the water to be passed through the ore at the same rate that it is being applied so that the system is in equilibrium or in balance. Once an area is no longer actively being leached (i.e., no new solution is being applied), then the ore would drain back down to its specific retention moisture content and release the difference back into the solution collection system. The water balance model tracks these changes in moisture content in the ore and accounts for the addition and subtraction of water volume in the system.

Once all additions and losses to the volume of water stored in the system have been estimated and accounted for at the end of the month, the model evaluates whether or not there is sufficient water available in storage to maintain the solution application rate for the next month. Heap leach pads are designed as fully lined containment systems that release nothing back into the environment. Solutions that are not stored within the ore itself are routed through the system and stored in the process ponds. However, should extreme events exceed the storage capacity of the system, then the excess must be extracted from the system.

Precipitation was studied by Stantec and utilized multiple regional sources of data including the site-specific Dark Star climate station. The site-specific data has a record length of only about two (2) years. Available regional meteoric records included data sets as long as 130 years. Details on the development of a representative meteoric record for the project site can be found in a report from Stantec dated April 19, 2019.

Given the location of the site in mountainous terrain at elevations well above 6000 ft AMSL and the existence of sub-freezing temperatures from late October through April each year, a significant percentage of the precipitation at site occurs as snow. The accumulation of water as the snow water equivalent (SWE) in a growing snowpack over the winter months has an impact on the hydrology of the site by storing water from November through March or early April, then rapidly releasing that stored water over the months of April and May. The water balance model controls the accumulation of SWE in the snowpack as a function of precipitation and temperature using a monthly series of snowpack factors. The monthly snowpack factors were selected to mimic as closely as possible the behavior observed at Snotel sites in the region (the snowpack growing rapidly from November through February, leveling out from March through early April, and declining rapidly from April through May. The snowpack algorithms affect the routing and the timing of the winter precipitation and spring melt, but they have no impact on the net water balance.

Results of the deterministic modeling are as follows. In general, outside makeup water is required from startup through the end of the facility life which is anticipated to be on the order of 9 years of mining and ore stacking, followed by an additional 2 years of leaching with no new ore added to the heap. Modeling disclosed no significant trend toward accumulation of water in the system over time during normal operations.

Upon completion of active leaching operations, solution management will be required until such time as the closure cover is established and clean runoff is diverted off the facility. Once the solution draindown rate falls to a level that can be safely and passively contained in the post-closure Event Pond, active solution management can cease (i.e., no pumping). The current water balance model does not address these post-closure conditions (which will need to be addressed in a separate draindown model at some later time).

Detailed phasing and scheduling of the liner deployment is shown in Table 18-3.

Table 18-3: Summary of Phased Liner Deployment

Phase	Lined Surface Area (ft^2)
1	3,556,782
2	3,182,446
3	2,128,147
4	1,114,481

Table 18-4 summarizes results from the deterministic modeling using the typical/average range cycle of the meteoric record. The maximum, average, and minimum values reported in Table 18-4 represent the range of daily values represented over the life of each respective phase.

Table 18-4: Results Summary from the Simple Deterministic Model – Typical/Average Range Cycle

Parameter	Phase	Max	Average	Min
Water Stored in Process Ponds (gallons)	**1**	1,303,445	399,815	0
	2	5,092,061	473,598	0
	3	26,807,682	3,419,074	0
	4	14,776,718	2,633,475	0
Outside Makeup Water (gallons/min)	**1**	785	76	0
	2	947	127	0
	3	1,043	123	0
	4	912	157	0
Percent of Time Makeup Water Demand is Zero	**1**	---	8.9%	---
	2	---	0%	---
	3	---	0.8%	---
	4	---	30.5%	---

Pond sizing is based on a hydrologic analysis and the results of the simple deterministic water balance mode. The combined capacity of the pregnant solution pond and the stormwater event pond are designed to contain the total of the solution volumes resulting from the following design criteria:

- The average of the maximum pond volumes for each phase established from the water balance model,
- The immediate runoff from the 100-year 24-hour storm event over the area of the full HLF and any additional exposed liner over the full lined footprint of the HLF,
- 24 hours. of draindown at the full barren solution pumping rate, and
- 2 feet of pond freeboard for each pond.

18.8 SEISMIC HAZARD ANALYSIS

The site resides in the Basin and Range physiographic province which consists of a region of crustal extension (spreading) that began approximately 17 million years ago during the Miocene Epoch. The province extends from southern Oregon and Idaho southeastward penetrating well into Mexico. Its westernmost extent is the range front fault(s) of the eastern Sierra Nevada Range and its easternmost extent the range front fault(s) of the Wasatch Range. The southern projection of the province is bounded on the west by the gulf of California and the Baja Peninsula and on the east by the Laramide aged thrust front of the Sierra Madre Occidental Range. The spreading and thinning of the crust in the Nevada portion of the province is dominated by listric normal faulting that bounds the mountain ranges and flattens out with depth, even joining opposing faults at times. This pattern has resulted in what is described as “horst and graben topography” where the horsts are the uplifted areas (mountain ranges) and the grabens are the down-dropped blocks (alluvial valley floors) between ranges.

The identification of representative seismic source zones for a project of this type requires a review of the patterns revealed in a plot of the mapped earthquake epicenter locations classed by magnitude, and a review of the patterns revealed in a plot of the mapped young, potentially active fault locations. We have identified eight (8) seismic source zones which (proceeding from southwest to northeast) are as follows:

1. Sierra Range-front Zone
2. Walker Lane Zone
3. Shoshone Mountains Zone
4. Southern Nevada Zone
5. Nevada Great Basin Zone

6. Idaho Mountains Zone
7. Salt Lake Zone
8. Wasatch Front – Hurricane Fault Zone

The purpose of identifying discrete seismic source zones is to characterize and quantify the nature of the largest earthquake that is likely to occur within the zone. This information can be utilized in either a deterministic seismic hazard analysis (DSHA) or a probabilistic seismic hazard analysis (PSHA). Although different in approach, they probably have more in common than they have differences. Of interest is the largest earthquake that could reasonably be expected to occur within the zone, the mean rate of occurrence or recurrence interval, and the location of the earthquake. Seismic source zones come in two (2) varieties:

1. An Aerial Seismic Source where earthquakes are uniformly distributed throughout the area and assumed to be equally likely to occur anywhere within the area.
2. A Linear Seismic Source where earthquakes occur along a narrow linear band (fault) but are again assumed to be equally likely to occur anywhere along the fault line.

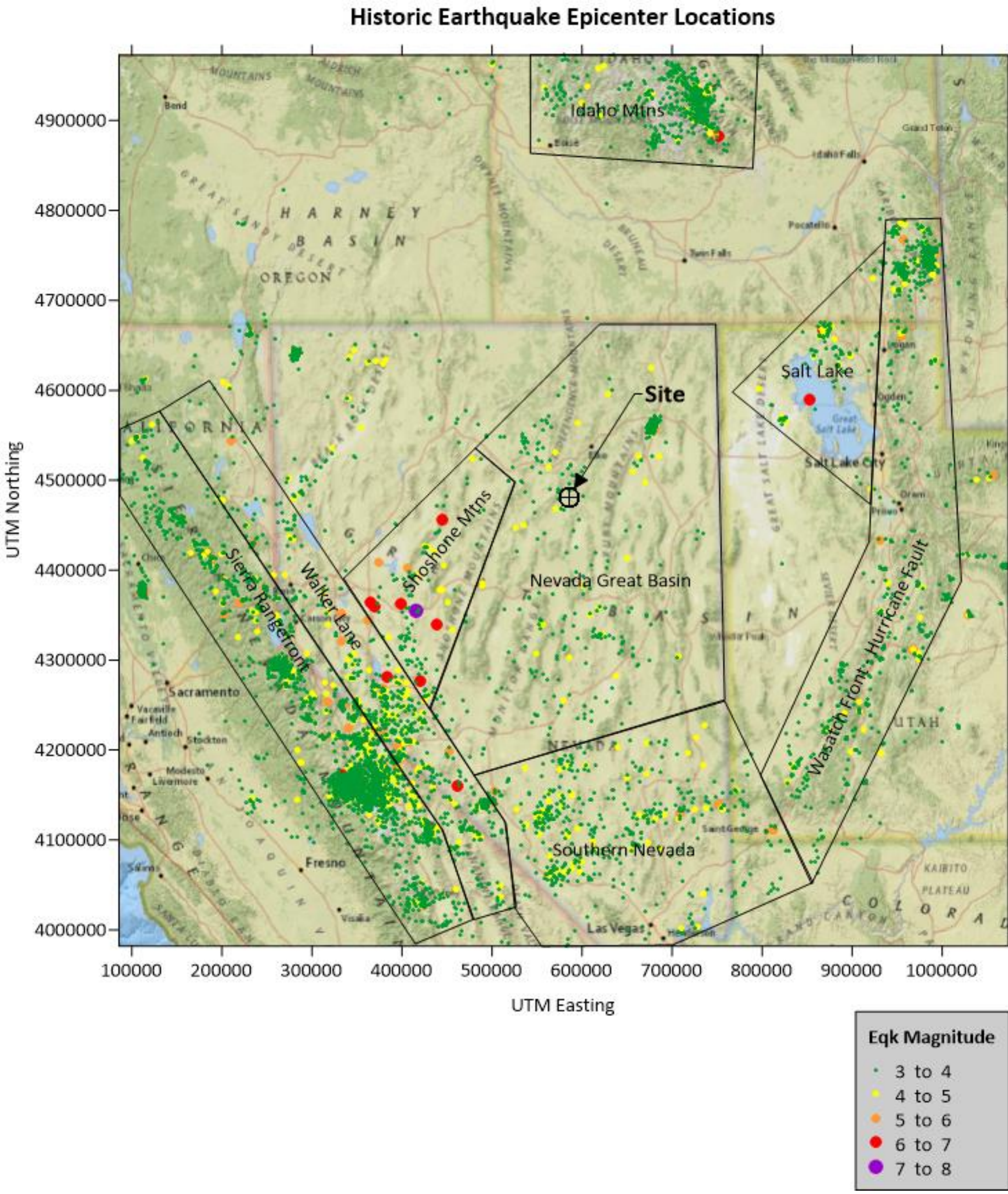


Figure 18-6: Plot of Historic Earthquake Events and Selected Seismic Source Zones within a 500 km Radius

Ground motion response to earthquakes depends not just on the character of the earthquake, but also the character of the subsurface conditions at the site. Of concern is the nature of the soil/rock in the upper 30 m of soil/rock profile. Test pits and drilling at the site indicate that the soil cover is of moderate thickness (typically 6 m to 14 m thick) and the underlying rock moderately to highly weathered. Therefore, for the purpose of this investigation, the site was assigned to Site Class D (stiff soil) with an assumed representative shear velocity (Vs30) of 365 m/s (1200 ft/s) consistent with the recommendations in the ASCE 7-16 design standard.

The steps involved in a DSHA analysis are as follows:

1. Using information derived from geologic maps, fault maps, and plots of historic earthquake events, identify discrete seismic source zone polygons.
2. Extract "clipped" data sets lying within each seismic source zone that represent the nature of the seismicity within the zone.
3. Estimate the Maximum Considered Earthquake ("MCE") associated with each seismic source.
4. Estimate the closest point of approach to the site of interest for the selected MCE in each seismic source zone.
5. Estimate site specific ground motions by attenuating motions over the distance between the earthquake epicenter and the site.

A review of the mapped USGS faults revealed a maximum surface rupture length within the Nevada Great Basin Zone on the order of 29 km at a location approximately 42.5 km south of the site. Using the criteria of Wells and Coppersmith (1994), and assuming the maximum surface fault rupture for a single event to be half of the mapped length, the maximum expected event magnitude would be 6.4. The closest location of a mapped active fault is 5.3 km from the site and the fault has a total surface rupture length of 5.55 km. Conservatively assuming this fault rupture to represent a single event, the 5.55 km length corresponds an event magnitude of 5.9. Therefore, for the Nevada Great Basin Zone containing the site, three (3) ground motion attenuation profiles were developed; one for the MCE of magnitude 6.4 at a distance of 42.5 km, one for a magnitude 5.9 event at a distance of 5.3 km, and a magnitude 4.5 event at a distance of 1 km.

Results of analyses for all seismic source zones are summarized in Table 18-6 and Table 18-7. Most building codes (including ASCE 7-16 and IBC 2018) allow for either a site-specific deterministic design approach or a probabilistic approach. For the site specific DSHA procedure the estimated spectral acceleration values at the various natural periods are used to develop a mean spectral acceleration response spectrum and an 84th percentile response spectrum. These accelerations are then used to develop design response spectra for estimating seismic loads used for structural design (which will also vary as a function of occupancy and use) and for geotechnical analysis.

The PSHA analysis can be performed using the same seismic source zones and by replacing the maximum credible earthquake with the probability distribution of earthquake events, the site distance with the probability distribution of site distances and adding a random component to the attenuated spectral acceleration values, then using a Monte Carlo type sampling model to compile a new distribution of spectral accelerations associated with an exceedance probability. However, some developed countries, including the U.S. and Canada, have their own web-based PSHA programs that use regionally based maps of seismic source zones (similar, but not the same as those used in our DSHA analysis), and compute site distances by asking you to enter a specific geographic site location using latitude and longitude.

A deterministic approach to seismic hazard analysis or DSHA and a probabilistic approach or PSHA have produced similar design pseudo-acceleration response spectra with the DSHA results being the larger of the two (see Figure 18-9). Per ASCE 7-16 guidelines, the lesser of the two or the PSHA results for a maximum considered earthquake having a 2% probability of exceedance in 50 yrs. was selected as the Site-Specific Design Response Spectra (see Figure 18-10).

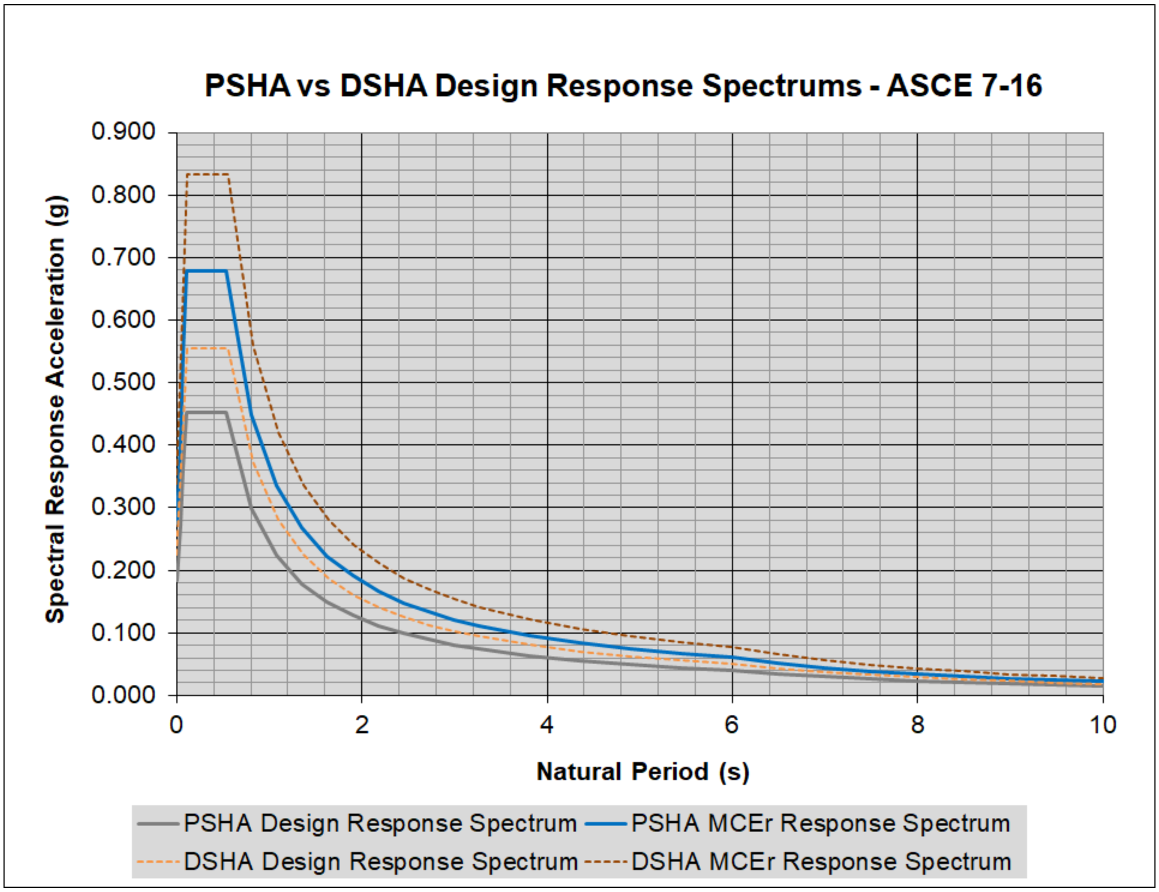


Figure 18-7: Plot of PSHA Results and Comparison with DSHA Results

Geotechnical design procedures often involve estimates of the Peak Ground Acceleration ("PGAm") or a reduced/scaled version of the ground acceleration referred to as the pseudostatic acceleration coefficient. The design PGAm value for the site is 0.294 g.

For seismic slope stability analyses in soil and rock, a hierarchy of analysis methods should be implemented with progression to the next method in the hierarchy required only in the event of failure to satisfy the requirements of the previous method. Recommended methods in the order of their application are as follows:

- Pseudostatic stability analysis using a pseudostatic acceleration coefficient of 0.06 g (to be used only at sites with no liquefaction potential).
- Seismic displacement analysis using the procedures of Newmark, 1965, Makdisi and Seed, 1978, or Bray and Travasarou, 2007 showing acceptably small displacements.
- Full dynamic analysis of soil-structure interaction coupled with continuum modeling showing acceptably small displacements.

Table 18-5: Mean Deterministic Pseudo-Acceleration Response Spectrum by Seismic Source Zone

Seismic Source Zone	Max Historic	Gutenberg-Richter	Surface Fault Rupture	MCE	Mean	Median	Closest	PGA	0.2 s	0.5 s	1.0 s	2.0 s	4.0 s	6.0 s	8.0 s	10.0 s
Mean Results:																
Sierra Range-front	6.4	7	6.6	7	398	402	327	---	---	---	---	---	---	---	---	---
Walker Lane	6.5	6.5	6.8	6.8	335	327	261	0.004	0.008	0.015	0.011	0.006	0.003	0.001	0.001	0
Shoshone Mountains	7.1	7.6	6.6	7.6	207	217	71	0.077	0.192	0.169	0.101	0.049	0.023	0.013	0.008	0.006
Southern Nevada	5.9	6.2	6.6	6.6	376	369	276	0.003	0.006	0.011	0.008	0.005	0.002	0.001	0.001	0
NV Great Basin M 6.4 @ 42.5 km	5.9	5.6	6.4	6.4	132	122	42.5	0.057	0.146	0.107	0.056	0.024	0.008	0.004	0.002	0.001
NV Great Basin M 5.9 @ 5.3 km	5.9	5.6	6.4	5.9	132	122	5.3	0.275	0.652	0.436	0.212	0.069	0.02	0.009	0.004	0.003
NV Great Basin M 4.5 @ 1 km	5.9	5.6	6.4	4.5	132	122	1	0.144	0.265	0.214	0.035	0.008	0.001	0.001	0	0
Idaho Mountains	6.9	6.4	6.7	6.7	458	462	391	---	---	---	---	---	---	---	---	---
Salt Lake	6.5	6.5	6.5	6.5	331	337	243	0.004	0.008	0.012	0.009	0.005	0.002	0.001	0.001	0
Wasatch Front – Hurricane Fault	5.9	6	6.6	6.6	435	447	337	---	---	---	---	---	---	---	---	---
							Max. Sa:	**0.275**	**0.652**	**0.436**	**0.212**	**0.069**	**0.023**	**0.013**	**0.008**	**0.006**
					Site Class =	D	Note: Site-Specific Ground Motion Analysis May Be Required - See ASCE 7-16 Section 11.4.8 and 21.2									

Table 18-6: 84th Percentile Deterministic Pseudo-Acceleration Response Spectrum by Seismic Source Zone

Seismic Source Zone	Max Historic	Gutenberg-Richter	Surface Fault Rupture	MCE	Mean	Median	Closest	PGA	0.2 s	0.5 s	1.0 s	2.0 s	4.0 s	6.0 s	8.0 s	10.0 s
84th Percentile (Mean + 1 Standard Deviation) Results:																
Sierra Range-front	6.4	7	6.6	7	398	402	327	---	---	---	---	---	---	---	---	---
Walker Lane	6.5	6.5	6.8	6.8	335	327	261	0.008	0.016	0.029	0.022	0.012	0.005	0.003	0.002	0.001
Shoshone Mountains	7.1	7.6	6.6	7.6	207	217	71	0.136	0.351	0.322	0.205	0.097	0.046	0.025	0.017	0.012
Southern Nevada	5.9	6.2	6.6	6.6	376	369	276	0.005	0.011	0.021	0.017	0.009	0.004	0.002	0.001	0.001
NV Great Basin M 6.4 @ 42.5 km	5.9	5.6	6.4	6.4	132	122	42.5	0.103	0.272	0.211	0.112	0.045	0.016	0.007	0.005	0.003
NV Great Basin M 5.9 @ 5.3 km	5.9	5.6	6.4	5.9	132	122	5.3	0.493	1.187	0.846	0.43	0.141	0.045	0.018	0.009	0.005
NV Great Basin M 4.5 @ 1 km	5.9	5.6	6.4	4.5	132	122	1	0.309	0.564	0.245	0.073	0.015	0.003	0.003	0	0
Idaho Mountains	6.9	6.4	6.7	6.7	458	462	391	---	---	---	---	---	---	---	---	---
Salt Lake	6.5	6.5	6.5	6.5	331	337	243	0.007	0.015	0.024	0.018	0.009	0.003	0.002	.001.	0.001
Wasatch Front – Hurricane Fault	5.9	6	6.6	6.6	435	447	337	---	---	---	---	---	---	---	---	---
							Max. Sa:	**0.493**	**1.187**	**0.846**	**0.43**	**0.141**	**0.046**	**0.025**	**0.017**	**0.012**
					Site Class =	D	Note: Site-Specific Ground Motion Analysis May Be Required - See ASCE 7-16 Section 11.4.8 and 21.2									

Final Seismic Design Criteria Summary

ASCE 7-16 Section 21.2.3: The site-specific MCEr spectral response acceleration at any period shall be taken as the lesser of the spectral response accelerations from the probabilistic ground motions of Section 21.2.1 and the deterministic ground motions of Section 21.2.2.

Site-Specific MCEr - Section 21.2.3 ------> PSHA

PSHA Results:

Parameter	Value	
Ss	0.479	g
S1	0.159	g
Sms	0.679	g
Sm1	0.363	g
Sds	0.452	g
Sd1	0.242	g
Site Class:	D	
Fa	1.417	
Fv	2.282	
PGA	0.212	g
Fpga	1.387	
PGAm	0.294	g
Tl	6.000	s

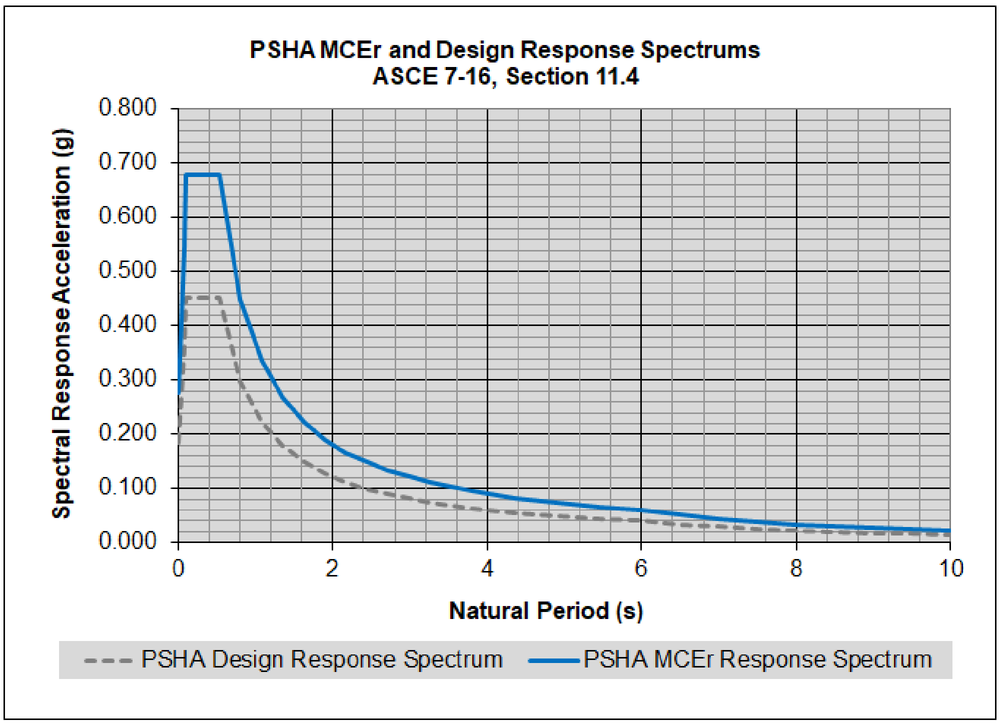


Figure 18-8: PSHA Results and Design Response Spectra

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19 MARKET STUDIES AND CONTRACTS

No market studies were completed and no contracts are in place in support of this Technical Report. Gold and silver production can generally be sold to any of a number of financial institutions or refining houses and therefore no market studies are required.

It is assumed that the doré produced at the South Railroad Project will be of a specification comparable with other Nevada gold and silver producers and as such, acceptable to all refineries.

Gold and silver produced by the South Railroad Project would be sold to refineries or other financial institutions and the settlement price would be based on the then-current spot price for gold and silver on public markets. There would be no direct marketing of the metal. The base case financial model for the South Railroad Project utilizes a gold price of $1,650/oz and a silver price of $21.50/oz.

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20 ENVIRONMENTAL STUDIES, PERMITTING, AND SOCIAL OR COMMUNITY IMPACT

EM Strategies, a WestLand Resources Inc. Company ("EMS"), a permit acquisition strategy and government relations consulting firm, provided the following information on environmental considerations, permitting, and social and community impacts.

20.1 INTRODUCTION

As environmental consultants to Gold Standard, and at the request of Gold Standard, EMS has completed the following assessment of environmental studies, permitting, and social or community impacts for the proposed Gold Standard's South Railroad Mine Project ("SRMP"), which is located within South Railroad portion of the Railroad-Pinion property. The SRMP has been defined for permitting purposes and is currently approximately 10,479 acres in size. The SRMP is a hard rock precious-metal development project. Gold Standard submitted a Plan of Operations (under 43 Code of Federal Regulations [CFR] 3809) and a Nevada Reclamation Permit (NRP) Application (under Nevada Administrative Code [NAC] 519A) (Plan Application) to the BLM Tuscarora Field Office and the NDEP's Bureau of Mining Regulation and Reclamation ("BMRR") on November 6, 2020.

The SRMP is located on public lands administered by the BLM and private lands controlled by Gold Standard in Sections 1,2,11 through 16, and 20 through 29, Township 30 North, Range 53 East (T30N, R53E), and Sections 35, T31N, R53E, Mount Diablo Base and Meridian. The access to the SRMP is via the South Fork Route, which is from State Route (SR) 228 on County Road (CR) 715 and 715B to BLM Route 1119, and on the CR 720 to the SRMP area. In general, the proposed mine operations will consist of two open pit mines and waste rock storage areas, and the processing of the ore will use a heap leaching method. Gold Standard plans the construction, operation, reclamation, and closing of this mining operation. Major components include:

- Two areas of open pits (Pinion and Dark Star deposits);
- Three waste rock storage areas;
- One heap leach processing facility;
- Reagent area;
- Exploration;
- Laydown areas;
- A water delivery and distribution system;
- A power delivery and distribution system;
- Excess water management system; including a surface discharge to Dixie Creek;
- Storm water diversion ditches and storm water sediment basins;
- Haul roads and
- Upgrade of the existing access road to the SRMP.

Gold Standard proposes to mine approximately 71.9 million tons of heap-leach ore and 294.5 million tons of waste rock (total of 366.4 million tons). The strip ratio is 4.10 tons of waste for every one ton of ore over the eight year life of the mine. The ore and waste would be extracted from the open pits using conventional surface mining methods of drilling, blasting, loading, and hauling. Gold Standard would use hydraulic shovels or front-end loaders to load the blasted mineralized material and waste into the haul trucks. The haul trucks would transport the waste rock to the rock disposal area near the open pit and transport the mineralized material directly to the heap leach pad as ROM ore. The heap leach would use a dilute NaCN solution to liberate the precious metals. A carbon absorption desorption process would be used to precipitate the precious metals. The precipitate would then be refined in a furnace to produce doré bars for shipment off site. The project facilities would disturb approximately 1,775 acres. There is an existing exploration Plan of Operations that covers the planned mining and processing facilities and authorizes up to 65.8 acres of exploration surface disturbance within the SRMP and outside of the planned mine facility footprints. Exploration activities, estimated to disturb up to 150 additional acres, would also occur within the SRMP and incorporate the existing exploration Plan level disturbance. The current exploration Plan would continue to be used for exploration outside of the Plan Application boundary. The exploration activities would be based on work plans submitted to the BLM for review and concurrence that the activities are consistent with the Plan.

The review and approval process for the Plan Application by the BLM constitutes a federal action under the NEPA and BLM regulations. Thus, for the BLM to process the Plan Application the BLM is required to comply with the NEPA and prepare either an EA, or an EIS. The BLM has determined that an EIS, will be required to comply with NEPA.

Prior to initiating the NEPA document (EIS), the NEPA contractor (SWCA) will prepare Resource Reports for each environmental resource, which will evaluate the potential effect of the project on each environmental resource. Each Resource Report is then reviewed and approved by the BLM. The NEPA contractor then uses the Resource Reports to complete the NEPA document.

The following sections provide additional detailed information on the principal permits necessary to develop each phase of the project and the NEPA process, as well as the status relative to each permit process.

20.2 ENVIRONMENTAL BASELINE STUDIES

Gold Standard has been conducting environmental baseline studies over the past several years as part of their ongoing permitting efforts prior to and subsequent to the submittal of the Plan Application. The main portion for the Project Area has been surveyed for surface water resources, including WOTUS, biological resources, and cultural resources. The SRMP access road remain to be surveyed for cultural resources. In 2018, Gold Standard commenced material characterization testing of the mineralized material and waste rock to determine the metal leaching and acid generation potential. In addition, an evaluation of the groundwater resources was commenced to determine groundwater supply potential, as well as the potential impacts from groundwater pumping and pit lake development. Between January 2019 and December 2021 Gold Standard has had numerous meetings with the BLM and the EIS Contractor to determine what additional baseline data collection is needed for the permitting process and NEPA. In the spring of 2022, Gold Standard will be collecting additional baseline environmental data including, biology and cultural resources all the South Fork Access Road and hydrology and mussel data from Dixie Creek.

