Technical Report on the Pueblo Viejo Mine, Dominican Republic

PUEBLO VIEJO JV

March 17, 2023

Effective Date: 31 December 2022

Chad Yuhasz, B.Sc. (Geology), P.Geo. (BC)
Richard Quarmby, B.Sc. (Chem Eng), MIoMMM, CEng, MSAIChE, PrEng
Mike Saarelainen, B.Eng., FAusIMM
Neil Bar, B.Eng., M.Eng.Sc., M.Eng., RPEQ
Bill Burton, M.Eng., P.Eng. (BC)

CAUTIONARY STATEMENT ON FORWARD-LOOKING INFORMATION

This report contains forward-looking statements. All statements, other than statements of historical fact regarding Pueblo Viejo Dominicana Jersey 2 Limited (formerly Pueblo Viejo Dominicana Corporation), Barrick Gold Corporation, Newmont Corporation, or the Pueblo Viejo Mine, are forward-looking statements. The words "believe", "expect", "anticipate", "contemplate", "target", "plan", "intend", "project", "continue", "budget", "estimate", "potential", "may", "will", "can", "could" and similar expressions identify forward-looking statements. In particular, this report contains forward looking statements with respect to cash flow forecasts, projected capital, operating and exploration expenditure, targeted cost reductions, mine life and production rates, potential mineralization and metal or mineral recoveries and information pertaining to potential improvements to financial and operating performance and mine life at the Pueblo Viejo Mine, including the process plant extension and construction of the new Naranjo tailings storage facility. All forward-looking statements in this report are necessarily based on opinions and estimates made as of the date such statements are made and are subject to important risk factors and uncertainties, many of which cannot be controlled or predicted. Material assumptions regarding forward-looking statements are discussed in this report, where applicable. In addition to such assumptions, the forward-looking statements are inherently subject to significant business, economic and competitive uncertainties, and contingencies. Known and unknown factors could cause actual results to differ materially from those projected in the forward-looking statements. Such factors include, but are not limited to: fluctuations in the spot and forward price of commodities (including gold, diesel fuel, natural gas and electricity); the speculative nature of mineral exploration and development; changes in mineral production performance, exploitation and exploration successes; diminishing quantities or grades of reserves; increased costs, delays, suspensions, and technical challenges associated with the construction of capital projects; operating or technical difficulties in connection with mining or development activities, including disruptions in the maintenance or provision of required infrastructure and information technology systems; damage to Pueblo Viejo Dominicana Jersey 2 Limited's, Barrick Gold Corporation's, Newmont Corporation's, or Pueblo Viejo Mine reputation due to the actual or perceived occurrence of any number of events, including negative publicity with respect to the handling of environmental matters or dealings with community groups, whether true or not; risk of loss due to acts of war, terrorism, sabotage and civil disturbances; fluctuations in the currency markets; changes in interest rates; changes in national and local government legislation, taxation, controls or regulations and/or changes in the administration of laws, policies and practices including expropriation or nationalization of property and political or economic developments in the Dominican Republic; uncertainty whether the Pueblo Viejo Mine will meet Barrick Gold Corporation's capital allocation objectives; the impact of inflation; failure to comply with environmental and health and safety laws and regulations; timing of receipt of, or failure to comply with, necessary permits and approvals; non-renewal of key licences by governmental authorities; litigation; contests over title to properties or over access to water, power and other required infrastructure; risks associated with artisanal and small-scale mining; increased costs and physical risks including extreme weather events and resource shortages, related to climate change; availability and increased costs associated with mining inputs and labour, and risks associated with diseases, epidemics and pandemics, including the effects and potential effects of the global Covid-19 pandemic. In addition, there are risks and hazards associated with the business of mineral exploration, development, and mining, including environmental hazards, industrial accidents, unusual or unexpected formations, pressures, cave-ins, flooding, and gold ore losses (and the risk of inadequate insurance, or inability to obtain insurance, to cover these risks).

Many of these uncertainties and contingencies can affect Pueblo Viejo Mine's actual results and could cause actual results to differ materially from those expressed or implied in any forward-looking statements made by, or on behalf of, Pueblo Viejo Dominicana Jersey 2 Limited, Barrick Gold Corporation, or Newmont Corporation. All of the forward-looking statements made in this report are qualified by these cautionary statements. Pueblo Viejo Mine, Barrick Gold Corporation, Newmont Corporation, and the Qualified Persons who authored or contributed to this report undertake no obligation to update publicly or otherwise revise any forward-looking statements whether as a result of new information or future events or otherwise, except as may be required by law.

Table of Contents

1 Executive Summary 13
1.1 Location 13
1.2 Ownership 13
1.3 History 13
1.4 Geology and Mineralization 14
1.5 Exploration Status 14
1.6 Mineral Resource Estimate 14
1.7 Mineral Reserve Estimate 15
1.8 Mining Methods 15
1.9 Mineral Processing 16
1.10 Project Infrastructure 17
1.11 Market Studies and Contracts 17
1.12 Environmental, Permitting and Social Considerations 18
1.13 Capital and Operating Costs 18
1.14 Economic Analysis 18
1.15 Interpretation and Conclusions 19
1.16 Recommendations 25
2 Introduction 27
2.1 Effective Date 27
2.2 Qualified Persons 27
2.3 Site Visit of Qualified Persons 29
2.4 List of Abbreviations 30
3 Reliance on Other Experts 32
4 Property Description and Location 33
4.1 Project Location 33
4.2 Mineral Rights 35
4.3 Surface Rights 35
4.4 Permits 36
4.5 Ownership, Royalties and Lease Obligations 37
5 Accessibility, Climate, Local Resources, Infrastructure and Physiography 39
5.1 Accessibility 39
5.2 Climate and Physiography 39
5.3 Local Resources 40
5.4 Infrastructure 40

6 History ... 42
6.1 Pre-1969 ... 42
6.2 Rosario / AMAX (1969 to 1992) ... 42
6.3 Privatization (1996) ... 43
6.4 GENEL JV ... 43
6.5 Mount Isa Mines ... 44
6.6 Newmont ... 44
6.7 Placer Dome Inc. ... 44
6.8 Barrick ... 44
6.9 Past Production ... 45
7 Geological Setting and Mineralization ... 46
7.1 Regional Geology ... 46
7.2 Local Geology ... 47
7.3 Property Geology ... 50
7.4 Mineralization ... 52
8 Deposit Types ... 54
8.1 Main Deposits ... 57
8.2 Satellite Deposits ... 60
9 Exploration ... 61
9.1 Discussion ... 62
10 Drilling ... 63
10.1 Pre-PV Drilling ... 67
10.2 Evaluation of Drilling Programs ... 69
10.3 PV Drilling ... 70
11 Sample Preparation, Analysis and Security ... 72
11.1 Sampling Collection and Preparation Methods ... 72
11.2 Laboratory Security and Analyses ... 74
11.3 Sample Preparation and Analysis ... 76
11.4 Database ... 83
12 Data Verification ... 85
12.1 Data Verification ... 85
12.2 Comments on Data Verification ... 86
13 Mineral Processing and Metallurgical Testing ... 87
13.1 Existing Operation ... 87
13.2 Expansion Project ... 95
13.3 Recovery Estimates ... 103

13.4 PV Historical Performance ... 107
14 Mineral Resources Estimate ... 109
14.1 Summary ... 109
14.2 Resource Database ... 110
14.3 Geological Modelling ... 113
14.4 Bulk Density ... 125
14.5 Compositing ... 126
14.6 Treatment of High-Grade Outliers (Top Capping) ... 129
14.7 Gold and Silver ... 129
14.8 Contact Analysis ... 136
14.9 Variography ... 137
14.10 Resource Estimation ... 141
14.11 Total Sulfur and Sulfide Sulfur ... 148
14.12 Resource Classification ... 153
14.13 Block Model Validation ... 156
14.14 Stockpile Resources ... 159
14.15 Resource Cut-Off Grades ... 161
14.16 Mineral Resource Statement ... 161
14.17 2022 Versus 2020 End of Year Model Comparison ... 162
14.18 Declared Resources Change 2021 to 2022 ... 165
14.19 Discussion ... 166
15 Mineral Reserve Estimate ... 168
15.1 Mineral Reserves Statement ... 168
15.2 Mineral Reserves Estimation Process ... 169
15.3 Open Pit Optimisation ... 171
15.4 Sensitivity ... 178
15.5 Reconciliation ... 180
15.6 Discussion ... 183
16 Mining Methods ... 184
16.1 Summary ... 184
16.2 Mine Design ... 185
16.3 Geotechnical, Hydrogeological Parameters and Stability Analysis ... 188
16.4 Production Schedule ... 192
16.5 Mine Equipment ... 197
16.6 Workforce ... 198
16.7 Discussion ... 198

17 Recovery Methods 199
17.1 Existing Operation 199
17.2 Expansion Project 202
17.3 Power, Water, and Process Reagents Requirements 211
17.4 Tailings and Water Balance 216
17.5 Deleterious Elements 217
18 Project Infrastructure 220
18.1 Site Access 220
18.2 Mine Roads 220
18.3 General Infrastructure 220
18.4 Supply Chain 222
18.5 Power Supply 222
18.6 Communication and IT Facilities 223
18.7 Workforce 223
18.8 Fuel 225
18.9 Water Supply 225
18.10 Waste Management 226
18.11 Fire Protection 226
18.12 Dust Control 226
18.13 Landfill 227
18.14 Tailings Facilities 227
18.15 PAG Transport Infrastructure 233
18.16 Security 234
19 Market Studies and Contracts 235
19.1 Markets 235
19.2 Contracts 235
20 Environmental Studies, Permitting, and Social or Community Impact 236
20.1 Environmental Studies 237
20.2 Project Permitting 238
20.3 Water and Waste Management 239
20.4 Social and Community Requirements 245
20.5 Mine Closure Requirements 250
21 Capital and Operating Costs 252
21.1 Capital Costs 252
21.2 Operating Costs 253
22 Economic Analysis 254

23 Adjacent Properties 255
24 Other Relevant Data and Information 256
25 Interpretation and Conclusions 257
25.1 Geology and Mineral Resources 257
25.2 Mining and Mineral Reserves 257
25.3 Mineral Processing 258
25.4 Infrastructure 258
25.5 Environment, Permitting, and Social Aspects 259
25.6 Risks 259
26 Recommendations 263
26.1 Geology and Mineral Resources 263
26.2 Mining and Mineral Reserves 263
26.3 Mineral Processing 264
26.4 Infrastructure 264
26.5 Environment, Permitting, and Social and Community 264
27 References 265
28 Date and Signature Page 267
29 Certificate of Qualified Persons 268
29.1 Mike Saarelainen 268
29.2 Chad Yuhasz 270
29.3 Richard Quarmby 272
29.4 Neil Bar 274
29.5 Bill Burton 276

List of Tables

Table 1-1 Summary of Mineral Resources (100% Basis) – 31 December 2022 14
Table 1-2 Summary of Pueblo Viejo Mineral Reserves (100% Basis) – 31 December 2022..... 15
Table 1-3 PV Risk Analysis 23
Table 2-1 QP Responsibilities 28
Table 6-1 Pueblo Viejo Past Production Summary 45
Table 10-1 Pueblo Viejo Drilling Summary 64
Table 10-2 Placer Dome Logging Criteria 69
Table 10-3 PV Drilling Campaign Summary (2006-2010) 70
Table 11-1 Sample Interval Data for Rosario, Genel JV and MIM drillholes 73
Table 11-2 Sample Length Average 73
Table 11-3 ALS Analytical Protocols for Placer Samples 75
Table 12-1 Validations and Action Items for Drillholes 86
Table 13-1 Metallurgical Ore Types 87
Table 13-2 Metallurgical Studies 88
Table 13-3 Modified BWi (kWh/t) 89
Table 13-4 2017 Bulk Sample Head Assays by Lab 97
Table 13-5 Referenced Metallurgical Studies, Expansion Pre-Feasibility and Feasibility Studies 101
Table 13-6 POX Recovery Formulas 105
Table 13-7 Mass pull and flotation recovery formulas 106
Table 13-8 Flotation & POX Silver Recoveries 107
Table 13-9 Historical Plant Performance 108
Table 14-1 Summary of Mineral Resources – 31 December 2022 110
Table 14-2 Lithologic Grouping 115
Table 14-3 Alteration Groupings 118
Table 14-4 Au, Ag, Cu and S(tot) Alteration Domain Grouping 122
Table 14-5 Lithology Grouping for C(tot) Domains 122
Table 14-6 Univariate Statistics Raw Assays by Domain 124
Table 14-7 Univariate Statistics 2m Composites by Domain 128
Table 14-8 Comparison of Capping Methods – Au 130
Table 14-9 Comparison of Capping Methods – Ag 130
Table 14-10 Univariate Statistics – Top 5% of Composites by Domain (Au) 132
Table 14-11 Univariate Statistics – Top 5% of Composites by Domain (Ag) 132
Table 14-12 Univariate Statistics – Capped Au by Domain 135
Table 14-13 Univariate Statistics – Capped Ag by Domain 135