Within and adjacent to the Project Area there are Greater Sage Grouse and Golden Eagles. These species will have an effect on how the SRMP is permitted and what mitigation in required or proposed.

20.3 BUREAU OF LAND MANAGEMENT PLAN OF OPERATIONS / NEVADA BUREAU OF MINING REGULATION AND RECLAMATION, NEVADA RECLAMATION PERMIT

The BLM and the BMRR have implemented a process for the Plan Application that commences prior to the submittal and continues through the review and approval process for the Plan Application. Gold Standard submitted a Plan Application for the project in November 2020 and BLM approval of this Plan Application occurred in December of 2020. A NEPA contractor (SWCA) was selected in August 2021 and initiated work in September 2021.

20.3.1 Bureau of Land Management Pre-Application Planning

As part of the pre-Plan Application planning process with the BLM, initial meetings were held between the proponent and the BLM to discuss the anticipated scope of the mining operation and review the likely environmental resource baseline data needs required for the processing of the Plan Application by the BLM.

The process for collecting baseline data generally includes the development of baseline data collection work plans, which are submitted to the BLM for review and approval prior to initiating the baseline data collection. Following approval, field surveys are carried out to collect relevant baseline data. Depending on the environmental resource to be evaluated, desktop studies may be utilized in lieu of field surveys. Findings of the field surveys are then summarized in a report that documents the data collected. This Technical Report is then submitted to the BLM for review and approval. In some cases, the baseline data collection process will also involve the State of Nevada, depending on the resource being assessed, particularly for geochemical and hydrological surveys. Baseline data for the project is being collected and several of the reports have been reviewed by the BLM. The required environmental baseline data include the following: mineralized material and waste rock geochemical characterization; hydrogeological characterization; a pit lake evaluation; an assessment of ecological risk; air quality modeling; and cultural and biological resources.

Cultural resource and biology surveys have been completed over the SRMP. Supplemental work to assess conditions in Dixie Creek and along the South Fork access route will be completed during the first half of 2022. Sample collection for the characterization of the mineralized material and waste has been completed and analysis of those samples is underway. The material characterization report was completed in the first half of 2020. The hydrogeologic evaluation commenced in the third quarter of 2018 and the report was completed in the second quarter of 2020. Revisions to the report to incorporate 2021 field data were drafted in Q4 2021 and are being finalized in Q1 2022.

20.3.2 Plan of Operations Processing

A Plan Application is required to be submitted to the BLM and the BMRR for any surface disturbance in excess of five acres. The single application utilizes the format of the Plan Application document accepted by the BLM and the BMRR. The Plan Application describes the operational procedures for the construction, operation, and closure of the project. As required by the BLM and BMRR, the Plan Application includes a waste rock management plan, quality assurance plan, a storm water plan, a spill prevention plan, reclamation plan, a monitoring plan, and an interim management plan. In addition, a reclamation report with a Reclamation Cost Estimate ("RCE") for the closure of the project is required. The content of the Plan Application is based on the mine plan design and the data gathered as part of the environmental baseline studies. The Plan Application 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 is determined prior to the BLM issuing a decision record on the Plan Application and BMRR issuing the RP.

The Plan Application was submitted in November 2020 after the project operational information was completed and essentially all the baseline surveys were completed. Key baseline reports for the project have been included in the Plan Application submittal to the BLM and NDEP/BMRR. Subsequent to the Plan Application submittal, Gold Standard identified a revised Project access route to the north that connects with State Route 228, south of Spring Creek in Elko County. A revision to the Plan Application will be submitted to the BLM/and NDEP/BMRR in the first half of 2022. As of the date of this report the Plan Application is being revised to reflect to Project access from the north and an increase in the overall size of the Project area.

The BLM will need to complete their review of the baseline reports in the Plan Application and approve the final version of the reports prior to moving through the NEPA process.

20.4 BUREAU OF LAND MANAGEMENT RIGHT OF WAY

A portion of the access route to the Project includes BLM Route 1119. This portion of the access road will require a BLM right-of-way (ROW) issued to either Gold Standard or Elko County. A ROW application and a Plan of Development will need to be submitted to the BLM in the first half of 2022. To process this ROW application the BLM will need to have completed a NEPA analysis. It is reasonable to assume that the BLM will use the same NEPA evaluation that is being completed for the Plan Application.

20.5 UNITED STATES ARMY CORPS OF ENGINEERS SECTION 404 PERMIT

Gold Standard has delineated and the United States Army Corps of Engineers ("USACE") has determined that there are WOTUS, including wetlands, within the Project Area. Based on the current design of the SRMP, the SRMP will likely have impacts to WOTUS, which will require an individual permit under Section 404 of the Clean Water Act. As part of their Section 404 permit application review process, the USACE looks at an avoid, minimize, mitigate process as part of their assessment. GSV is unable to avoid all the WOTUS in the SRMP design; however, Gold Standard has designed the SRMP to avoid as much of the WOTUS as is reasonably possible. Gold Standard will need to then mitigate for the WOTUS that is affected by the SRMP design.

20.6 NATIONAL ENVIRONMENTAL POLICY ACT

The NEPA process is triggered by a federal action. In this case, the issuance of a completeness letter for the Plan Application and the submittal of the Section 404 permit application triggers the federal action. The NEPA review process is completed with either an EA or an EIS. The BLM has determined that an EIS is required for this project. In addition, the BLM will be the lead federal agency for the completion of the NEPA process and the USACE will be a cooperating agency under NEPA.

The EIS process is conducted in accordance with NEPA regulations (40 CFR 1500 et. seq.), BLM, as lead federal agency, 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, the Draft EIS is prepared for the BLM by a third-party contractor. When the BLM determines the Draft EIS is complete, it would be submitted to the public for review. Comments received from the public would be incorporated into a Final EIS, which would 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. As of the date of this report an EIS contractor has been selected and has commenced work of the review of existing data and assessing its completeness for the NEPA analysis.

20.7 STATE OF NEVADA PERMITS

There are a number of environmental permits issued by the NDEP that are necessary to develop the SRMP and which Gold Standard needs to permit the SRMP etc. The NDEP issues permits that address water and air pollution, as well as land reclamation. The Nevada Division of Water Resources ("NDWR") issues water rights for the use and management of water.

20.7.1 Water Pollution Control Permit

A WPCP from the BMRR is needed to construct, operate, and close a mining facility in the State of Nevada. The contents of the application are prescribed in the NAC Section 445A.394 through 445A.399. A WPCP application for the project will be prepared and will be based on the following:

- Open pit mining, with an anticipated post-mining pit lake formation;
- Storage of non-acid and acid generating waste rock;
- Exploration;
- Dewatering and water management;
- Heap leach and process plant management; and
- Ancillary facilities that include storm water diversions, and sediment control basin.

WPCP applications will include an engineering design for waste rock storage areas and mill/tailings facilities, waste rock characterization reports, hydrogeological summary reports, engineering design for process components including methods for the control of storm water runoff, and containment reports detailing specifications for containment of process fluids. Applications will also contain the appropriate WPCP plans, including 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.

20.7.2 National Pollution Discharge Eliminate System Permit

A National Pollution Discharge Eliminate System (NPDES) Permit from the NDEP, Bureau of Water Pollution Control (BWPC) is needed to construct and operate the excess water discharge to the tributary of Dixie Creek. Under NRS 445A.450, the NDEP is authorized to implement the Federal NPDES program, and the contents of the application are prescribed in the 40 CFR 122.21. A NPDES permit application for the project will be prepared and will be based on the following:

- Applicant information;
- Description of operations;
- Outfall location;
- Discharge date;
- Type of waste;
- Effluent characteristics;
- Flow; and
- Description of the treatment system.

20.7.3 Air Quality Operating Permit

Gold Standard will need an air quality operating permit from the Nevada Bureau of Air Pollution Control (“BAPC”). The permit will likely be a Class II permit, where the emissions of each criteria pollutant would be less than 100 tons per year. The application would include specifics on each process component that could emit air pollutants and a detailed emissions inventory, as well as air quality modeling. The application preparation and processing time frame would be approximately three months.

20.7.4 Water Rights

Gold Standard will need to obtain water rights from the NDWR. Water and water rights will have to come from either Pine Valley or the Dixie Creek - Ten Mile Creek designated hydrologic basins. These basins are currently over appropriated relative to the Nevada State Engineer’s perennial yield for each basin. As a result, obtaining new water rights for mining-related consumptive uses is possible; however, multiple protests from existing water right holders should be expected. Obtaining non-consumptive water rights for de-watering activities that return the water to the basin will be more obtainable than consumptive water rights in the basin. Gold Standard anticipates the need to purchase or lease existing rights to meet their water demands for the project.

20.8 ELKO COUNTY SPECIAL USE PERMIT

Gold Standard will need a Special Use Permit issued by Elko County. This permit will need to include a road maintenance agreement for any county road to be used to access the project.

20.9 OTHER MINOR OR MINISTERIAL PERMITS

In addition to the principal environmental permits outlined above, Table 20-1 lists other notifications or ministerial permits that may likely be necessary to operate the project.

Table 20-1: Ministerial Permits, Plans, and Notifications

Notification/Permit	Agency	Timeframes
Above Ground Storage Tank Permit	Nevada Bureau of Corrective Actions	Up to six months to get registered; however, this is not required. The cost is $100 per tank per year and a requirement to perform monthly visual inspections
Agreement for Road Maintenance	Elko County	Up to six months to negotiate the agreement with the county roads department and the county commission.
Explosives Permit	Bureau of Alcohol, Tobacco, Firearms, and Explosives	N/A
Explosives User's License (User's Clearance)	Bureau of Alcohol, Tobacco, Firearms, and Explosives	N/A
Fire and Life Safety	Nevada State Fire Marshall	One week once the outlined materials are completed by WKM. Submit prior to construction and operation.
Hazardous Materials Permit	Nevada State Fire Marshall	One week once materials list is completed by WKM. Submit 30 days from the start of operations and annually thereafter by March 1st.
Hwy 278 Turn out Permit	NDOT (Right of way division)	TBD
Industrial Artificial Pond Permit	Nevada Department of Wildlife	Four weeks
Leach Pad Commencement	Nevada Bureau of Mining Regulation and Reclamation	One week
Leach Pad As-Built Report	Nevada Bureau of Mining Regulation and Reclamation	Four weeks
Process Plant As-Built Report	Nevada Bureau of Mining Regulation and Reclamation	Four weeks
MSHA Mine ID Number	MSHA	One week.
Mine Opening Notification	Nevada division of Minerals	One week.
Mine Registry	Nevada Division of Minerals	One week.
Notification of Commencement of Operations	Mine Safety & Health Administration	One week
Production/Dewatering Wells - Proof of Completion	Nevada Division of Water Resources	One week
Radio License	FCC	One week
RCRA Waste Mgt. ID - Mine	Nevada Bureau of Sustainable Materials Management/U.S. Environmental Protection Agency	Two weeks
Well Drilling Permit (Notice of Intent to Drill)	Nevada Division of Water Resources	One week
Potable Water System	Nevada Bureau of Safe Drinking Water	Eight months
Septic System	Nevada Bureau of Water Pollution Control	Six months to prepare the application (including the mercury control system) and process to obtain the permit.

20.10 ENVIRONMENTAL STUDY RESULTS AND KNOWN ISSUES

As previously outlined, the SRMP is a previously explored minerals property with exploration related disturbance. However, there have been very long periods of non-operation. There are no known ongoing environmental issues with any of the regulatory agencies. Gold Standard has been conducting baseline data collection for a couple of years for environmental studies required to support the Plan Application and permitting process. The waste and mineralized material characterization and the hydrogeologic evaluation are currently in their latter stages of development. Material characterization indicates the need to manage a significant portion of the waste rock as potentially acid generating in engineered facilities. Additional results to date indicate limited 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. There are golden eagle and Greater sage-grouse in the SRMP and the vicinity, which will need to be addressed in the permitting of the project. Gold Standard is working with the BLM on the management of these species.

20.11 WASTE DISPOSAL AND MONITORING

Waste rock characterization has been conducted and the results indicate that a portion of the waste rock and mineralized material are likely to be reactive, acid generating, and would leach metals. As a result, a detailed waste rock management plan and waste rock management strategy is being developed.

20.12 SOCIAL AND COMMUNITY ISSUES

Social and community impacts have been and are being considered and evaluated for the Plan Amendment and Plan Application performed for the project in accordance with the NEPA and other federal laws. Potentially affected Native American tribes, tribal organizations, and/or individuals are consulted during the preparation of all plan amendments to advise on the proposed projects that may have an effect on cultural sites, resources, and traditional activities.

Potential community impacts to existing population and demographics, income, employment, economy, public finance, housing, community facilities, and community services are evaluated for potential impacts as part of the NEPA process. There are no known social or community issues that would have a material impact on the project's ability to extract mineral resources. Identified socioeconomic issues (employment, payroll, services and supply purchases, and state and local tax payments) are anticipated to be positive.

20.13 MINE CLOSURE

A Tentative Plan for Permanent Closure ("TPPC") for the project would be submitted to the BMRR with the WPCP application. In the TPPC, the proposed heap leach closure approach would consist of fluid management through evaporation, covering the heap leach growth media, and then revegetating. Any residual heap leach drainage will be managed with evaporation cells.

The current bond for the SRMP is approximately $1,448,735 to reclaim the exploration related disturbance.

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21 CAPITAL AND OPERATING COSTS

Capital and operating costs were estimated for the feasibility study by RESPEC (mine development) and M3 (process plant, site development, power generation, and ancillaries), Stantec (site-wide water management systems), NewFields (heap leach and waste rock disposal facilities) and Linkan Engineering (water treatment plant and potable water systems). Table 21-1 shows the estimated capital costs for the project. This includes $190.2 million in Year -1 and $186.7 million for sustaining capital. Total capital costs are estimated at $376.9 million.

Table 21-1: Capital Cost Summary

Category	Units	Initial	Sustaining	Total
Site General (Earthworks)	K USD	$5,566	-	$5,566
Site Water Management (Stantec)	K USD	$15,367	$17,065	$32,431
Heap Leach Facility (NewFields)	K USD	$16,217	$22,144	$38,361
Waste Rock Disposal Facilities (NewFields)	K USD	$3,999	$7,756	$11,755
Process Plant (ADR, Refinery, Reagents)	K USD	$24,141	-	$24,141
Water Systems (Process Plant)	K USD	$2,309	-	$2,309
Water Treatment Plant & Potable (Linkan)	K USD	$4,065	$4,139	$8,204
Power Generation & Distribution	K USD	$18,367	-	$18,367
ADR Bldg. & Ancil. (Warehouse, Maint, Admin, Fuel)	K USD	$15,080	-	$15,080
Sub-Total Direct Cost (Process Plant & Support)	K USD	**$105,111**	**$51,104**	**$156,215**
Freight (Process Plant)	K USD	$3,220	-	$3,220
Construction Support (inc. Mobilization)	K USD	$4,333	-	$4,333
Engineering, Procurement, & Const. Mgmt.	K USD	$10,965	-	$10,965
Vendor Support	K USD	$701	-	$701
Spare Parts (Capital, Commissioning)	K USD	$1,542	-	$1,542
Generator Lease Capital Deferral	K USD	($6,940)	$7,416	$476
Indirect Costs (Support Facilities Scope)	K USD	$11,988	$14,088	$26,076
Contingency (Process Plant)	K USD	$12,386	-	$12,386
Contingency (Support Facilities Scope)	K USD	$6,184	$11,443	$17,627
Owner's Cost	K USD	$1,157	-	$1,157
Taxes (County) (Process Plant)	K USD	$2,968	-	$2,968
Sub-Total Indirect Cost (Process Plant & Support))	K USD	**$48,504**	**$32,948**	**$81,452**
Mine Capital Equipment	K USD	$13,733	$102,624	$116,358
Preproduction Costs	K USD	$22,640	-	$22,640
Contingency (Mine Capital Equipment)	K USD	$210	-	$210
Sub-Total Mine Capital	K USD	**$36,583**	**$102,624**	**$139,207**
TOTAL CAPITAL COST	K USD	**$190,197**	**$186,676**	**$376,873**

Table 21-2 shows the estimated operating costs for the LOM project. Operating costs were estimated at $807 million for the LOM. This is $11.23 per ton processed or $783 per ounce of gold produced.

Table 21-2: Operating Cost Summary

		Production Cost		
Category	**K USD**	**$ / ton**	**$ / Au oz**	**$ / Au oz***
Mining Costs	$615,504	$8.58	$598.18	-
Process Plant	$147,424	$2.05	$143.04	-
G&A	$37,750	$0.53	$36.63	-
Refining	$5,153	$0.07	$5.00	-
TOTAL OPERATING COST	**$544,573**	**$ 11.23**	**$782.85**	**$780.84**

** Including Silver Credit as a Reduction to Total Operating*

21.1 MINING CAPITAL

Mining capital estimates for this feasibility study assume owner operations of mining equipment and were based on the equipment and facilities required to achieve the production schedule shown in Table 16-4. Capital costs were estimated based on vendor quotations, estimation guides, and benchmarks of recent costs for similar projects. Mining capital includes assumptions for leased-to-own equipment along with equipment purchases. These include terms of 0% down and 5.55% annual effective interest rates for haul trucks and 20% down and 4.75% annual effective interest rates on remaining principal for other equipment based on vendor inputs. The down payments and principal portions of quarterly payments have been applied to capital while quarterly interest payments are applied to operating costs.

Leased-to-own equipment includes production drills, large loaders, hydraulic shovels, haul trucks, dozers, graders, water trucks, lube and fuel trucks, mechanics trucks, and tire trucks. In addition, pioneering drills are assumed to be rented. This is further discussed in the mine operating costs section (Section 21.3).

The mining capital estimate is summarized by year in Table 21-3. Note that numbers within the tables in this section are rounded which may lead to minor summation differences.

Table 21-3: Mining Capital Cost by Year

Total Mining Capital	Units	Yr -1	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Total
Primary Equipment	KUSD	$ 4,724	$ 6,276	$ 12,062	$ 11,831	$ 12,464	$ 12,634	$ 10,176	$ 8,965	$ 5,588	$ 84,719
Support Equipment	KUSD	$ 6,477	$ 3,081	$ 4,488	$ 4,000	$ 4,193	$ 3,449	$ 708	$ 182	$ -	$ 26,579
Blasting Equipment	KUSD	$ 129	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 129
Mine Maintenance Equipment	KUSD	$ 358	$ 223	$ 234	$ 245	$ 257	$ 201	$ -	$ -	$ -	$ 1,517
Other Mine Capital	KUSD	$ 2,046	$ 1,124	$ 14	$ 230	$ -	$ -	$ -	$ -	$ -	$ 3,414
Mine Preproduction	KUSD	$ 22,640	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 22,640
Mining Equipment Salvage	KUSD	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (12,410)	$ (12,410)
Total Mine Capital	KUSD	$ 36,373	$ 10,703	$ 16,798	$ 16,306	$ 16,914	$ 16,284	$ 10,884	$ 9,147	$ (6,822)	$ 126,587

21.1.1 Primary Equipment

Primary equipment purchases refer to the purchase of drills, loading equipment, and haul trucks. The total LOM primary equipment cost estimate is $84.7 million which includes:

- $8.6 million for production drills;
- $6.6 million for a large loader;
- $13.4 million for hydraulic shovels; and
- $56.1 million for 200-ton capacity haul trucks.

21.1.2 Support Equipment

Support equipment includes the equipment required to support the primary mining equipment. This includes dozers to manage dumping locations and cleanup of benches for drilling and loading equipment. This also includes road maintenance equipment such as water trucks and graders. The total estimated capital for support equipment is $26.6 million and includes:

- $11.0 million for dozers, and a rubber tire dozer (“RTD”);
- $2.8 million for motor graders;
- $4.1 million for water trucks;
- $6.0 million for truck and lowboy;
- $1.1 million for 6 yd excavator;
- $87,000 for in-pit pumps to control runoff water;
- $1.3 million for a 132-ton capacity crane (to be shared between mining and process); and
- $135,000 for a flatbed truck used for moving maintenance items within the mine.

21.1.3 Blasting Equipment

Blasting equipment includes a skid loader to be used for stemming holes. The cost estimate for the skid loader is $129,000. All other equipment is expected to be supplied by the blasting contractor.

21.1.4 Mine Maintenance Capital

Mine maintenance capital includes one large lubrication truck at $1,017,000, two mechanic’s trucks totaling $321,000, and a tire truck at $178,000.

21.1.5 Other Capital

Other capital includes an assortment of equipment and facilities totaling $3.4 million. This includes:

- $100,000 for light plants;
- $87,000 for ANFO storage bins;
- $12,000 for powder magazines to store boosters;
- $8,000 for a cap magazine;
- $75,000 for explosives storage site prep;
- $67,000 for mobile radios in equipment and assorted handheld radios;
- $750,000 for general shop equipment including hoists and other tooling;
- $105,000 for engineering computers, plotters, and other office equipment;
- $400,000 for geotechnical equipment;
- $20,000 for dust suppression storage bladders;
- $150,000 for surveying equipment and GPS base stations;
- $225,000 in access roads to each deposit and site preparation;
- $150,000 for ambulance and firefighting equipment; and
- $1.27 million for critical spares.

Note that the access roads to each deposit and site preparations are estimated for each deposit with $150,000 applied to the development of Dark Star and $75,000 applied for the preparation of Pinion. These amounts do not include the costs for the main access road.

21.1.6 Mine Pre-Production

Mine pre-production is considered as the cost of all mining prior to the start of gold production from the ROM leach pad. For the feasibility study, this will be a 6-month period from the start of mining operations. The total mining costs during pre-production are estimated at $22.6 million.

21.1.7 Mine Equipment Salvage

Mine equipment salvage has been estimated and applied at the end of the equipment useful life. The estimate assumes that the equipment value would depreciate immediately by 10% once placed into service. An assumed life-of-equipment hours were also assumed based on experience in operations. The life of equipment was compared to the equipment hours used by fleet or unit and the percent remaining was calculated. The percent remaining was then multiplied by the value of the equipment after the initial depreciation. Where the percent of remaining life was less than zero, no salvage was considered.

Table 21-4 shows the value estimate used for salvage. All dollar figures on this table are in $1,000. The last column in Table 21-4 shows the year when the salvage is applied. Total salvage value credited at the end of the mine life is $12.4 million.

Table 21-4: Salvage Value Estimate

Primary Equipment	Units	Hrs Used	Life Hrs	% Remain	Cost	Initial Depreciation	After Initial Depreciation	Salvage	Capex Consumed	Year for Salvage
Production Drill #1	1	42,468	40,000	-6%	$ 2,003	$ 200	$ 1,803	$ -	$ 2,003	6
Production Drill #2	1	45,446	40,000	-14%	$ 2,003	$ 200	$ 1,803	$ -	$ 2,003	7
Production Drill #3	1	45,503	40,000	-14%	$ 2,003	$ 200	$ 1,803	$ -	$ 2,003	7
Production Drill #4	1	39,834	40,000	0%	$ 2,003	$ 200	$ 1,803	$ 7	$ 1,996	7
30 cu yd Hyd. Shovel #1	1	60,327	50,000	-21%	$ 6,265	$ 627	$ 5,639	$ -	$ 6,265	7
30 cu yd Hyd. Shovel #2	1	46,298	50,000	7%	$ 6,265	$ 627	$ 5,639	$ 418	$ 5,847	7
25 cu yd Loader	1	42,732	30,000	-42%	$ 6,168	$ 617	$ 5,551	$ -	$ 6,168	7
Haul Truck Fleet #1	3	58,587	60,000	2%	$ 18,795	$ 1,880	$ 16,916	$ 398	$ 18,397	7
Haul Truck Fleet #2	2	57,796	60,000	4%	$ 12,530	$ 1,253	$ 11,277	$ 414	$ 12,116	7
Haul Truck Fleet #3	3	54,423	60,000	9%	$ 18,795	$ 1,880	$ 16,916	$ 1,572	$ 17,223	7
Haul Truck Fleet #4	3	50,225	60,000	16%	$ 18,795	$ 1,880	$ 16,916	$ 2,756	$ 16,039	7
Haul Truck Fleet #5	2	49,340	60,000	18%	$ 12,530	$ 1,253	$ 11,277	$ 2,003	$ 10,527	7
Water Truck - 20,000 Gallon #1	1	40,732	50,000	19%	1,937	$ 194	$ 1,743	$ 323	$ 1,614	7
Water Truck - 20,000 Gallon #2	1	40,732	50,000	19%	1,937	$ 194	$ 1,743	$ 323	$ 1,614	7
600 HP Dozer #1	2	43,659	40,000	-9%	3,812	$ 381	$ 3,431	$ -	$ 3,812	7
600 HP Dozer #2	2	38,336	40,000	4%	3,812	$ 381	$ 3,431	$ 143	$ 3,669	7
900 HP RTD	1	53,264	30,000	-78%	2,618	$ 262	$ 2,356	$ -	$ 2,618	7
Truck and Lowboy	1	9,400	30,000	69%	5,661	$ 566	$ 5,095	$ 3,499	$ 2,163	7
6 cu yd backhoe	1	15,666	40,000	61%	1,011	$ 101	$ 910	$ 554	$ 457	7
18' Motor Grader #1	1	46,998	40,000	-17%	1,296	$ 130	$ 1,167	$ -	$ 1,296	7
18' Motor Grader #2	1	46,998	40,000	-17%	1,296	$ 130	$ 1,167	$ -	$ 1,296	7

21.2 PROCESS CAPITAL

21.2.1 Process Capital Cost Summary

The process plant costs are comprised of costs for the process facilities, as well as costs for site-wide water management systems, heap leach pad and ponds construction, waste rock storage facilities, infrastructure development, power generation and distribution, and ancillaries. The direct costs are developed from labor, materials, plant equipment, sub-contracts, and construction equipment. Indirect costs are applied to the direct costs to account for items such as: freight, construction support; engineering, procurement, and construction management (EPCM); vendor support during specialty construction and commissioning; spare parts; contingency; owner's costs; and taxes. Together, the direct and indirect costs form the capital costs.

The direct process plant cost for this FS has multiple contributors. Stantec developed the direct costs for the site-wide water management systems. NewFields developed the costs for the heap leach facility and the waste rock storage facilities. M3 developed the costs for site layout, the process plant, power generation and distribution and several ancillaries. The process plant includes the adsorption, desorption and recovery plant, as well as the refinery and reagents. The ancillaries include components such as laboratory, warehouse and maintenance, including the truck shop, administration building, and the fuel station.

Indirect costs were then calculated following industry accepted methodologies, including application of contingency based on the completed level of design on a scope or individual work type basis. The agglomerate contingency for the process plant is estimated at 14.8% of total contracted cost. Total contracted costs include all process plant direct costs, plus construction support costs, EPCM costs, vendor support costs, and spare parts costs. First fills were calculated by M3. Owner's Costs were defined by GSV. Elko County Sales taxes are included at 7.10% of plant equipment and material costs.

Process plant capital costs were independently developed, and all capital cost estimates are based on the purchase of new equipment.

The total evaluated project cost is projected to be in the accuracy range of +/-15%.

Table 21-5: Initial Capital Process Plant Cost Summary

Category (all costs are in USD 1,000)	Labor	Plant Equip.	Material	Sub Contract	Const. Equip.	Total
Site General (Earthworks)	2,804	-	850	395	1,516	5,566
Site Water Management (Stantec)	-	-	-	15,367	-	15,367
Heap Leach Facility (NewFields)	-	-	-	16,217	-	16,217
Waste Rock Disposal Facilities (NewFields)	-	-	-	3,999	-	3,999
Process Plant (ADR, Refinery, Reagents)	7,087	10,876	4,740	365	1,074	24,141
Water Systems (Process Plant)	1,129	-	834	53	293	2,309
Water Treatment Plant & Potable (Linkan)	-	-	-	4,065	-	4,065
Power Generation & Distribution	2,358	14,425	1,100	285	199	18,367
ADR Bldg. & Ancillaries	4,386	2,739	4,685	2,566	703	15,080
Sub-Total Direct Cost (Process Plant)	**17,764**	**28,040**	**12,209**	**43,313**	**3,786**	**105,111**
Freight (Process Plant)						3,220
Construction Support (inc. Mobilization)						4,333
Engineering, Procurement, & Const. Mgmt.						10,965
Vendor Support						701
Spare Parts (Capital, Commissioning)						1,542
Generator Lease Capital Deferral						(6,940)
Indirect Costs (Support Facilities Scope)						11,988
Contingency (Process Plant)						12,386
Contingency (Support Facilities Scope)						$6,184
Owner's Cost						$1,157
Taxes (County) (Process Plant)						$2,968
Sub-Total Indirect Cost (Process Plant)						**48,504**
TOTAL CAPITAL COST (Process Plant)						**153,615**

21.2.2 Freight

Estimates for equipment and material freight costs are based on bulk freight loads and have been estimated at 8% of the equipment cost.

21.2.3 Construction Support

Mobilization is included as an indirect cost at 4% of total direct field costs for process plant direct costs.

Temporary construction facilities are included at 0.5% of total direct field cost (TDFC). Temporary construction power is included at 0.1% of TDFC.

21.2.4 EPCM

Engineering is included at 6.5% of total constructed cost (TCC) for the process plant scope. Project management and administration is included at 0.75% of TCC. Project services are included at 1.0% of TCC. Project controls are included at 0.75% of TCC. Construction Management is included at 6.0% of TCC.

An EPCM Fee is included at 1.5% of total direct field cost.

EPCM construction trailers are included at 0.25% of total direct field cost.

21.2.5 Vendor Support

Vendor supervision of specialty construction is included at 1.5% of plant equipment supply costs. Vendor pre-commissioning is included at 0.5% of plant equipment supply costs. Vendor commissioning is included at 0.5% of plant equipment supply costs.

21.2.6 Spare Parts

Capital spare parts are included at 5.0% of plant equipment supply costs. Commissioning spare parts are included at 0.5% of plant equipment supply costs. Two-year operating spare parts are excluded.

21.2.7 Generator Lease

Four LNG generators are envisioned for the project. Financing of the generators are under the assumption of leased-to-own equipment. These include terms of 20% down and 6.0% annual effective interest rates for the four LNG power generators. The down payments and principal portions of quarterly payments have been applied to capital while quarterly interest payments are applied to operating costs.

21.3 OWNER'S COSTS

Owner's costs were developed by GSV. The Owner's Costs include items such as salaries and wages for the project personnel, housing, and accommodations for owner's team during project development, transportation for owner's team during project development, owner's team vehicles, office services, and travel during project development. There is also an allowance for external services, such as geotechnical investigation and permit support.

For the project, the Owner's Costs have been reduced by $5.45 million. The reduction is based on GSV planning to spend this amount funded by current (Q1-2022) capital within GSV. As such, these costs represent a sunk cost for project purposes.

21.4 MINE OPERATING COST

Mine operating costs were estimated using first principals. This was done using estimated hourly costs of equipment and personnel against the anticipated hours of work for each. The equipment hourly costs were estimated for fuel, oil and lubrication, tires, under-carriage, repair and maintenance costs, and special wear items.

The largest consumable miner operating costs are tires, fuel, and explosives. Tire costs vary by equipment and assumed hours per tire. Fuel costs were assumed to be $2.50 per gallon. ANFO and emulsion blend is assumed to be $578 per ton which includes transportation costs.

Personnel costs include supervision, operating labor, and maintenance labor. The mine operating costs are summarized by year in Table 21-6. The LOM operating costs, before capitalization of pre-production costs, are $639.1 million and average $1.74 per ton. After capitalization of pre-stripping, the LOM mine operating cost is estimated to be $616.5 million or $1.68 per ton mined. Note that numbers within the tables in this section are rounded which may lead to minor summation differences.

Table 21-6: Yearly Mine Operating Cost Estimate

Mine Op Cost Summary	Units	Yr -1	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Total
Mine General Service	K USD	$ 888	$ 1,427	$ 1,426	$ 1,426	$ 1,426	$ 1,427	$ 1,426	$ 1,426	$ 951	$ 11,824
Mine Maintenance	K USD	$ 2,107	$ 4,210	$ 4,206	$ 4,206	$ 4,206	$ 4,210	$ 4,206	$ 4,206	$ 2,803	$ 34,360
Engineering	K USD	$ 557	$ 1,032	$ 1,032	$ 1,032	$ 1,032	$ 1,032	$ 1,032	$ 1,032	$ 688	$ 8,468
Geology	K USD	$ 424	$ 756	$ 756	$ 756	$ 756	$ 756	$ 756	$ 756	$ 504	$ 6,218
Drilling	K USD	$ 2,654	$ 7,007	$ 10,068	$ 11,176	$ 11,624	$ 11,112	$ 11,047	$ 9,592	$ 3,349	$ 77,629
Blasting	K USD	$ 3,263	$ 8,130	$ 11,206	$ 12,636	$ 13,099	$ 12,616	$ 12,380	$ 10,790	$ 4,222	$ 88,342
Loading	K USD	$ 2,898	$ 7,522	$ 11,530	$ 12,359	$ 12,517	$ 12,179	$ 12,205	$ 11,278	$ 3,593	$ 86,082
Hauling	K USD	$ 4,339	$ 16,300	$ 29,679	$ 30,222	$ 29,989	$ 29,802	$ 29,547	$ 29,410	$ 13,206	$ 212,493
Mine Support	K USD	$ 4,841	$ 9,655	$ 12,363	$ 12,364	$ 12,366	$ 12,383	$ 12,365	$ 12,361	$ 6,652	$ 95,348
Total Mining Cost	K USD	$ 21,972	$ 56,038	$ 82,266	$ 86,177	$ 87,016	$ 85,514	$ 84,963	$ 80,852	$ 35,967	$ 620,765
Leased Equipment Interest	K USD	$ 498	$ 2,915	$ 3,981	$ 3,621	$ 2,783	$ 1,900	$ 1,182	$ 605	$ 183	$ 17,668
Rental Equipment Charges	K USD	$ 170	$ 139	$ 139	$ 93	$ -	$ 170	$ -	$ -	$ -	$ 711
Total Additional Operating Costs	K USD	$ 668	$ 3,055	$ 4,120	$ 3,713	$ 2,783	$ 2,070	$ 1,182	$ 605	$ 183	$ 18,378
Net Total Mining Cost	K USD	$ 22,640	$ 59,092	$ 86,386	$ 89,891	$ 89,798	$ 87,585	$ 86,145	$ 81,457	$ 36,150	$ 639,144
Prestrip Mining Capital	K USD	$ 22,640	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 22,640
Net Mine Operating Cost	K USD	$ -	$ 59,092	$ 86,386	$ 89,891	$ 89,798	$ 87,585	$ 86,145	$ 81,457	$ 36,150	$ 616,504
Cost per Ton											
Mine General Service	$/ton	$ 0.07	$ 0.05	$ 0.03	$ 0.03	$ 0.03	$ 0.03	$ 0.03	$ 0.03	$ 0.07	$ 0.03
Mine Maintenance	$/ton	$ 0.17	$ 0.13	$ 0.09	$ 0.08	$ 0.07	$ 0.08	$ 0.08	$ 0.09	$ 0.20	$ 0.09
Engineering	$/ton	$ 0.05	$ 0.03	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.05	$ 0.02
Geology	$/ton	$ 0.03	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.04	$ 0.02
Drilling	$/ton	$ 0.22	$ 0.22	$ 0.21	$ 0.21	$ 0.21	$ 0.21	$ 0.21	$ 0.21	$ 0.23	$ 0.21
Blasting	$/ton	$ 0.27	$ 0.26	$ 0.24	$ 0.24	$ 0.23	$ 0.24	$ 0.23	$ 0.24	$ 0.30	$ 0.24
Loading	$/ton	$ 0.24	$ 0.24	$ 0.24	$ 0.23	$ 0.22	$ 0.23	$ 0.23	$ 0.25	$ 0.25	$ 0.23
Hauling	$/ton	$ 0.35	$ 0.52	$ 0.63	$ 0.57	$ 0.53	$ 0.56	$ 0.56	$ 0.64	$ 0.92	$ 0.58
Mine Support	$/ton	$ 0.39	$ 0.31	$ 0.26	$ 0.23	$ 0.22	$ 0.23	$ 0.23	$ 0.27	$ 0.47	$ 0.26
Total Mining Cost	$/ton	$ 1.79	$ 1.78	$ 1.74	$ 1.61	$ 1.55	$ 1.62	$ 1.61	$ 1.77	$ 2.52	$ 1.69
Leased Equipment Interest	$/ton	$ 0.04	$ 0.09	$ 0.08	$ 0.07	$ 0.05	$ 0.04	$ 0.02	$ 0.01	$ 0.01	$ 0.05
Rental Equipment Charges	$/ton	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ -	$ 0.00	$ -	$ -	$ -	$ 0.00
Total Additional Operating Costs	$/ton	$ 0.05	$ 0.10	$ 0.09	$ 0.07	$ 0.05	$ 0.04	$ 0.02	$ 0.01	$ 0.01	$ 0.05
Net Total Mining Cost	$/ton	$ 1.84	$ 1.87	$ 1.83	$ 1.68	$ 1.60	$ 1.66	$ 1.63	$ 1.79	$ 2.53	$ 1.74
Prestrip Mining Capital	$/ton	$ 1.84	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.06
Net Mine Operating Cost	$/ton	$ -	$ 1.87	$ 1.83	$ 1.68	$ 1.60	$ 1.66	$ 1.63	$ 1.79	$ 2.53	$ 1.68

21.4.1 Mine General Services

Mine general services costs include mining supervision along with engineering and geology services. Supervision allows for a mine superintendent, mine general foreman and mine shift foremen. Engineering personnel include a chief engineer along with engineers and surveying crew to support mine planning and operations. Geology is intended to support ore control, geological mapping, and sampling requirements.

Table 21-7 shows the yearly cost estimate for the mine general services.

Table 21-7: Mine General Services Costs

Mine General Services	Units	Yr -1	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Total
Supervision	K USD	$ 764	$ 1,146	$ 1,146	$ 1,146	$ 1,146	$ 1,146	$ 1,146	$ 1,146	$ 764	$ 9,546
Hourly Personnel	K USD	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total	K USD	$ 764	$ 1,146	$ 1,146	$ 1,146	$ 1,146	$ 1,146	$ 1,146	$ 1,146	$ 764	$ 9,546
Engineering											
Salaried Personnel	K USD	$ 381	$ 679	$ 679	$ 679	$ 679	$ 679	$ 679	$ 679	$ 453	$ 5,584
Hourly Personnel	K USD	$ 161	$ 323	$ 323	$ 323	$ 323	$ 323	$ 323	$ 323	$ 215	$ 2,635
Total	K USD	$ 542	$ 1,001	$ 1,001	$ 1,001	$ 1,001	$ 1,001	$ 1,001	$ 1,001	$ 668	$ 8,220
Mine Geology											
Salaried Personnel	K USD	$ 318	$ 543	$ 543	$ 543	$ 543	$ 543	$ 543	$ 543	$ 362	$ 4,484
Hourly Personnel	K USD	$ 88	$ 175	$ 175	$ 175	$ 175	$ 175	$ 175	$ 175	$ 117	$ 1,431
Total	K USD	$ 406	$ 719	$ 719	$ 719	$ 719	$ 719	$ 719	$ 719	$ 479	$ 5,916
Supplies & Other											
Mine General Services Supplies	K USD	$ 6	$ 12	$ 12	$ 12	$ 12	$ 12	$ 12	$ 12	$ 8	$ 100
Engineering Supplies	K USD	$ 15	$ 30	$ 30	$ 30	$ 30	$ 30	$ 30	$ 30	$ 20	$ 248
Geology Supplies	K USD	$ 19	$ 37	$ 37	$ 37	$ 37	$ 37	$ 37	$ 37	$ 25	$ 302
Outside Services	K USD	$ 38	$ 75	$ 75	$ 75	$ 75	$ 75	$ 75	$ 75	$ 50	$ 613
Light Vehicles	K USD	$ 81	$ 194	$ 194	$ 194	$ 194	$ 194	$ 194	$ 194	$ 129	$ 1,567
Total	K USD	$ 173	$ 378	$ 377	$ 377	$ 377	$ 378	$ 377	$ 377	$ 251	$ 3,066
Totals - Mining General											
Mine General	K USD	$ 903	$ 1,456	$ 1,455	$ 1,455	$ 1,455	$ 1,456	$ 1,455	$ 1,455	$ 970	$ 12,061
Engineering	K USD	$ 557	$ 1,032	$ 1,032	$ 1,032	$ 1,032	$ 1,032	$ 1,032	$ 1,032	$ 688	$ 8,468
Geology	K USD	$ 424	$ 756	$ 756	$ 756	$ 756	$ 756	$ 756	$ 756	$ 504	$ 6,218
Totals	K USD	$ 1,884	$ 3,243	$ 3,243	$ 3,243	$ 3,243	$ 3,243	$ 3,243	$ 3,243	$ 2,162	$ 26,747
Cost per Ton Mined											
Mine General	$/ton	$ 0.07	$ 0.05	$ 0.03	$ 0.03	$ 0.03	$ 0.03	$ 0.03	$ 0.03	$ 0.07	$ 0.03
Engineering	$/ton	$ 0.05	$ 0.03	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.05	$ 0.02
Geology	$/ton	$ 0.03	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.04	$ 0.02
Totals	$/ton	$ 0.15	$ 0.10	$ 0.07	$ 0.06	$ 0.06	$ 0.06	$ 0.06	$ 0.07	$ 0.15	$ 0.07

21.4.2 Mine Maintenance

Mine maintenance costs include the cost of personnel for maintenance, supervision, and planning, along with shop support personnel, including light vehicle mechanics, welders, servicemen, tire men, and maintenance labor.

The estimated mine maintenance costs are shown in Table 21-8. Note that these costs do not include the maintenance labor directly allocated to the various equipment, which is accounted for in the other mining cost categories.

Table 21-8: Yearly Mine Maintenance Costs

Wages & Salaries	Units	Yr -1	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Total
Supervision	K USD	$ 391	$ 782	$ 782	$ 782	$ 782	$ 782	$ 782	$ 782	$ 522	$ 6,390
Planners	K USD	$ 120	$ 240	$ 240	$ 240	$ 240	$ 240	$ 240	$ 240	$ 160	$ 1,961
Hourly Personnel	K USD	$ 864	$ 1,728	$ 1,728	$ 1,728	$ 1,728	$ 1,728	$ 1,728	$ 1,728	$ 1,152	$ 14,109
Total	K USD	$ 1,375	$ 2,750	$ 2,750	$ 2,750	$ 2,750	$ 2,750	$ 2,750	$ 2,750	$ 1,833	$ 22,460
Other Costs											
Supplies	K USD	$ 72	$ 144	$ 144	$ 144	$ 144	$ 144	$ 144	$ 144	$ 96	$ 1,176
Light Vehicles	K USD	$ 9	$ 21	$ 21	$ 21	$ 21	$ 21	$ 21	$ 21	$ 14	$ 173
Total	K USD	$ 81	$ 165	$ 165	$ 165	$ 165	$ 165	$ 165	$ 165	$ 110	$ 1,349
Consumables & Other Costs	K USD	$ 673	$ 1,343	$ 1,340	$ 1,340	$ 1,340	$ 1,343	$ 1,340	$ 1,340	$ 892	$ 10,951
Parts / MARC Cost	K USD	$ 59	$ 116	$ 116	$ 116	$ 116	$ 116	$ 116	$ 116	$ 77	$ 949
Wages & Salaries	K USD	$ 1,375	$ 2,750	$ 2,750	$ 2,750	$ 2,750	$ 2,750	$ 2,750	$ 2,750	$ 1,833	$ 22,460
Total	K USD	$ 2,107	$ 4,210	$ 4,206	$ 4,206	$ 4,206	$ 4,210	$ 4,206	$ 4,206	$ 2,803	$ 34,360
Consumables	$/ton	$ 0.05	$ 0.04	$ 0.03	$ 0.03	$ 0.02	$ 0.03	$ 0.03	$ 0.03	$ 0.06	$ 0.03
Parts / MARC Cost	$/ton	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.01	$ 0.00
Maintenance Labor	$/ton	$ 0.11	$ 0.09	$ 0.06	$ 0.05	$ 0.05	$ 0.05	$ 0.05	$ 0.06	$ 0.13	$ 0.06
Total	$/ton	$ 0.17	$ 0.13	$ 0.09	$ 0.08	$ 0.07	$ 0.08	$ 0.08	$ 0.09	$ 0.20	$ 0.09

21.4.3 Drilling

Drilling cost estimates are shown in Table 21-9. The LOM drilling costs are estimated to be $77.6 million or $0.21 per ton including pre-production.

Table 21-9: Yearly Drilling Costs

Drilling Operating Costs	Units	Yr -1	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Total
Prod Drill Fuel Consumption	K Gal	178	481	714	825	879	820	821	693	229	5,639
Prod Drill Fuel Cost	K USD	$ 445	$ 1,202	$ 1,785	$ 2,062	$ 2,197	$ 2,050	$ 2,052	$ 1,734	$ 572	$ 14,098
Prod Drill Lube & Oil	K USD	$ 352	$ 949	$ 1,410	$ 1,629	$ 1,735	$ 1,619	$ 1,621	$ 1,369	$ 452	$ 11,135
Prod Drill Drill Bits & Steel	K USD	$ 422	$ 1,139	$ 1,692	$ 1,955	$ 2,082	$ 1,943	$ 1,946	$ 1,644	$ 542	$ 13,366
Prod Drill Total Consumables	K USD	$ 1,220	$ 3,290	$ 4,887	$ 5,646	$ 6,014	$ 5,612	$ 5,619	$ 4,747	$ 1,566	$ 38,599
Prod Drill Parts	K USD	$ 566	$ 1,528	$ 2,269	$ 2,621	$ 2,792	$ 2,606	$ 2,609	$ 2,204	$ 727	$ 17,923
Prod Drill Maintenance Labor	K USD	$ 266	$ 702	$ 936	$ 950	$ 977	$ 950	$ 977	$ 916	$ 366	$ 7,040
Pioneer Drill Fuel Consumption	K Gal	6	10	12	12	-	10	-	-	-	49
Pioneer Drill Fuel Cost	K USD	$ 15	$ 24	$ 30	$ 29	$ -	$ 25	$ -	$ -	$ -	$ 123
Pioneer Drill Lube & Oil	K USD	$ 4	$ 7	$ 9	$ 8	$ -	$ 7	$ -	$ -	$ -	$ 35
Pioneer Drill Drill Bits & Steel	K USD	$ 11	$ 18	$ 23	$ 22	$ -	$ 19	$ -	$ -	$ -	$ 94
Pioneer Drill Total Consumables	K USD	$ 30	$ 50	$ 62	$ 60	$ -	$ 50	$ -	$ -	$ -	$ 252
Pioneer Drill Parts / MARC Cost	K USD	$ 16	$ 26	$ 32	$ 31	$ -	$ 26	$ -	$ -	$ -	$ 131
Pioneer Drill Maintenance Labor	K USD	$ 19	$ 30	$ 41	$ 27	$ -	$ 27	$ -	$ -	$ -	$ 145
Total Drill Fuel Consumption	K Gal	184	490	726	837	879	830	821	693	229	5,688
Total Drill Fuel Cost	K USD	$ 460	$ 1,226	$ 1,815	$ 2,091	$ 2,197	$ 2,074	$ 2,052	$ 1,734	$ 572	$ 14,221
Total Drill Lube & Oil	K USD	$ 356	$ 956	$ 1,418	$ 1,637	$ 1,735	$ 1,626	$ 1,621	$ 1,369	$ 452	$ 11,170
Total Drill Drill Bits & Steel	K USD	$ 434	$ 1,158	$ 1,715	$ 1,977	$ 2,082	$ 1,962	$ 1,946	$ 1,644	$ 542	$ 13,460
Total Drill Total Consumables	K USD	$ 1,250	$ 3,340	$ 4,949	$ 5,706	$ 6,014	$ 5,662	$ 5,619	$ 4,747	$ 1,566	$ 38,851
Total Drill Parts / MARC Cost	K USD	$ 582	$ 1,553	$ 2,301	$ 2,652	$ 2,792	$ 2,632	$ 2,609	$ 2,204	$ 727	$ 18,053
Total Drill Maintenance Labor	K USD	$ 285	$ 733	$ 977	$ 977	$ 977	$ 977	$ 977	$ 916	$ 366	$ 7,184
Total Drill Maintenance Allocation	K USD	$ 867	$ 2,286	$ 3,278	$ 3,629	$ 3,769	$ 3,609	$ 3,586	$ 3,120	$ 1,093	$ 25,237
Total Operator Wages & Burden	K USD	$ 537	$ 1,381	$ 1,841	$ 1,841	$ 1,841	$ 1,841	$ 1,841	$ 1,726	$ 690	$ 13,541
Total Drilling Cost	K USD	$ 2,654	$ 7,007	$ 10,068	$ 11,176	$ 11,624	$ 11,112	$ 11,047	$ 9,592	$ 3,349	$ 77,629
Drilling Cost per Ton Mined by Item											
Fuel Cost	$/ton	$ 0.04	$ 0.04	$ 0.04	$ 0.04	$ 0.04	$ 0.04	$ 0.04	$ 0.04	$ 0.04	$ 0.04
Lube & Oil	$/ton	$ 0.03	$ 0.03	$ 0.03	$ 0.03	$ 0.03	$ 0.03	$ 0.03	$ 0.03	$ 0.03	$ 0.03
Drill Bits & Steel	$/ton	$ 0.04	$ 0.04	$ 0.04	$ 0.04	$ 0.04	$ 0.04	$ 0.04	$ 0.04	$ 0.04	$ 0.04
Total Consumables	$/ton	$ 0.10	$ 0.11	$ 0.10	$ 0.11	$ 0.11	$ 0.11	$ 0.11	$ 0.10	$ 0.11	$ 0.11
Parts / MARC Cost	$/ton	$ 0.05	$ 0.05	$ 0.05	$ 0.05	$ 0.05	$ 0.05	$ 0.05	$ 0.05	$ 0.05	$ 0.05
Maintenance Labor	$/ton	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.03	$ 0.02
Total Maintenance Allocation	$/ton	$ 0.07	$ 0.07	$ 0.07	$ 0.07	$ 0.07	$ 0.07	$ 0.07	$ 0.07	$ 0.08	$ 0.07
Operator Wages & Burden	$/ton	$ 0.04	$ 0.04	$ 0.04	$ 0.03	$ 0.03	$ 0.03	$ 0.03	$ 0.04	$ 0.05	$ 0.04
Total Drilling Cost	$/ton	$ 0.22	$ 0.22	$ 0.21	$ 0.21	$ 0.21	$ 0.21	$ 0.21	$ 0.21	$ 0.23	$ 0.21

21.4.4 Blasting

LOM blasting costs, including pre-production, are shown in Table 21-10. These costs are based on owner operations for blasting and assume heavy ANFO costs of $578/ton, including transportation costs, for blasting agents. Blasting accessories costs of $28.43 per hole were also included into the blasting cost estimate. The LOM blasting costs are estimated to be $88.3 million or $0.24 per ton including pre-production.

Table 21-10: Yearly Blasting Costs

Blasting Costs	Units	Yr -1	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Total
Fuel	K Gal	12	25	24	24	24	25	24	24	16	200
Blasting Consumables	K USD	$ 2,426	$ 6,455	$ 9,532	$ 10,961	$ 11,424	$ 10,941	$ 10,706	$ 9,116	$ 3,106	$ 74,667
Equipment Consumables	K USD	$ 32	$ 63	$ 63	$ 63	$ 63	$ 63	$ 63	$ 63	$ 42	$ 517
Equipment Maintenance Allocations	K USD	$ 2	$ 3	$ 3	$ 3	$ 3	$ 3	$ 3	$ 3	$ 2	$ 28
Personnel	K USD	$ 209	$ 418	$ 418	$ 418	$ 418	$ 418	$ 418	$ 418	$ 278	$ 3,411
Supplies	K USD	$ 6	$ 12	$ 12	$ 12	$ 12	$ 12	$ 12	$ 12	$ 8	$ 98
Outside Services	K USD	$ 589	$ 1,178	$ 1,178	$ 1,178	$ 1,178	$ 1,178	$ 1,178	$ 1,178	$ 785	$ 9,620
Total Blasting Costs	K USD	$ 3,263	$ 8,130	$ 11,206	$ 12,636	$ 13,099	$ 12,616	$ 12,380	$ 10,790	$ 4,222	$ 88,342
Cost per Ton											
Blasting Consumables	$/ton	$ 0.20	$ 0.20	$ 0.20	$ 0.21	$ 0.20	$ 0.21	$ 0.20	$ 0.20	$ 0.22	$ 0.20
Equipment Consumables	$/ton	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00
Equipment Maintenance Allocations	$/ton	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00
Personnel	$/ton	$ 0.02	$ 0.01	$ 0.01	$ 0.01	$ 0.01	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.01
Supplies	$/ton	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00
Outside Services	$/ton	$ 0.05	$ 0.04	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.03	$ 0.05	$ 0.03
Total	$/ton	$ 0.27	$ 0.26	$ 0.24	$ 0.24	$ 0.23	$ 0.24	$ 0.23	$ 0.24	$ 0.30	$ 0.24

21.4.5 Loading

Loading costs are based on operation of two hydraulic shovels with 30 cubic yard buckets for all primary production. In addition, a 25 cubic yard front-end-loader is assumed to be used as supplemental production and projects. The LOM loading costs are estimated to be $86.1 million or $0.23 per ton including pre-production. The yearly loading cost estimate is shown in Table 21-11.

Table 21-11: Yearly Loading Costs

Shovel Costs	**Units**	**Yr -1**	**Yr 1**	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**	**Yr 6**	**Yr 7**	**Yr 8**	**Total**
Fuel Consumption	K Gal	260	595	1,162	1,170	1,157	1,147	1,134	1,114	332	8,070
Fuel Cost	K USD	$ 649	$ 1,487	$ 2,905	$ 2,925	$ 2,892	$ 2,867	$ 2,834	$ 2,785	$ 829	$ 20,175
Lube & Oil	K USD	$ 240	$ 550	$ 1,073	$ 1,081	$ 1,068	$ 1,059	$ 1,047	$ 1,029	$ 306	$ 7,453
Wear Items & GET	K USD	$ 154	$ 354	$ 691	$ 696	$ 688	$ 682	$ 674	$ 662	$ 197	$ 4,798
Total Consumables	K USD	$ 1,044	$ 2,391	$ 4,669	$ 4,702	$ 4,649	$ 4,608	$ 4,556	$ 4,476	$ 1,332	$ 32,426
Parts / MARC Cost	K USD	$ 665	$ 1,523	$ 2,975	$ 2,996	$ 2,962	$ 2,936	$ 2,903	$ 2,852	$ 849	$ 20,661
Total Equip. Allocation (no labor)	K USD	$ 1,708	$ 3,914	$ 7,645	$ 7,698	$ 7,611	$ 7,544	$ 7,458	$ 7,328	$ 2,181	$ 53,087
Loader Cost											
Fuel Consumption	K Gal	79	287	193	299	339	295	313	194	73	2,072
Fuel Cost	K USD	$ 197	$ 718	$ 483	$ 748	$ 847	$ 737	$ 782	$ 484	$ 183	$ 5,179
Lube & Oil	K USD	$ 79	$ 287	$ 193	$ 299	$ 339	$ 294	$ 313	$ 193	$ 73	$ 2,070
Tires	K USD	$ 49	$ 180	$ 121	$ 187	$ 212	$ 184	$ 196	$ 121	$ 46	$ 1,297
Wear Items & GET	K USD	$ 39	$ 142	$ 96	$ 148	$ 168	$ 146	$ 155	$ 96	$ 36	$ 1,026
Total Consumables	K USD	$ 364	$ 1,327	$ 892	$ 1,382	$ 1,566	$ 1,362	$ 1,446	$ 895	$ 339	$ 9,571
Parts / MARC Cost	K USD	$ 122	$ 444	$ 299	$ 462	$ 524	$ 456	$ 484	$ 299	$ 113	$ 3,202
Total Equip. Allocation (no labor)	K USD	$ 486	$ 1,771	$ 1,191	$ 1,844	$ 2,090	$ 1,817	$ 1,930	$ 1,194	$ 452	$ 12,773
Total Loading Cost											
Fuel Consumption	K Gal	338	882	1,355	1,469	1,496	1,442	1,447	1,308	405	10,142
Fuel Cost	K USD	$ 846	$ 2,205	$ 3,388	$ 3,673	$ 3,740	$ 3,604	$ 3,617	$ 3,269	$ 1,012	$ 25,354
Lube & Oil	K USD	$ 319	$ 836	$ 1,266	$ 1,380	$ 1,407	$ 1,354	$ 1,360	$ 1,222	$ 379	$ 9,523
Tires	K USD	$ 49	$ 180	$ 121	$ 187	$ 212	$ 184	$ 196	$ 121	$ 46	$ 1,297
Wear Items & GET	K USD	$ 193	$ 496	$ 787	$ 844	$ 856	$ 828	$ 829	$ 758	$ 233	$ 5,824
Total Consumables	K USD	$ 1,407	$ 3,718	$ 5,562	$ 6,083	$ 6,214	$ 5,970	$ 6,001	$ 5,371	$ 1,671	$ 41,997
Parts / MARC Cost	K USD	$ 787	$ 1,967	$ 3,274	$ 3,458	$ 3,486	$ 3,392	$ 3,386	$ 3,151	$ 962	$ 23,863
Total Equip. Allocation (no labor)	K USD	$ 2,194	$ 5,685	$ 8,836	$ 9,542	$ 9,700	$ 9,361	$ 9,388	$ 8,522	$ 2,633	$ 65,860
Maintenance Labor	K USD	$ 244	$ 611	$ 936	$ 977	$ 977	$ 977	$ 977	$ 957	$ 336	$ 6,991
Operator Wages & Burden	K USD	$ 460	$ 1,227	$ 1,759	$ 1,841	$ 1,841	$ 1,841	$ 1,841	$ 1,800	$ 624	$ 13,231
Total Loading Costs	K USD	$ 2,898	$ 7,522	$ 11,530	$ 12,359	$ 12,517	$ 12,179	$ 12,205	$ 11,278	$ 3,593	$ 86,082
Cost per Ton											
Fuel Cost	$/ton	$ 0.07	$ 0.07	$ 0.07	$ 0.07	$ 0.07	$ 0.07	$ 0.07	$ 0.07	$ 0.07	$ 0.07
Lube & Oil	$/ton	$ 0.03	$ 0.03	$ 0.03	$ 0.03	$ 0.03	$ 0.03	$ 0.03	$ 0.03	$ 0.03	$ 0.03
Tires / Under Carriage	$/ton	$ 0.00	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00
Wear Items & GET	$/ton	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.02
Total Consumables	$/ton	$ 0.11	$ 0.12	$ 0.12	$ 0.11	$ 0.11	$ 0.11	$ 0.11	$ 0.12	$ 0.12	$ 0.11
Parts / MARC Cost	$/ton	$ 0.06	$ 0.06	$ 0.07	$ 0.06	$ 0.06	$ 0.06	$ 0.06	$ 0.07	$ 0.07	$ 0.07
Total Equip. Allocation (no labor)	$/ton	$ 0.18	$ 0.18	$ 0.19	$ 0.18	$ 0.17	$ 0.18	$ 0.18	$ 0.19	$ 0.18	$ 0.18
Maintenance Labor	$/ton	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.02
Operator Wages & Burden	$/ton	$ 0.04	$ 0.04	$ 0.04	$ 0.03	$ 0.03	$ 0.03	$ 0.03	$ 0.04	$ 0.04	$ 0.04
Total Loading Cost	$/ton	$ 0.24	$ 0.24	$ 0.24	$ 0.23	$ 0.22	$ 0.23	$ 0.23	$ 0.25	$ 0.25	$ 0.23

21.4.6 Hauling

Haulage cost was estimated using the truck hour estimates discussed in Section 16.5.3. The LOM hauling costs are estimated to be $212.5 million or $0.58 per ton including pre-production. The yearly haulage cost estimate is shown in Table 21-12.