Table 14-14 Sage2001 Correlogram Calculation Parameters 137
Table 14-15 Modelled Correlograms – Au 138
Table 14-16 Modelled Correlograms – Ag 138
Table 14-17 Total Sulfur Domains Variogram Model Parameters 139
Table 14-18 Geometric Definition of the Block Model 142
Table 14-19 Faults and Lineaments Used to Guide the LVA Search Orientations 144
Table 14-20 First Pass Au Estimation Parameters 146
Table 14-21 Total and Sulfide Sulfur estimation plan 149
Table 14-22 Total Carbon Estimation plan 151
Table 14-23 Resource Classification Criteria 153
Table 14-24 Resource Classification Parameters 154
Table 14-25 Summary of Blocks Modified by Smoothing 154
Table 14-26 Global Comparison of OK, ID and NN Estimates - Au 157
Table 14-27 Global Comparison of OK, ID and NN Estimates - Ag 157
Table 14-28 Comparison of Capped and Uncapped Estimates - Au 159
Table 14-29 Comparison of Capped and Uncapped Estimates - Silver 159
Table 14-30 Summary of Mineral Resources (100% Basis) - 31 December 2022 162
Table 14-31 Comparison of 2020 and 2022 Models (inside LOM 1.0g/t Au COG) 163
Table 15-1 Pueblo Viejo Mineral Reserves as of 31 December 2022 (100% Basis) 168
Table 15-2 Pueblo Viejo Mineral Reserves Detail 171
Table 15-3 Mining Operating Costs 173
Table 15-4 Fixed Costs Applied to Ore Processing Tonnes 174
Table 15-5 Ore Variable Costs for Flotation and POX 174
Table 15-6 TSF Sustaining Capital Costs 175
Table 15-7 Other Sustaining Capital 175
Table 15-8 Total Mining Cost for Pit Optimization 176
Table 15-9 Total Ore Cost Example Flotation & POX 177
Table 15-10 Pueblo Viejo Pit Optimization Results 178
Table 15-11 2022 EOY Total Reconciliation 181
Table 15-12 Grade Control Model versus Resource Model - Gold 181
Table 15-13 Grade Control Model versus Resource Model - Silver 181
Table 15-14 Mill Production versus Resource Model – Gold 183
Table 15-15 Mill Production versus Resource Model - Silver 183
Table 16-1 Final Pit Design Versus Pit Shell Comparison 186
Table 16-2 Limestone Classification 187
Table 16-3 Geotechnical Slope Design Parameters 190

Table 16-4 Mining and Processing LOM Schedule 195
Table 16-5 Primary Production Equipment 197
Table 16-6 Planned Equipment Availability and Utilization 197
Table 16-7 PV Direct Employees circa 31 December 2022 198
Table 16-8 PV Contractor Employees circa 31 December 2022 198
Table 17-1 Main Equipment 205
Table 17-2 Front-End Process Design Criteria 209
Table 17-3 Back-End Process Design Criteria 210
Table 17-4 Power Consumption in GWh 212
Table 17-5 Main Water Streams in the Plant 213
Table 17-6 Reagent Consumption 215
Table 17-7 Process Work Force circa 31 December 2022 216
Table 17-8 Effluent treatment clarifier 217
Table 18-1 PV Direct Employees circa 31 December 2022 224
Table 18-2 PV Contractor Employees circa 31 December 2022 225
Table 18-3 Storage Volume Design Basis 229
Table 18-4 PAG Handling System Design Factors 234
Table 21-1 Mining Capital Expenditure Summary 252
Table 21-2 Expansion Project Capital Expenditure Summary 253
Table 21-3 LOM Average Unit Operating Costs Summary 253
Table 25-1 PV Risk Analysis 261

List of Figures

Figure 4-1 Location Map 33
Figure 4-2 Montenegro Fiscal Reserve 34
Figure 7-1 Regional Geological Map for the Pueblo Viejo District 46
Figure 7-2 Geological Map of Mining Concession Area 48
Figure 7-4 Stratigraphy Column Interpreted and Modelled 51
Figure 7-5 Simplified Facies Architecture of the Pueblo Viejo Succession 51
Figure 7-6 Mineralization- Alteration Sequence. 53
Figure 7-7 Mineralization Controls of the Monte Negro (left) and Moore (Right) Ore Bodies 53
Figure 8-1 Depocenter Section into an Extensional Fault System 55
Figure 8-2 Surface and Section 3D Magnetic Inversion 56
Figure 8-3 Model Type Deposit for Pueblo Viejo 56
Figure 8-4 Overview Map Showing Main Ore Bodies and Satellites Deposits 59
Figure 10-1 Pueblo Viejo Drillhole Location Map 66
Figure 11-1 PV Assay Lab Sample Preparation Procedure 77
Figure 11-2 Placer CRM Gold Assay Performance. 80
Figure 11-3 Pueblo Viejo Field Duplicate Performance 81
Figure 11-4 Pueblo Viejo Gold Assay Coarse Blank Performance 81
Figure 11-5 Standard Quality Control Charts 82
Figure 13-1 MO-BSD CIL Gold Recovery vs. Degree of Sulfide Oxidation 90
Figure 13-2 MO-VCL CIL Gold Recovery vs. Degree of Sulfide Oxidation 91
Figure 13-3 Relationship Between Gold Recovery and Organic Carbon Content in Oxidised Solids 92
Figure 13-4 Effect of Gold Head Grade on Gold Recovery 92
Figure 13-5 CIL Gold Recovery vs Primary Grind Size 93
Figure 13-6 Iron Removal Efficiency, Wash Ratio and CCD#3 Underflow Solids Content (%) 94
Figure 13-7 Silver Liberation in Lime Boil with Temperature and Lime Ratio 94
Figure 13-8 2017 Low Grade Stockpile Bulk Sample Locations 97
Figure 13-9 2018 Low Grade Stockpile Bulk Sample 98
Figure 13-10 Distribution of Assay Population Versus Selected Intervals 99
Figure 13-11 2022 Gold Recovery – Modelled Versus Actual 103
Figure 13-12 Flotation Gold Recovery, Model versus Lab Results, Blue Coast (2020) 105
Figure 14-1 Plan View of Drilling 111
Figure 14-2 Summary of Drill Data included in Estimate 112
Figure 14-3 Breakdown of Drill Data by Year 112

Figure 14-4 Drill Data Added 112
Figure 14-5 Contact Plot for Au Across Monte Oculto Fault 114
Figure 14-6 Boxplot – Grouped Lithologies 116
Figure 14-7 Boxplot – Grouped Alteration 119
Figure 14-8 Partition Analysis – Au 120
Figure 14-9 Partition Analysis – Total Sulfur 121
Figure 14-10 Grouped Lithologies for Total Carbon Domains 123
Figure 14-11 Acid Silica Over-Printing from Geochem Proxy 123
Figure 14-12 Scatterplot – Total Sulfur against Density 125
Figure 14-13 Comparison of Measured and Calculated Density by Sulfur Bin 126
Figure 14-14 Histogram – Raw Sample Length 127
Figure 14-15 Histogram Comparing Raw and Composited Data 127
Figure 14-16 Top 5% of Data by Domain – Au 133
Figure 14-17 Example Contact Plots by Domain 136
Figure 14-18 Summary of Contact Boundary Types 136
Figure 14-19 Example Correlogram - AU4 137
Figure 14-20 S3 Domain Variogram Maps and Model in the Three Main Directions 139
Figure 14-21 Plan View and Cross Sections of >15% Total Sulfur Composites and Anisotropy Model 140
Figure 14-22 C4 Domain Variogram Maps and Model in the Three Main Directions 141
Figure 14-23 Block Model Bounds and Exploration and Resource Definition Drilling 142
Figure 14-24 Faults and Lineaments Used to Guide the LVA Search Orientations 143
Figure 14-25 Percentage of Blocks Filled by Estimation Pass 147
Figure 14-27 Percent of Blocks Estimated by Estimation Pass - Sulfur 150
Figure 14-29 Example Resource Classification (290RL) 155
Figure 14-30 Spatial Location of Manually Modified Ore Blocks in Pit Design 156
Figure 14-32 Stockpile Location 160
Figure 14-33 Tonnage-Grade Curve within LOM 163
Figure 14-34 Boxplot comparing 2020 and 2022 Gold data within a 1g/t Grade Shell 164
Figure 14-35 Boxplot comparing 2020 and 2022 Silver data within a 1g/t Grade Shell 164
Figure 14-36 Section Comparing 2020 and 2022 models (2094550E) 165
Figure 14-37 Waterfall chart - Change in Contained Au oz in Declared Resources 166
Figure 15-1 Gold Price Sensitivity Within the Optimised Shell 179
Figure 15-2 Processing Cost Sensitivity Within the Optimised Shell 179
Figure 15-3 Mining Cost Sensitivity Within the Optimised Shell 180
Figure 15-4 2022 Monthly Grades and Tonnes Comparison 182
Figure 15-5 2022 Monthly Grades and Tonnes Comparison 182

(Mine Call Grade versus Plant Check Out Silver Grade) 182
Figure 16-1 Final Pit Design Versus Whittle Shell Comparison 186
Figure 16-2 Geotechnical Domains and 2023 Ultimate Shell and Quarries 191
Figure 17-1 Pueblo Viejo Simplified Process Flow Diagram 202
Figure 17-2 Simplified Process Flow Diagram with the New Systems to be Installed and Systems Requiring Upgrades 206
Figure 17-3 Simplified Process Flow Diagram for the Modifications Needed for the Autoclave System 206
Figure 17-4 Simplified Process Flowsheet for the Expanded Plant 207
Figure 17-5 Water Balance of the Current Operation 219
Figure 18-1 Major Site Infrastructure Plan 221
Figure 18-2 Naranjo TSF Site Plan 228
Figure 18-3 Example Naranjo TSF Dam Cross-section 230
Figure 18-4 Naranjo TSF PAG Rock Proposed Placement Location 231
Figure 18-5 PAG Transport Infrastructure 234
Figure 20-1 Pueblo Viejo Watershed Diagram 241
Figure 20-2 Pueblo Viejo Water Flow Diagram 242
Figure 20-3 PV Resettlement Process Strategic Steps 247

1 Executive Summary

The Technical Report on the Pueblo Viejo Mine (the Mine, Pueblo Viejo, or PV) located in the Dominican Republic was prepared by Pueblo Viejo and regional Barrick Gold Corporation (Barrick) team members. The purpose of this report is to support the public disclosure of the Mineral Resources and Mineral Reserves estimates for the Mine as of 31 December 2022. Pueblo Viejo Dominicana Jersey 2 Limited (PVD; formerly Pueblo Viejo Dominica Corporation or PVDC) is the operating company for the joint venture (JV) partners Barrick and Newmont Corporation (Newmont). Barrick is the operator of the Mine and owner of a 60% interest in PVD, with Newmont owning the remaining 40%. This Technical Report conforms to NI 43-101 Standards of Disclosure for Mineral Projects.

All costs presented in this document are in USD (US$ or $) unless otherwise noted.

1.1 Location

Pueblo Viejo, a precious metal deposit, is located in the central part of the Dominican Republic on the Caribbean island of Hispaniola in the province of Sanchez Ramirez. The Mine is 15 km west of the provincial capital of Cotui and approximately 100 km northwest of the national capital of Santo Domingo. PV holds 100% of the mineral rights to the Pueblo Viejo deposit.

1.2 Ownership

Barrick is the operator of the Mine and owner of a 60% interest in Pueblo Viejo, with Newmont owning the remaining 40%.

Barrick is a Canadian publicly traded gold and copper mining company with a portfolio of operating mines and projects across North America, Africa, South America, and Asia.