Table 21-12: Yearly Haulage Costs

Total Truck Hours	Units	Yr -1	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Total
Productive Hours	Prod Hrs	10,609	39,785	72,258	73,333	72,521	71,867	70,979	70,503	31,463	513,318
Operating Efficiency	%	83%	83%	83%	83%	83%	83%	83%	83%	83%	83%
Operating Hours	Op Hrs	12,731	47,741	86,709	87,999	87,025	86,241	85,175	84,603	37,755	615,981
Equipment Hours	Eq Hrs	14,550	54,562	99,096	100,571	99,457	98,561	97,343	96,690	43,149	703,978
Number of Trucks	#	5	8	13	13	13	13	13	13	13	13
Truck Availability	%	90%	90%	90%	89%	88%	87%	86%	85%	85%	90%
Available Equipment Hours	Op Hrs	12,739	47,738	86,758	88,017	87,020	86,261	85,182	84,723	38,253	616,690
Use of Available Hours	%	100%	100%	100%	100%	100%	100%	100%	100%	99%	100%
Haulage Cost											
Fuel Consumption	K Gal	528	1,980	3,596	3,650	3,609	3,577	3,532	3,509	1,566	25,546
Fuel Cost	K USD	$ 1,320	$ 4,950	$ 8,990	$ 9,124	$ 9,023	$ 8,942	$ 8,831	$ 8,772	$ 3,915	$ 63,866
Lube & Oil	K USD	$ 606	$ 2,271	$ 4,125	$ 4,187	$ 4,140	$ 4,103	$ 4,052	$ 4,025	$ 1,796	$ 29,307
Tires	K USD	$ 361	$ 1,352	$ 2,456	$ 2,492	$ 2,465	$ 2,442	$ 2,412	$ 2,396	$ 1,069	$ 17,445
Wear Items & GET	K USD	$ 182	$ 682	$ 1,239	$ 1,257	$ 1,243	$ 1,232	$ 1,217	$ 1,209	$ 539	$ 8,800
Total Consumables	K USD	$ 2,468	$ 9,255	$ 16,810	$ 17,060	$ 16,871	$ 16,719	$ 16,513	$ 16,402	$ 7,319	$ 119,417
Parts / MARC Cost	K USD	$ 579	$ 2,172	$ 3,945	$ 4,004	$ 3,959	$ 3,924	$ 3,875	$ 3,849	$ 1,718	$ 28,025
Total Equip. Allocation (no labor)	K USD	$ 3,047	$ 11,427	$ 20,755	$ 21,064	$ 20,830	$ 20,643	$ 20,388	$ 20,251	$ 9,037	$ 147,443
Maintenance Labor	K USD	$ 448	$ 1,689	$ 3,093	$ 3,175	$ 3,175	$ 3,175	$ 3,175	$ 3,175	$ 1,445	$ 22,549
Operator Wages & Burden	K USD	$ 844	$ 3,184	$ 5,831	$ 5,984	$ 5,984	$ 5,984	$ 5,984	$ 5,984	$ 2,723	$ 42,501
Total Haulage Costs	K USD	$ 4,339	$ 16,300	$ 29,679	$ 30,222	$ 29,989	$ 29,802	$ 29,547	$ 29,410	$ 13,206	$ 212,493
Cost per Ton Moved											
Fuel Cost	$/ton	$ 0.11	$ 0.16	$ 0.19	$ 0.17	$ 0.16	$ 0.17	$ 0.17	$ 0.19	$ 0.27	$ 0.17
Lube & Oil	$/ton	$ 0.05	$ 0.07	$ 0.09	$ 0.08	$ 0.07	$ 0.08	$ 0.08	$ 0.09	$ 0.13	$ 0.08
Tires	$/ton	$ 0.03	$ 0.04	$ 0.05	$ 0.05	$ 0.04	$ 0.05	$ 0.05	$ 0.05	$ 0.07	$ 0.05
Wear Items & GET	$/ton	$ 0.01	$ 0.02	$ 0.03	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.03	$ 0.04	$ 0.02
Total Consumables	$/ton	$ 0.20	$ 0.29	$ 0.36	$ 0.32	$ 0.30	$ 0.32	$ 0.31	$ 0.36	$ 0.51	$ 0.33
Parts / MARC Cost	$/ton	$ 0.05	$ 0.07	$ 0.08	$ 0.07	$ 0.07	$ 0.07	$ 0.07	$ 0.08	$ 0.12	$ 0.08
Total Equip. Allocation (no labor)	$/ton	$ 0.25	$ 0.36	$ 0.44	$ 0.39	$ 0.37	$ 0.39	$ 0.39	$ 0.44	$ 0.63	$ 0.40
Maintenance Labor	$/ton	$ 0.04	$ 0.05	$ 0.07	$ 0.06	$ 0.06	$ 0.06	$ 0.06	$ 0.07	$ 0.10	$ 0.06
Operator Wages & Burden	$/ton	$ 0.07	$ 0.10	$ 0.12	$ 0.11	$ 0.11	$ 0.11	$ 0.11	$ 0.13	$ 0.19	$ 0.12
Total Haulage Costs	$/ton	$ 0.35	$ 0.52	$ 0.63	$ 0.57	$ 0.53	$ 0.56	$ 0.56	$ 0.64	$ 0.92	$ 0.58

21.4.7 Mine Support

Yearly mine support cost estimates are shown in Table 21-13 including pre-production costs. These costs assume the hourly costs for required support equipment and personnel as discussed in Sections 16.5 and 16.6 respectively. The LOM support costs are estimated to be $95.3 million or $0.26 per ton including pre-production.

Table 21-13: Yearly Mine Support Costs

Total Mine Support Costs	Units	Yr -1	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Total
Consumables	K USD	$ 1,759	$ 3,498	$ 4,606	$ 4,607	$ 4,608	$ 4,620	$ 4,607	$ 4,605	$ 2,417	$ 35,326
Parts / MARC Cost	K USD	$ 763	$ 1,518	$ 1,870	$ 1,871	$ 1,871	$ 1,876	$ 1,871	$ 1,870	$ 1,038	$ 14,548
Maintenance Labor	K USD	$ 794	$ 1,587	$ 2,015	$ 2,015	$ 2,015	$ 2,015	$ 2,015	$ 2,015	$ 1,094	$ 15,564
Operating Labor	K USD	$ 1,525	$ 3,051	$ 3,872	$ 3,872	$ 3,872	$ 3,872	$ 3,872	$ 3,872	$ 2,102	$ 29,910
Total	K USD	$ 4,841	$ 9,655	$ 12,363	$ 12,364	$ 12,366	$ 12,383	$ 12,365	$ 12,361	$ 6,652	$ 95,348
Cost per Ton Mined											
Consumables	$/ton	$ 0.14	$ 0.11	$ 0.10	$ 0.09	$ 0.08	$ 0.09	$ 0.09	$ 0.10	$ 0.17	$ 0.10
Maintenance Allocations	$/ton	$ 0.06	$ 0.05	$ 0.04	$ 0.04	$ 0.03	$ 0.04	$ 0.04	$ 0.04	$ 0.07	$ 0.04
Maintenance Labor	$/ton	$ 0.06	$ 0.05	$ 0.04	$ 0.04	$ 0.04	$ 0.04	$ 0.04	$ 0.04	$ 0.08	$ 0.04
Operating Labor	$/ton	$ 0.12	$ 0.10	$ 0.08	$ 0.07	$ 0.07	$ 0.07	$ 0.07	$ 0.08	$ 0.15	$ 0.08
Total Costs	$/ton	$ 0.39	$ 0.31	$ 0.26	$ 0.23	$ 0.22	$ 0.23	$ 0.23	$ 0.27	$ 0.47	$ 0.26

21.4.8 Leasing and Rental Costs

Leasing and rental costs were assumed for specific equipment based on vendor inputs as to typical leasing rates. The leasing of equipment was assumed to be "lease to own" terms where Gold Standard Ventures would own the equipment at the end of the lease terms. Leased equipment, other than haul trucks, assumed 20% down payment of the equipment value, including taxes, erecting, and commissioning. An annual percentage rate (APR) of 4.75% was used with equipment amortized over a period of five years. Haul trucks were leased using 0% down payment with a 5.5% APR over seven years. Leased equipment was broken down by period in which it was placed into service for the purpose of amortization and includes:

Primary Mining Equipment

- Four production drills put into service between third quarter of year -1 and first quarter of year 4;
- One 25 cubic yard loader put into service in the fourth quarter of year -1;
- Two 30 cubic yard hydraulic shovels put into service in the third quarter of year -1 and first quarter of year 2; and
- Thirteen 200-ton capacity haul trucks put into service between first quarter year -1 and the first quarter of year 2.

Support equipment

- Four 600 hp size dozers put into service with two in third quarter of year -1 and two in the first quarter of year 2;
- One 900 hp size rubber tire dozer put into service in third quarter of year -1;
- Two 18-foot motor graders both put into service in third quarter of year -1;
- Two 20,000-gallon water trucks both put into service in third quarter of year -1;
- One truck and lowboy put into service in third quarter of year -1; and
- One 6 cubic yard excavator put into service in third quarter of year -1.

Maintenance Equipment

- One lube and fuel truck put into service in third quarter of year -1;
- Two mechanic trucks put into service in third quarter of year -1; and
- One tire truck put in service into third quarter of year -1.

Equipment rental was assumed for short term equipment requirements for pioneer drills. One pioneer drill is assumed to be rented during the first two months of each Dark Star mining phase as well as the first two months of the first two Pinion mining phases.

Rental terms are assumed to require 10% down payment of the equipment value, included taxes, erecting, and commissioning along with 6% rental payments. This is assumed to cover mobilization and demobilization. The rental payments are applied directly to operating costs.

Table 21-14 shows the total estimated leasing and rental costs applied to operating costs. These costs are on top of the leasing costs that are capitalized and represent the leasing interest and all rental costs. The LOM leasing and rental costs are estimated to be $18.4 million or $0.05 per ton including pre-production.

Table 21-14: Lease and Rental Operating Costs

Leasing Interest Payments	Units	Yr -1	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Total
Primary Equipment	K USD	$ 284	$ 2,158	$ 3,272	$ 3,067	$ 2,434	$ 1,767	$ 1,152	$ 603	$ 183	$ 14,919
Support Equipment	K USD	$ 199	$ 707	$ 669	$ 525	$ 331	$ 129	$ 30	$ 2	$ -	$ 2,591
Maintenance Equipment	K USD	$ 14	$ 51	$ 40	$ 29	$ 17	$ 5	$ -	$ -	$ -	$ 157
Total Leased Equipment Interest	K USD	$ 498	$ 2,915	$ 3,981	$ 3,621	$ 2,783	$ 1,900	$ 1,182	$ 605	$ 183	$ 17,668
Total Leased Equipment Interest	$/ton Mined	$ 0.01	$ 0.11	$ 0.15	$ 0.12	$ 0.09	$ 0.06	$ 0.11	$ 0.22	$ -	$ 0.05
Rental Equipment Costs											
Down Payments and Mob/DeMob	K USD	$ 77	$ -	$ -	$ -	$ -	$ 77	$ -	$ -	$ -	$ 155
Rental Interest Charge	K USD	$ 93	$ 139	$ 139	$ 93	$ -	$ 93	$ -	$ -	$ -	$ 556
Total Rental Equipment Costs	K USD	$ 170	$ 139	$ 139	$ 93	$ -	$ 170	$ -	$ -	$ -	$ 711
	$/ton Mined	$ 0.00	$ 0.01	$ 0.01	$ 0.00	$ -	$ 0.01	$ -	$ -	$ -	$ 0.00
Total Addition to Operating Costs	K USD	$ 668	$ 3,055	$ 4,120	$ 3,713	$ 2,783	$ 2,070	$ 1,182	$ 605	$ 183	$ 18,378
	$/ton Mined	$ 0.05	$ 0.10	$ 0.09	$ 0.07	$ 0.05	$ 0.04	$ 0.02	$ 0.01	$ 0.01	$ 0.05

21.5 PROCESS OPERATING COST SUMMARY

Process operating costs have been estimated by M3 from first principles. Labor costs were estimated using project specific staffing, salary and wage, and benefit requirements. Unit consumptions of materials, supplies, power, and delivered supply costs were also estimated. LOM overall average processing costs are estimated at an average cost of $2.05 per ton. Process operating costs by process type are shown in Table 21-15.

Table 21-15: LOM Operating Costs by Process Type, US$/ton ore

Type	Operating Cost (US$/Ton)
ROM	$2.05

Operating costs were estimated based on 4th quarter 2021 US dollars and are presented with no added contingency based upon the design and operating criteria present in this Technical Report. Operating costs are considered to have an accuracy of +/- 15%.

The process operating costs presented are based upon the ownership of all process production equipment and site facilities. The owner will employ and direct all operating maintenance and support personnel for all site activities.

Operating costs estimates have been based upon information obtained from the following sources:

- Project metallurgical test work and process engineering
- Development of a detailed equipment list and demand calculations
- M3 In-house data for reagent pricing
- Experience with other similar operations

Where specific data do not exist, cost allowances have been based upon consumption and operating requirements from other similar properties for which reliable data exist. Overall LOM operating costs by year and process type are presented in Table 21-16.

Table 21-16: Life of Mine Average Process Operating Cost by Year

Category	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	LOM Total
Total Tons												
TOTAL Process Plant Ore (000's)	**7,295**	**7,688**	**10,800**	**10,396**	**11,940**	**10,170**	**7,367**	**6,214**	**-**	**-**	**-**	**71,870**
Operating Costs (US$000's)												
TOTAL ROM Ore	$11,124	$13,097	$18,399	$17,710	$20,340	$17,326	$12,550	$10,586	$2,279	$2,279	$1,140	$126,831
TOTAL Water Management Systems	$6,442	$3,442	$3,442	$3,442	$165	$165	$165	$1,165	$165	$186	$93	$18,873
TOTAL Generator Lease (Interest)	$425	$371	$314	$253	$189	$120	$48	-	-	-	-	$1,721
GRAND TOTAL (US$000's)	**$17,992**	**$16,911**	**$22,155**	**$21,406**	**$20,694**	**$17,611**	**$12,763**	**$11,751**	**$2,444**	**$2,465**	**$1,233**	**$147,424**

21.5.1 Personnel and Staffing

Staffing requirements for process personnel have been estimated by M3 based on experience with similar-sized operations in Nevada. Total process personnel requirements are estimated at 33 persons for the ROM operation. For the last 2.5 years of non-active mining or ore placement on the pad, the ADR facility requirements are estimated at 7 persons. Personnel requirements and costs are estimated at $2.5 million per year for the ROM operation and $735 thousand per year for the ADR Only facility operation.

21.5.2 Power

Power usage for the process and process-facilities 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. Power requirements for the project are presented in Table 21-17.

Table 21-17: Power Requirements Summary

	ROM Process		
Area Description	**Connecter Power (kW)**	**Demand (kW)**	**Annual (kWh)**
AREA 310 - HEAP LEACH PAD & PONDS	22	14	126,804
AREA 350 - SOLUTION TRANSFER	1,725	740	6,484,314
AREA 400 - ADR	247	97	850,166
AREA 500 - REFINERY	245	73	640,938
AREA 650 - WATER SYSTEMS	340	168	1,469,778
AREA 800 - REAGENTS	33	11	92,221
AREA 900 - ANCILLARY FACILITIES	75	25	216,144
AREA 960 - FUEL STATION	7	4	37,465
Total	**2,693**	**1,132**	**9,917,830**

Power will be generated via LNG generators on the project site at an estimated cost of $0.15/kWh.

21.5.3 Consumable Items

Operating supplies have been estimated based upon unit costs and consumption rates projected by metallurgical tests. Freight costs are included in all operating supply and reagent estimates. Reagent consumptions have been derived from test work and from design criteria considerations. Other consumable items have been estimated by M3 based on experience with other similar operations. Table 21-18 presents average consumptions for major consumables.

Table 21-18: Process Consumables Average Annual Consumptions

Item	Form	Average Annual Consumption
Sodium Cyanide	Liquid at 30% NaCN by Weight	2,070 tons
Lime	Bulk Delivery (22 tons)	9,000 tons
Antiscalant	Liquid Tote (IBC)	90 tons
Carbon	1000 lb Supersacks	45 tons
Nitric Acid	Liquid at 57% Acid by weight	225 tons
Caustic	Liquid at 50% NaOH by Weight	90 tons
Refinery Fluxes	Dry Solid Bags	10 tons

Operating costs for consumable items have been distributed based on tonnage and gold/silver production or smelting batches, as appropriate.

21.5.4 Maintenance

Annual maintenance costs have been included for the process facilities. The maintenance costs are estimated from the capital cost of the plant equipment at an allowance of 5% for parts repair or replacement. Maintenance labor is also included. The maintenance labor includes one maintenance supervisor, four mechanics, and two electricians. These personnel are included as part of the overall process personnel quantity. An allowance for outside repairs is also included at 10% of the maintenance parts allowance. The total annual maintenance is estimated at $1.69 million per year for the first eight years of operation.

21.5.5 Supplies and Services

Estimates for supplies and services have been included for items such as lubricants, third-party services for the process plant, safety items, and minor supplies and tools outside of maintenance. The total annual supplies and services is estimated at $338 thousand per year for the first eight years of operation.

21.5.6 Process Operating Cost Exclusions

The following operating costs are excluded from the process plant operating cost estimate:

- G&A costs (see section 21.6)
- Access road and internal roads maintenance
- Operating cost contingency
- Escalation costs
- Currency exchange fluctuations

21.5.7 Generator Lease Costs

Leasing costs were assumed for the LNG Generators based on vendor inputs as to typical leading rate. The leasing of equipment was assumed to be “lease to own” terms where GSV would own the equipment at the end of the lease terms. Leased generators assumed 20% down payment of the equipment value. An annual percentage rate (APR) of 6% was assumed with equipment amortized over a period of eight years for the four generators. Leased equipment was broken down by period in which it was placed into service for the purpose of amortization.

21.6 G&A COSTS

G&A costs were included based on benchmarks for similar-sized facilities within Nevada or the surrounding region. The G&A costs also include an allowance for bussing personnel to and from site during operations.

G&A costs are included at $4.25 million per year for the first eight years of operation, which are the years of active mining and ore stacking on the pad. An annual G&A cost of $1.5 million is included for years 9 and 10, which are the full years of solution application on the heap leach pad for recovery of residual ounces from the pad. G&A costs of $750 thousand are included for the last half year of solution application on the heap leach pad for recovery of residual ounces from the pad.

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22 ECONOMIC ANALYSIS

The economic analysis in this study includes a feasibility study-compliant modeling of the annual cash flows based on projected production volume, sales revenue, initial capital, operating cost, and sustaining capital with resulting evaluation of key economic indicators such as internal rate of return (IRR), net present value (NPV), and payback period (time in years to recapture the initial capital investment) for the Project. The sales revenue is based on the production of gold and silver in doré bullion. The estimates of the capital expenditures and site production costs have been developed specifically for this project and have been presented in the Section 21 of this Technical Report.

22.1 MINING PHYSICALS

The cash-flow model uses the mining and production schedules as discussed in Section 16 and summarized in Table 22-1. Results from the heap leach metal production model are included with this table to facilitate direct comparison between placed ounces, recoverable ounces, and recovered ounces. Placed ounces are per the mine plan and stacking plan. Recoverable ounces follow the leach kinetic curves for the placed ounces after cyanide-bearing solution has started being applied. Recovered ounces incorporate the time based constraints for the time it takes leached ounces to reach the pad liner and report to the metal recovery plant. Ore is placed on the pad for an eight year period. Solution application continues for an additional 2.5 years to allow recovery of the solubilized ounces.

22.2 PROCESS PLANT PRODUCTION STATISTICS

Ore will be processed by cyanide heap leaching as ROM and recovered via an ADR facility as described in Section 17 of this Technical Report. Overall production over the life of mine is summarized in Table 22-2.

Table 22-1: Yearly Mine & Process 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
Total Ore	K Tons	1,150	6,145	7,688	10,877	10,319	12,563	9,547	7,367	6,214	-	-	-	71,870
	Au oz/t	0.019	0.024	0.034	0.032	0.017	0.017	0.015	0.019	0.023	-	-	-	0.022
	Ag oz/t	-	0.020	0.031	0.063	0.080	0.091	0.062	0.171	0.204	-	-	-	0.085
	K oz Au	22	149	264	347	180	218	141	137	145	-	-	-	1,604
	K oz Ag	-	122	235	687	828	1,141	594	1,259	1,270	-	-	-	6,137
Total Waste	K Tons	11,127	25,416	39,504	42,536	45,953	40,325	43,339	38,241	8,073	-	-	-	294,514
Total Mined	K Tons	12,277	31,561	47,192	53,413	56,272	52,888	52,886	45,608	14,287	-	-	-	366,384
Strip Ratio	W : O	9.68	4.14	5.14	3.91	4.45	3.21	4.54	5.19	1.30	-	-	-	4.10
Total Ore Processed	**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**
Total Ore Processed	K Tons	-	7,295	7,688	10,800	10,396	11,940	10,170	7,367	6,214	-	-	-	71,870
	Au oz/t	-	0.023	0.034	0.032	0.017	0.017	0.015	0.019	0.023	-	-	-	0.022
	Ag oz/t	-	0.019	0.031	0.063	0.080	0.090	0.066	0.171	0.204	-	-	-	0.085
Total Placed	K oz Au	-	171	264	346	182	205	154	137	145	-	-	-	1,604
Total Recoverable	K oz Au	-	122	193	233	108	120	93	77	90	-	-	-	1,035
Total Recovered	K oz Au	-	82	197	191	138	106	103	80	95	25	12	2	1,031
Total Placed	K oz Ag	-	122	235	679	836	1,069	667	1,259	1,270	-	-	-	6,137
Total Recoverable	K oz Ag	-	13	25	78	88	111	67	139	143	-	-	-	664
Total Recovered	K oz Ag	-	4	31	32	95	84	82	98	154	29	34	8	651
Cumulative Recovery	% Au	-	47.8%	64.0%	60.2%	63.2%	61.1%	61.8%	61.4%	61.8%	63.3%	64.1%	64.3%	64.3%
	% Ag	-	3.4%	9.7%	6.4%	8.7%	8.4%	9.1%	8.7%	9.4%	9.9%	10.5%	10.6%	10.6%

Table 22-2: Life of Mine Process Statistics

Total Ore (kt)	71,870
Gold (oz/t)	0.022
Silver (oz/t)	0.085
Contained Gold (kozs)	1,604
Contained Silver (kozs)	6,137
Gold Recovery %	64.5%
Silver Recovery %	10.8%
Recovered Gold (kozs)	1,031
Recovered Silver (kozs)	651

22.3 SMELTER RETURN FACTORS

No contractual payable metal rates have yet been negotiated with smelters. M3 used typical rates based on industry experience or published guidelines. Payable rates for metals used were 99.97% for gold and 99.0% for silver. A bullion refining, transportation and insurance charge of $5 per troy ounce of gold was applied.

The project has a silver streaming agreement where GSV retains 15% of the revenue associated with silver. The impact of the silver streaming agreement is reflected in the project economic parameters.

22.4 CAPITAL EXPENDITURE

The capital expenditure schedule for the life of mine is shown in Table 22-3 below.

Table 22-3: Capital Expenditure Schedule

Capital Expenditure, $000	Initial	Sustaining									
	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Mine Pre-Production	$22,640										
Mine Capital	$13,943	$10,703	$16,798	$16,306	$16,914	$16,284	$10,884	$9,147	$5,588	$0	$0
Process	$152,458	$27,169	$8,953	$15,149	$6,798	$13,850	$5,375	$2,563	$1,329	$1,223	$1,644
Owner's Cost	$1,157										
Total	$190,197	$37,872	$25,751	$31,455	$23,712	$30,133	$16,259	$11,710	$6,918	$1,223	$1,644

22.5 REVENUE

Annual revenue is determined by applying metal prices to the annual payable metal estimated for each operating year. Sales prices have been applied to all life-of-mine production without escalation or hedging. Gold bullion revenue is based on the gross value of the payable metals sold before refining and transportation charges. Gold and silver metal pricing are based on a market study by the Owner as presented in Section 19:

Gold $1,650 per troy ounce
Silver $21.50 per troy ounce

22.6 TOTAL PRODUCTION COST

The total production cost includes mine operations, process plant operations, general administration, reclamation and closure, and government fees. Table 22-4 shows the estimated operating costs by area based on payable metals for the life of mine.

Table 22-4: LOM Operating Costs

LOM Operating Cost ($000)	
Mining	$616,504
Process Plant	$147,424
G&A	$37,750
Refining	$5,153
Total Operating Cost	$806,832
Royalty	$10,911
Salvage Value	-$12,410
Reclamation/Closure	$22,569
Total Production Cost	$827,901

22.7 DEPRECIATION

The depreciation cost was calculated using a 7-year modified accelerated cost recovery system (MACRS) depreciation method following both initial and sustaining capital.

22.8 ROYALTIES

As discussed in Section 4 to this Technical Report, portions of the unpatented and private lands are encumbered with royalties predominantly in the form of standard NSR or GSR and MP royalty agreements, or NPI agreements. GSV intends to buy down certain existing NSR royalties prior to production. The royalty value in Table 22-4 reflects the expected net royalty amounts.

22.9 GOVERNMENT FEES

No government fees have been applied to the financial model.

22.10 EXCISE TAX

An excise tax is applied to gross revenue. The excise tax rate is 0.75% for gross annual revenue between $20 million and $150 million. The excise tax rate is 1.10% for gross annual revenue above $150 million.

22.11 INCOME TAX

A net proceeds tax of 5% is applied to revenue minus excise tax, operating cost, and depreciation. Regular corporate tax of 21% is applied to taxable corporation income after adjustments for state tax, if any, and net proceeds tax. No state income tax was applied.

22.12 NET INCOME AFTER-TAX

The net income after-taxes is projected to be $403 million.

22.13 PROJECT FINANCING

It is assumed that the project will be all equity financed.

22.14 ECONOMIC INDICATORS

The economic analyses for the project are summarized in Table 22-5 below. The NPV calculations have been conducted per the Mid-Year discounting method, as opposed to the Year-End discounting method. The Mid-Year discounting method provides a closer representation of how cash flows are expected to be received in a normal year of operation.

Table 22-5: Key Economic Results

Indicators	Before-Tax	After-Tax
LOM Cash Flow ($000)	$497,330	$403,162
NPV @ 5% ($000)	$388,866	$314,791
NPV @ 10% ($000)	$307,248	$247,592
IRR	49.2%	44.3%
Payback (years)	1.9	1.9

22.15 SENSITIVITY ANALYSIS

Table 22-6 below shows the sensitivity analysis of the key economic indicators (cash flow, NPV, IRR, and payback) to changes in gold prices.

Table 22-6: Sensitivity Analysis

Financial Indicators	Spot Case	Base +$150	**Base Case**	Base -150	Base -250
Gold Price (per troy oz)	$1,899	$1,800	**$1,650**	$1,500	$1,400
Silver Price (per troy oz)	$21.50	$21.50	**$21.50**	$21.50	$21.50
Pre-tax Cash Flow, $M	$753.9	$651.9	**$497.3**	$342.8	$239.8
Pre-tax Net Present Value (5%) in $M	$603.0	$517.9	**$388.9**	$259.9	$173.9
Pre-tax Internal Rate of Return (IRR)	68.2%	60.8%	**49.2%**	36.5%	27.2%
Pre-tax Payback (Years)	1.6	1.7	**1.9**	2.1	2.4
After-tax Cash Flow, $M	$606.3	$526.1	**$403.2**	$280.9	$199.0
After-tax Net Present Value (5%) in $M	$486.4	$418.7	**$314.8**	$211.2	$141.6
After-tax Internal Rate of Return (IRR)	62.1%	55.3%	**44.3%**	32.6%	24.0%
After-tax Payback (Years)	1.6	1.7	**1.9**	2.2	2.4

22.16 DETAILED FINANCIAL MODEL

The detailed financial model, shown in Table 22-7 below, was developed in compliance with the FS requirement. This model has captured all the parameters of the mine production volume, annual sales revenue, and all the associated costs. This model was used to calculate the economics of the project, as well as for the sensitivity analysis.