Newmont is an American publicly traded mining company producing gold, copper, zinc, and lead with operations and projects in North America, South America, Australia, and Africa.

1.3 History

Pueblo Viejo is an open pit gold mine in the production phase. Commercial production was achieved in January 2013 and Pueblo Viejo completed its ramp-up to full design capacity in 2014.

1.4 Geology and Mineralization

The Pueblo Viejo deposit area is considered an example of a high-sulfidation epithermal gold-silver deposit. The deposit is hosted in a portion of a Lower Cretaceous intra-oceanic island arc with bimodal volcanism that forms the base of the Greater Antilles Caribbean islands. In the Project area, the arc is primarily represented by the Los Ranchos Formation. The Hatillo Formation, consisting of limestones, is overthrust onto the Los Ranchos Formation to the southwest of the Pueblo Viejo deposit area. The Lagunas Formation, a fore-arc basin assemblage, overlies the Hatillo Formation, and crops out to the south of the Project area. Mineralization is hosted in the Los Ranchos Formation, which in the Project area, is subdivided into three facies, consisting of sedimentary facies (carbonaceous sediments), quartz-bearing facies (epiclastic lithologies and volcanoclastic rocks), and andesitic facies (extrusive intermediate composition volcanic rocks). Mineralization events are strongly related to the alteration sequence with disseminated pyrite occurring in an early event and sulfide veinlets occurring in a later event. Pyrite is the primary sulfide. Minor constituents can include sphalerite, local enargite and minor amounts of barite, rutile, telluride, and Pb-sulfides. Sphalerite and enargite (with antimony replacing arsenic) are present with pyrite, primarily as veins or filling fractures.

1.5 Exploration Status

Ongoing near mine exploration is focused on quarry support to minimize costs and maximize use of locally available limestone and rock necessary for ore processing and tailings storage facility (TSF) construction.

1.6 Mineral Resource Estimate

Table 1-1 Summary of Mineral Resources (100% Basis) – 31 December 2022

Classification	Tonnage (Mt)	Grade		Contained Metal	
		(g/t Au)	(g/t Ag)	(Moz Au)	(Moz Ag)
Measured	77.2	2.08	11.69	5.2	29.0
Indicated	315.8	1.99	12.32	20.2	125.1
Total M&I	**393.0**	**2.01**	**12.19**	**25.4**	**154.1**
Total Inferred	**7.6**	**1.8**	**10.5**	**0.4**	**2.6**

Notes:
1. Mineral Resources are reported on a 100% basis and inclusive of Mineral Reserves.
2. CIM (2014) Standards and CIM (2019) MRMR Best Practice Guidelines were followed for Mineral Resources
3. Mineral Resources are estimated based on an economic cut-off value.
4. Mineral Resources are estimated using a long-term price of US$1,700/oz Au and US$21/oz Ag.
5. Resource block model dimensions of 10m x 10m x 10m were assumed to reflect mining selectivity.
6. Numbers may not add due to rounding.
7. The QP responsible for the Mineral Resource Estimate is Chad Yuhasz, P.Geo.

1.7 Mineral Reserve Estimate

Table 1-2 Summary of Pueblo Viejo Mineral Reserves (100% Basis) – 31 December 2022

Type	Category	Tonnes (Mt)	Au Grade (g/t Au)	Contained Gold (Moz Au)	Ag Grade (g/t Ag)	Contained Silver (Moz Ag)
Stockpiles	**Probable**	**95.4**	**2.17**	**6.7**	**15.10**	**46.3**
Open Pits	Proven	58.8	2.29	4.3	12.94	24.5
	Probable	137.4	2.15	9.5	12.84	56.7
	Proven and Probable	**196.1**	**2.19**	**13.8**	**12.87**	**81.1**
Total Mineral Reserves	**Proven**	58.8	2.29	4.3	12.94	24.5
	Probable	232.8	2.16	16.2	13.76	103.0
	Proven and Probable	**291.6**	**2.19**	**20.5**	**13.60**	**127.5**

Notes
1. Proven and Probable Mineral Reserves are reported on 100% basis. Barrick's and Newmont's attributable shares of the Mineral Reserves are 60% and 40%, respectively.
2. The Mineral Reserve estimate has been prepared according to CIM (2014) Standards and using CIM (2019) MRMR Best Practice Guidelines.
3. Open pit Mineral Reserves are reported at a gold price of US$1,300/oz Au and US$18.00/oz for silver.
4. A cash-flow method for ore/waste categorisation was used applying appropriate costs and modifying factors.
5. Block model dimensions are 10m x 10m x 10m to reflect mining selectivity. No additional mining recovery or dilution factors are applied.
6. Stockpiles are classed as Probable to reflect metallurgical recovery uncertainties.
7. All reported metal is contained before process recovery; metal recoveries are variable based on material type, sulfur grades, and sulfide grades.
8. Contained metal is reported in millions of troy ounces.
9. Numbers may not add due to rounding.
10. The QP responsible for the Mineral Reserve Estimate is Mike Saarelainen, FAusIMM

1.8 Mining Methods

Pueblo Viejo is a mature mining operation with an extensive operating history. Mine development of the current operations by Barrick began in August 2010.

The Mine consists of two main open pits (Moore and Monte Negro) plus a smaller satellite pit (Cumba) and is mined by conventional truck and shovel methods.

The pit stages have been designed to optimize the early extraction of the higher-grade ore. Notwithstanding, the sulfur grade is an important consideration because the metallurgical aspects of the processing operation, the recoveries achieved, and the processing costs strongly depend on sulfur content in the plant feed, with benefits from consistency and low variability.

Mineral processing requires a significant amount of limestone slurry and lime derived from high quality limestone. Limestone quarries, located adjacent to the mine, have been in production since 2009 to supply material for TSF construction and the process plant.

PAG waste rock from the pits is hauled to dedicated waste dump locations (currently the Hondo dump). From 2025 onwards, a crushing, conveying, and stacking system is planned to transport and place PAG waste mined from the pit directly into the planned Naranjo TSF. The PAG waste material deposited in Hondo is intended to be rehandled into completed pit void locations when available, and the remainder will be rehandled into the PAG handling system to the Naranjo TSF after pit mining is completed.

The remaining pit only Mineral Reserves are estimated at 196.1 Mt of ore with a strip ratio 2.6:1. Mineral Total Reserves (pit plus stockpiles) are estimated to be 291.6 Mt at a strip ratio of 1.8:1.

The remaining pit life, based on the Mineral Reserves estimate, is projected to be 19 years, until 2041, with the processing of low-grade ore stockpiles and limestone mining continuing until 2044. To maximize project economics, higher grade ore is processed in the early years, while lower grade ore is stockpiled for later processing. Stockpiled ore is mined with a reclamation sequence to maximize ore delivery and revenue. Life of Mine (LOM) planned total material movement, including limestone, will range from approximately 59 Mtpa to 98 Mtpa.

1.9 Mineral Processing

The processing plant design capacity is currently approximately 24,000 tpd, and the average processing rate was 25,886 tpd in 2022.

An expansion project (the Expansion Project) is in the late stages of completion to increase processing capacity from the current 8.6 Mtpa to approximately 14 Mtpa, as well as increase the tailings storage capacity of the asset, resulting in a forecast processing life of over 19 years.

The completion of the Expansion Project allows the operation to maintain a minimum average annual gold production of approximately 800,000 ounces after 2022 (on a 100% basis).

Due diligence has been applied in the gathering and the interpretation of data during the entire process of the development of this Expansion Project. This pertains to both the metallurgical sample sourcing along with selected appropriate test work, then the transference of these results into meaningful and relevant design parameters to support the indicated flowsheet and associated financials. This notion is manifested by the following principles seen adopted:

- Several stages of increasingly detailed studies to feasibility level including a fully phased HAZOP program.
- Broad range of metallurgical samples selected, sometimes blended, all based on spatial, lithological and geometallurgical grounds, ensuring an all-encompassing representation of ore in-pit and stockpile mining areas.

- Test work programs designed to support and drive the proposed flowsheet during its development.
- Ongoing improvement of recovery and operating cost models based on testwork, both past and ongoing, but also long-term existing operational plant experience.
- Plant design undertaken by reputable engineering resources using latest acceptable standard industrial practice coupled with parameters directly sourced from operational experience, subject from time to time and endorsed via third party review.

1.10 Project Infrastructure

The Pueblo Viejo operation is a mature project that has been operating since 2010. It has well developed infrastructure supporting the current operations and plans for additional infrastructure to support Mine growth.

The Expansion Project includes an expansion to the processing facilities, which is in the late stages of completion.

Also, as part of the Expansion Project, a pre-feasibility study (PFS) has been completed supporting the planned construction of a new TSF (Naranjo TSF) and waste crushing, conveying, and stacking system for the mined potentially acid generating (PAG) waste material.

1.11 Market Studies and Contracts

The principal commodity produced at Pueblo Viejo is gold and silver doré, which is freely traded at prices that are widely known, so that prospects for sale of any production are virtually assured.

Pueblo Viejo is a large modern operation, and Barrick and Newmont are major international firms with policies and procedures for the letting of contracts. The contracts for smelting and refining are considered routine contracts for a large producer and the terms of such contracts are within industry norms.

There are numerous contracts at the mine including project development contracts to provide services augmenting Barrick's efforts.

There are no contracts related to Pueblo Viejo which, in and of themselves, are material to Barrick.

1.12 Environmental, Permitting and Social Considerations

PV has submitted an Environmental and Social Impact Assessment (ESIA) for the construction of the new Naranjo TSF (Naranjo TSF). A decision on the ESIA is expected during the first half of 2023 and together with a separate permit from INDRHI, which is the hydraulic resources unit of the Ministry of Environment, expected to be granted in Q3 2023, will allow the commencement of construction of the Naranjo TSF.

The Expansion Project requires the construction and operation of the Naranjo TSF, which includes the construction of a conveyor. For this, the resettlement of seven communities are required. Land acquisition and involuntary resettlement, and livelihood restoration plans are in place and comply with national law and guided by international standards, especially the Performance Standard 5 from World Bank and International Finance Corporation (IFC).

Preliminary studies of the Naranjo TSF project have identified that approximately 3,500 ha are required for the Project, with the number of households affected to be determined through the assessment that is currently taking place.

1.13 Capital and Operating Costs

Pueblo Viejo is an operational project with an extensive historical basis enabling accurate estimation of future capital and operating costs.

The total LOM capital cost is estimated to be US$3,779.4M and includes sustaining costs for mining and processing, capitalised stripping, G&A, and the Expansion Project capital including the completion of the processing expansion, the Naranjo TSF, and the crushing, conveying, and stacking costs.

The operating costs for the LOM were developed considering the planned mine physicals, equipment hours, labor projections, consumables forecasts, and other expected incurred costs.

The average LOM total operating cost per tonne of ore processed is estimated to be US$53.89/t.

1.14 Economic Analysis

This section is not required as Barrick, the operator of Pueblo Viejo for both exploration and mining, is a producing issuer, the property is currently in production and the proposed expansion of current annual production of gold at Pueblo Viejo is not material.

The QP has reviewed an economic analysis of the Pueblo Viejo Mine using the Mineral Reserve estimates presented in this Report; results confirm that the outcome is a positive cash flow that supports the statement of Mineral Reserves.

1.15 Interpretation and Conclusions

Geology and Mineral Resources

QA/QC

Pueblo Viejo has documented standard operating procedures (SOP) for the drilling, logging, and sampling processes, which meet industry standards. The geological and mineralization modelling are based on visibly identifiable geological contacts, tested, and proven structural controls, and data supported geochemical signatures, which support a geologically robust interpretation and model.

Pueblo Viejo has a QA/QC program in place to ensure the accuracy and precision of the assay results from the analytical laboratory. Checks conducted on the quality control database indicated that the results are of acceptable precision and accuracy for use in Mineral Resource estimation.

Mineral Resources

Geological models and subsequent Mineral Resource estimates continue to evolve with each successive model update, incorporating additional knowledge and data from the operations of the open pit. Significant infill and conversion drilling, combined with grade control drill programs and pit mapping have been completed to increase the confidence in the resulting Mineral Resources and Mineral Reserves.

In the QP's opinion, the Pueblo Viejo Mineral Resources outlier capping, domaining, and estimation approach are appropriate, and reflect industry best practice, and therefore considers the Mineral Resources at Pueblo Viejo to be appropriately estimated and classified.

The QP is not aware of any environmental, permitting, legal, title, taxation socioeconomic, marketing, political, metallurgical, fiscal, or other relevant factors, that could materially affect the Mineral Resource estimate.

Mining and Mineral Reserves

Pueblo Viejo is a mature mining operation with an extensive operating history. Mine development of the current operations by Barrick began in August 2010.

The Mine consists of two main open pits (Moore and Monte Negro) plus a smaller satellite pit (Cumba) and is mined by conventional truck and shovel methods.

The remaining pit only Mineral Reserves are estimated at 196.1 Mt of ore with a strip ratio 2.6:1. Total Mineral Reserves (pit plus stockpiles) are estimated to be 291.6 Mt at a strip ratio of 1.8:1.

The remaining pit life, based on the Mineral Reserves estimate, is projected to be 19 years, until 2041, with the processing of low-grade ore stockpiles and limestone mining continuing until 2044. To maximize project economics, higher grade ore is processed in the early years, while lower grade ore is stockpiled for later processing. Stockpiled ore is mined with a reclamation sequence to maximize ore delivery and revenue. Life of Mine (LOM) planned total material movement, including limestone, will range from approximately 59 Mtpa to 98 Mtpa.

The QP responsible for the Mineral Reserves has directly supervised the estimation process, has performed an independent verification of the estimated tonnes and grade, and in their opinion, the process has been carried out to industry standards and uses appropriate modifying factors for the conversion of Mineral Resources to Mineral Reserves.

The QP is not aware of any environmental, legal, title, socioeconomic, marketing, mining, metallurgical, infrastructure, permitting, fiscal, or other relevant factors that could materially affect the Mineral Reserve estimate. As noted in Section 4, while the permitting process for the Expansion Project is not finalised, Barrick sees no impediment to obtaining all required permits in the normal course of business.

Mineral Processing

Significant testwork has already been undertaken on the various refractory ore types, including the major stockpile inventory. Based on testwork completed, the overall recoveries depicted for the Project are deemed realistic. The QP is satisfied that Pueblo Viejo can maintain production, gold recovery, and reagent consumptions as forecasted.

The QP considers the modelled recoveries for all ore sources and the processing plant and engineering unit costs to be acceptable.

Infrastructure

The Pueblo Viejo operation is a mature project that has been operating since 2010. It has well developed infrastructure supporting the current operations and plans for additional infrastructure to support the Project growth.

The most significant infrastructure projects planned for PV's growth include the Naranjo TSF and a crushing conveying, stacking system for PAG transport. Both infrastructure projects are supported by a minimum of PFS level studies and are being further developed to more detailed levels of study.

The QP's responsible for the Infrastructure Section believe that the current infrastructure and planned infrastructure PFS's support the estimation of Mineral Resources and Mineral Reserves.

Environment, Permitting, and Social Aspects

PV has acquired all the permits necessary for the current operations. There are certain permits related to the Naranjo TSF and other changes that are in the process of approval. One of which is an ESIA for the construction of the new Naranjo TSF which PV has submitted and expects a decision during the first half of 2023. Another key permit is from INDRHI, which is the hydraulic resources unit of the Ministry of Environment, expected to be granted in Q3 2023. Both of these permits will allow the commencement of construction of the Naranjo TSF.

The key environmental concerns are addressed in the EISA and PV have numerous management plans in place to manage these risks.

Community engagement and development (CED) is managed by a dedicated team supporting PV's Social Management System, which includes the following Social Management Plans: Engagement and Disclosure; Land Acquisition and Involuntary Resettlement; Community Development (emphasizing education, capacity building, production, income generation and diversification, microenterprises, community water and preventive health); Local Content (local employment and development of local suppliers); Community Safety; Support for Environmental Management; and Monitoring and Evaluation.

The Expansion Project requires the construction and operation of the proposed Naranjo TSF and includes the construction of a conveyor. For this, the resettlement of seven communities is required. Land acquisition and involuntary resettlement, and livelihood restoration plans are in place and comply with national law and guided by international standards. This is being managed by the PV CED team.

Risks

Risk Analysis Definitions

The following definitions have been employed by the QP's in assigning risk factors to the various aspects and components of the Project:

- **Low** – Risks that are considered to be average or typical for a deposit of this nature and could have a relatively insignificant impact on the economics. These generally can be mitigated by

normal management processes combined with minor cost adjustments or schedule allowances.

- **Minor** – Risks that have a measurable impact on the quality of the estimate but not sufficient to have a significant impact on the economics. These generally can be mitigated by normal management processes combined with minor cost adjustments or schedule allowances.
- **Moderate** – Risks that are considered to be average or typical for a deposit of this nature but could have a more significant impact on the economics. These risks are generally recognisable and, through good planning and technical practices, can be minimised so that the impact on the deposit or its economics is manageable.
- **Major** – Risks that have a definite, significant, and measurable impact on the economics. This may include basic errors or substandard quality in the basis of estimate studies or project definition. These risks can be mitigated through further study and expenditure that may be significant. Included in this category may be environmental/social non-compliance, particularly regarding Equator Principles and IFC Performance Standards.
- **High** – Risks that are largely uncontrollable, unpredictable, unusual, or are considered not to be typical for a deposit of a particular type. Good technical practices and quality planning are no guarantee of successful exploitation. These risks can have a major impact on the economics of the deposit including significant disruption of schedule, significant cost increases, and degradation of physical performance. These risks cannot likely be mitigated through further study or expenditure.

In addition to assigning risk factors, the QP's provided opinion on the probability of the risk occurring during the LOM. The following definitions have been employed by the QP's in assigning probability of the risk occurring:

- **Rare** – The risk is very unlikely to occur during the Project life.
- **Unlikely** – The risk is more likely not to occur than occur during the Project life.
- **Possible** – There is an increased probability that the risk will occur during the Project life.
- **Likely** – The risk is likely to occur during the Project life.
- **Almost Certain** – The risk is expected to occur during the Project life.

Risk Analysis Table

Table 1-3 details the PV Risk Analysis as determined by the QP's.

Table 1-3 PV Risk Analysis

Issue	Likelihood	Consequence Rating	Risk Rating	Mitigation
Geology and Mineral Resources - Confidence in Mineral Resource Models	Unlikely	Minor	Low	Additional scheduled infill drilling maintaining two years of full grade control coverage ahead of mining. Resource model updated on a regular basis using production reconciliation results.
Mining and Mineral Reserves - Open Pit Slope Stability	Unlikely	Moderate	Minor	Continued 24hr in-pit monitoring with Radar, geotechnical drilling well ahead in advance, instrumentation, and continued updating of geotechnical and hydrology models.
Processing - Salts build-up in the process water – leading to carbon fouling in the CIL and elution circuits	Possible	Moderate	Medium	A full salt and water balance has been completed and tracked in the plant to ensure that correct water dilution into the critical streams of elution is managed with minimum impact on carbon fouling and gold recovery.
Processing - Reagent consumptions and recoveries hence operating costs and economics may be affected by potential uncharacteristic behaviours given the possible blends	Possible	Minor	Low	Process operating costs and recoveries have been estimated based on specialist studies on the variable ore types however it has been recommended that ongoing testwork ensue, in particular with blends incorporating stockpile material, on account of the large component of the feed it represents, itself requiring standalone locale-based domaining, to further understand and optimize the process recoveries and costs.
Environmental -Tailings failure	Rare	High	Medium	Engineering design and construction of TSF to international standards, proper water management at the TSF; emergency spillway; buttressing if required.
Environmental - Hydrocarbon or ARD spillage	Possible	Moderate	Medium	Water and hydrocarbon monitoring and management processes employed on site.
Environmental - Commercial and Reputational Issues due to GHG Emissions	Possible	Moderate	Moderate	Continue transition to renewable energy sources. Continue identifying opportunities through the climate committee
Social - Community unrest	Possible	Moderate	Moderate	Dedicated community engagement by company social and sustainability department. Accessible Grievance Mechanism. Community development project.
Country & Political - Security - Governmental	Possible	Major	Moderate	Dedicated government liaison team. Engagement with local authorities. Government participation/ownership.
Permitting delays	Possible	High	Moderate	Dedicated government liaison team/constant engagement with government authorities

Expansion Project construction delays - Naranjo TSF - PAG Transport System	Possible	Minor	Low	Several months buffer capacity available in Llagal TSF. Construction schedule can be accelerated with increased equipment and personnel numbers. Extra design capacity for PAG in Hondo dump.
Processing & Infrastructure -Delay or unable to exploit limestone resources located outside of fiscal reserve boundary, impacting the availability of process and TSF construction limestone	Possible	Minor	Minor	Sufficient limestone resources are available within the fiscal reserve boundary, but at a higher strip ratio and cost. Drilling, testing and modeling of diorite resources continue as a potentially cheaper, alternative source of TSF construction material
Mining & Infrastructure -PAG transport and stacking system does not operate at design capacity	Unlikely	Moderate	Minor	Additional mobile fleet to supplement transport and deposition of PAG using conventional truck haulage. Increased operating and sustaining capital costs
Capital and Operating Costs	Possible	Moderate	Low	Continue to track actual costs and LOM forecast costs, including considerations for inflation and foreign exchange.
Fiscal Stability	Possible	Moderate	Moderate	Regularly communicate with government and other key stakeholders regarding taxes paid by PV and the direct and indirect impact of those tax payments. Re-enforce the importance of PV's tax, customs and stability provisions during all government engagements. Continue to work closely with the tax authorities and engage with Congress

1.16 Recommendations

The QP's have made the following recommendations.

Geology and Mineral Resources

- Continue to improve geology and estimation models with learnings acquired through continued mining development.
- Continue to investigate and improve, geochemical signature modeling, as a geological reconciliation of visual alteration logging, to remove the 1.0g/t grade shell currently used to removal bimodal distributions.
- Review grade capping strategy and metal at risk, as current approach is potentially aggressive (removing too much metal).
- Incorporate additional data density variability samples into sample workflow and update current density estimation procedures.
- Continue to collect additional Sulfide Sulfur, Total and Organic Carbon assay data to drive continuous improvement in models.

Mining and Mineral Reserves

- Continue pit slope geotechnical investigations, analyses, dewatering and depressurisation activities to improve pit wall stability and the possibility of steepening the final pit slope angle.
- Investigate options to minimise costs of the PAG waste transportation requirements.
- Continue efforts to process higher grade ore earlier in the LOM schedule through either mining or stockpile rehandle optimisations.
- Maintain efforts to improve the mining fleet productivities and utilisations to decrease operating costs and/or mining capital.
- Develop process recovery and operating cost relationships for the combined direct POX and flotation-POX streams, instead of assuming only conservative flotation-POX parameters for mine planning activities.

Mineral Processing

- Continue with laboratory assessment of blend behaviors with differing regimes of reagents to ensure validity of the recovery and operating cost predictions, as well as pre-empt potential anomalies.

- Monitor the TSF reclaim water including in-plant recovered process water to ensure no buildup of chemicals detrimental to the process. Whilst the water balance has been designed to prevent such an occurrence, prudence suggests confirmation by observation hence mitigation where necessary.
- There are opportunities for further optimizing the water management via fast-tracking the replacement of fresh water to reclaim water, where several projects have already been identified. Plans, however, need to be implemented, being mindful of the larger picture or site-wide balance. Subsequent consideration will incorporate the needs of ecological flows, process requirements, precipitation and evaporation variations and finally, governmental regulation.
- Process Control – The addition of control and instrumentation mechanisms with a view to optimize operability of processing circuits is not new, indeed Pueblo Viejo possesses a plethora of said paraphernalia, as well as implementing dedicated optimization software to its milling circuits. The opportunity and intention remains to roll this initiative out to encompass the autoclave operation as well, potentially using artificial intelligence to combine and optimize the operation of several successive circuits.

Infrastructure

- Continue the study work for the Naranjo TSF and the PAG transport system.
- Continue to investigate lower costs sources of TSF construction and limestone material.

Environment, Permitting, and Social and Community

- Continue the permitting and land acquisition process required for the Naranjo TSF construction and operation.
- Continued stakeholder engagement and public education of the Expansion Project.
- Continue identifying and implementing initiatives of renewable energies to support Barrick global commitment on Climate Change (GHG reduction of 30% by 2030 while maintaining a steady production profile, and Net Zero by 2050).