Table 22-7: Detailed Financial Model

GSV South Railroad FS-Financial Model																	
M3-PN185074.602	LOM	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15
Mine																	
Ore (kt)	71,870	1,150	6,145	7,688	10,877	10,319	12,563	9,547	7,367	6,214	-	-	-	-	-	-	-
Gold (oz/t)	0.022	0.019	0.024	0.034	0.032	0.017	0.017	0.015	0.019	0.023	-	-	-	-	-	-	-
Silver (oz/t)	0.085	-	0.020	0.031	0.063	0.080	0.091	0.062	0.171	0.204	-	-	-	-	-	-	-
Contained Gold (kozs)	1,604	22	149	264	347	180	218	141	137	145	-	-	-	-	-	-	-
Contained Silver (kozs)	6,137	-	122	235	687	828	1,141	594	1,259	1,270	-	-	-	-	-	-	-
Waste (kt)	294,514	11,127	25,416	39,504	42,536	45,953	40,325	43,339	38,241	8,073	-	-	-	-	-	-	-
Total Material Mined (kt)	366,384	12,277	31,561	47,192	53,413	56,272	52,888	52,886	45,608	14,287	-	-	-	-	-	-	-
Process Plant																	
ROM Processing																	
Dark Star (kt)	32,142	765	5,422	5,552	6,189	5,119	3,993	5,102	-	-	-	-	-	-	-	-	-
Gold (oz/t)	0.026	0.019	0.025	0.040	0.041	0.016	0.016	0.013	-	-	-	-	-	-	-	-	-
Silver (oz/t)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Contained Gold (kozs)	840	15	136	222	257	80	63	68	-	-	-	-	-	-	-	-	-
Contained Silver (kozs)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gold Recovery %	72.0%																
Silver Recovery %	0.0%																
Recovered Gold (kozs)	604	2	54	122	161	102	79	53	20	9	1	-	-	-	-	-	-
Recovered Silver (kozs)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pinion (kt)	39,728		1,108	2,136	4,611	5,277	7,947	5,068	7,367	6,214	-	-					
Gold (oz/t)	0.019		0.018	0.020	0.019	0.019	0.018	0.017	0.019	0.023	-	-					
Silver (oz/t)	0.154		0.110	0.110	0.147	0.158	0.135	0.132	0.171	0.204	-	-	-	-	-	-	-
Contained Gold (kozs)	764		20	42	89	102	143	86	137	145	-	-	-	-	-	-	-
Contained Silver (kozs)	6,137		122	235	679	836	1,069	667	1,259	1,270	-	-	-	-	-	-	-
Gold Recovery%	56.3%																
Silver Recovery%	10.8%																
Recovered Gold (kozs)	430		5	21	30	50	58	59	69	86	54	-	-	-	-	-	-
Recovered Silver (kozs)	664		5	20	42	74	93	87	114	137	91	-	-	-	-	-	-
Total ROM (kt)	71,870	765	6,530	7,688	10,800	10,396	11,940	10,170	7,367	6,214	-	-	-	-	-	-	-
Gold (oz/t)	0.022	0.019	0.024	0.034	0.032	0.017	0.017	0.015	0.019	0.023	-	-	-	-	-	-	-
Silver (oz/t)	0.085	-	0.019	0.031	0.063	0.080	0.090	0.066	0.171	0.204	-	-	-	-	-	-	-
Contained Gold (kozs)	1,604	15	156	264	346	182	205	154	137	145	-	-	-	-	-	-	-
Contained Silver (kozs)	6,137	-	122	235	679	836	1,069	667	1,259	1,270	-	-	-	-	-	-	-
Gold Recovery %	64.5%																
Silver Recovery %	10.8%																
Recovered Gold (kozs)	1,035	2	59	143	192	152	137	112	89	95	55	-	-	-	-	-	-
Recovered Silver (kozs)	664	-	5	20	42	74	93	87	114	137	91	-	-	-	-	-	-
Total Processing																	
Total Ore (kt)	71,870	765	6,530	7,688	10,800	10,396	11,940	10,170	7,367	6,214	-	-	-	-	-	-	-
Gold (oz/t)	0.022	0.019	0.024	0.034	0.032	0.017	0.017	0.015	0.019	0.023	-	-	-	-	-	-	-
Silver (oz/t)	0.085	-	0.019	0.031	0.063	0.080	0.090	0.066	0.171	0.204	-	-	-	-	-	-	-
Contained Gold (kozs)	1,604	15	156	264	346	182	205	154	137	145	-	-	-	-	-	-	-
Contained Silver (kozs)	6,137	-	122	235	679	836	1,069	667	1,259	1,270	-	-	-	-	-	-	-
Gold Recovery %	64.5%	11.9%	37.8%	54.3%	55.4%	83.6%	66.7%	72.5%	64.9%	65.3%	-	-	-	-	-	-	-
Silver Recovery %	10.8%		3.9%	8.5%	6.2%	8.9%	8.7%	13.1%	9.0%	10.8%	-	-	-	-	-	-	-
Leached Gold Recovery %	99.6%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Leached Silver Recovery %	98.1%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Recovered Gold (kozs)	1,031		84	131	112	194	209	79	57	50	6	1	-	-	-	-	-
Recovered Silver (kozs)	651		-	-	-	58	175	308	304	196	17	3	-	-	-	-	-
Payable Metals																	
Gold (kozs)	1,030		82	197	191	138	105	103	80	95	25	12	2	-	-	-	-
Silver (kozs)	644		4	30	32	94	83	81	97	153	29	34	8	-	-	-	-
Metal Prices																	
Gold ($/oz)	$1,650.00		$1,650.00	$1,650.00	$1,650.00	$1,650.00	$1,650.00	$1,650.00	$1,650.00	$1,650.00	$1,650.00	$1,650.00	$1,650.00				
Silver ($/oz)	$21.50		$21.50	$21.50	$21.50	$21.50	$21.50	$21.50	$21.50	$21.50	$21.50	$21.50	$21.50				
Revenues ($000)																	
Gold	$1,700,026		$134,573	$324,351	$315,483	$228,359	$174,067	$169,835	$131,754	$156,266	$41,033	$20,418	$3,887	$0	$0	$0	$0
Silver; Net of Silver Streaming Agreement	$2,078		$13	$98	$102	$305	$268	$260	$314	$492	$92	$109	$26	$0	$0	$0	$0
Total Revenues	$1,702,105		$134,586	$324,449	$315,585	$228,664	$174,335	$170,095	$132,068	$156,758	$41,125	$20,527	$3,913	$0	$0	$0	$0

GSV South Railroad FS-Financial Model M3-PN185074.602	LOM	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15
Operating Cost ($000)																	
Mining	$616,504		$59,092	$86,386	$89,891	$89,798	$87,585	$86,145	$81,457	$36,150	$0	$0	$0	$0	$0	$0	$0
Process Plant	$147,424		$17,992	$16,911	$22,155	$21,406	$20,694	$17,611	$12,763	$11,751	$2,444	$2,465	$1,233	$0	$0	$0	$0
G&A	$37,750		$4,250	$4,250	$4,250	$4,250	$4,250	$4,250	$4,250	$4,250	$1,500	$1,500	$750	$0	$0	$0	$0
Refining	$5,153		$408	$983	$956	$692	$528	$515	$399	$474	$124	$62	$12	$0	$0	$0	$0
Total Operating Cost	$806,832		$81,743	$108,530	$117,252	$116,146	$113,056	$108,521	$98,869	$52,625	$4,069	$4,027	$1,995	$0	$0	$0	$0
Royalty	$10,911		$0	$0	$2,271	$1,954	$1,757	$1,335	$1,264	$1,446	$884	$0	$0	$0	$0	$0	$0
Salvage Value	-$12,410		$0	$0	$0	$0	$0	$0	$0	-$12,410	$0	$0	$0	$0	$0	$0	$0
Reclamation/Closure	$22,569		$0	$183	$1,333	$1,321	$1,254	$1,388	$2,176	$2,334	$1,622	$0	$10,958	$0	$0	$0	$0
Total Production Cost	$827,901		$81,743	$108,712	$120,856	$119,421	$116,067	$111,244	$102,309	$43,995	$6,575	$4,027	$12,952	$0	$0	$0	$0
Operating Income	$874,204		$52,844	$215,737	$194,729	$109,243	$58,268	$58,851	$29,760	$112,763	$34,550	$16,500	-$9,039	$0	$0	$0	$0
Depreciation ($000)																	
Total Capital	$433,214		$50,292	$51,256	$56,183	$62,151	$66,807	$34,485	$32,052	$29,689	$23,822	$17,141	$9,337	$0	$0	$0	$0
Total Depreciation	$433,214		$50,292	$51,256	$56,183	$62,151	$66,807	$34,485	$32,052	$29,689	$23,822	$17,141	$9,337	$0	$0	$0	$0
Net Income after Depreciation	$440,990		$2,552	$164,481	$138,546	$47,092	-$8,539	$24,366	-$2,292	$83,074	$10,727	-$642	-$18,377	$0	$0	$0	$0
Taxes ($000)																	
Net Proceeds & Excise Tax	$39,599		$1,659	$11,079	$10,085	$5,164	$2,146	$2,364	$841	$4,822	$1,155	$285	$0	$0	$0	$0	$0
Income Tax	$54,570		$284	$4,908	$19,719	$7,845	$1,577	$2,082	$0	$13,060	$3,975	$1,120	$0	$0	$0	$0	$0
Total Taxes	$94,169		$1,944	$15,987	$29,804	$13,009	$3,722	$4,446	$841	$17,882	$5,130	$1,404	$0	$0	$0	$0	$0
Net Income After-Taxes ($000)	$346,821		$608	$148,494	$108,742	$34,083	-$12,261	$19,921	-$3,132	$65,192	$5,597	-$2,046	-$18,377	$0	$0	$0	$0
Cash Flow ($000)																	
Net Income Before-Taxes	$440,990		$2,552	$164,481	$138,546	$47,092	-$8,539	$24,366	-$2,292	$83,074	$10,727	-$642	-$18,377	$0	$0	$0	$0
Add back Depreciation	$433,214		$50,292	$51,256	$56,183	$62,151	$66,807	$34,485	$32,052	$29,689	$23,822	$17,141	$9,337	$0	$0	$0	$0
Operating Cash Flow	$874,204		$52,844	$215,737	$194,729	$109,243	$58,268	$58,851	$29,760	$112,763	$34,550	$16,500	-$9,039	$0	$0	$0	$0
Working Capital ($000)																	
Accounts Receivable	$0	$0	-$3,687	-$5,202	$243	$2,381	$1,488	$116	$1,042	-$676	$3,168	$564	$455	$107	$0	$0	$0
Accounts Payable	$0	$23,449	-$8,702	$1,808	$1,779	-$1,091	$411	-$2,270	-$1,751	-$6,292	-$6,689	$47	-$453	-$246	$0	$0	$0
Inventory (parts)	$0	$0															
Total Working Capital	$0	$23,449	-$12,389	-$3,394	$2,021	$1,290	$1,899	-$2,154	-$709	-$6,969	-$3,520	$611	$2	-$139	$0	$0	$0
Initial Capital Expenditures ($000)																	
Pre-stripping	$22,640	$22,640	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Mining	$13,943	$13,943	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Process	$152,458	$152,458	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Owner's Cost	$1,157	$1,157	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sustaining Capital Expenditures ($000)																	
Mining	$102,624		$10,703	$16,798	$16,306	$16,914	$16,284	$10,884	$9,147	$5,588	$0	$0	$0	$0	$0	$0	$0
Process	$84,052		$27,169	$8,953	$15,149	$6,798	$13,850	$5,375	$2,563	$1,329	$1,223	$1,644	$0	$0	$0	$0	$0
Owner's Cost	$0		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Capital	$376,873	$190,197	$37,872	$25,751	$31,455	$23,712	$30,133	$16,259	$11,710	$6,918	$1,223	$1,644	$0	$0	$0	$0	$0
Cash Flow Before-Taxes ($000)	$497,330	-$166,748	$2,582	$186,592	$165,296	$86,822	$30,033	$40,438	$17,341	$98,877	$29,807	$15,467	-$9,037	-$139	$0	$0	$0
Cumulative Cash Flow Before-Taxes ($000)		-$166,748	-$164,166	$22,426	$187,722	$274,544	$304,577	$345,015	$362,356	$461,233	$491,039	$506,506	$497,469	$497,330	$497,330	$497,330	$497,330
Taxes	$94,169	$0	$0	$1,944	$15,987	$29,804	$13,009	$3,722	$4,446	$841	$17,882	$5,130	$1,404	$0	$0	$0	$0
Cash Flow After-Taxes ($000)	$403,162	-$166,748	$2,582	$184,649	$149,309	$57,018	$17,025	$36,716	$12,895	$98,036	$11,924	$10,337	-$10,442	-$139	$0	$0	$0
Cumulative Cash Flow After-Taxes ($000)		-$166,748	-$164,166	$20,482	$169,791	$226,809	$243,833	$280,549	$293,444	$391,481	$403,405	$413,742	$403,300	$403,162	$403,162	$403,162	$403,162
Financial Indicators Before-Taxes																	
NPV @ 0%	$497,330																
NPV @ 5%	$388,866																
NPV @ 10%	$307,248																
IRR	49.2%																
Payback (years)	1.9		1.0	0.9	-	-	-	-	-	-	-	-	-	-	-	-	-
Financial Indicators After-Taxes																	
NPV @ 0%	$403,162																
NPV @ 5%	$314,791																
NPV @ 10%	$247,592																
IRR	44.3%																
Payback (years)	1.9		1.0	0.9	-	-	-	-	-	-	-	-	-	-	-	-	-
Payable Au (kozs)	1,030	-	82	197	191	138	105	103	80	95	25	12	2	-	-	-	-
Mining	$616,504	$0	$59,092	$86,386	$89,891	$89,798	$87,585	$86,145	$81,457	$36,150	$0	$0	$0	$0	$0	$0	$0
Process Plant	$147,424	$0	$17,992	$16,911	$22,155	$21,406	$20,694	$17,611	$12,763	$11,751	$2,444	$2,465	$1,233	$0	$0	$0	$0
G&A	$37,750	$0	$4,250	$4,250	$4,250	$4,250	$4,250	$4,250	$4,250	$4,250	$1,500	$1,500	$750	$0	$0	$0	$0

GSV South Railroad FS-Financial Model																
M3-PN185074.602	LOM	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15
Refining	$5,153	$0	$408	$983	$956	$692	$528	$515	$399	$474	$124	$62	$12	$0	$0	$0	$0
Royalty	$10,911	$0	$0	$0	$2,271	$1,954	$1,757	$1,335	$1,264	$1,446	$884	$0	$0	$0	$0	$0	$0
Cash Cost before By-Product Credit	$817,743	$0	$81,743	$108,530	$119,523	$118,100	$114,813	$109,856	$100,132	$54,071	$4,953	$4,027	$1,995	$0	$0	$0	$0
$/Au oz	$794	$0	$1,002	$552	$625	$853	$1,088	$1,067	$1,254	$571	$199	$325	$847	$0	$0	$0	$0
Silver Credit	$2,078	$0	$13	$98	$102	$305	$268	$260	$314	$492	$92	$109	$26	$0	$0	$0	$0
Cash Cost after By-Product Credit	$815,664	$0	$81,729	$108,432	$119,421	$117,795	$114,546	$109,596	$99,818	$53,579	$4,860	$3,918	$1,969	$0	$0	$0	$0
$/oz Au	$792	$0	$1,002	$552	$625	$851	$1,086	$1,065	$1,250	$566	$195	$317	$836	$0	$0	$0	$0
Sustaining Capital Expenditures																	
Mining	$102,624	$0	$10,703	$16,798	$16,306	$16,914	$16,284	$10,884	$9,147	$5,588	$0	$0	$0	$0	$0	$0	$0
Process	$84,052	$0	$27,169	$8,953	$15,149	$6,798	$13,850	$5,375	$2,563	$1,329	$1,223	$1,644	$0	$0	$0	$0	$0
Owner's Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Salvage Value	-$12,410	$0	$0	$0	$0	$0	$0	$0	$0	-$12,410	$0	$0	$0	$0	$0	$0	$0
Reclamation/Closure	$22,569	$0	$0	$183	$1,333	$1,321	$1,254	$1,388	$2,176	$2,334	$1,622	$0	$10,958	$0	$0	$0	$0
Net Proceeds Tax	$39,599	$0	$1,659	$11,079	$10,085	$5,164	$2,146	$2,364	$841	$4,822	$1,155	$285	$0	$0	$0	$0	$0
AISC	$1,052,098	$0	$121,261	$145,445	$162,294	$147,991	$148,079	$129,607	$114,545	$55,243	$8,860	$5,846	$12,926	$0	$0	$0	$0
$/oz Au	$1,021	$0	$1,487	$740	$849	$1,069	$1,404	$1,259	$1,434	$583	$356	$472	$5,487	$0	$0	$0	$0

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23 ADJACENT PROPERTIES

The Railroad- Pinion property is situated along the southeastern portion of the Carlin Gold Trend. The Rain Mining District, which is largely controlled by Nevada Gold Mines, is located 2 to 3 km (1.2 to 2 miles) north of the Railroad-Pinion property. The Rain District has been an active exploration and mining area for several decades and is the location for current and past mining activities by Nevada Gold Mines and Newmont Mining at the Rain open pit and underground mine and Emigrant open pit mine. To the south of the Railroad-Pinion property, several exploration areas have received sporadic exploration over the past three to four decades including Pony Creek. Adjacent properties with bearing or influence on the Railroad-Pinion property are described below. The authors of this Technical Report have not visited or worked at any of these projects and where references are made to past production and/or historic or current mineral resources the authors have not verified the information.

23.1 RAIN

Rain is a Carlin-style, sedimentary rock-hosted gold deposit that is located approximately four miles (seven kilometers) north of Gold Standard's North Bullion mineral resource. Newmont operated the Rain open pit mine, the Rain underground mine and the SMZ open pit mine from 1988 to 2000; and produced approximately 1.24 million ounces (Ressel *et al.*, 2015. Longo *et al*. (2002) summarized a number of mineral resources for the three deposits as follows: Rain open pit 15.5 million tons (14.1 million tonnes) at 0.066 opt (2.3 g/t) Au for a total of 1,017,300 ounces of gold; Rain Underground 1.154 million tons (1.04 million tonnes) at 0.23 opt (7.9 g/t) Au for a total of 265,000 ounces of gold and the SMZ open pit 1.5 million tons (1.4 million tonnes) at 0.019 opt (0.65 g/t) Au for a total of 30,000 ounces of gold. The mineral resources pre-date NI 43-101 and little or no detailed information such as potential mineral resource category or number of drill holes is presented for the estimates or how the mineral resources were arrived at. Therefore, the estimates are considered historic in nature and should not be relied upon. The authors of this Technical Report have been unable to verify this and this information is not necessarily indicative of the mineralization of the Railroad-Pinion property.

Along strike to the northwest of the Rain Project and likely on the same structure are the Saddle and Tess gold deposits. The mineralized zones are roughly 3.5 km (2 miles) north of the Railroad-Pinion Project and 10 km (6 miles) northwest of the North Bullion mineral resource. Longo *et al*. (2002) states that Newmont identified a primarily underground high sulphide mineral resource of 1.37 million tons (1.23 million tonnes) at 0.572 opt (19.6 g/t) Au for a total of 782,000 ounces of gold at Saddle and 3.99 million tons (3.59 million tonnes) at 0.37 opt (12.7 g/t) Au for a total of 1,475,000 ounces of gold at Tess. The project was part of the Newmont South Area of operations but has recently been consolidated under the Newmont/Barrick Joint Venture (Nevada Gold Mines). No mining has been conducted at the two deposits. The mineral resources pre-date NI 43-101 and little or no detailed information such as potential mineral resource category or number of drill holes etc. is presented for the estimates or how the mineral resources were arrived at, therefore, the estimates are considered historic in nature and should not be relied upon. The authors of this Technical Report have not visited the Rain property, nor have they verified the historic estimates provided by Longo *et al*. (2002).

The Rain trend of mineralization is characterized by disseminated gold mineralization hosted in dominantly oxidized, silicified, dolomitized, and barite rich collapse breccia with rare sulfides, developed along the Webb Formation mudstone/Devils Gate Formation calcarenite contact and along the Rain Fault. Ore-controlling features at Rain include the west-northwest striking Rain fault, the Webb/Devils Gate contact, collapse breccia and northeast striking cross faults. Shallow oxide zones at the Rain deposit give way along the west-northwest trend to deeper sulphide- and carbon-bearing zones of substantial size and grade at the Saddle and Tess deposits.

23.2 EMIGRANT

Emigrant is a Carlin-style, sedimentary rock-hosted gold deposit that is located approximately four miles (seven kilometers) north-northeast of the North Bullion mineral deposits. Until recently Newmont/Nevada Gold Mines has been mining the deposit through open pit methods and processing the ore at an onsite, run of mine heap leach operation with some crushing. The operation currently appears to be shut down. Disseminated gold mineralization is hosted in oxidized, silicified, dolomitized, and barite rich collapse breccia developed within the Webb Formation mudstone. Important ore-controlling features at Emigrant include the north-south-striking Emigrant Fault, collapse breccia and the Northeast Fault.

Open pit, oxide mineral resource and mineral reserve calculations for Newmont's Carlin Trend operations are typically commingled into a single heading of "Carlin open pits, Nevada" category. In 2003, mineral reserves at Emigrant were published at 1,220,000 ounces (Newmont, 2012). No details were provided by Newmont as to the quality of the mineral reserves. The mine is expected to produce roughly 800,000 ounces of gold over a ten plus year mine life and has recently commenced production (Harding, 2012). The authors of this Technical Report have been unable to verify this and this information is not necessarily indicative of the mineralization on the Railroad-Pinion property.

23.3 PONY CREEK PROPERTY

Pony Creek is located approximately six miles (10 kilometers) south of the Pinion deposit. Gold mineralization is hosted in north to northeast-trending shears in rhyolite intrusive and Mississippian to Permian age sediments proximal to the intrusive (Russell, 2006).

24 OTHER RELEVANT DATA AND INFORMATION

There are no additional data for the South Railroad property beyond that discussed in the preceding sections.

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25 INTERPRETATION AND CONCLUSIONS

The authors of this Technical Report believe that South Railroad is a project of merit and warrants advancing the study to detailed engineering and ultimately project construction.

The authors have reviewed the project data, including the drill-hole database and available metallurgical information, and have visited the project site. The authors believe that the data provided by Gold Standard, as well as the geological interpretations Gold Standard has derived from the data, are generally an accurate and reasonable representation of the Railroad-Pinion property. Based on the positive results of this FS, the project should continue on a path to a production decision.

Presently there are 1.60 million proven and probable ounces of gold and 6.1 million ounces of silver in the Dark Star and Pinion deposits estimated mineral reserves combined, 1.78 million measured and indicated ounces of gold in the Dark Star and Pinion deposits estimated mineral resources combined, inclusive of mineral reserves in the Dark Star and Pinion deposits, and there are 0.72 million inferred ounces of gold in the Dark Star, Pinion, Jasperoid Wash and North Bullion deposits estimated mineral resources combined. There are also 7.1 million Measured and Indicated and 0.9 million Inferred ounces of silver in the Pinion resource. Mineral resources that are not mineral reserves do not have demonstrated economic viability.

Results of historical metallurgical tests and those commissioned by Gold Standard indicate there are multiple metallurgical material types within the Pinion and Dark Star gold deposits. Due to the multiple material types and the dependence of gold recoveries on head grades, 40 different gold and silver ROM recovery equations are used to project the processing and gold and silver production estimates presented in this Technical Report.

The process selected for recovery of gold and silver from the Pinion and Dark Star mineralized material is a conventional heap-leach recovery circuit. The material will be mined by standard open-pit mining methods and trucked from each deposit to a centralized area of heap-leach pads and processing facilities.

The FS indicates an average gold production over the estimated 8-year LOM of about 124,000 ounces per year, with peak production in Year 2 of 197,000 ounces of gold. Cash costs are estimated to be $792 per ounce of gold after by-product credit, and AISC are estimated to be $1,021 per ounce of gold. The resulting after-tax cash flow is $403.2 million, for an after-tax NPV (5%) of $314.8 million and an estimated payback period of 1.9 years.

25.1 PROJECT RISKS

25.1.1 Geotechnical Characterization

At the date of this Technical Report, the access road improvements and materials required have been assumed to be in relative alignment with existing roads in the area, which needs to be verified in future studies. Costs in the FS assume average ground conditions and that no additional major engineering will be required. Surface geotechnical work is anticipated to be completed this summer as weather and permitting allows. Worse than assumed ground conditions may increase the cost of access road development.

25.1.2 Pit Lake Geochemistry

- The ground water hydrology model is currently under development. At present no major risks were identified related to ground water considerations.
- At the date of this Technical Report, the pit lake geochemistry and ground water model are still under development. At present, the FS financials assumes that no water treatment is required for final pit lakes. Pit lake geochemistry and ground water modeling is currently in progress. Results of this work could indicate the

need for water treatment and/or other closure requirements to meet state water standards. Water treatment of pit lakes may increase the closure cost of the project.

25.2 PROJECT OPPORTUNITIES

1. Oxide mineral resources ($1,750 Au) are currently drilled to Inferred (Jasperoid Wash and POD) status, as are sulfide mineral resources in the North Bullion and POD deposits. These mineral resources are not included in the current mine plan and should be evaluated for impacts to the project and work required to bring forward.
2. Mine plans should undergo various iterations to
   a. Evaluate opportunity for utilizing surface exposed mineralization at Dark Star Main and Pinion for placement as crushed over-liner.
   b. Evaluate recently discovered mineralized gravels east of the Dark Star Main pit for potential inclusion in the mine design or utilization as heap leach gravel over-liner cover.
3. Pit designs should undergo various iterations to
   a. Investigate opportunities to utilize limestone material in the Pinion deposit for neutralization capacity of PAG material which may reduce waste rock storage facility construction.
   b. Investigate opportunities to utilize limestone sources for construction and construction cement requirements, as well as lime to be used for leaching.
4. Water disposal investigations should undergo iterations to
   a. Determine areas for possible land application and/or rapid infiltration basins which may reduce capital and operating costs for water treatment

25.3 EXPLORATION AND MINERAL RESOURCE EXPANSION

Pinion remains open to exploration and expansion in all directions, particularly to the south where the most recent resources were extended, and to the north where the near-surface LT target has yet to be modeled. These areas require additional drilling to define the economic edges to mineralization. At Dark Star, the known mineralization is well-defined within the limits of the current resources, however, there is potential at depth on the West fault, and beneath colluvial cover along strike to the north. Additionally, Jasperoid Wash is open along strike and mineral resources can potentially be increased with expansion drilling. Jasperoid Wash and the deposits at North Bullion contain oxide and sulfide mineral resources at $1,750 gold price. The mineralization at Jasperoid Wash, and the POD, Sweet Hollow and South Lodes deposits at North Bullion have the potential to be mined via open pits, whereas the sulfide mineralization at the North Bullion deposit could be exploited in a combination open pit and underground scenario. Current classification of mineral resources as Inferred prevent the material from these deposits from consideration within the FS and mineral reserves. Mineral resources that are not mineral reserves do not have demonstrated economic viability.

Gold Standard's Railroad-Pinion property is centered on another window of the Carlin trend. The property has all the promising geologic characteristics of other productive districts of the Carlin trend, including carbonate host rocks, older thrust faults and folds, younger extensional faults and an Eocene (Carlin age) magmato-thermal event. Deposits at Railroad-Pinion are hosted both in collapse breccia developed along the Devonian Devils Gate limestone/Mississippian Tripon Pass micrite contact and within highly permeable Pennsylvanian-Permian carbonate units. These units are common hosts for Carlin-type gold deposits throughout north-central Nevada. The structural setting with north-, northeast- and northwest-striking Tertiary extensional faults overprinted on earlier compressional structures is a classic Carlin framework. There are numerous un-drilled and under-drilled targets along prospective structural corridors.

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26 RECOMMENDATIONS

Based on the results of the feasibility work the authors believe that the Railroad-Pinion property is a project of merit and warrants the proposed program and level of expenditures outlined below, focused on the gold deposits in the South Railroad portion of the property.

The total cost of recommendations is expected to reach $8 million for a multi-faceted program including exploration, permitting and engineering. The subsection describes the recommended efforts.

26.1 PRELIMINARY EXPLORATION

The Railroad-Pinion property is large, and merits continued exploration outside of the immediate Dark Star and Pinion deposit areas. Recommended exploration includes mapping and sampling within under-explored portions of the property. Exploration would include mapping, sampling, and 2D seismic to help define faults.

26.2 EXPLORATION AND EXPANSION DRILLING

Pinion mineralization remains open to the south and southeast, and additional exploration and expansion drilling is merited to determine the ultimate footprint of this deposit. Additional RC drilling is recommended. The total for this task is $1.5 million.

North Bullion sulfide mineralization remains open to the northwest, and additional exploration and expansion drilling is merited to determine the size of this deposit. Additional RC drilling is recommended. The total for this task is $1.0 million.

26.3 PERMITTING

It is recommended that Gold Standard continue the NEPA / EIS permitting activities in support of open-pit mining at Dark Star and Pinion. The cost is estimated at $2.0 million.

26.4 DETAILED DESIGN ENGINEERING

It is recommended that Gold Standard continue the detailed design activities in support of a potential construction decision for the project. The cost is estimated at $3.6 million

1. Detailed Design Engineering Studies to Potential Construction Decision
    a. Site Access Road
    b. Containment Designs to Support Water Pollution Control Permit
    c. Potable Water System Detailed Design
    d. Water Treatment System Detailed Design
    e. Geotechnical Survey of Initial Facility Foundations (Continued)
    f. Hydrology Field Pilot Study for Dark Star North Dewatering
    g. Water Management System Detailed Design
    h. M3 Major Facilities/Infrastructure Detailed Design

26.5 TOTAL COST OF RECOMMENDED STUDY PROGRAM

Table 26-1 is a summary of the costs of the recommended work to advance the project to a construction decision.

Table 26-1: Cost Estimate for the Recommended Study Program

Preliminary Exploration	Cost	Sub-total
Mapping and Sampling	$50,000	
Seismic	$450,000	**$500,000**
Expansion Drilling		
Pinion	$1,500,000	
North Bullion	$1,000,000	**$2,500,000**
Permitting		**$2,000,000**
Detailed Design		**$3,600,000**
Grand Total (rounded to x,000s)		**$8,000,000**

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APPENDIX A – FEASIBILITY STUDY CONTRIBUTORS AND PROFESSIONAL QUALIFICATIONS – CERTIFICATES OF QUALIFIED PERSONS

CERTIFICATE OF QUALIFIED PERSON

Matthew Sletten

I, Matthew Sletten, PE, do hereby certify that:

1. I am a Project Manager of:

   M3 Engineering & Technology Corp.
   2175 W. Pecos Rd. Suite 3
   Chandler, AZ 85224

2. I graduated with a BS in Civil Engineering and an MS in Civil Engineering from the South Dakota School of Mines and Technology in 2004 and 2006, respectively.

3. I am a Professional Engineer in good standing in the State of Arizona in the area of Civil Engineering.

4. I have worked as an engineer and project manager in the base metals and precious metals industry for a total of 15 years. My experience includes detailed engineering, engineering management, project management, corporate management, capital and operating cost development and report development for major mining projects throughout the world.

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

6. I am a contributing author for the preparation of the technical report titled "South Railroad Project NI 43-101F1 Technical Report, Feasibility Study, Elko, Nevada, USA" dated March 14, 2022, with an effective date of February 23, 2022 (the "Technical Report"), prepared for Gold Standard Ventures Corp. I am responsible for the preparation of Sections 1.1, 1.10, 1.13, 1.14, 1.15, 4, 5, 18.1, 18.2, 18.3, 18.4, 18.5, 18.8, 19, 21 except (21.1 and 21.4), 22, 23, 24, 25, and 26. I have not visited the project site.

7. I have prior involvement with the project or property that is the subject of the Technical Report. I was involved in the preparation of the South Railroad Project NI 43-101 Technical Report, Preliminary Feasibility Study, Carlin Trend, Nevada, USA, dated October 24, 2019, with an effective date of September 9, 2019.

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

9. I am independent of the issuer applying all the tests in Section 1.5 of NI 43-101.

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

11. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

Signed and dated this 14th day of March 2022.

(Signed) "*Matthew Sletten*"
Signature of Qualified Person

Matthew Sletten, PE

CERTIFICATE OF QUALIFIED PERSON

Benjamin Bermudez

I, Benjamin Bermudez, PE, do hereby certify that:

1. I am currently employed as a Chemical/Process Engineer at M3 Engineering & Technology Corporation, 2051 W Sunset Rd, Suite 101, Tucson, AZ 85704, USA.

2. I am a graduate of Arizona State University and received a Bachelor of Science degree in Chemical Engineering in 2009.

3. I am a Registered Professional Engineer in good standing in the State of Arizona in the area of Chemical Engineering (No. 54919).

4. I have worked as an engineer for a total of 13 years. My experience includes mineral process plant engineering, support of new and on-going process plant operations, financial modeling of mineral properties, and project management.

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

6. I am contributing author for the preparation of the technical report titled "South Railroad Project 43-101F1 Technical Report Feasibility Study", Elko, Nevada, USA" dated March 14, 2022, with an effective date of February 23, 2022 (the "Technical Report"), prepared for Gold Standard Ventures Corp. I am responsible for the preparation of Sections 1.7 and 17. I have not visited the project site.

7. I have prior involvement with the project or property that is the subject of the Technical Report. I was involved in the preparation of the South Railroad Project NI 43-101 Technical Report, Preliminary Feasibility Study, Carlin Trend, Nevada, USA, dated October 24, 2019, with an effective date of September 9, 2019, and South Railroad Project NI 43-101 Technical Report, Updated Preliminary Feasibility Study, Elko, Nevada, USA, dated March 23, 2020, with an effective date of Februay 13, 2020.

8. 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.

9. I am independent of the issuer applying all of the tests in Section 1.5 of NI 43-101.

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

11. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

Signed and dated this 14th day of March 2022.

(Signed) *"Benjamin Bermudez*"
Signature of Qualified Person

Benjamin Bermudez, PE

CERTIFICATE OF QUALIFIED PERSON
Art S. Ibrado

I, Art S. Ibrado, PhD, PE, do hereby certify that:

1. I am a consulting metallurgical engineer of Fort Lowell Consulting PLLC, 5411 E Francisco Loop, Tucson, AZ 85712, USA.