2 Introduction

This Technical Report on the Pueblo Viejo Gold Mine, located in the Dominican Republic, has been prepared by Barrick on behalf of PV. The purpose of this Technical Report is to support public disclosure of updated Mineral Resource and Mineral Reserve estimates at the mine as of 31 December 2022.

The Mine is located in the central part of the Dominican Republic on the Caribbean island of Hispaniola in the province of Sanchez Ramirez. The Mine is 15 km west of the provincial capital of Cotuí and approximately 100 km northwest of the national capital of Santo Domingo. Construction of the Project started in 2008, and first production occurred in 2012. PV holds 100% of the mineral rights to the Pueblo Viejo deposit.

The Mineral Resource and Mineral Reserve estimates have been prepared according to the Canadian Institute of Mining, Metallurgy and Petroleum CIM (2014) Standards as incorporated by reference in NI 43-101. Mineral Resource and Mineral Reserve estimates were also prepared using the guidance outlined in CIM Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines 2019 (CIM (2019) MRMR Best Practice Guidelines).

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

All costs presented in this document are in USD (US$ or $) unless otherwise noted.

2.1 Effective Date

The effective date of this Technical Report is 31 December 2022.

2.2 Qualified Persons

This Technical Report was prepared by Barrick on behalf of PV and incorporates the work of several third parties, including BGC Engineering Inc. and Gecko Geotechnics LLC.

The Qualified Persons (QP's) and their responsibilities for this Technical Report are listed in Section 29 Certificates of Qualified Persons and summarised in Table 2-1. The QP's and their respective companies are only responsible for the sections of this Technical Report attributed to them in Table 2-1. Neither the QP's nor their respective companies express any opinion as to any parts or sections of this Technical Report that are not attributed to them in Table 2-1.

Table 2-1 QP Responsibilities

Qualified Person	Company	Title/Position	Sections
Mike Saarelainen, B.Eng., FAusIMM	Barrick Gold Corporation	Chief Mining Engineer, LATAM & Australia Pacific	15, 16.1-16.2, 16.4-16.7, 18-1 to 18-13, 18-15 to 18-16, and 21
Neil Bar B.Eng., M.Eng.Sc., M.Eng., RPEQ	Gecko Geotechnics LLC.	Principal Geotechnical Engineer	16.3
Chad Yuhasz, P.Geo.	Barrick Gold Corporation	Head of Mineral Resource Management, LATAM & Australia Pacific	4 to 12, 14, and 19, 20, 22-24
Richard Quarmby BSc (Chem Eng), PrEng & CEng, MSAIChE & MIMMM	Barrick Gold Corporation	Group Metallurgist, Projects	13, 17
Bill Burton, M.Eng., P.Eng. (BC)	BGC Engineering Inc.	Principal Geotechnical Engineer	18.14
All			1 to 3, 25 to 27

2.3 Site Visit of Qualified Persons

Below are the most recent site visits of the QP's:

- Mike Saarelainen was previously employed at PV for four years from 2015 to 2019, most recently as mining lead for the PV Expansion project. He visited the mine in August and November 2022, and has reviewed mining performance results, Mineral Reserve model updates, mine strategy, mine planning, and capital and operating costs.
- Chad Yuhasz visited the Mine in May 2022 for the purpose of overseeing the technical start of geologic and resource modeling, with additional site visits completed in July, September, and November of 2022 to review project status, mining performance results and technical reviews.
- Richard Quarmby, Barrick Group Metallurgist – Projects, was seconded to PV to lead the Plant Expansion Feasibility Study, spending a total of almost three years on site. He has reviewed the metallurgical testwork as well as the recovery methods for the integrity of the plant design as being fit for purpose. His secondment to PV ended (and consequently his last visit to the Mine was) on 27 March 2022.
- Neil Bar was previously employed at PV as Head of Geotechnics and Hydrogeology. Mr. Bar has overseen or reviewed the recent geotechnical test work, modelling, and stability analysis conducted at and for PV. His last visit to the Mine ended on 30 June 2022.
- Bill Burton visited the Mine three times in 2022 for the purpose of the Naranjo Tailings Storage Facility (Naranjo TSF) site investigation review and coordination, as well as discussion with PV regarding the Pre-Feasibility Study (PFS) design. His last visit to the Mine was 6 – 9 February 2023.

2.4 List of Abbreviations

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

Unit	Measure	Unit	Measure
°	degree	m^3	cubic metre
°C	degree Celsius	m^3/d	cubic metre per day
µm	micrometre	m^3/h	cubic metres per hour
A	ampere	mg/L	milligrams per litre
BWi	Bond Ball Mill Work Index	min	minute
CCD	Counter current decantation	mm	millimetre
CIL	Carbon-in-Leach	Moz	million ounces
cm	centimetre	MPa	megapascal
D	Diameter	Mt	million metric tonnes
DDH	Diamond Drill Holes	Mtpa	million metric tonnes per annum
EIA	Environmental Impact Assessment	MVA	megavolt-amperes
EM	Electromagnetic	MW	megawatt
ETP	Effluent Treatment Plant	O/F	Overflow
EW	Electrowinning	oz	Troy ounce (31.10348 g)
FTCIL	Flotation tails CIL	P80	80% passing
G	giga (billion)	PAG	Potentially Acid Generating
g	gram	POX	Pressure Oxidization
g/t	grams per tonne	ppm	parts per million
GSI	Geological strength index	PSI	pounds per square inch
GWh	Gigawatt hour	PSIG	pounds per square inch gauge
ha	hectare	QP	Qualified Person
HDH	Horizontal drain hole	RAB	Rotary Air Blast
HDS	High density sludge	RC	reverse circulation drilling
HFO	Heavy Fuel Oil	RL	Relative Elevation
hrs	hours	RQD	Rock Quality Designation
hr	hour	RWi	Bond Rod Mill Work Index
in	inch	s	second
IP	Induced polarization	SABC	Semi-Autogenous Ball mill Crusher
k	kilo (thousand)	SAG	Semi-Autogenous grinding
kg	kilogram	SPI	Power Index
km	kilometre	SS-SAG	Single Stage SAG
km^2	square kilometre	t	metric tonne
koz	thousand ounces	tpd	metric tonnes per day
kPa	kilopascal	tph	metric tonnes per hour
kt	thousand metric tonnes	t/m3	metric tonne per cubic metre
ktpa	kilo tone per annum	tpa	metric tonnes per annum
kV	kilovolt	TSF	Tailings Storage Facility
kW	kilowatt	U/F	Underflow
kWh	kilowatt-hour	UCS	Unconfined Compressive Strength

kWh/m^3	kilowatt-hour per cubic metre	US$	United States dollar
kWh/t	kilowatt-hour per tonne	V	volt
L	litre	W	watt
L/s	litres per second	Wi	Work Index
M	mega (million)	wt %	content by weight
m	metre	yr	year
m^2	square metre		

3 Reliance on Other Experts

This report has been prepared by Barrick. The information, conclusions, opinions, and estimates contained herein are based on:

- Information available at the time of preparation of this Technical Report,
- Assumptions, conditions, and qualifications as set forth in this Technical Report.

For the purpose of this report, the QP's have relied upon information provided by PV's legal counsel regarding the validity of the permits and the fiscal regime applicable in according to Dominican laws as part of ongoing annual reviews. This opinion has been relied upon in Section 4 (Property Description and Location) and in the summary of this report.

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

4 Property Description and Location

4.1 Project Location

Pueblo Viejo is located in the central part of the Dominican Republic on the Caribbean island of Hispaniola in the province of Sanchez Ramirez (Figure 4-1). The Project is 15 km west of the provincial capital of Cotuí and approximately 100 km northwest of the national capital of Santo Domingo.

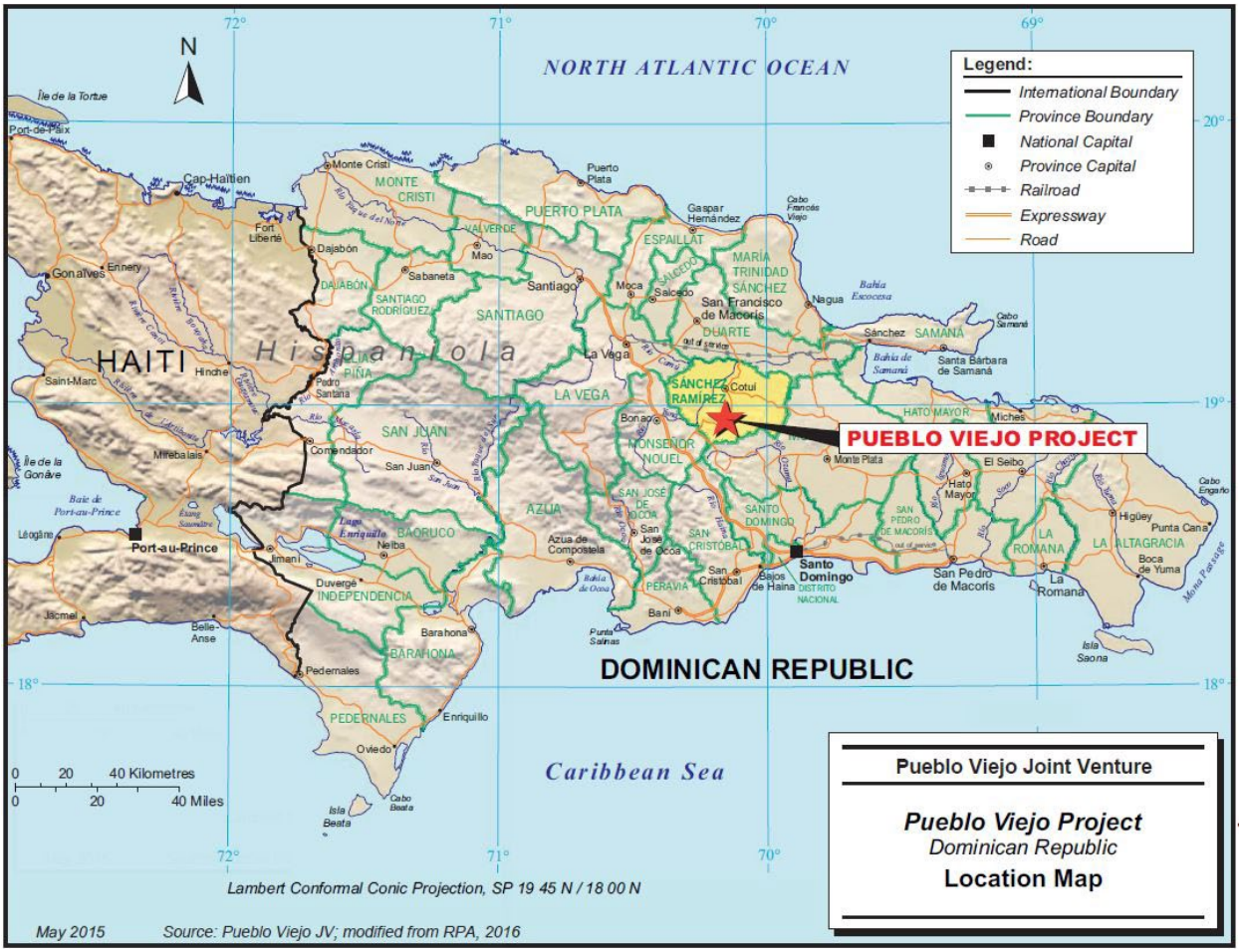


Figure 4-1 Location Map

The Pueblo Viejo property, situated on the Montenegro Fiscal Reserve (MFR), is centred at approximately 18°55'9.15"N, 70°10'20.35"W in an area of moderately hilly topography (Figure 4-2). The MFR covers an area of 7,995 ha and encompasses all the areas previously included in the Pueblo Viejo and Pueblo Viejo II concession areas, which were owned by Rosario Dominicana S.A. (Rosario) until March 7, 2002, as well as the El Llagal and Naranjo areas.

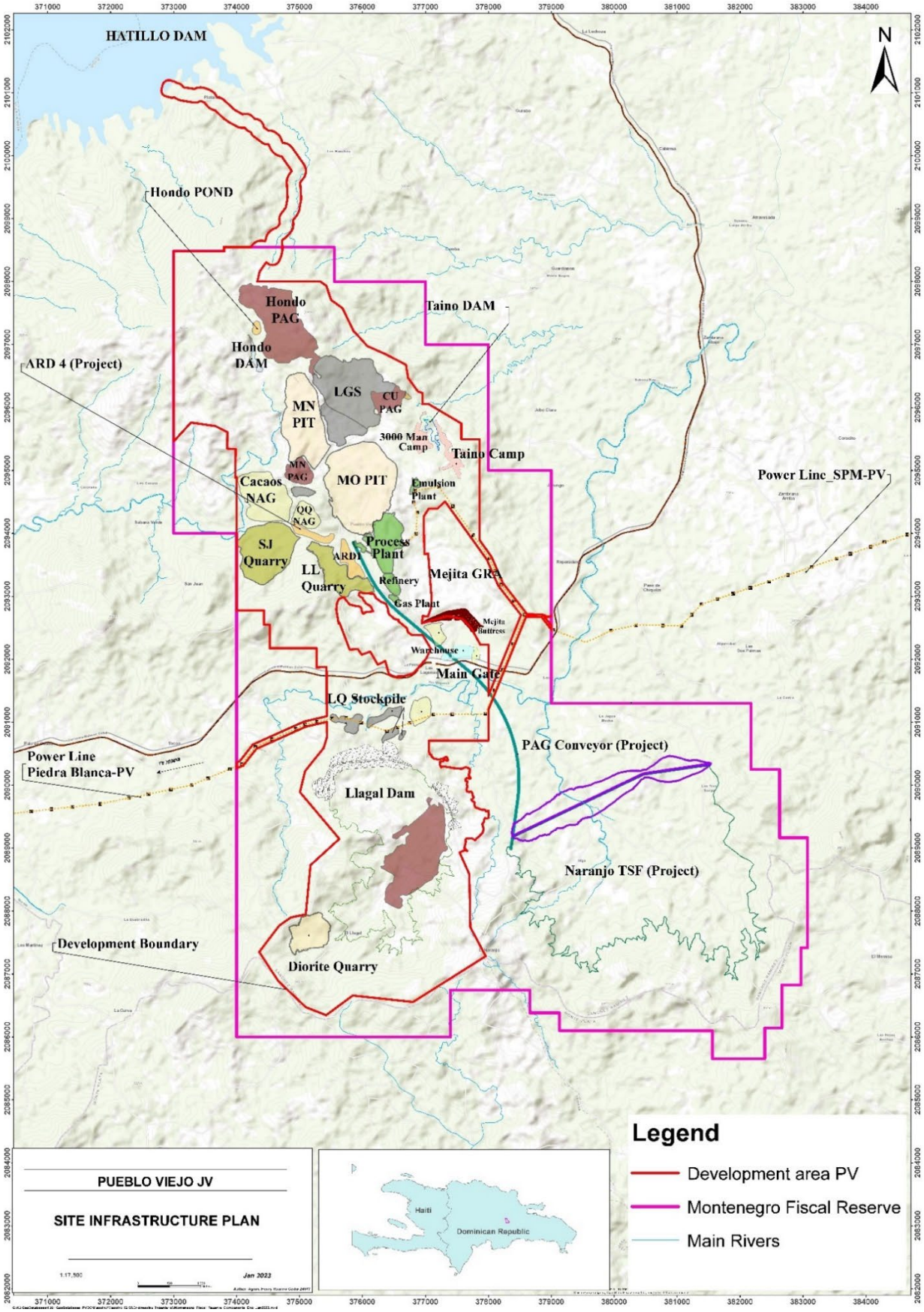


Figure 4-2 Montenegro Fiscal Reserve

4.2 Mineral Rights

PV mineral rights are incorporated within concessions and tenements known as the Montenegro Fiscal Reserve (MFR) which has been leased by the Dominican Government to PV enabling the exploitation of the minerals contained within.

PV is the holder of the lease right to the MFR by virtue of a Special Lease Agreement of Mining Rights (SLA); the SLA enables exploitation of the minerals within the MFR. The SLA was ratified by the Dominican National Congress and published in the Official Gazette of the Dominican Republic on 21 May 2003 and became effective shortly thereafter. The MFR was modified by virtue of Presidential Decrees Nos. 722-04 and 270-22 to include El Llagal and El Naranjo respectively, resulting in a current area for the MFR of 7,995 ha. The SLA governs the development and operation of the Mine and includes the right to exploit the Mejita tailings storage facility and the Hatillo limestone deposit. The Mejita tailings storage facility has not been declared as a development area by PV, and the Las Lagunas tailings storage facility was excluded from the SLA. The SLA was modified in 2009 and 2013 but the modifications were related to fiscal terms and clarification of various administrative and operational to the mutual benefit of the Government and PV.

The SLA provides the right to operate the Pueblo Viejo mine for a 25-year period commencing on February 26, 2008, with one extension by right for 25 years and a second 25-year extension by mutual agreement of the parties, allowing a possible total term of 75 years.

Pertinent terms of the SLA include the following:

- PV may exploit the Hatillo limestone deposit and all other limestone deposits within the MFR at no additional charge.
- The Dominican state will acquire and lease to PV the lands and mineral rights necessary for the permanent disposal of tailings and waste.
- The Dominican state will mitigate all historical environmental matters, except those conditions within areas designated for development by PV.
- The Dominican state will relocate, at its sole cost and in accordance with World Bank Standards, those persons dwelling in the Los Cacaos section of the site.
- The Dominican state will provide a permanent and reliable water source necessary to conduct the operations.

4.3 Surface Rights

Under the SLA, PV holds the surface rights for the current mining operations. Additional land necessary for the operations has been acquired and/or leased to PV under the SLA.

The planned Naranjo TSF requires that PVD obtain surface rights in the planned facility location and will require completion of a resettlement program.

Separately, the Dominican government has granted surface rights for construction and operation of a water pipeline.

4.4 Permits

PV has acquired all the permits necessary for the current operations. There are certain permits related to the Naranjo TSF and other additions to the operation that are pending approval or will be required, such as the environmental permit for the construction of the Naranjo TSF as described further below.

Initially, PV completed a Feasibility Study on the original Mine in September 2005 and presented an Environmental Impact Assessment (EIA) to the Dominican state in November of the same year. The Ministry of Environment approved the EIA in December 2006 and granted Environmental Licence No. 101-06. Requirements of the Environmental Licence included submission of the detailed design of tailings dams, installation of monitoring stations, and submission for review of the waste management plan and incineration plant.

Additional environmental reports were subsequently submitted in 2008, 2020 and 2022 to address an increase in the planned processing rate, the plant expansion and the Naranjo TSF, respectively. The last amendment to the environmental license was issued on August 13, 2020, which authorized the plant expansion to a processing rate of approximately14 Mtpa.

For the Naranjo TSF, an Environmental and Social Impact Assessment (ESIA) was prepared and submitted to the Ministry of Environment in October 2022, and it is currently under review. Once the feasibility study for the Naranjo TSF is completed, it will be presented to the Dominican Government. PV also needs to submit the detailed engineering of the Naranjo TSF to the National Water Resources Institute for review and approval. The location of the Naranjo TSF was one of the preferred options for the Ministry of Energy and Mines and the Ministry of Environment based on the review conducted by such institutions.

Separate from the mine operations, by means of the second amendment to the SLA which became effective on 5 October 2013 (as described above) and mainly covers changes to the special tax regime previously agreed upon in the SLA, the Dominican Government granted PV a power concession to self-generate electricity and sell excess power. Also, in March 2012, PV obtained an environmental licence for the Quisqueya Power Plant and a power transmission line from San Pedro to the Mine site.

The principal agencies from which permits, licences, and agreements are required for mine operation in the Dominican Republic include:

- Minister of Energy and Mines (Ministerio de Energía y Minas)
- Ministry of Environment and Natural Resources – MIMARENA (Ministerio de Medio Ambiente y Recursos Naturales)
- Dominican Institute of Hydraulic Resources – INDRHI (Instituto Dominicano de Recursos Hidráulicos)
- Various Municipalities (Cotuí, for example)
- Ministry of Public Works and Communications – MOPC (Ministerio de Obras Públicas y Comunicaciones)
- National Institute of Potable Water and Sewage – INAPA (Instituto Nacional de Aguas Potables y Alcantarillados)
- General Mining Agency – DGM (Dirección General de Minería)
- Ministry of Industry and Commerce – MIC (Ministerio de Industria y Comercio)
- Ministry of Defense (Ministerio de Defensa)
- Ministry of Public Health and Social Assistance – MISPAS (Ministerio de Salud Pública y Asistencia Social)
- National Energy Commission – CNE (Comisión Nacional de Energía)
- Dominican Telecommunications Institute – INDOTEL (Instituto Dominicano de las Telecomunicaciones)
- Ministry of Housing and Buildings (Ministerio de la Vivienda y Edificaciones)

The processes to obtain and renew permits are well understood by PV and similar permits have been granted to the operations in the past. PV expects to be granted all permits and approvals necessary and see no impediment to such. For permits that require renewal, PV expects to obtain them in the normal course of business.

The QP understands the extent of all environmental liabilities to which the property is subject to have been appropriately met.

4.5 Ownership, Royalties and Lease Obligations

Under the SLA, PV is obligated to make the following payments to the Dominican State:

- Net Smelter Royalty (NSR) payments of 3.2% based on gross revenues less some deductible costs (royalties do not apply to copper or zinc).
- Net Profits Interest (NPI) payment of 28.75% based on adjusted taxable cash-flow.

- Corporate income tax under a stabilized tax regime and an Annual Minimum Tax (AMT) of 25% (only applicable when there is a positive difference between the product of the applicable AMT rate (which varies with the price of gold) multiplied by gross receipts with the sum of the NPI and income tax for a particular year); and
- Other general tax obligations.

The second amendment to the SLA in 2013 included additional and accelerated tax revenues to the Dominican government. It also included the establishment of a graduated minimum tax, which is adjusted up or down every three years based on a financial model prepared by PV, subject to Government approval. PV prepared an updated financial model underpinning the graduated minimum tax rates for the period from 2023 through 2025. This was submitted to the Government on 28 December 2022, as of the date of this report PV are still waiting for final approval from the Ministry of Energy and Mines.

PVD's activities at the Pueblo Viejo mine are compliant in all material respects with applicable corporate standards and environmental regulations.

On September 29, 2015, Barrick closed a gold and silver streaming transaction with Royal Gold for production linked to Barrick's 60% interest in the Pueblo Viejo mine. Under the terms of the agreement, Barrick sells gold and silver to Royal Gold equivalent to: (i) 7.5% of Barrick's interest in the gold produced at Pueblo Viejo until 990,000 oz of gold have been delivered, and 3.75% thereafter; and (ii) 75% of Barrick's interest in the silver produced at Pueblo Viejo until 50 Moz ounces have been delivered, and 37.5% thereafter. Silver is delivered based on a fixed recovery rate of 70%. Silver above this recovery rate is not subject to the stream. There is no obligation to deliver gold or silver under the agreement if there is no production from Pueblo Viejo.

5 Accessibility, Climate, Local Resources, Infrastructure and Physiography

5.1 Accessibility

Access from Santo Domingo, the country's capital and largest city is by paved road. A four lane, paved highway (Autopista Duarte, Highway #1) is the main route between Santo Domingo and the country's second largest city, Santiago, which connects to a secondary highway, #17, at the town of Piedra Blanca, approximately 78 km from Santo Domingo. This secondary highway is a two lane, paved highway that passes through the towns of Maimon, Palo de Cuaba, and La Cabirma on the way to Cotuí. The gatehouse for the Pueblo Viejo Mine is 22 km from Piedra Blanca and approximately 6.5 km from Palo de Cuaba.

The main port facility in the Dominican Republic is Haina in Santo Domingo. Other port facilities are located at Puerto Plata, Boca Chica, and San Pedro de Macoris.

Commercial airlines have regular flights to and from the cities of Santo Domingo, Santiago, Puerto Plata, and Punta Cana.

5.2 Climate and Physiography

The central region of the Dominican Republic is dominated by the Cordillera Central mountain range, which runs from the Haitian border to the Caribbean Sea. The highest point in the Cordillera Central is Pico Duarte at 3,175 m. Pueblo Viejo is located in the eastern portion of the Cordillera Central where local topography ranges from 565 m at Loma Cuaba to approximately 65 m at the Hatillo Reservoir.

Two rivers run through the concession, the Margajita and the Maguaca. The Margajita drains into the Yuna River upstream from the Hatillo Reservoir, while the Maguaca joins the Yuna below the Hatillo Reservoir. The flows of both rivers vary substantially during rainstorms.