2. I hold the following academic degrees:
Bachelor of Science in Metallurgical Engineering, University of the Philippines, 1980
Master of Science (Metallurgy), University of California at Berkeley, 1986
Doctor of Philosophy (Metallurgy), University of California at Berkeley, 1993

3. I am a registered professional engineer in the State of Arizona (No. 58140).

4. I have worked as a metallurgist in the academic and research setting for five years, excluding graduate school research, in the mining industry for 13 years, in engineering at M3 Engineering Corp for 12 years, and as independent consultant since August 2021.

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

6. I am a contributing author for the preparation of the technical report titled “South Railroad Project NI 43-101F1 Technical Report, Feasibility Study, Elko, Nevada, USA” dated March 14, 2022, with an effective date of February 23, 2022 (the “Technical Report”), prepared for Gold Standard Ventures Corp. I am responsible for the preparation of Sections 2, 3, and 27. I visited the project site on September 25, 2019, for a period of one day.

7. I have prior involvement with the project or property that is the subject of the Technical Report. I was involved in the preparation of South Railroad Project NI 43-101 Technical Report, Preliminary Feasibility Study, Carlin Trend, Nevada, USA, dated October 24, 2019, with an effective date of September 9, 2019, and South Railroad Project NI 43-101 Technical Report, Updated Preliminary Feasibility Study, Elko, Nevada, USA, dated March 23, 2020, with an effective date of Februay 13, 2020.

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

9. I am independent of the issuer applying all of the tests in Section 1.5 of NI 43-101.

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

11. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

Signed and dated this 14th day of March 2020.

(Signed) “Art S. Ibrado”
Signature of Qualified Person

Art S. Ibrado, PE

Print Name of Qualified Person

CERTIFICATE OF QUALIFIED PERSON

Michael S. Lindholm, C.P.G.

I, Michael S. Lindholm, C.P.G., do hereby certify that:

1. I am a Senior Geologist of Mine Development Associates, Inc. (a Division of RESPEC), 210 South Rock Blvd., Reno, Nevada, 89502.

2. I graduated with a Bachelor of Science degree in Geology from Stephen F. Austin State University in 1984 and with a Master of Science degree in Geology from Northern Arizona University in 1989.

3. I am a Certified Professional Geologist (#11477) in good standing with the American Institute of Professional Geologists. I am also registered as Professional Geologist in the state of California (#8152).

4. I have worked as geologist for 33 years. I have conducted exploration, definition, modeling, and estimation of sediment-hosted epithermal gold-silver deposits in the Western US.

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

6. I am a contributing author for the preparation of the technical report titled "South Railroad Project NI 43-101F Technical Report, Feasibility Study, Elko, Nevada, USA", dated March 14, 2022, with an effective date of February 23, 2022 (the "Technical Report"), prepared for Gold Standard Ventures Corp. I am responsible for the preparation of Sections 1.3, 1.4, 1.5, 1.8.1, 6, 7, 8, 9, 10, 11, 12, and 14. I have visited the project site for a period of one day each on September 19, 2018 and July 16, 2020.

7. I have prior involvement with the project or property that is the subject of the Technical Report. I was involved in the preparation of the South Railroad Project NI 43-101F1 Technical Report, Updated Preliminary Feasibility Study, Elko County, Nevada, USA, dated March 23, 2020, with an effective date of February 13, 2020.

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

9. I am independent of the issuer applying all of the tests in Section 1.5 of NI 43-101.

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

11. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

Signed and dated this 14th day of March 2022.

(Signed) "*Michael S. Lindholm*"
Signature of Qualified Person

Michael S. Lindholm

CERTIFICATE OF QUALIFIED PERSON

Thomas L. Dyer, PE

I, Thomas L. Dyer, PE, do hereby certify that:

1. I am a Principal Engineer of Mine Development Associates, Inc. (a Division of RESPEC), 210 South Rock Blvd., Reno, Nevada, 89502.
2. I graduated with a Bachelor of Science degree in Mine Engineering from South Dakota School of Mines and Technology in 1996.
3. I am a Registered Professional Engineer in the state of Nevada (#15729) and a Registered Member (#4029995RM) of the Society of Mining, Metallurgy and Exploration.
4. I have worked as a mining engineer for more than 25 years. Relevant experience includes mine design, reserve estimation and economic analysis of precious-metals deposits in the United States and various countries in the world. I worked as Chief Engineer of an operating heap leach and mill gold mine in Nevada.
5. I have read the definition of "qualified person" set out in National Instrument 43-101 Standards of Disclosure for Mineral Projects ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
6. I am a contributing author for the preparation of the technical report titled "South Railroad Project NI 43-101F1 Technical Report, Feasibility Study, Elko, Nevada, USA", dated March 14, 2022, with an effective date of February 23, 2022 (the "Technical Report"), prepared for Gold Standard Ventures Corp. I am responsible for the preparation of Sections 1.8, 1.9, 15, 16, 21.1, and 21.4. I visited the project site on November 18, 2016 for a period of two days.
7. I have prior involvement with the project or property that is the subject of the Technical Report. I was involved in the preparation of the South Railroad Project NI 43-101 Technical Report, Preliminary Feasibility Study, Carlin Trend, Nevada, USA, dated October 24, 2019, with an effective date of September 9, 2019. Through Mine Development Associates Inc., I have completed internal mining and economic studies for Gold Standard Ventures Corp. since 2016.
8. As at the effective date of the Technical Report, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.
9. I am independent of the issuer applying all of the tests in Section 1.5 of NI 43-101.
10. I have read NI 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.
11. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

Signed and dated this 14th of March, 2022.

(Signed) *"Thomas L. Dyer"*
Signature of Qualified Person

Thomas L. Dyer, PE
Print Name of Qualified Person

CERTIFICATE OF QUALIFIED PERSON
Jordan M. Anderson

I, Jordan M. Anderson, Qualified Professional (QP), do hereby certify that:

1. I am a consulting mining engineer of RESPEC, 210 S. Rock Blvd. Reno, NV, 89502

2. I hold the following academic degrees:
   Bachelor of Science in Mine Engineering, South Dakota School of Mines, 2009
   Master of Business Administration, University of South Dakota, 2019

3. I am a registered member of the Society for Mining, Metallurgy and Exploration (No 4148636)

4. I have worked as a mine engineer for 12 years. Relevant experience in mine design, reserve estimation, and economic analysis of precious-metals deposits. I worked as Engineering Superintendent for an operating heap leach and mill gold mine in Nevada.

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

6. I am a contributing author for the preparation of the technical report titled "South Railroad Project NI 43-101F1 Technical Report, Feasibility Study, Elko, Nevada, USA" dated March 14, 2022, with an effective date of February 23, 2022 (the "Technical Report"), prepared for Gold Standard Ventures Corp. I am responsible for the preparation of Section 1.8, 1.9, 15, 16, 21.1 and 21.4. I visited the project site on February 23 2022, for a period of one day.

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

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

9. I am independent of the issuer applying all of the tests in Section 1.5 of NI 43-101.

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

11. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

Signed and dated this 14th day of March 2022.

(Signed) "Jordan M. Anderson"
Signature of Qualified Person

Jordan M. Anderson
Print Name of Qualified Person

CERTIFICATE OF QUALIFIED PERSON

Gary L. Simmons

I, Gary L Simmons, Qualified Professional (QP), do hereby certify that:

1. I am the Principal Owner of:

   GL Simmons Consulting, LLC
   15293 Shadow Mountain Ranch Road
   Larkspur, CO 80118

2. I graduated with a Bachelor of Science Degree in Metallurgical Engineering from the Colorado School of Mines, Golden, Colorado, USA, in 1973.

3. I am a Professional Metallurgical Engineer, registered with the Mining and Metallurgical Society of America, Qualified Professional (QP) Member in Metallurgy, Member Number – 01013QP, in good standing in the USA.

4. I have practiced in my profession since 1973. My relevant experience includes mine site and corporate level process development, project engineering, operations supervision and as a mineral processing project development consultant, in the base metals and gold/silver mining business, for a total of 46 years.

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

6. I am a contributing author for the preparation of the technical report titled "South Railroad Project NI 43-101F1 Technical Report, Feasibility Study, Elko, Nevada, USA" dated March 14, 2022, with an effective date of February 23, 2022 (the "Technical Report"), prepared for Gold Standard Ventures Corp. I am a contributing author for Sections 1.6 and 13. I have visited the project site on October 9, 2020 for period of one day.

7. I have been involved with this project since 2016 as a metallurgical consultant and have authored internal reports and have been a contributing qualified person for press releases and regulatory filings relating to metallurgy. I was involved in the preparation of the South Railroad Project NI 43-101 Technical Report, Preliminary Feasibility Study, Carlin Trend, Nevada, USA, dated October 24, 2019, with an effective date of September 9, 2019.

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

9. I am independent of the issuer applying all of the tests in Section 1.5 of NI 43-101.

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

11. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

Signed and dated this 14th of March 2022.

(Signed) *"Gary L. Simmons"*
Signature of Qualified Person

Gary L. Simmons
Print Name of Qualified Person

CERTIFICATE OF QUALIFIED PERSON

Richard DeLong

I, Richard DeLong, M.S., P.G., MMSA QP, do hereby certify that:

1. I a Senior Vice President of:

   EM Strategies, a WestLand Resources, Inc. COmpany
   1650 Meadow Wood Lane, Reno, Nevada 89502

2. I graduated with a Masters Degree in Geology and a Masters Degree in Resource Management from the University of Idaho.

3. I am a Professional Geologist in good standing in the State of Idaho in the area of Geology (No. 727). I am also recognized as a Qualified Person Member with special expertise in Environmental Permitting and Compliance with the Mining and Metallurgical Society of America (No. 01471QP).

4. I have worked as an environmental permitting and compliance specialist for a total of 34 years. My experience includes permit acquisition of sate and federal permits and baseline data acquisition programs for mining and exploration operations.

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

6. I am a contributing author for the preparation of the technical report titled "South Railroad Project NI 43-101F1 Technical Report, Feasibility Study, Elko, Nevada, USA" dated March 14, 2022, with an effective date of February 23, 2022 (the "Technical Report"), prepared for Gold Standard Ventures Corp. I am responsible for the preparation of Sections 1.2, 1.11, 1.12, and 20. I have not visited the project site.

7. I have prior involvement with the project or property that is the subject of the Technical Report. My involvement with the property is the ongoing work associated with environmental baseline data collection and the acquisition of the necessary state and federal permits for the development of the mining operation. I was involved in the preparation of the South Railroad Project NI 43-101 Technical Report, Preliminary Feasibility Study, Carlin Trend, Nevada, USA, dated October 24, 2019, with an effective date of September 9, 2019.

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

9. I am independent of the issuer applying all of the tests in Section 1.5 of NI 43-101.

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

11. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

Signed and dated this 14th of March 2022.

(Signed) "*Richard DeLong*"
Signature of Qualified Person

Richard DeLong
Print Name of Qualified Person

CERTIFICATE OF QUALIFIED PERSON
Kevin Lutes

I, Kevin Lutes PE, do hereby certify that:

1. I am employted as a Principal Engineer with NewFields Mining Design & Technical Servicies, with an office address of 2227 North 5th Street, Elko, Nevada, 89801, USA

2. I hold the following academic degrees:
Bachelor of Science in Civil Engineering, 1997

3. I am a registered professional engineer in the States of Nevada (16021), Idaho (13997), and Alaska (12560)

4. I have worked as a civil engineer for the past 25 years with a focus on mining projects, including heap leach pads, tailings storage facilities, and mine waste facilities..

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

6. I am a contributing author for the preparation of the technical report titled "South Railroad Project NI 43-101F1 Technical Report, Feasibility Study, Elko, Nevada, USA" dated March 14, 2022, with an effective date of February 23, 2022 (the "Technical Report"), prepared for Gold Standard Ventures Corp. I am responsible for the preparation of Section 18.6 and 18.7. I have visited the project site on multiple occasions in 2021 and most recently in February of 2021.

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

8. I am independent of the issuer applying all of the tests in Section 1.5 of NI 43-101.

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

10. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

Signed and dated this 14th of March 2022.

Signature of Qualified Person

Kevin Lutes, PE
Print Name of Qualified Person

APPENDIX B – CLAIMS LIST

Railroad-Pinion Property of Gold Standard Ventures

Listing of Patented and Unpatented Federal Lode Claims
Owned or Controlled by Gold Standard Ventures

Patented Claims Owned and Leased by Gold Standard Ventures

Elko County, Nevada

Patent Name	MS ID	Assessed Owner	Controlled By	Property
Bald Eagle	4592	Gold Standard Ventures (US)	Gold Standard Ventures (US)	Lode
Blue Jay	4592	Gold Standard Ventures (US)	Gold Standard Ventures (US)	Lode
Bullion	1487	Gold Standard Ventures (US)	Gold Standard Ventures (US)	Lode
Cleveland	1498	Gold Standard Ventures (US)	Gold Standard Ventures (US)	Lode
Grey Eagle	4592	Gold Standard Ventures (US)	Gold Standard Ventures (US)	Lode
Hecla	1491	Gold Standard Ventures (US)	Gold Standard Ventures (US)	Lode
Hoffman	1500	Gold Standard Ventures (US)	Gold Standard Ventures (US)	Lode
Kansas City	4592	Gold Standard Ventures (US)	Gold Standard Ventures (US)	Lode
Lucky Boy	4592	Gold Standard Ventures (US)	Gold Standard Ventures (US)	Lode
Mounted Ledge	1499	Gold Standard Ventures (US)	Gold Standard Ventures (US)	Lode
Safety Pin	4592	Gold Standard Ventures (US)	Gold Standard Ventures (US)	Lode
Silver King	1492	Gold Standard Ventures (US)	Gold Standard Ventures (US)	Lode
Sky Blue	1495	Gold Standard Ventures (US)	Gold Standard Ventures (US)	Lode
Standing Elk Lode	1486	Gold Standard Ventures (US)	Gold Standard Ventures (US)	Lode
Standing Elk MS	1486	Gold Standard Ventures (US)	Gold Standard Ventures (US)	Mill Site
Tom Boy	4592	Gold Standard Ventures (US)	Gold Standard Ventures (US)	Lode
Tripoli	1497	Gold Standard Ventures (US)	Gold Standard Ventures (US)	Lode
Webfoot	1488	Gold Standard Ventures (US)	Gold Standard Ventures (US)	Lode
Kenilworth	4608	Sylvania Resources LLC	Sylvania Lease	Lode
Sylvania	4608	Sylvania Resources LLC	Sylvania Lease	Lode
Valley View	4608	Sylvania Resources LLC	Sylvania Lease	Lode
Victor Fraction	4608	Sylvania Resources LLC	Sylvania Lease	Lode
Vindicator Fraction	4608	Sylvania Resources LLC	Sylvania Lease	Lode
Wide West	4608	Sylvania Resources LLC	Sylvania Lease	Lode
Bald Mountain Chief	1489	Victory Exploration - ANv	ANv Lease	Lode
Copper Bell	1490	Victory Exploration - ANv	ANv Lease	Lode
Sun Lode	1494	Sun Lode Company LLC	Sun Lode Lease	Lode
Androsa	3382	Canadian American Mining Comp. L.L.C.	Gold Standard Ventures (US)	Lode
Gladstone	3365	Canadian American Mining Comp. L.L.C.	Gold Standard Ventures (US)	Lode

Unpatented Lode Claims Owned by Gold Standard

Elko County, Nevada, Mount Diablo Base and Meridian

North Railroad Portion of the Property

County Claim Name	NMC #	Book/Page	Doc #	Amended
B-1	138543	313/159	131352	
B-2	138544	313/160	131353	
B-3	138545	313/161	131354	
B-4	138546	313/162	131355	
B-5	138547	313/163	131356	
BARDY	75877	98/350	38115	
BLACK	75973	45/154	15175	
BLUE	75974	45/159	15180	
BURKE FRACTION	75975	8/300	n/a	21/94
CANARY	75976	39/366	5371	
CISS 1	407849	560/304	228452	
CISS 2	407850	560/305	228453	
CISS 3	407851	560/306	228454	
CISS 4	407852	560/307	228455	
CISS 5	407853	560/308	228456	
CISS 6	407854	560/309	228457	
CISS 7	407855	560/310	228458	
CISS 8	407856	560/311	228459	
CISS 9	407857	560/312	228460	
CISS 10	407858	560/313	228461	
CISS 11	407859	560/314	228462	
CISS 12	407860	560/315	228463	
CISS 13	407861	560/316	228464	
CISS 14	407862	560/317	228465	
CISS 15	407863	560/318	228466	
CISS 16	407864	560/319	228467	
CISS 17	407865	560/320	228468	
CISS 18	407866	560/321	228469	
CISS 19	407867	560/322	228470	
CISS 20	407868	560/323	228471	
CISS 21	407869	560/324	228472	
CISS 22	407870	560/325	228473	
CISS 23	407871	560/326	228474	
CISS 24	407872	560/327	228475	
CISS 25	407873	560/328	228476	
CISS 26	407874	560/329	228477	
CISS 27	407875	560/330	228478	
CISS 28	407876	560/331	228479	
CISS 29	407877	560/332	228480	
CISS 30	407878	560/333	228481	
CISS 31	407879	560/334	228482	
CISS 32	407880	560/335	228483	

County Claim Name	NMC #	Book/Page	Doc #	Amended
CISS 33	407881	560/336	228484	
CISS 34	407882	560/337	228485	
CISS 35	407883	560/338	228486	
CISS 36	407884	560/339	228487	
CISS 106	407954	560/409	228557	
CISS 107	407955	560/410	228558	
CISS 108	407956	560/411	228559	
CISS 109	407957	560/412	228560	
CISS 110	407958	560/413	228561	
CISS 111	407959	560/414	228562	
CISS 112	407960	560/415	228563	
CISS 113	407961	560/416	228564	
CISS 114	407962	560/417	228565	
CISS 115	407963	560/418	228566	
CISS 116	407964	560/419	228567	
CISS 117	407965	560/420	228568	
CISS 118	407966	560/421	228569	
CISS 119	407967	560/422	228570	
CISS 124	407968	560/423	228571	
CISS 125	407969	560/424	228572	
CISS 126	407970	560/425	228573	
CISS 127	407971	560/426	228574	
CISS 128	407972	560/427	228575	
CISS 129	407973	560/428	228576	
CISS 130	407974	560/429	228577	
CISS 131	407975	560/430	228578	
CISS 132	407976	560/431	228579	
CISS 133	407977	560/432	228580	
CISS 134	407978	560/433	228581	
CISS 135	407979	560/434	228582	
CISS 136	407980	560/435	228583	
CISS 137	407981	560/436	228584	
DIKE NO. 1	75977	21/534	44926	
DIKE NO. 2	75978	21/535	44927	
DIKE NO. 3	75979	21/535	44928	
DIKE NO. 4	75980	21/536	44929	
DIKE NO. 6	75981	21/536	44930	
DIKE NO. 7	75982	21/537	44931	
DIKE NO. 8	75983	21/537	44932	
DIKE NO. 9	75984	21/538	44933	
DIKE NO. 11	75985	21/538	44934	

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GOLD	75987	45/161	15182	
GREEN	75988	45/160	15181	
HANNAH	75880	98/353	38118	
HOFFMAN FRACTION	75989	7/598	n/a	17/101
HOLD UP	75990	17/5	8002	
HOME 1	164143	326/659	136567	
HOME 2	164144	326/660	136568	
HOME 3	164145	326/661	136569	
HOME 4	164146	326/662	136570	
HOME 5	164147	326/663	136571	
HOME 6	164148	326/664	136572	
HOME 7	164149	326/665	136573	
HOME 8	164150	326/666	136574	
HOME 9	164151	326/667	136575	
HOME 10	164152	326/668	136576	
HOME 11	164153	326/669	136577	
HOME 12	164154	326/670	136578	
HOME 13	164155	326/671	136579	
HOME 14	164156	326/672	136580	
HOME 15	164157	326/673	136581	
HOME 16	164158	326/674	136582	
HOME 17	164159	326/675	136583	
HOME 18	164160	326/676	136584	
HOME 19	190211	350/307	146804	
HOME 20	190212	350/308	146805	
HOME 21	190213	350/309	146806	
HOME 22	190214	350/310	146807	
HOME 23	190215	350/311	146808	
HOME 24	190216	350/312	146809	
HOME 25	190217	350/313	146810	
HOME 26	190218	350/314	146811	
HOME 27	190219	350/315	146812	
HOME 28	190220	350/316	146813	
HOME 29	190221	350/317	146814	
HOME 30	190222	350/318	146815	
HOME 31	190223	350/319	146816	
HOME 42	227247	378/289	158546	
HOME 43	227248	378/290	158547	
HOME 44	227249	378/291	158548	

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HOME 46	227251	378/293	158550	
HOME 47	227252	378/294	158551	
HOME 48	227253	378/295	158552	
HOME 49	227254	378/296	158553	
HOME 50	227255	378/297	158554	
HOME 51	227256	378/298	158555	
HOME 52	227257	378/299	158556	
HOME STAKE	75991	17/6	8003	
JKR 1	1025800		627853	
JKR 2	1025801		627854	
JKR 3	1025802		627855	
JKR 4	1025803		627856	
JKR 5	1025804		627857	
JKR 6	1025805		627858	
JKR 7	1025806		627859	
JKR 8	1025807		627860	
JKR 9	1025808		627861	
JKR 10	1025809		627862	
JKR 11	1025810		627863	
JKR 12	1025811		627864	
JKR 13	1025812		627865	
JKR 14	1025813		627866	
JKR 15	1025814		627867	
JKR 16	1025815		627868	
JKR 17	1025816		627869	
JKR 18	1025817		627870	
JKR 19	1025818		627871	
JKR 20	1025819		627872	
JKR 21	1025820		627873	
JKR 22	1025821		627874	
JKR 23	1025822		627875	
JKR 24	1025823		627876	
JKR 25	1025824		627877	
JKR 26	1025825		627878	
JMD 1	1013878		620141	
JMD 2	1013879		620142	
JMD 3	1013880		620143	
JMD 4	1013881		620144	
JMD 5	1013882		620145	
JMD 6	1013883		620146	

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JMD 10	1013887		620150	
JMD 11	1013888		620151	
JMD 12	1013889		620152	
JMD 13	1013890		620153	
JOHN	75876	98/349	38114	
KEN	75881	98/356	38121	
KEY	75992	8/377	n/a	20/694
LARK	75993	7/603	n/a	
LAST CHANCE	75994	20/413	35070	
LT 1	504170	629/422	257084	
LT 2	504171	629/423	257085	
LT 3	504172	629/424	257086	
LT 4	504173	629/425	257087	
LT 5	504174	629/426	257088	
LT 6	504175	629/427	257089	
LT 7	504176	629/428	257090	
LT 8	504177	629/429	257091	
LT 9	504178	629/430	257092	
LT 10	504179	629/431	257093	
LT 11	504180	629/432	257094	
LT 12	504181	629/433	257095	
LT 13	504182	629/434	257096	
LT 14	504183	629/435	257097	
LT 15	504184	629/436	257098	
LT 16	504185	629/437	257099	
LT 17	504186	629/438	257100	
LT 18	504187	629/439	257101	
LT 19	504188	629/440	257102	
LT 20	504189	629/441	257103	
LT 21	504190	629/442	257104	
LT 22	504191	629/443	257105	
LT 23	504192	629/444	257106	
LT 24	504193	629/445	257107	
LT 25	504194	629/446	257108	
LT 26	504195	629/447	257109	
LT 27	504196	629/448	257110	
MAGGIE	75878	98/351	38116	
MAHOGANY	75995	8/308	n/a	21/95

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MOON NO. 2	75999	45/158	15179	
NEVADA	76000	7/85	n/a	7/597
NEW 56	202156	357/213	149637	
NEW 57	202157	357/214	149638	
NEW 58	202158	357/215	149639	
NEW 59	202159	357/216	149640	
NEW 60	202160	357/217	149641	
NEW 61	202161	357/218	149642	
NEW 62	202162	357/219	149643	
NEW 63	202163	357/220	149644	
NEW 65	202165	357/222	149646	
NEW 66	202166	357/223	149647	
NEW 67	202167	357/224	149648	
NEW 68	202168	357/225	149649	
NEW 69	202169	357/226	149650	
NEW 70	202170	357/227	149651	
NEW 71	202171	357/228	149652	
NEW 72	202172	357/229	149653	
NEW 135	227243	378/300	158558	
NEW 136	227244	378/301	158559	
NEW 137	227245	378/302	158560	
NEW 138	227246	378/303	158561	
OWL	76001	7/604	n/a	
PAM	75883	98/354	38119	
PETER	75882	98/355	38120	
PIN 1	698494	854/764	352404	
PIN 2	698495	854/765	352405	
PIN 3	698496	854/766	352406	
PIN 4	698497	854/767	352407	
PIN 5	698498	854/768	352408	
PIN 6	698499	854/769	352409	
PIN 7	698500	854/770	352410	
PIN 8	698501	854/771	352411	
PIN 9	698502	854/772	352412	
PIN 10	698503	854/773	352413	
PIN 11	698504	854/774	352414	
PIN 12	698505	854/775	352415	
PINE 1	407779	560/234	228381	

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PINE 3	407781	560/236	228383	
PINE 4	407782	560/237	228384	
PINE 5	407783	560/238	228385	
PINE 6	407784	560/239	228386	
PINE 7	407785	560/240	228387	
PINE 8	407786	560/241	228388	
PINE 9	407787	560/242	228389	
PINE 10	407788	560/243	228390	
PINE 11	407789	560/244	228391	
PINE 12	407790	560/245	228392	
PINE 13	407791	560/246	228393	
PINE 14	407792	560/247	228394	
PINE 15	407793	560/248	228395	
PINE 16	407794	560/249	228396	
PINE 17	407795	560/250	228397	
PINE 18	407796	560/251	228398	
PINE 58	407836	560/291	228438	
PINE 59	407837	560/292	228439	
PINE 60	407838	560/293	228440	
PINE 61	407839	560/294	228441	
PINE 62	407840	560/295	228442	
PINE 63	407841	560/296	228443	
PINE 64	407842	560/297	228444	
PINE 65	407843	560/298	228445	
PINE 66	407844	560/299	228446	
PINK	76002	45/162	15183	
PORTAL	76003	8/262	n/a	
PORTAL FRACTION R	1013877		620139	
RED R	1013875		620137	
RED WEST	1013876		620138	
RF 1	403753	558/437	227904	
RF 2	403754	558/438	227905	
RF 3	403755	558/439	227906	
RF 4	403756	558/440	227907	
RF 5	403757	558/441	227908	
RF 6	403758	558/442	227909	
RF 7	403759	558/443	227910	
RF 8	403760	558/444	227911	
RN 1	602676	727/444	293981	
RN 2	602677	727/445	293982	

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RN 4	602679	727/447	293984	
RN 5	602680	727/448	293985	
RN 6	602681	727/449	293986	
RN 7	602682	727/450	293987	
RN 8	602683	727/451	293988	
RN 9	602684	727/452	293989	
RN 10	602685	727/453	293990	
RN 11	602686	727/454	293991	
RN 12	602687	727/455	293992	
RN 13	602688	727/456	293993	
RN 14	602689	727/457	293994	
RN 15	602690	727/458	293995	
RN 16	602691	727/459	293996	
RN 17	602692	727/460	293997	
RN 18	602693	727/461	293998	
RN 19	602694	727/462	293999	
RN 20	602695	727/463	294000	
RN 21	602696	727/464	294401	
RN 22	602697	727/465	294402	
RN 23	602698	727/466	294403	
RN 24	602799	727/467	294004	
RN 25	602700	727/468	294005	
ROB	75879	98/352	38117	
RR 1	320216	473/538	197675	
RR 2	320217	473/539	197676	
RR 3	320218	473/540	197677	
RR 4	320219	473/541	197678	
RR 5	320220	473/542	197679	
RR 6	320221	473/543	197680	
RR 7	320222	473/544	197681	
RR 8	320223	473/545	197682	
RR 9	320224	473/546	197683	
RR 10	320225	473/547	197684	
RR 11	320226	473/548	197685	
RR 12	320227	473/549	197686	
RR 13	320228	473/550	197687	
RR 14	320229	473/551	197688	
RR 15	320230	473/552	197689	
RR 16	320231	473/553	197690	
RR 17	320232	473/554	197691	