The Dominican Republic has a tropical climate with little fluctuation in seasonal temperatures, although August is generally the hottest month, with January and February being the coolest. The average annual temperatures in the Mine area are approximately 25°C, ranging from daytime highs of 32°C to nighttime lows of 18°C. Annual rainfall is approximately 1,800 mm, with May through October typically being the wettest months. The Dominican Republic is located in the Atlantic hurricane zone, with the Atlantic hurricane season running from 1 June to 30 November. The TSFs and Mine design and operations consider the effects and risks of the high rainfall environment as part of their design criteria.

The PV operation is situated in a seismically active area. The island of Hispaniola sits on top of small crustal blocks sandwiched between the North American and Caribbean plates, with major earthquakes occurring on average every 50 years. The TSFs and Mine designs consider this potential seismic activity as part of their design criteria.

As a result of previous mining and agriculture, there is little primary vegetation on the Pueblo Viejo Mine site and surrounding concessions. Secondary vegetation is abundant outside the excavated areas and can be quite dense. Rosario, the previous owner of the concessions, also aided the growth of secondary vegetation by planting trees throughout the property for soil stabilization.

The economic base near the Mine area is mainly agriculture and cattle ranching. Vegetation mainly consists of crops and grasses. Around the Naranjo TSF study area, it has been observed that the forested areas correspond to a secondary forest in the process of succession. The presence of the Lauraceae family (an indicator of natural regeneration) is the most representative, in addition to the Fabaceae family (resistant to poor and degraded soils) and other families related to secondary forests in the process of natural regeneration. The vast majority of trees correspond to a medium stratum with heights between 11 m and 20 m and young trees with diameters between 10 cm and 25 cm, which reinforce the area's classification as secondary forest.

5.3 Local Resources

The city of Santo Domingo is the principal supply source for the Mine. It is a port city with a population of over 3.5 million with daily air service to the USA and other countries. Where possible, services are sourced from the adjacent townships with numerous programs initiated by PV to assist the development of local businesses.

PV is a major employer within the Dominican Republic. Technical and non-technical staff positions and labour requirements, including contractors, are filled from local communities as a priority. Mining is an important economic activity, and the total number of employees at the Pueblo Viejo Mine is approximately 3,000 direct employees and 6,400 contractors.

There are numerous technical colleges and universities in the country with an ample supply of technically qualified people available; however, there are limited mining specific disciplines and experience, so internal development is often necessary.

Non-technical labour is in plentiful supply from local towns and communities.

5.4 Infrastructure

The Pueblo Viejo Mine is located approximately 100 km northwest of Santo Domingo, the capital of the Dominican Republic. The main road from Santo Domingo to within about 22 km of the Mine site

is a surfaced, four-lane, divided highway that is generally in good condition. Access from the divided highway to the site is via a two-lane, surfaced road. Gravel surfaced internal access roads provide access to the Mine site facilities.

A network of haul roads within the Mine supplement existing roads so that Mine trucks can haul ore, waste, overburden, and limestone.

As well as the existing access roads, the site infrastructure includes accommodations, offices, a truck shop, a medical clinic, and other buildings, water supply, the TSF, and water treatment facilities.

A double and single fence system protects the process plant site. Within the plant site area, the freshwater system, potable water system, fire water system, sanitary sewage system, storm drains, and fuel lines are buried underground. Process piping is typically left above ground on pipe racks or in pipe corridors.

The current TSF is operating in the El Llagal valley approximately 3.5 km south of the plant site. The new Naranjo TSF, which is needed to support the mine life extension and process plant expansion is planned to be constructed approximately 6km to the southeast of the plant site.

The Pueblo Viejo Mine is supplied with electric power from two sources via two independent 230 kV transmission circuits. The primary source of electric power for the Mine is the Quisqueya 1 power plant, which is owned and operated by PV and located near the city of San Pedro de Macoris.

The site has sufficient access, surface rights, and suitable sources of power, water, and personnel to maintain an efficient mining operation except for the surface rights for the Naranjo TSF which are in process as stated above.

The PV infrastructure is discussed in detail in Section 18.

6 History

6.1 Pre-1969

The earliest records of Spanish mine workings at Pueblo Viejo are from 1505, although Spanish explorers sent into the island's interior during the second visit of Columbus in 1495 may have found the deposit being actively mined by the native population. The Spanish mined the deposit until 1525, when the mine was abandoned in favour of newly discovered deposits on the American mainland.

There are few records of activity at Pueblo Viejo from 1525 to 1950, when the Dominican government sponsored geological mapping in the region. Exploration at Pueblo Viejo focused on sulfide veins hosted in unoxidized sediments in stream bed outcrops. A small pilot plant was built, but economic quantities of gold and silver could not be recovered.

6.2 Rosario / AMAX (1969 to 1992)

During the 1960s, several companies inspected the property, but no serious exploration was conducted until Rosario Resources Corporation of New York optioned the property in 1969. As before, exploration was directed first at the unoxidized rock where sulfide veins outcropped in the stream valley and the oxide cap was only a few metres thick. As drilling moved out of the valley and on to higher ground, the thickness of the oxide cap increased to a maximum of 80 m, revealing an oxide ore deposit of significant tonnage.

In 1972, Rosario was incorporated (40% Rosario Resources Corporation of New York, 40% Simplot Industries and 20% Dominican Republic Central Bank). Open pit mining of the oxide resource commenced on the Moore deposit in 1975. In 1979, the Dominican Central Bank purchased all foreign held shares in the mine. Management of the operation continued under contract to Rosario until 1987. Rosario was merged into AMAX Inc. in 1980 (continued to be referred to as Rosario, below).

Rosario continued exploration throughout the 1970s and early 1980s, looking for additional oxide resources to extend the life of the mine. The Monte Negro, Mejita, and Cumba deposits were identified by soil sampling and percussion drilling and were put into production in the 1980s. Rosario also performed regional exploration, evaluating much of the ground adjacent to the Pueblo Viejo concessions with soil geochemistry surveys and percussion drilling. An airborne electromagnetic (EM) survey was flown over much of the Maimon Formation to the south and west of Pueblo Viejo.

With the oxide resources diminishing, Rosario initiated studies on the underlying refractory sulfide resource to continue the operation. Feasibility level studies were conducted by Fluor Engineers Inc. (Fluor) in 1986 and Stone & Webster Engineering/American Mine Services (SW/AMS) in 1992.

Fluor concluded that developing a sulfide project would be feasible if based on roasting technology, with sulfuric acid as a by-product. Rosario rejected this option due to environmental concerns related to acid production.

SW/AMS concluded that a roasting circuit would be profitable at 15,000 tpd using limestone slurry for gas scrubbing and a new kiln to produce lime for gas cleaning and process neutralization.

Rosario continued to mine the oxide material until approximately 1991, when the oxide resource was essentially exhausted. A carbon-in-leach (CIL) plant circuit and new tailings facility at Las Lagunas were commissioned to process transitional sulfide ore at a maximum of 9,000 tpd. Results were poor, with gold recoveries varying from 30% to 50%. Selective mining continued in the 1990s on high-grade ore with higher estimated recoveries. Mining in the Moore deposit stopped early in the 1990s owing to high copper content (which resulted in high cyanide consumption) and increased ore hardness. Mining ceased in the Monte Negro deposit in 1998, and stockpile mining continued until July 1999, when the operation was shut down.

During these 24 years of historical production (between 1975 and 1999), the Pueblo Viejo Mine produced a total of 5.5 Moz of gold and 25.2 Moz of silver.

6.3 Privatization (1996)

Lacking funds and technology to process the sulfide ore, Rosario attempted two bidding processes to joint venture or dispose of the property, one in approximately 1992 and the other in 1996. In November 1996, Rosario selected Salomon Brothers (Salomon Smith Barney) to coordinate a process to find a strategic partner to rehabilitate the operation and to determine the best technology to economically exploit the sulfide resource (the privatization process). Three companies were involved in the privatization process: GENEL JV, Mount Isa Mines Ltd. (MIM), and Newmont. This privatization process was not achieved, but each of the three companies conducted work on the property during their evaluations.

6.4 GENEL JV

The GENEL JV was formed in 1996 as a 50:50 joint venture between Eldorado Gold Corporation and Gencor Inc. (later Gold Fields Inc.) to pursue their common interest in Pueblo Viejo. The GENEL JV spent approximately US$6M between 1996 and 1999 in studying the Mine and advancing the privatization process. Studies included diamond drilling, developing a new geological model, mining studies, evaluation of refractory ore milling technologies, socio-economic evaluation, and financial analysis.

6.5 Mount Isa Mines

In 1997, MIM conducted a due diligence program as part of its effort to win Pueblo Viejo in the privatization process. MIM conducted a 31-hole, 4,600 m diamond drilling program, collected a metallurgical sample from drill core, carried out detailed pit mapping, completed induced polarization (IP) geophysical surveys over the known deposits, and organized aerial photography over the mining concessions to create a surface topography. MIM also proposed to carry out a pilot plant and feasibility study using ultra-fine grinding/ferric sulfate leaching.

6.6 Newmont

In 1992 and again in 1996, Newmont proposed a pilot plant and feasibility study for ore roasting/bioheap oxidation. Samples were collected for analysis, but no results are available.

6.7 Placer Dome Inc.

In 2000, the Dominican Republic invited international bids for the leasing and mineral exploitation of the Pueblo Viejo mine site. In July 2001, PV (then known as Placer Dome Dominicana Corporation), an affiliate of Placer Dome Inc., was awarded the bid and acquired the Project. PV and the Dominican Republic subsequently negotiated the SLA for the MFR. Between 2002 and mid-2005, PV, then a subsidiary of Placer Dome Inc. (together Placer), completed extensive work on Pueblo Viejo, including drilling, geological studies, and Mineral Resource and Reserve estimation. This work was compiled in a Feasibility Study completed in July 2005.

In addition to drilling programs in 2002 and 2004, Placer conducted structural pit mapping of the Moore and Monte Negro open pits in 2002. Placer also mapped and sampled a 105 km^2 area around the concessions as part of an ongoing environmental baseline study to identify ARD sources outside the main deposit areas. Part of the regional mapping and sampling program focused on evaluating the potential for mineralization in the proposed El Llagal tailings storage area. Mapping and stream sediment sampling were conducted in the El Llagal valley and adjacent Maguaca and Naranjo river valleys. Further geotechnical evaluation of the El Llagal valley resulted in BGC Engineering Inc. (BGC) of Vancouver drilling 20 core holes and collecting numerous outcrop samples. Select samples identified with the most favourable mineralization were sent for gold and trace element analysis.

6.8 Barrick

In March 2006, Barrick acquired Placer Dome Inc. and, in May 2006, amalgamated the companies. At the same time, Barrick sold a 40% stake in Pueblo Viejo to Goldcorp Inc. (Goldcorp Inc. was subsequently acquired by Newmont in 2019). On 26 February 2008, PV delivered the Project Notice

to the Government of the Dominican Republic pursuant to the SLA and delivered the Pueblo Viejo Feasibility Study to the Government. In 2009, the Dominican Republic and PV agreed to amend the terms of the SLA. The amendment became effective on 13 November 2009, following its ratification by the Dominican National Congress. The Pueblo Viejo mine achieved commercial production in January 2013.

6.9 Past Production

In August 2010, the open pit pre-stripping started. The ore mined from 2010 to 2022 totalled 175.3 Mt averaging 3.1 g/t Au. Ore processed during this period totalled 78.5 Mt at 4.2 g/t Au with an average recovery of 90% for 9.7 Moz. Of gold recovered as well as 23.7 g/t Ag with an average recovery of 55% for 32.4 Moz. Of silver recovered (see Table 6-1).