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RR 21	320236	473/558	197695	
RR 22	320237	473/559	197696	
RR 23	320238	473/560	197697	
RR 24	320239	473/561	197698	
RR 25	320240	473/562	197699	
RR 26	320241	473/563	197700	
RR 27	320242	473/564	197701	
RR 28	320243	473/565	197702	
RR 29	320244	473/566	197703	
RR 30	320245	473/567	197704	
RR 31	320246	473/568	197705	
RR 32	320247	473/569	197706	
RR 33	320248	473/570	197707	
RR 34	320249	473/571	197708	
RR 35	320250	473/572	197709	
RR 36	320251	473/573	197710	
RR 37	320252	473/574	197711	
RR 38	320253	473/575	197712	
RR 39	320254	473/576	197713	
RR 40	426606	572/466	233143	
RR 41	426607	572/467	233144	
RR 42	426608	572/468	233145	
RR 43	426609	572/469	233146	
RR 44	426610	572/470	233147	
RR 45	426611	572/471	233148	
RR 46	426612	572/472	233149	
RR 47	426613	572/473	233150	
RR 48	426614	572/474	233151	
RR 49	426615	572/475	233152	
RR 50	426616	572/476	233153	
RR 51	426617	572/477	233154	
RR 52	426618	572/478	233155	
RR 53	426619	572/479	233156	
RR 54	426620	572/480	233157	
RR 55	466934	605/248	247268	
RR 56	466935	605/249	247269	
RR 57	466936	605/250	247270	
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RR 63	466942	605/256	247276	
RR 64	466943	605/257	247277	
RRW 1	1055758		647488	
RRW 2	1055759		647489	
RRW 3	1055760		647490	
RRW 4	1055761		647491	
RRW 5	1055762		647492	
RRW 6	1055763		647493	
RRW 7	1055764		647494	
RRW 8	1055765		647495	
RRW 9	1055766		647496	
RRW 10	1055767		647497	
RRW 11	1055768		647498	
RRW 12	1055769		647499	
RRW 13	1055770		647500	
RRW 14	1055771		647501	
RRW 15	1055772		647502	
RRW 16	1055773		647503	
RRW 17	1055774		647504	
RRW 18	1055775		647505	
RRW 19	1055776		647506	
RRW 20	1055777		647507	
RRW 21	1055778		647508	
RRW 22	1055779		647509	
RRW 23	1055780		647510	
RRW 24	1055781		647511	
RRW 25	1055782		647512	
RRW 26	1055783		647513	
RRW 27	1055784		647514	
RRW 28	1055785		647515	
RRW 29	1055786		647516	
RRW 30	1055787		647517	
RRW 31	1055788		647518	
RRW 32	1055789		647519	
RRW 33	1055790		647520	
RRW 34	1055791		647521	
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RRW 41	1055798		647528	
RRW 42	1055799		647529	
RRW 43	1055800		647530	
RRW 44	1055801		647531	
RRW 45	1055802		647532	
RRW 46	1055803		647533	
RRW 47	1055804		647534	
RRW 48	1055805		647535	
RRW 49	1055806		647536	
RRW 50	1055807		647537	
RRW 51	1055808		647538	
RRW 52	1055809		647539	
RRW 53	1055810		647540	
RRW 54	1055811		647541	
RRW 55	1055812		647542	
RRW 56	1055813		647543	
RRW 57	1055814		647544	
RRW 58	1055815		647545	
RRW 59	1055816		647546	
RRW 60	1055817		647547	
RRW 61	1055818		647548	
RRW 62	1055819		647549	
RRW 63	1055820		647550	
RRW 64	1055821		647551	
RRW 65	1055822		647552	
RRW 66	1055823		647553	
RRW 67	1055824		647554	
RRW 68	1055825		647555	
RRW 69	1055826		647556	
RRW 70	1055827		647557	
RRW 71	1055828		647558	
RRW 72	1055829		647559	
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RRW 83	1055840		647570	
RRW 84	1055841		647571	
RRW 85	1055842		647572	
RRW 86	1055843		647573	
RRW 87	1055844		647574	
RRW 88	1055845		647575	
RRW 89	1055846		647576	
RRW 90	1055847		647577	
RRW 91	1055848		647578	
RRW 92	1055849		647579	
RRW 93	1055850		647580	
RRW 94	1055851		647581	
RRW 95	1055852		647582	
RRW 96	1055853		647583	
RRW 97	1055854		647584	
RRW 98	1055855		647585	
RRW 99	1055856		647586	
RRW 100	1055857		647587	
RRW 101	1055858		647588	
RRW 102	1055859		647589	
RRW 103	1055860		647590	
RRW 104	1055861		647591	
RRW 105	1055862		647592	
RRW 106	1055863		647593	
RRW 107	1055864		647594	
RRW 108	1055865		647595	
RRW 109	1055866		647596	
RRW 110	1073755		658461	
SELCO 1	75884	98/339	38104	
SELCO 2	75885	98/340	38105	
SELCO 3	75886	98/341	38106	
SELCO 4	75887	98/342	38107	
SELCO 5	75888	98/343	38108	
SELCO 6	75889	98/344	38109	
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SELCO 13	75896	98/510	38208	
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SELCO 22	75905	98/519	38217	
SELCO 23	75906	98/520	38218	
SELCO 24	75907	98/521	38219	
SELCO 25	75908	98/522	38220	
SELCO 26	75909	98/523	38221	
SELCO 27	75910	98/224	38023	
SELCO 28	75911	98/225	38024	
SELCO 29	75912	98/226	38025	
SELCO 30	75913	98/524	38222	
SELCO 31	75914	98/525	38223	
SELCO 32	75915	101/56	39393	
SELCO 33	75916	101/57	39394	
SELCO 34	75917	101/58	39395	
SELCO 35	75918	101/59	39396	
SELCO 36	75919	101/60	39397	
SELCO 37	75920	101/61	39398	
SELCO 38	75921	114/400	45258	115/665
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SELCO 40	75923	114/402	45260	
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SELCO 43	75926	114/405	45263	
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SELCO 60	75943	116/61	46009	
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SELCO 67	75950	115/671	45945	
SELCO 69	75952	115/673	45947	
SELCO 70	75953	115/674	45948	
SELCO 71	75954	115/675	45949	
SELCO 72	75955	115/676	45950	
SELCO 73	75956	115/677	45951	
SELCO 74	75957	115/678	45952	
SELCO 75	75958	115/679	45953	
SELCO 76	75959	115/680	45954	
SELCO 77	75960	115/681	45955	
SELCO 78	75961	115/682	45956	
SELCO 79	75962	115/683	45957	
SELCO 80	75963	115/684	45958	
SELCO 81	75964	115/685	45959	
SELCO 84	75967	115/688	45962	
SELCO 85	75968	115/689	45963	
SELCO 86	75969	115/690	45964	
SELCO 87	75970	115/691	45965	
SELCO 88	75971	115/692	45966	
SELCO 89	75972	115/693	45967	
SNOWBIRD	76006	7/597	n/a	
SPRING	76007	17/101	8688	
STAR	76008	45/155	15176	
STORM KING	76009	5/294	n/a	17/102
UHALDE-BORNE	76010	40/110	5925	
UHALDE-BORNE NORTH	76011	39/47	4812	
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WCS 2	1073757		658464	
WCS 3	1073758		658465	
WCS 4	1073759		658466	

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WCS 6	1073761		658468	
WCS 7	1073762		658469	
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WCS 25	1073780		658487	
WCS 26	1073781		658488	
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WRN 2	602702	727/470	294008	
WRN 3	602703	727/471	294009	
WRN 4	602704	727/472	294010	
WRN 5	602705	727/473	294011	
WRN 6	602706	727/474	294012	
WRN 7	602707	727/475	294013	
WRN 8	602708	727/476	294014	
WRN 9	602709	727/477	294015	
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WRN 11	602711	727/479	294017	
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JMD 19	1098813		682372	
JMD 20	1098814		682373	

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JMD 42	1098836		682395	
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JMD 44	1102649		687333	
JMD 45	1102650		687334	

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PF 5	NMC1116610		706344
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PF 10	NMC1116615		706349
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PF 12	NMC1116617		706351
PF 13	NMC1116618		706352
PF 14	NMC1116619		706353

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PF 16	NMC1116621		706355
PF 17	NMC1116622		706356
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PF 19	NMC1116624		706358
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PF 24	NMC1116629		706363
PF 25	NMC1116630		706364
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PF 44	NMC1124638		712278
PF 45	NMC1124639		712279
PF 46	NMC1124640		712280
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PF 48	NMC1124642		712282
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PF 50	NMC1124644		712284
PF 51	NMC1124645		712285
PF 52	NMC1124646		712286

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CISS 37	407885	560/340	228488
CISS 38	407886	560/341	228489
CISS 39	407887	560/342	228490
CISS 40	407888	560/343	228491
CISS 41	407889	560/344	228492
CISS 42	407890	560/345	228493
CISS 43	407891	560/346	228494
CISS 44	407892	560/347	228495
CISS 45	407893	560/348	228496
CISS 46	407894	560/349	228497
CISS 47	407895	560/350	228498
CISS 48	407896	560/351	228499
CISS 49	407897	560/352	228500
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CISS 51	407899	560/354	228502
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CISS 53	407901	560/356	228504
CISS 54	407902	560/357	228505
CISS 55	407903	560/358	228506
CISS 56	407904	560/359	228507
CISS 57	407905	560/360	228508
CISS 58	407906	560/361	228509
CISS 59	407907	560/362	228510
CISS 60	407908	560/363	228511
CISS 61	407909	560/364	228512
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CISS 63	407911	560/366	228514
CISS 64	407912	560/367	228515
CISS 65	407913	560/368	228516
CISS 66	407914	560/369	228517
CISS 67	407915	560/370	228518
CISS 68	407916	560/371	228519
CISS 69	407917	560/372	228520
CISS 70	407918	560/373	228521
CISS 71	407919	560/374	228522
CISS 72	407920	560/375	228523
CISS 73	407921	560/376	228524
CISS 74	407922	560/377	228525
CISS 75	407923	560/378	228526
CISS 76	407924	560/379	228527
CISS 77	407925	560/380	228528
CISS 78	407926	560/381	228529
CISS 79	407927	560/382	228530
CISS 80	407928	560/383	228531
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CISS 82	407930	560/385	228533
CISS 83	407931	560/386	228534
CISS 84	407932	560/387	228535
CISS 85	407933	560/388	228536
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CISS 87	407935	560/390	228538
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PP 2	829753	2/22681	484938
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PP 7	829758	2/22686	484943
PP 8	829759	2/22687	484944
PP 9	829760	2/22688	484945
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PP 17	829768	2/22696	484953
PP 18	829769	2/22697	484954
PP 19	829770	2/22698	484955
PP 20	829771	2/22699	484956
PP 21	829772	2/22700	484957
PP 22	829773	2/22701	484958
PP 23	829774	2/22702	484959
PP 24	829775	2/22703	484960
PP 25	829776	2/22704	484961
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PP 38	829789	2/22717	484974
PP 39	829790	2/22718	484975
PP 40	829791	2/22719	484976
PP 41	829792	2/22720	484977

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PP 43	829794	2/22722	484979
PP 44	829795	2/22723	484980
PP 45	829796	2/22724	484981
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PP 59	829810	2/22738	484995
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PP 61	829812	2/22740	484997
PP 62	829813	2/22741	484998
PP 63	829814	2/22742	484999
PP 64	829815	2/22743	485000
PP 65	829816	2/22744	485001
PP 66	829817	2/22745	485002
PP 67	829818	2/22746	485003
PP 68	829819	2/22747	485004
PP 69	829820	2/22748	485005
PP 70	829821	2/22749	485006
PP 71	829822	2/22750	485007
PP 72	829823	2/22751	485008
PP 73	829824	2/22752	485009
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PP 75	829826	2/22754	485011
PP 76	829827	2/22755	485012
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PP 79	881624	4/57465	526780
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PR 12	881636	4/57477	526773
PR 13	881637	4/57478	526774
PR 14	881638	4/57479	526775
PR 15	881639	4/57480	526776
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TC 2	125640	304/7	127283
TC 3	125641	304/8	127284
TC 4	125642	304/9	127285
TC 5	125643	304/10	127286
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TC 9	125647	304/14	127290
TC 10	125648	304/15	127291
TC 11	133862	309/184	129702
TC 12	148871	329/58	137481
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TC 14	148873	329/60	137483
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TC 17	148876	329/63	137486
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TC 21	148880	329/67	137490
TC 22	148881	329/68	137491
TC 23	148882	329/69	137492
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TC 25	148884	329/71	137494
TC 26	148885	329/72	137495
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TC 30	403762	558/427	227893
TC 31	403763	558/428	227894
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TC 34	403766	558/431	227897
TC 35	403767	558/432	227898
TC 36	403768	558/433	227899
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TC 39	403771	558/436	227902
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TC 38R	1102652		687336

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WC 13	1117631		707301
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TM 13		709580	1120109
TM 14		709581	1120110
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WX 4	11/19/2016	2/13/2017	721916	1139469
WX 5	11/19/2016	2/13/2017	721917	1139470
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WX 7	11/19/2016	2/13/2017	721919	1139472
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WX 9	11/19/2016	2/13/2017	721921	1139474
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WX 11	11/19/2016	2/13/2017	721923	1139476
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WX 83	11/18/2016	2/13/2017	721995	1139548
WX 84	11/18/2016	2/13/2017	721996	1139549
WX 85	11/18/2016	2/13/2017	721997	1139550
WX 86	11/18/2016	2/13/2017	721998	1139551
WX 87	11/18/2016	2/13/2017	721999	1139552
WX 88	11/18/2016	2/13/2017	722000	1139553
WX 89	11/18/2016	2/13/2017	722001	1139554

County Claim Name	Location Date	Recorded	Document No.	BLM NMC No.
WX 90	11/18/2016	2/13/2017	722002	1139555
WX 91	11/18/2016	2/13/2017	722003	1139556
WX 92	11/18/2016	2/13/2017	722004	1139557
WX 93	11/18/2016	2/13/2017	722005	1139558
WX 94	11/18/2016	2/13/2017	722006	1139559
WX 95	11/18/2016	2/13/2017	722007	1139560
WX 96	11/18/2016	2/13/2017	722008	1139561
WX 97	11/18/2016	2/13/2017	722009	1139562
WX 98	11/18/2016	2/13/2017	722010	1139563
WX 99	11/18/2016	2/13/2017	722011	1139564
WX 100	11/18/2016	2/13/2017	722012	1139565
WX 101	11/18/2016	2/13/2017	722013	1139566
WX 102	11/18/2016	2/13/2017	722014	1139567
WX 103	11/18/2016	2/13/2017	722015	1139568
WX 104	11/18/2016	2/13/2017	722016	1139569
WX 105	11/18/2016	2/13/2017	722017	1139570
WX 106	11/18/2016	2/13/2017	722018	1139571
WX 107	11/18/2016	2/13/2017	722019	1139572
WX 108	11/18/2016	2/13/2017	722020	1139573
WX 109	11/18/2016	2/13/2017	722021	1139574
WX 110	11/18/2016	2/13/2017	722022	1139575
WX 111	11/18/2016	2/13/2017	722023	1139576
WX 112	11/18/2016	2/13/2017	722024	1139577
WX 113	11/20/2016	2/13/2017	722025	1139578
WX 114	11/20/2016	2/13/2017	722026	1139579
WX 115	11/20/2016	2/13/2017	722027	1139580
WX 116	11/20/2016	2/13/2017	722028	1139581
WX 117	11/20/2016	2/13/2017	722029	1139582
WX 118	11/20/2016	2/13/2017	722030	1139583
WX 119	11/20/2016	2/13/2017	722031	1139584
WX 120	11/20/2016	2/13/2017	722032	1139585
WX 121	11/20/2016	2/13/2017	722033	1139586
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WX 124	11/20/2016	2/13/2017	722036	1139589
WX 125	11/20/2016	2/13/2017	722037	1139590
WX 126	11/20/2016	2/13/2017	722038	1139591
WX 127	12/1/2016	2/13/2017	722039	1139592
WX 128	12/1/2016	2/13/2017	722040	1139593
WX 129	12/1/2016	2/13/2017	722041	1139594
WX 130	12/1/2016	2/13/2017	722042	1139595
WX 131	12/1/2016	2/13/2017	722043	1139596
WX 132	12/1/2016	2/13/2017	722044	1139597
WX 133	12/1/2016	2/13/2017	722045	1139598
WX 134	12/1/2016	2/13/2017	722046	1139599
WX 135	12/1/2016	2/13/2017	722047	1139600
WX 136	12/1/2016	2/13/2017	722048	1139601
WX 137	12/1/2016	2/13/2017	722049	1139602

County Claim Name	Location Date	Recorded	Document No.	BLM NMC No.
WX 138	12/1/2016	2/13/2017	722050	1139603
WX 139	12/1/2016	2/13/2017	722051	1139604
WX 140	12/1/2016	2/13/2017	722052	1139605
WX 141	12/1/2016	2/13/2017	722053	1139606
WX 142	12/1/2016	2/13/2017	722054	1139607
WX 143	12/1/2016	2/13/2017	722055	1139608
WX 144	12/1/2016	2/13/2017	722056	1139609
WX 145	12/1/2016	2/13/2017	722057	1139610
WX 146	12/1/2016	2/13/2017	722058	1139611
WX 147	12/1/2016	2/13/2017	722059	1139612
WX 148	12/1/2016	2/13/2017	722060	1139613
WX 149	12/1/2016	2/13/2017	722061	1139614
WX 150	12/1/2016	2/13/2017	722062	1139615
WX 151	12/1/2016	2/13/2017	722063	1139616
WX 152	12/1/2016	2/13/2017	722064	1139617
WX 153	12/1/2016	2/13/2017	722065	1139618
WX 154	12/1/2016	2/13/2017	722066	1139619
WX 155	12/1/2016	2/13/2017	722067	1139620
WX 156	12/1/2016	2/13/2017	722068	1139621

Claim Name	NMC #
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PBX 65	1139778

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PBX 144	1139857
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PBX 147	1139860
PBX 148	1139861
PBX 149	1139862

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			County		BLM
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1	PBG 1	3/14/2017	6/5/2017	725624	1144005
2	PBG 2	3/14/2017	6/5/2017	725625	1144006
3	PBG 3	3/14/2017	6/5/2017	725626	1144007
4	PBG 4	3/14/2017	6/5/2017	725627	1144008
5	PBG 5	3/14/2017	6/5/2017	725628	1144009
6	PBG 6	3/14/2017	6/5/2017	725629	1144010
7	PBG 7	3/14/2017	6/5/2017	725630	1144011
8	PBG 8	3/14/2017	6/5/2017	725631	1144012
9	PBG 9	3/14/2017	6/5/2017	725632	1144013
10	PBG 10	3/14/2017	6/5/2017	725633	1144014
11	PBG 11	3/14/2017	6/5/2017	725634	1144015
12	PBG 12	3/14/2017	6/5/2017	725635	1144016
13	PBG 13	3/21/2017	6/5/2017	725636	1144017
14	PBG 14	3/21/2017	6/5/2017	725637	1144018
15	PBG 15	3/21/2017	6/5/2017	725638	1144019
16	PBG 16	3/21/2017	6/5/2017	725639	1144020
17	PBG 17	3/21/2017	6/5/2017	725640	1144021
18	PBG 18	3/25/2017	6/5/2017	725641	1144022
19	PBG 19	3/25/2017	6/5/2017	725642	1144023

Count	Claim Name	Location Date	Recording Date	County Document No.	BLM NMC No.
20	PBG 20	3/25/2017	6/5/2017	725643	1144024
21	PBG 21	3/25/2017	6/5/2017	725644	1144025
22	PBG 22	3/25/2017	6/5/2017	725645	1144026
23	PBG 23	3/25/2017	6/5/2017	725646	1144027
24	PBG 24	3/25/2017	6/5/2017	725647	1144028
25	PBG 25	3/21/2017	6/5/2017	725648	1144029
26	PBG 26	3/21/2017	6/5/2017	725649	1144030
27	PBG 27	3/21/2017	6/5/2017	725650	1144031
28	PBG 28	3/21/2017	6/5/2017	725651	1144032
29	PBG 29	3/21/2017	6/5/2017	725652	1144033
30	PBG 30	3/21/2017	6/5/2017	725653	1144034
31	PBG 31	3/21/2017	6/5/2017	725654	1144035
32	PBG 32	3/25/2017	6/5/2017	725655	1144036
33	PBG 33	3/25/2017	6/5/2017	725656	1144037
34	PBG 34	3/25/2017	6/5/2017	725657	1144038
35	PBG 35	3/25/2017	6/5/2017	725658	1144039
36	PBG 36	3/25/2017	6/5/2017	725659	1144040
37	PBG 37	3/25/2017	6/5/2017	725660	1144041
38	PBG 38	3/25/2017	6/5/2017	725661	1144042
39	PBG 39	3/25/2017	6/5/2017	725662	1144043
40	PBG 40	3/25/2017	6/5/2017	725663	1144044
41	PBG 41	3/25/2017	6/5/2017	725664	1144045
42	PBG 42	3/25/2017	6/5/2017	725665	1144046
43	PBG 43	3/25/2017	6/5/2017	725666	1144047
44	PBG 44	3/25/2017	6/5/2017	725667	1144048
45	PBG 45	3/25/2017	6/5/2017	725668	1144049
46	PBG 46	3/22/2017	6/5/2017	725669	1144050
47	PBG 47	3/22/2017	6/5/2017	725670	1144051
48	PBG 48	3/22/2017	6/5/2017	725671	1144052
49	PBG 49	3/22/2017	6/5/2017	725672	1144053
50	PBG 50	3/22/2017	6/5/2017	725673	1144054
51	PBG 51	3/22/2017	6/5/2017	725674	1144055
52	PBG 52	3/22/2017	6/5/2017	725675	1144056
53	PBG 53	3/22/2017	6/5/2017	725676	1144057
54	PBG 54	3/22/2017	6/5/2017	725677	1144058
55	PBG 55	3/22/2017	6/5/2017	725678	1144059
56	PBG 56	3/22/2017	6/5/2017	725679	1144060

Count	Claim Name	Location Date	Recording Date	County Document No.	BLM NMC No.
57	PBG 57	3/22/2017	6/5/2017	725680	1144061
58	PBG 58	3/22/2017	6/5/2017	725681	1144062
59	PBG 59	3/22/2017	6/5/2017	725682	1144063
60	PBG 60	3/22/2017	6/5/2017	725683	1144064
61	PBG 61	3/22/2017	6/5/2017	725684	1144065
62	PBG 62	3/22/2017	6/5/2017	725685	1144066
63	PBG 63	3/22/2017	6/5/2017	725686	1144067
64	PBG 64	3/22/2017	6/5/2017	725687	1144068
65	PBG 65	3/22/2017	6/5/2017	725688	1144069
66	PBG 66	3/22/2017	6/5/2017	725689	1144070
67	PBG 67	3/22/2017	6/5/2017	725690	1144071
68	PBG 68	3/22/2017	6/5/2017	725691	1144072
69	PBG 69	3/22/2017	6/5/2017	725692	1144073
70	PBG 70	3/22/2017	6/5/2017	725693	1144074
71	PBG 71	3/22/2017	6/5/2017	725694	1144075
72	PBG 72	3/22/2017	6/5/2017	725695	1144076
73	PBG 73	3/22/2017	6/5/2017	725696	1144077
74	PBG 74	3/22/2017	6/5/2017	725697	1144078
75	PBG 75	3/22/2017	6/5/2017	725698	1144079
76	PBG 76	3/22/2017	6/5/2017	725699	1144080
77	PBG 77	3/22/2017	6/5/2017	725700	1144081
78	PBG 78	3/22/2017	6/5/2017	725701	1144082
79	PBG 79	3/22/2017	6/5/2017	725702	1144083
80	PBG 80	3/22/2017	6/5/2017	725703	1144084
81	PBG 81	3/22/2017	6/5/2017	725704	1144085
82	PBG 82	3/22/2017	6/5/2017	725705	1144086
83	PBG 83	3/15/2017	6/5/2017	725706	1144087
84	PBG 84	3/15/2017	6/5/2017	725707	1144088
85	PBG 85	3/15/2017	6/5/2017	725708	1144089
86	PBG 86	3/15/2017	6/5/2017	725709	1144090
87	PBG 87	3/15/2017	6/5/2017	725710	1144091
88	PBG 88	3/15/2017	6/5/2017	725711	1144092
89	PBG 89	3/15/2017	6/5/2017	725712	1144093
90	PBG 90	3/15/2017	6/5/2017	725713	1144094
91	PBG 91	3/15/2017	6/5/2017	725714	1144095
92	PBG 92	3/15/2017	6/5/2017	725715	1144096
93	PBG 93	3/15/2017	6/5/2017	725716	1144097

Count	Claim Name	Location Date	Recording Date	County Document No.	BLM NMC No.
94	PBG 94	3/15/2017	6/5/2017	725717	1144098
95	PBG 95	3/15/2017	6/5/2017	725718	1144099
96	PBG 96	3/15/2017	6/5/2017	725719	1144100
97	PBG 97	3/15/2017	6/5/2017	725720	1144101
98	PBG 98	3/15/2017	6/5/2017	725721	1144102
99	PBG 99	3/15/2017	6/5/2017	725722	1144103
100	PBG 100	3/15/2017	6/5/2017	725723	1144104
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102	PBG 102	3/15/2017	6/5/2017	725725	1144106
103	PBG 103	3/15/2017	6/5/2017	725726	1144107
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105	PBG 105	3/15/2017	6/5/2017	725728	1144109
106	PBG 106	3/15/2017	6/5/2017	725729	1144110
107	PBG 107	3/15/2017	6/5/2017	725730	1144111
108	PBG 108	3/15/2017	6/5/2017	725731	1144112
109	PBG 109	3/15/2017	6/5/2017	725732	1144113
110	PBG 110	3/15/2017	6/5/2017	725733	1144114
111	PBG 111	3/15/2017	6/5/2017	725734	1144115
112	PBG 112	3/15/2017	6/5/2017	725735	1144116
113	PBG 113	3/15/2017	6/5/2017	725736	1144117
114	PBG 114	3/15/2017	6/5/2017	725737	1144118
115	PBG 115	3/15/2017	6/5/2017	725738	1144119
116	PBG 116	3/15/2017	6/5/2017	725739	1144120
117	PBG 117	3/15/2017	6/5/2017	725740	1144121
118	PBG 118	3/15/2017	6/5/2017	725741	1144122
119	PBG 119	3/15/2017	6/5/2017	725742	1144123
120	PBG 120	3/15/2017	6/5/2017	725743	1144124
121	PBG 121	3/15/2017	6/5/2017	725744	1144125
122	PBG 122	3/15/2017	6/5/2017	725745	1144126
123	PBG 123	3/15/2017	6/5/2017	725746	1144127
124	PBG 124	3/20/2017	6/5/2017	725747	1144128
125	PBG 125	3/20/2017	6/5/2017	725748	1144129
126	PBG 126	3/20/2017	6/5/2017	725749	1144130
127	PBG 127	3/20/2017	6/5/2017	725750	1144131
128	PBG 128	3/20/2017	6/5/2017	725751	1144132
129	PBG 129	3/20/2017	6/5/2017	725752	1144133
130	PBG 130	3/20/2017	6/5/2017	725753	1144134

Count	Claim Name	Location Date	Recording Date	County Document No.	BLM NMC No.
131	PBG 131	3/20/2017	6/5/2017	725754	1144135
132	PBG 132	3/20/2017	6/5/2017	725755	1144136
133	PBG 133	3/20/2017	6/5/2017	725756	1144137
134	PBG 134	3/20/2017	6/5/2017	725757	1144138
135	PBG 135	3/20/2017	6/5/2017	725758	1144139
136	PBG 136	3/20/2017	6/5/2017	725759	1144140
137	PBG 137	3/20/2017	6/5/2017	725760	1144141
138	PBG 138	3/20/2017	6/5/2017	725761	1144142
139	PBG 139	3/20/2017	6/5/2017	725762	1144143
140	PBG 140	3/20/2017	6/5/2017	725763	1144144
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143	PBG 143	3/20/2017	6/5/2017	725766	1144147
144	PBG 144	3/20/2017	6/5/2017	725767	1144148
145	PBG 145	3/20/2017	6/5/2017	725768	1144149
146	PBG 146	3/20/2017	6/5/2017	725769	1144150
147	PBG 147	3/20/2017	6/5/2017	725770	1144151
148	PBG 148	3/20/2017	6/5/2017	725771	1144152
149	PBG 149	3/20/2017	6/5/2017	725772	1144153
150	PBG 150	3/20/2017	6/5/2017	725773	1144154
151	PBG 151	3/20/2017	6/5/2017	725774	1144155
152	PBG 152	3/20/2017	6/5/2017	725775	1144156
153	PBG 153	3/20/2017	6/5/2017	725776	1144157
154	PBG 154	3/20/2017	6/5/2017	725777	1144158
155	PBG 155	7/9/2017	9/26/017	730923	1149827
156	PBG 156	7/9/2017	9/26/017	730924	1149828
157	PBG 157	7/9/2017	9/26/017	730925	1149829
158	PBG 158	7/9/2017	9/26/017	730926	1149830
159	PBG 159	10/18/2017	1/10/2018	735553	1163261
160	PBG 160	10/18/2017	1/10/2018	735554	1163262
161	PBG 161	10/18/2017	1/10/2018	735555	1163263
162	PBG 162	10/18/2017	1/10/2018	735556	1163264
163	PBG 163	10/18/2017	1/10/2018	735557	1163265
164	PBG 164	5/14/2018	8/8/2018	744728	1177559
165	PBG 165	5/14/2018	8/8/2018	744729	1177560
166	PBG 166	5/14/2018	8/8/2018	744730	1177561
167	PBG 167	5/14/2018	8/8/2018	744731	1177562

Count	Claim Name	Location Date	Recording Date	County Document No.	BLM NMC No.
168	PBG 168	5/14/2018	8/8/2018	744732	1177563
169	PBG 169	5/14/2018	8/8/2018	744733	1177564

Unpatented Lode Claims Leased by Gold Standard

Elko County, Nevada, Mount Diablo Base and Meridian

North Railroad Portion of the Property

Claim Name	NMC #	County	
		Book/Page	Document #
GUTSY 1203	399864	553/106	226058
GUTSY 1204	399865	553/107	226059
GUTSY 1205	399866	553/108	226060
GUTSY 1206	399867	553/109	226061
GUTSY 1207	399868	553/110	226062
GUTSY 1208	399869	553/111	226063
GUTSY 1209	399870	553/112	226064
GUTSY 1210	399871	553/113	226065
GUTSY 1211	399872	553/114	226066
GUTSY 1212	399873	553/115	226067
GUTSY 1213	399874	553/116	226068
GUTSY 1214	399875	553/117	226069
GUTSY 1215	399876	553/118	226070
GUTSY 1216	399877	553/119	226071
GUTSY 1217	399878	553/120	226072
GUTSY 1218	399879	553/121	226073
GUTSY 1219	399880	553/122	226074
GUTSY 1220	399881	553/123	226075
GUTSY 1221	399882	553/124	226076
GUTSY 1222	399883	553/125	226077
GUTSY 1223	399884	553/126	226078
GUTSY 1224	399885	553/127	226079
GUTSY 1225	399886	553/128	226080
GUTSY 1226	399887	553/129	226081
GUTSY 1227	399888	553/130	226082
GUTSY 1228	399889	553/131	226083
GUTSY 1229	399890	553/132	226084
GUTSY 1230	399891	553/133	226085
GUTSY 1231	399892	553/134	226086
GUTSY 1232	399893	553/135	226087
GUTSY 1233	399894	553/136	226088
GUTSY 1234	399895	553/137	226089
GUTSY 1235	399896	553/138	226090
GUTSY 1236	399897	553/139	226091
GUTSY 1237	399898	553/140	226092

Claim Name	NMC #	County	
		Book/Page	Document #
GUTSY 1238	399899	553/141	226093
GUTSY 1239	399900	553/142	226094
GUTSY 1240	399901	553/143	226095
GUTSY 1241	399902	553/144	226096
GUTSY 1242	399903	553/145	226097
GUTSY 1243	399904	553/146	226098
GUTSY 1244	399905	553/147	226099
GUTSY 1245	399906	553/148	226100
GUTSY 1246	399907	553/149	226101
GUTSY 1247	399908	553/150	226102
GUTSY 1248	399909	553/151	226103
GUTSY 1249	399910	553/152	226104
GUTSY 1250	399911	553/153	226105
GUTSY 1251	399912	553/154	226106
GUTSY 1252	399913	553/155	226107
GUTSY 1253	399914	553/156	226108
GUTSY 1254	399915	553/157	226109
GUTSY 1255	399916	553/158	226110
GUTSY 1256	399917	553/159	226111
GUTSY 1257	399918	553/160	226112
GUTSY 1258	399919	553/161	226113
GUTSY 1259	399920	553/162	226114
GUTSY 1260	399921	553/163	226115
GUTSY 1261	399922	553/164	226116
GUTSY 1262	399923	553/165	226117
GUTSY 1263	399924	553/166	226118
GUTSY 1264	399925	553/167	226119
GUTSY 1265	399926	553/168	226120
GUTSY 1266	399927	553/169	226121
GUTSY 1267	399928	553/170	226122
GUTSY 1268	399929	553/171	226123
GUTSY 1269	399930	553/172	226124
GUTSY 1270	399931	553/173	226125
GUTSY 1271	399932	553/174	226126
GUTSY 1272	399933	553/175	226127
GUTSY 1273	399934	553/176	226128
GUTSY 1274	399935	553/177	226129

South Railroad Portion of the Property

Claim Name	NMC #	Book/Page	County Document #
Joe PP 56	898185	5/20346	534020
Joe PP 58	898186	5/20348	534022
Joe PP 56A	1104555		691029
Joe PP 58A	1104556		691030

Claim Name	NMC #	Book/Page	County Document #
DIX 1	825914		476602
DIX 2	825915		476603
DIX 3	825916		476604
DIX 4	825917		476605
DIX 5	825918		476606
DIX 6	825919		476607
DIX 7	825920		476608
DIX 8	825921		476609
DIX 9	825922		476610
DIX 10	825923		476611
DIX 11	825924		476612
DIX 12	825925		476613
DIX 13	825926		476614
DIX 14	825927		476615
DIX 15	825928		476616
DIX 16	825929		476617
DIX 17	825930		476618
DIX 18	825931		476619
DIX 19	825932		476620
DIX 20	825933		476621
DIX 21	825934		476622
DIX 22	825935		476623
DIX 23	825936		476624
DIX 24	825937		476625
DIX 25	825938		476626
DIX 26	825939		476627
DIX 27	825940		476628
DIX 28	825941		476629
DIX 29	825942		476630
DIX 30	825943		476631
DIX 31	825944		476632
DIX 32	825945		476633
DIX 33	825946		476634
WMH 131	831193		487250
WMH 132	831194		487251
WMH 133	831195		487252
WMH 134	831196		487253
WMH 135	831197		487254

Claim Name	NMC #	Book/Page	County Document #
WMH 136	831198		487255
WMH 137	831199		487256
WMH 138	831200		487257
WMH 139	831201		487258
WMH 140	831202		487259
WMH 141	831203		487260
WMH 142	831204		487261
WMH 143	831205		487262
WMH 144	831206		487263
WMH 145	831207		487264
WMH 146	831208		487265
WMH 147	831209		487266
WMH 148	831210		487267
WMH 151	831211		487268
WMH 152	831212		487269
WMH 153	831213		487270
WMH 154	831214		487271
WMH 155	831215		487272
WMH 156	831216		487273
WMH 157	831217		487274
WMH 158	831218		487275
WMH 159	831219		487276
WMH 160	831220		487277
WMH 161	831221		487278
WMH 162	831222		487279
WMH 163	831223		487280
WMH 164	831224		487281
WMH 165	831225		487282
WMH 166	831226		487283
WMH 167	831227		487284
WMH 168	831228		487285
TF 1	831229		487286
TF 2	831230		487287
TF 3	831231		487288
TF 4	831232		487289
TF 5	831233		487290
TF 6	831234		487291
TF 7	831235		487292
TF 8	831236		487293
TF 9	831237		487294
TF 10	831238		487295
TF 11	831239		487296
TF 12	831240		487297
TF 13	831241		487298
TF 14	831242		487299
TF 15	831243		487300
TF 16	831244		487301
TF 17	831245		487302

Claim Name	NMC #	Book/Page	County Document #
TF 18	831246		487303
TF 19	831247		487304
TF 20	831248		487305
TF 21	831249		487306
TF 22	831250		487307
TF 23	831251		487308
TF 24	831252		487309
TF 25	831253		487310
TF 26	831254		487311
TF 27	831255		487312
TF 28	831256		487313
TF 29	831257		487314
TF 30	831258		487315
TF 31	831259		487316
TF 32	831260		487317
TF 33	831261		487318
TF 34	831262		487319
TF 35	831263		487320
TF 36	831264		487321
Calavera 6	276106		179214
Calavera 21	276121		179229

Claim Name	Location Date	Recorded	County Document No.	BLM No.
WMH 9	9/8/2001	12/5/2001	477034	NMC826307
WMH 10	9/8/2001	12/5/2001	477035	NMC826308
WMH 11	9/8/2001	12/5/2001	477036	NMC826309
WMH 12	9/8/2001	12/5/2001	477037	NMC826310
WMH 13	9/8/2001	12/5/2001	477038	NMC826311
WMH 14	9/8/2001	12/5/2001	477039	NMC826312
WMH 17	9/8/2001	12/5/2001	477042	NMC826315
WMH 19	9/8/2001	12/5/2001	477044	NMC826317
WMH 31	9/8/2001	12/5/2001	477046	NMC826319
WMH 32	9/8/2001	12/5/2001	477047	NMC826320
WMH 33	9/8/2001	12/5/2001	477048	NMC826321
WMH 34	9/8/2001	12/5/2001	477049	NMC826322
WMH 38	9/8/2001	12/5/2001	477053	NMC826326
WMH 40	9/8/2001	12/5/2001	477055	NMC826328

Claim Name	Location Date	Recording Date	County Document No.	BLM NMC No.
Pine 1	6/9/2006	8/3/2006	557790	932037
Pine 2	6/9/2006	8/3/2006	557791	932038
Pine 3	6/9/2006	8/3/2006	557792	932039
Pine 4	6/9/2006	8/3/2006	557793	932040
Pine 5	6/9/2006	8/3/2006	557794	932041

Pine 6	6/9/2006	8/3/2006	557795	932042
Pine 7	6/9/2006	8/3/2006	557796	932043
Pine 8	6/9/2006	8/3/2006	557797	932044
Pine 9	6/9/2006	8/3/2006	557798	932045
Pine 10	6/9/2006	8/3/2006	557799	932046

APPENDIX C – BREAKDOWN OF MINERAL RESOURCES BY AREA AND OXIDATION STATE

Appendix C

Resource Tabulations

Dark Star Measured Oxide

Cutoff			
oz Au/ton	**Tons**	**oz Au/ton**	**oz Au**
0.001	8,345,000	0.03	229,000
0.002	7,274,000	0.03	228,000
0.003	6,202,000	0.04	225,000
0.004	5,590,000	0.04	223,000
0.005	**5,255,000**	**0.04**	**222,000**
0.006	5,040,000	0.04	221,000
0.007	4,864,000	0.05	219,000
0.008	4,665,000	0.05	218,000
0.009	4,464,000	0.05	216,000
0.010	4,310,000	0.05	215,000
0.015	3,493,000	0.06	205,000
0.020	2,913,000	0.07	195,000
0.025	2,482,000	0.07	185,000
0.030	2,178,000	0.08	177,000
0.035	1,954,000	0.09	169,000
0.040	1,765,000	0.09	162,000
0.045	1,618,000	0.10	156,000
0.050	1,479,000	0.10	150,000
0.075	930,000	0.12	116,000
0.100	635,000	0.14	90,000

Dark Star Measured Transitional

Cutoff			
oz Au/ton	**Tons**	**oz Au/ton**	**oz Au**
0.001	5,781,000	0.01	73,000
0.002	4,652,000	0.02	72,000
0.003	3,583,000	0.02	69,000
0.004	3,035,000	0.02	67,000
0.005	**2,709,000**	**0.02**	**66,000**
0.006	2,428,000	0.03	64,000
0.007	2,237,000	0.03	63,000
0.008	2,056,000	0.03	62,000
0.009	1,953,000	0.03	61,000
0.010	1,762,000	0.03	59,000
0.015	1,137,000	0.05	51,000
0.020	831,000	0.06	46,000
0.025	666,000	0.06	43,000
0.030	562,000	0.07	40,000
0.035	461,000	0.08	37,000
0.040	423,000	0.08	35,000
0.045	373,000	0.09	33,000
0.050	337,000	0.09	31,000
0.075	199,000	0.11	23,000
0.100	117,000	0.14	16,000

Dark Star Indicated Oxide

Cutoff			
oz Au/ton	**Tons**	**oz Au/ton**	**oz Au**
0.001	23,778,000	0.02	390,000
0.002	20,546,000	0.02	384,000
0.003	17,824,000	0.02	378,000
0.004	15,679,000	0.02	370,000
0.005	**14,328,000**	**0.03**	**364,000**
0.006	13,195,000	0.03	358,000
0.007	12,337,000	0.03	353,000
0.008	11,596,000	0.03	347,000
0.009	10,931,000	0.03	341,000
0.010	10,366,000	0.03	336,000
0.015	7,647,000	0.04	303,000
0.020	5,634,000	0.05	268,000
0.025	4,268,000	0.06	237,000
0.030	3,378,000	0.06	213,000
0.035	2,714,000	0.07	191,000
0.040	2,291,000	0.08	176,000
0.045	1,937,000	0.08	161,000
0.050	1,675,000	0.09	148,000
0.075	878,000	0.11	100,000
0.100	526,000	0.13	70,000

Dark Star Indicated Transitional

Cutoff			
oz Au/ton	**Tons**	**oz Au/ton**	**oz Au**
0.001	20,968,000	0.01	252,000
0.002	18,046,000	0.01	247,000
0.003	15,520,000	0.02	242,000
0.004	13,698,000	0.02	236,000
0.005	**12,410,000**	**0.02**	**230,000**
0.006	11,356,000	0.02	224,000
0.007	10,492,000	0.02	218,000
0.008	9,619,000	0.02	212,000
0.009	8,928,000	0.02	206,000
0.010	8,188,000	0.02	199,000
0.015	4,876,000	0.03	158,000
0.020	2,982,000	0.04	126,000
0.025	2,009,000	0.05	104,000
0.030	1,482,000	0.06	90,000
0.035	1,159,000	0.07	79,000
0.040	900,000	0.08	69,000
0.045	752,000	0.08	63,000
0.050	637,000	0.09	58,000
0.075	353,000	0.12	41,000
0.100	233,000	0.13	30,000

Dark Star Indicated Refractory

Cutoff			
oz Au/ton	**Tons**	**oz Au/ton**	**oz Au**
0.001	3,220,000	0.02	59,000
0.002	2,862,000	0.02	58,000
0.003	2,451,000	0.02	57,000
0.004	2,144,000	0.03	56,000
0.005	1,970,000	0.03	56,000
0.006	1,791,000	0.03	55,000
0.007	1,670,000	0.03	54,000
0.008	1,559,000	0.03	53,000
0.009	1,461,000	0.04	52,000
0.010	1,364,000	0.04	51,000
0.015	920,000	0.05	46,000
0.020	692,000	0.06	42,000
0.025	575,000	0.07	39,000
0.030	517,000	0.07	38,000
0.035	442,000	0.08	35,000
0.040	375,000	0.09	33,000
0.045	**343,000**	**0.09**	**31,000**
0.050	311,000	0.10	30,000
0.075	206,000	0.11	24,000
0.100	131,000	0.13	17,000

Dark Star Inferred Oxide - Open Pit

Cutoff			
oz Au/ton	**Tons**	**oz Au/ton**	**oz Au**
0.001	1,221,000	0.01	9,000
0.002	630,000	0.01	8,000
0.003	551,000	0.01	8,000
0.004	484,000	0.02	7,000
0.005	**439,000**	**0.02**	**7,000**
0.006	384,000	0.02	7,000
0.007	338,000	0.02	7,000
0.008	314,000	0.02	6,000
0.009	278,000	0.02	6,000
0.010	250,000	0.02	6,000
0.015	165,000	0.03	5,000
0.020	125,000	0.03	4,000
0.025	74,000	0.04	3,000
0.030	51,000	0.05	2,000
0.035	35,000	0.05	2,000
0.040	32,000	0.05	2,000
0.045	25,000	0.06	1,000
0.050	21,000	0.06	1,000
0.075	-	0.00	-
0.100	-	0.00	-

Dark Star Inferred Transitional - Open Pit

Cutoff			
oz Au/ton	**Tons**	**oz Au/ton**	**oz Au**
0.001	2,171,000	0.007	15,000
0.002	1,387,000	0.010	14,000
0.003	1,080,000	0.012	13,000
0.004	968,000	0.013	13,000
0.005	**853,000**	**0.014**	**12,000**
0.006	773,000	0.015	12,000
0.007	705,000	0.016	11,000
0.008	643,000	0.017	11,000
0.009	592,000	0.018	10,000
0.010	533,000	0.018	10,000
0.015	330,000	0.022	7,000
0.010	533,000	0.018	10,000
0.025	78,000	0.036	3,000
0.030	52,000	0.041	2,000
0.035	29,000	0.049	1,000
0.040	15,000	0.059	1,000
0.045	15,000	0.059	1,000
0.050	13,000	0.061	1,000
0.075	2,000	0.078	-
0.100	-	0.000	-

Dark Star Inferred Refractory - Open Pit

Cutoff			
oz Au/ton	**Tons**	**oz Au/ton**	**oz Au**
0.001	258,000	0.01	2,000
0.002	161,000	0.01	2,000
0.003	153,000	0.02	2,000
0.004	145,000	0.02	2,000
0.005	133,000	0.02	2,000
0.006	124,000	0.02	2,000
0.007	109,000	0.02	2,000
0.008	96,000	0.02	2,000
0.009	92,000	0.02	2,000
0.010	81,000	0.02	2,000
0.015	54,000	0.03	2,000
0.020	32,000	0.04	1,000
0.025	26,000	0.04	1,000
0.030	15,000	0.05	1,000
0.035	11,000	0.05	1,000
0.040	7,000	0.06	-
0.045	**4,000**	**0.07**	**-**
0.050	4,000	0.07	-
0.075	-	0.00	-
0.100	-	0.00	-

Pinion Measured Oxide - Open Pit

Cutoff					
oz Au/ton	Tons	oz Au/ton	oz Au	oz Ag/ton	oz Ag
0.001	2,738,000	0.019	53,000	0.17	467,000
0.002	2,624,000	0.020	52,000	0.18	465,000
0.003	2,545,000	0.021	52,000	0.18	463,000
0.004	2,475,000	0.021	52,000	0.18	457,000
0.005	**2,409,000**	**0.022**	**52,000**	**0.19**	**453,000**
0.006	2,298,000	0.022	51,000	0.19	443,000
0.007	2,187,000	0.023	50,000	0.20	433,000
0.008	2,046,000	0.024	49,000	0.20	415,000
0.009	1,908,000	0.025	48,000	0.21	395,000
0.010	1,803,000	0.026	47,000	0.21	382,000
0.015	1,293,000	0.032	41,000	0.24	306,000
0.020	897,000	0.038	34,000	0.25	227,000
0.025	614,000	0.045	28,000	0.26	161,000
0.030	465,000	0.051	24,000	0.27	124,000
0.035	341,000	0.058	20,000	0.27	92,000
0.040	252,000	0.065	16,000	0.29	73,000
0.045	198,000	0.071	14,000	0.28	55,000
0.050	164,000	0.076	12,000	0.29	47,000

Pinion Measured Transitional - Open Pit

Cutoff					
oz Au/ton	Tons	oz Au/ton	oz Au	oz Ag/ton	oz Ag
0.001	212,000	0.014	3,000	0.17	37,000
0.002	188,000	0.016	3,000	0.19	36,000
0.003	177,000	0.017	3,000	0.20	36,000
0.004	175,000	0.017	3,000	0.20	36,000
0.005	**166,000**	**0.018**	**3,000**	**0.21**	**35,000**
0.006	147,000	0.019	3,000	0.22	32,000
0.007	133,000	0.020	3,000	0.22	29,000
0.008	126,000	0.021	3,000	0.20	25,000
0.009	115,000	0.022	3,000	0.20	23,000
0.010	108,000	0.023	2,000	0.21	22,000
0.015	68,000	0.030	2,000	0.20	13,000
0.020	49,000	0.034	2,000	0.20	10,000
0.025	40,000	0.037	1,000	0.22	9,000
0.030	36,000	0.038	1,000	0.24	9,000
0.035	19,000	0.045	1,000	0.29	6,000
0.040	9,000	0.051	-	0.33	3,000
0.045	5,000	0.061	-	0.29	1,000
0.050	3,000	0.074	-	0.31	1,000

Pinion Indicated Oxide - Open Pit

Cutoff oz Au/ton	Tons	oz Au/ton	oz Au	oz Ag/ton	oz Ag
0.001	57,814,000	0.014	827,000	0.12	6,787,000
0.002	52,986,000	0.016	821,000	0.13	6,724,000
0.003	49,301,000	0.016	809,000	0.13	6,631,000
0.004	46,139,000	0.017	798,000	0.14	6,501,000
0.005	**43,478,000**	**0.018**	**787,000**	**0.15**	**6,370,000**
0.006	41,014,000	0.019	775,000	0.15	6,222,000
0.007	38,627,000	0.020	757,000	0.16	6,065,000
0.008	36,138,000	0.021	741,000	0.16	5,858,000
0.009	33,634,000	0.021	720,000	0.17	5,617,000
0.010	31,232,000	0.022	696,000	0.17	5,381,000
0.015	21,038,000	0.027	570,000	0.19	4,092,000
0.020	13,390,000	0.033	438,000	0.21	2,849,000
0.025	8,392,000	0.039	326,000	0.23	1,924,000
0.030	5,411,000	0.045	245,000	0.24	1,323,000
0.035	3,649,000	0.052	188,000	0.25	917,000
0.040	2,434,000	0.059	143,000	0.26	621,000
0.045	1,735,000	0.065	113,000	0.26	452,000
0.050	1,305,000	0.071	93,000	0.26	337,000

Pinion Indicated Transitional - Open Pit

Cutoff oz Au/ton	Tons	oz Au/ton	oz Au	oz Ag/ton	oz Ag
0.001	3,116,000	0.010	32,000	0.10	297,000
0.002	2,673,000	0.012	32,000	0.11	288,000
0.003	2,379,000	0.013	31,000	0.12	276,000
0.004	2,132,000	0.014	30,000	0.12	263,000
0.005	**1,930,000**	**0.015**	**29,000**	**0.13**	**247,000**
0.006	1,763,000	0.016	28,000	0.13	233,000
0.007	1,606,000	0.017	27,000	0.14	217,000
0.008	1,439,000	0.018	26,000	0.14	200,000
0.009	1,298,000	0.019	25,000	0.14	180,000
0.010	1,168,000	0.020	24,000	0.14	167,000
0.015	718,000	0.025	18,000	0.15	109,000
0.020	451,000	0.030	13,000	0.14	64,000
0.025	248,000	0.036	9,000	0.12	31,000
0.030	173,000	0.040	7,000	0.13	22,000
0.035	99,000	0.046	5,000	0.12	11,000
0.040	46,000	0.056	3,000	0.11	5,000
0.045	33,000	0.062	2,000	0.11	4,000
0.050	24,000	0.067	2,000	0.08	2,000

Pinion Inferred Oxide - Open Pit

Cutoff					
oz Au/ton	**Tons**	**oz Au/ton**	**oz Au**	**oz Ag/ton**	**oz Ag**
0.001	3,501,000	0.005	19,000	0.03	111,000
0.002	1,950,000	0.009	17,000	0.05	100,000
0.003	1,632,000	0.010	16,000	0.06	95,000
0.004	1,371,000	0.011	15,000	0.06	88,000
0.005	**1,191,000**	**0.012**	**14,000**	**0.07**	**82,000**
0.006	1,044,000	0.013	13,000	0.07	74,000
0.007	911,000	0.014	13,000	0.08	68,000
0.008	814,000	0.015	12,000	0.08	64,000
0.009	692,000	0.016	11,000	0.08	58,000
0.010	631,000	0.016	10,000	0.09	54,000
0.015	321,000	0.020	7,000	0.10	33,000
0.020	120,000	0.026	3,000	0.13	15,000
0.025	49,000	0.031	2,000	0.08	4,000
0.030	26,000	0.035	1,000	0.06	2,000
0.035	13,000	0.038	1,000	0.06	1,000
0.040	2,000	0.043	-	0.06	-
0.045	-	0.000	-	0.00	-
0.050	-	0.000	-	0.00	-

Pinion Inferred Transitional - Open Pit

Cutoff					
oz Au/ton	**Tons**	**oz Au/ton**	**oz Au**	**oz Ag/ton**	**oz Ag**
0.001	364,000	0.004	1,000	0.04	14,000
0.002	208,000	0.006	1,000	0.06	13,000
0.003	150,000	0.007	1,000	0.08	12,000
0.004	120,000	0.008	1,000	0.09	11,000
0.005	**108,000**	**0.008**	**1,000**	**0.09**	**10,000**
0.006	98,000	0.009	1,000	0.10	9,000
0.007	73,000	0.010	1,000	0.11	8,000
0.008	63,000	0.010	1,000	0.11	7,000
0.009	46,000	0.010	-	0.12	5,000
0.010	30,000	0.011	-	0.13	4,000
0.015	-	0.000	-	0.00	-
0.020	-	0.000	-	0.00	-
0.025	-	0.000	-	0.00	-
0.030	-	0.000	-	0.00	-
0.035	-	0.000	-	0.00	-
0.040	-	0.000	-	0.00	-
0.045	-	0.000	-	0.00	-
0.050	-	0.000	-	0.00	-

Jasperoid Wash Inferred Oxide - Open Pit

Cutoff			
oz Au/ton	**Tons**	**oz Au/ton**	**oz Au**
0.001	20,264,000	0.007	148,000
0.002	19,030,000	0.008	147,000
0.003	17,018,000	0.008	141,000
0.004	14,554,000	0.009	132,000
0.005	**12,491,000**	**0.010**	**124,000**
0.006	11,449,000	0.010	118,000
0.007	9,377,000	0.011	104,000
0.008	6,519,000	0.013	83,000
0.009	5,053,000	0.014	71,000
0.010	3,818,000	0.015	59,000
0.015	1,582,000	0.021	33,000
0.020	732,000	0.025	18,000
0.025	235,000	0.030	7,000
0.030	75,000	0.036	3,000
0.035	33,000	0.040	1,000
0.040	15,000	0.044	1,000
0.045	2,000	0.048	-
0.050	-	0.000	-

Jasperoid Wash Inferred Transitional - Open Pit

Cutoff			
oz Au/ton	**Tonnes**	**oz Au/ton**	**oz Au**
0.001	1,336,000	0.006	8,000
0.002	1,225,000	0.007	8,000
0.003	991,000	0.007	7,000
0.004	867,000	0.008	7,000
0.005	**669,000**	**0.009**	**6,000**
0.006	583,000	0.010	6,000
0.007	386,000	0.011	4,000
0.008	268,000	0.013	3,000
0.009	203,000	0.014	3,000
0.010	159,000	0.015	2,000
0.015	76,000	0.020	1,000
0.020	30,000	0.023	1,000
0.025	7,000	0.028	-
0.030	2,000	0.031	-
0.035	-	0.000	-
0.040	-	0.000	-
0.045	-	0.000	-
0.050	-	0.000	-

North Bullion Inferred Oxide - Open Pit

Cutoff			
oz Au/ton	**Tons**	**oz Au/ton**	**oz Au**
0.001	394,000	0.003	1,000
0.002	256,000	0.004	1,000
0.003	151,000	0.006	1,000
0.004	109,000	0.006	1,000
0.005	**74,000**	**0.007**	**1,000**
0.006	50,000	0.008	-
0.007	29,000	0.010	-
0.008	23,000	0.010	-
0.009	17,000	0.011	-
0.010	8,000	0.012	-
0.015	1,000	0.016	-
0.000	-	-	-
0.000	-	-	-
0.000	-	-	-
0.000	-	-	-
0.000	-	-	-
0.000	**-**	**-**	**-**
0.000	-	-	-
0.000	-	-	-

North Bullion Inferred Refractory - Open Pit

Cutoff			
oz Au/ton	**Tons**	**oz Au/ton**	**oz Au**
0.001	19,836,000	0.024	482,000
0.002	15,699,000	0.030	476,000
0.003	13,412,000	0.035	471,000
0.004	12,603,000	0.037	468,000
0.005	12,065,000	0.039	464,000
0.006	11,432,000	0.040	462,000
0.007	10,694,000	0.043	457,000
0.008	9,892,000	0.046	451,000
0.009	9,006,000	0.049	443,000
0.010	8,140,000	0.054	436,000
0.015	5,674,000	0.071	405,000
0.020	4,529,000	0.085	386,000
0.025	4,050,000	0.093	375,000
0.030	3,780,000	0.097	368,000
0.035	3,547,000	0.102	360,000
0.040	3,350,000	0.105	353,000
0.045	**3,140,000**	**0.110**	**344,000**
0.050	2,936,000	0.114	334,000
0.100	1,100,000	0.187	206,000

North Bullion Inferred Refractory - Underground

Cutoff			
oz Au/ton	**Tons**	**oz Au/ton**	**oz Au**
0.010	504,000	0.131	66,000
0.020	504,000	0.131	66,000
0.030	504,000	0.131	66,000
0.040	504,000	0.131	66,000
0.050	504,000	0.131	66,000
0.060	504,000	0.131	66,000
0.070	504,000	0.131	66,000
0.080	504,000	0.131	66,000
0.090	504,000	0.131	66,000
0.100	**504,000**	**0.131**	**66,000**
0.140	130,000	0.179	23,000
0.190	38,000	0.228	9,000
0.240	10,000	0.284	3,000
0.290	4,000	0.319	1,000
0.340	1,000	0.356	-
0.000	-	0.000	-
0.000	-	0.000	-
0.000	-	0.000	-
0.000	-	0.000	-
0.000	-	0.000	-

Sweet Hollow Inferred Oxide - Open Pit

Cutoff oz Au/ton	Tons	oz Au/ton	oz Au
0.001	5,024,000	0.010	50,000
0.002	4,446,000	0.011	49,000
0.003	3,981,000	0.012	48,000
0.004	3,349,000	0.014	46,000
0.005	**2,873,000**	**0.015**	**44,000**
0.006	2,599,000	0.016	42,000
0.007	2,433,000	0.017	41,000
0.008	2,251,000	0.018	40,000
0.009	2,057,000	0.019	38,000
0.010	1,840,000	0.020	36,000
0.015	874,000	0.028	24,000
0.020	464,000	0.037	17,000
0.025	283,000	0.046	13,000
0.030	187,000	0.056	11,000
0.035	138,000	0.065	9,000
0.040	112,000	0.071	8,000
0.045	95,000	0.077	7,000
0.050	82,000	0.081	7,000
0.100	14,000	0.115	2,000

Sweet Hollow Inferred Refractory - Open Pit

Cutoff oz Au/ton	Tons	oz Au/ton	oz Au
0.001	249,000	0.009	2,000
0.002	147,000	0.014	2,000
0.003	93,000	0.021	2,000
0.004	84,000	0.023	2,000
0.005	78,000	0.024	2,000
0.006	74,000	0.025	2,000
0.007	71,000	0.026	2,000
0.008	67,000	0.027	2,000
0.009	64,000	0.028	2,000
0.010	61,000	0.029	2,000
0.015	48,000	0.033	2,000
0.020	38,000	0.037	1,000
0.025	30,000	0.041	1,000
0.030	25,000	0.044	1,000
0.035	19,000	0.048	1,000
0.040	14,000	0.052	1,000
0.045	**11,000**	**0.054**	**1,000**
0.050	7,000	0.057	-
0.000	-	0.000	-

POD Inferred Oxide - Open Pit

Cutoff oz Au/ton	Tons	oz Au/ton	oz Au
0.001	1,599,000	0.032	51,000
0.002	1,388,000	0.037	51,000
0.003	1,280,000	0.039	50,000
0.004	1,207,000	0.042	50,000
0.005	**1,149,000**	**0.044**	**50,000**
0.006	1,101,000	0.045	50,000
0.007	1,063,000	0.047	50,000
0.008	1,029,000	0.048	49,000
0.009	987,000	0.050	49,000
0.010	953,000	0.051	49,000
0.015	705,000	0.064	45,000
0.020	555,000	0.077	43,000
0.025	488,000	0.085	41,000
0.030	462,000	0.088	41,000
0.035	434,000	0.092	40,000
0.040	400,000	0.096	38,000
0.045	367,000	0.101	37,000
0.050	338,000	0.106	36,000
0.100	133,000	0.160	21,000

POD Inferred Refractory - Open Pit

Cutoff oz Au/ton	Tons	oz Au/ton	oz Au
0.001	688,000	0.063	43,000
0.002	647,000	0.066	43,000
0.003	610,000	0.070	43,000
0.004	583,000	0.073	43,000
0.005	567,000	0.075	43,000
0.006	556,000	0.077	43,000
0.007	547,000	0.078	43,000
0.008	540,000	0.079	43,000
0.009	533,000	0.080	43,000
0.010	525,000	0.081	42,000
0.015	459,000	0.091	42,000
0.020	418,000	0.098	41,000
0.025	400,000	0.101	40,000
0.030	390,000	0.103	40,000
0.035	375,000	0.106	40,000
0.040	344,000	0.112	39,000
0.045	**310,000**	**0.120**	**37,000**
0.050	286,000	0.126	36,000
0.100	159,000	0.169	27,000

South Lodes Inferred Oxide - Open Pit

Cutoff			
oz Au/ton	**Tons**	**oz Au/ton**	**oz Au**
0.001	1,343,000	0.011	15,000
0.002	1,204,000	0.012	14,000
0.003	1,070,000	0.013	14,000
0.004	922,000	0.015	14,000
0.005	**798,000**	**0.016**	**13,000**
0.006	719,000	0.018	13,000
0.007	676,000	0.018	12,000
0.008	648,000	0.019	12,000
0.009	620,000	0.019	12,000
0.010	589,000	0.020	12,000
0.015	358,000	0.024	9,000
0.020	206,000	0.030	6,000
0.025	105,000	0.037	4,000
0.030	68,000	0.042	3,000
0.035	49,000	0.046	2,000
0.040	35,000	0.049	2,000
0.045	24,000	0.052	1,000
0.050	15,000	0.056	1,000
0.000	-	0.000	-

South Lodes Inferred Refractory - Open Pit

Cutoff			
oz Au/ton	**Tons**	**oz Au/ton**	**oz Au**
0.001	9,000	0.004	-
0.002	7,000	0.005	-
0.003	4,000	0.006	-
0.004	3,000	0.007	-
0.005	2,000	0.009	-
0.006	1,000	0.012	-
0.007	1,000	0.012	-
0.008	1,000	0.014	-
0.009	1,000	0.014	-
0.010	1,000	0.015	-
0.015	-	0.019	-
0.020	-	0.023	-
0.000	-	0.000	-
0.000	-	0.000	-
0.000	-	0.000	-
0.000	-	0.000	-
0.000	**-**	**0.000**	**-**
0.000	-	0.000	-
0.000	-	0.000	-