Table 6-1 Pueblo Viejo Past Production Summary

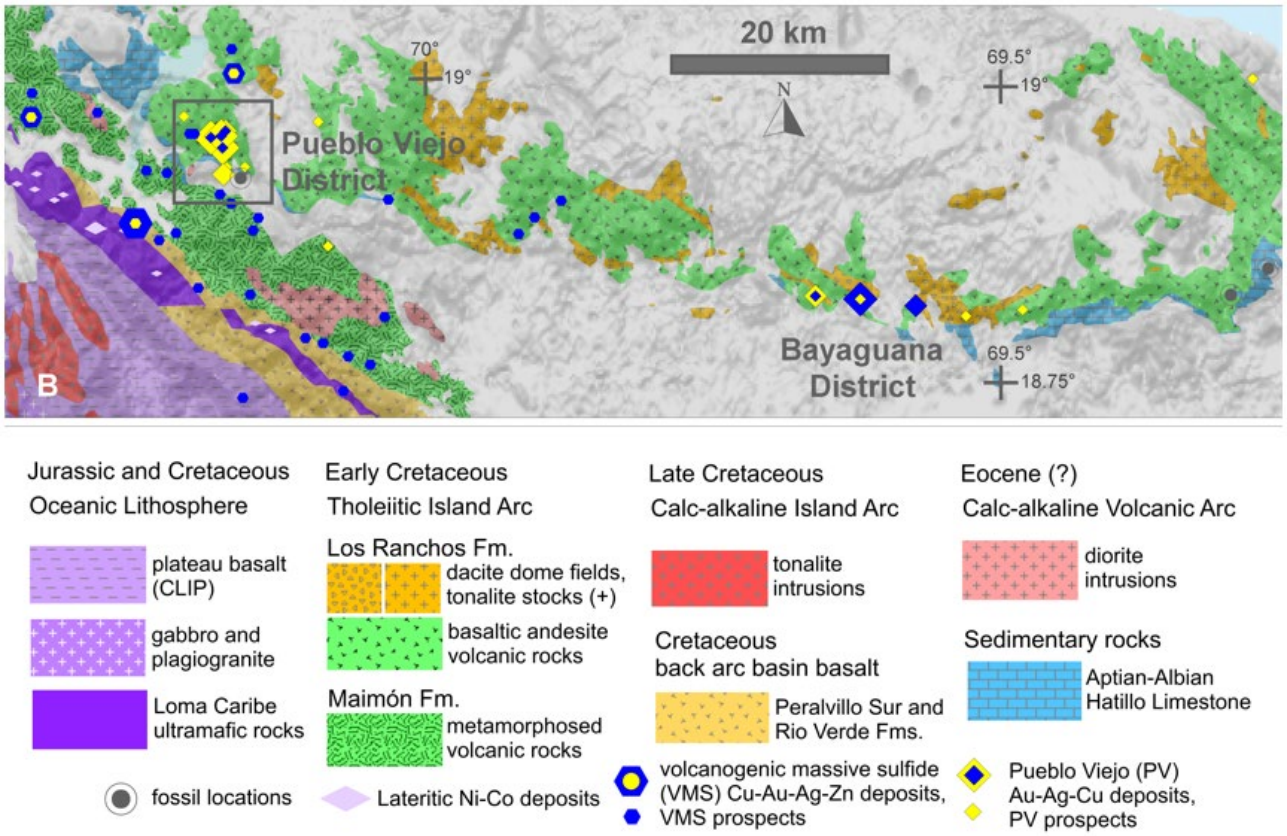
Year	Total Mined* (Mt)	Ore Mined		Ore Processed			Recovery		Recovered	
		(Mt)	(g/t Au)	(Mt)	(g/t Au)	(g/t Ag)	(% Au)	(% Ag)	(Moz. Au)	(Moz. Ag)
2010	2.3	0.6	2	0	0	0	0	0	0	0
2011	17.4	11.3	3.7	0	0	0	0	0	0	0
2012	16.1	10.8	4	0.7	5.1	40.1	93	48	0.1	0.5
2013	15.3	11.2	3.6	4.4	6.1	42.4	93	35	0.8	2.1
2014	35.1	17.8	3.8	6.7	5.5	31.7	93	56	1.1	3.9
2015	37.9	18.4	3.4	6.9	4.9	34	87	33	1	2.5
2016	38.8	18.6	3.1	7.5	5.3	22	91	63	1.2	3.4
2017	39.1	22.5	3.1	8	4.6	23.3	92	75	1.1	4.5
2018	40.1	15.7	2.8	8.4	4.0	25.3	89	74	1	5
2019	41.2	13.5	2.8	8.6	3.9	19.3	90	59	1	3.2
2020	33.8	10.2	2.6	8.8	3.6	20.2	89	48	0.9	2.7
2021	41.1	13.3	2.4	9.1	3.2	17.3	88	48	0.8	2.4
2022	32.9	11.4	2.2	9.4	2.7	14.4	87	50	0.7	2.2
TOTAL	**391.1**	**175.3**	**3.1**	**78.5**	**4.2**	**23.7**	**90**	**55**	**9.7**	**32.4**

* Excludes limestone mining.
Totals may not add due to rounding.
All totals on a 100% basis

7 Geological Setting and Mineralization

7.1 Regional Geology

Pueblo Viejo is in the central part of Hispaniola Island. The main ore body is hosted in the Lower Cretaceous Los Ranchos Formation, a belt extending across the eastern half of the Dominican Republic, with a northwest trend and an average dip of 20˚ to the southwest, see Figure 7-1. Los Ranchos Formation consists of a lower complex of pillowed basalt, basaltic andesite flows, dacitic flows, tuffs, and intrusions, overlain by volcaniclastic sedimentary rocks. It is a Lower Cretaceous intra-oceanic island arc with bimodal volcanism that forms the base of the Greater Antilles Caribbean islands.



Source: Nelson et al. 2020, modified from Escuder-Viruete et al. 2007

Figure 7-1 Regional Geological Map for the Pueblo Viejo District

Geology and tectonic evolution of the Hispaniola show a thrusted-bound fragment of the ocean floor conformed of peridotite, which has been interpreted as a dismembered part of an ophiolite. An obduction process affecting the ocean floor was responsible for the metamorphism of rocks that belong to the Maimon Formation. The Hatillo Formation is over thrusting Los Ranchos Formation in a Cenomanian discordance to the southwest area of the Pueblo Viejo mining concession. The

Lagunas Formation overlays the limestone rocks of the Hatillo Formation as fore-arc basin, and it outcrops to the south. Both Formations are over thrusted by rocks of the Maimon Formation.

7.2 Local Geology

Figure 7-2 shows the surface expression of units of the Los Ranchos and Maimon Formation within the mining concession. From top to bottom, the underlying stratigraphic lithology of the Los Ranchos Formation shows the following units outcropping to the north and northeast of the district: Pueblo Viejo, Platanal, and Zambrana. The Los Ranchos Formation (Lower Cretaceous) is overlayed by the Hatillo Formation (Upper Cretaceous) in a discordant faulted contact that corresponds to a thrust fault with NNE verge; occasionally, some thrust splays are present. The Hatillo Formation is over thrusted by the Lagunas Formation and the Lower Cretaceous Maimon Formation outcrops over the entire south portion of the district. The lower contact of the Maimon Formation is well defined by a major structure called and mapped as the Hatillo Thrust Fault. Younger intrusive rocks from Eocene (dikes and stock) are presented crosscut on most of the Cretaceous outcropping rocks. The main rock type formations are detailed following Figure 7-2.

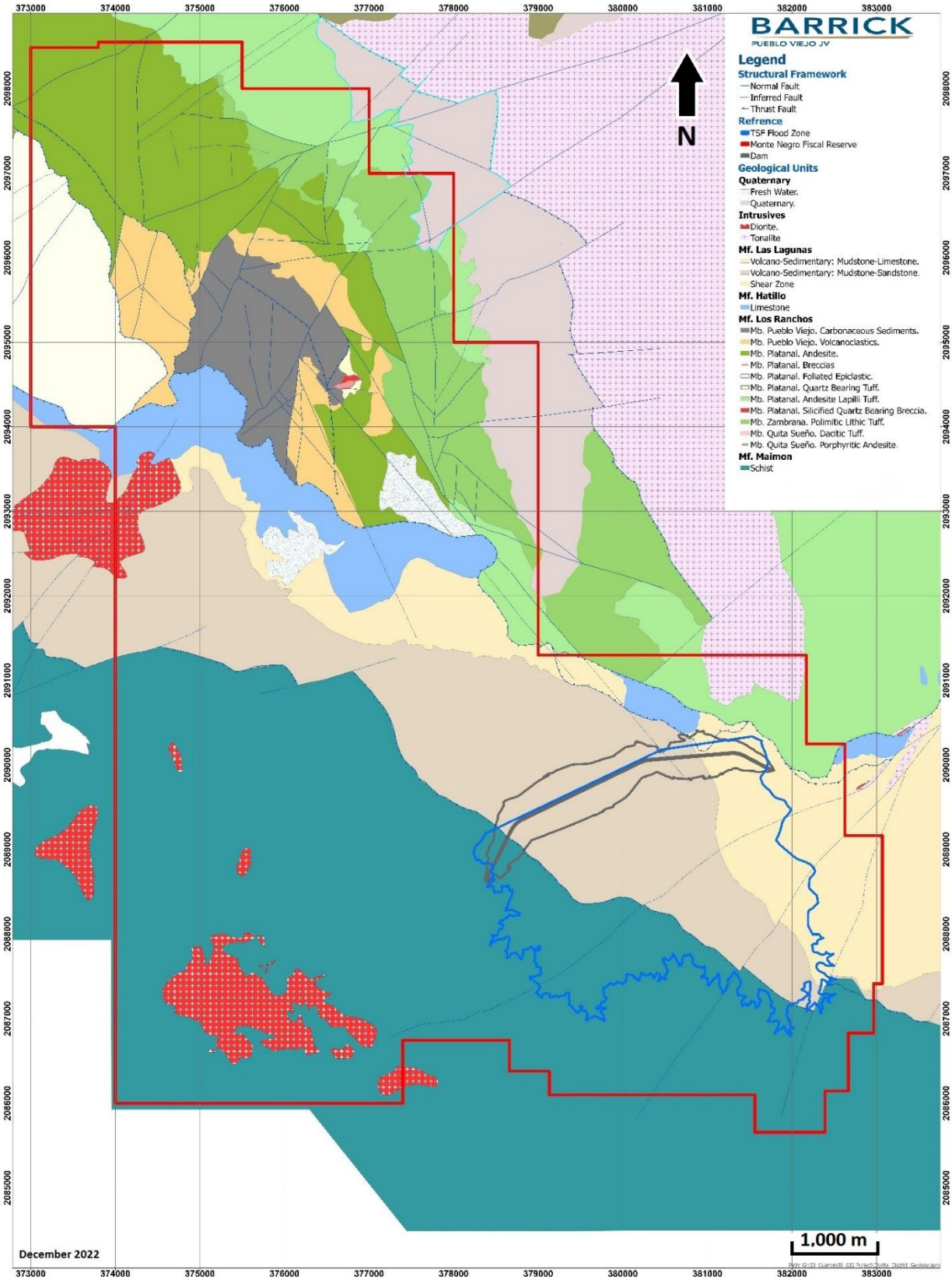


Figure 7-2 Geological Map of Mining Concession Area

Maimon Formation

The Maimon Formation outcrops to the southwest of the zone and consists of metamorphosed volcanic rocks of bimodal composition that are interpreted to represent rocks from an early Cretaceous fore-arc.

Los Ranchos Formation

The Los Ranchos Formation hosts the gold mineralization in the Pueblo Viejo deposit. From top to bottom, three members are exposed within the mining concession:

- Pueblo Viejo: characterized by carbonaceous sediments that includes sandstone, mudstone and conglomerate interlayered.
- Platanal: this member is underlaying Pueblo Viejo and is a comprised of andesitic and pyroclastic flows.
- Zambrana: the lowest member formed by andesitic tuffs.

Mineralization is wider in the permeable sediments of the upper member Pueblo Viejo, while narrow in the andesitic flows of the Platanal unit.

Hatillo Formation

The Hatillo Formation hosts limestone mined in the quarries of Pueblo Viejo. The nature of the contact between the Los Ranchos and Hatillo Limestone Formation corresponds to a low angle thrust fault. The base of this unit shows deformation, e.g., shear, gouge, and micro folding.

Las Lagunas Formation

Las Lagunas Formation conformably overlies the Hatillo Formation. It is characterized by a basal stratigraphic unit of epiclastic tuffs and volcano sedimentary siltstone with minor limestone beds. The upper portion of the formation has interlayered calcareous shale sequences, arenites, mudstone, and limestone layers.

Diorite

The Diorite is a fine-grained intrusive rock occurring in the concession as stocks, sills, and dikes. This rock outcrops with large exposure to the southwest of the San Juan limestone quarry and the Llagal area, where it was mined in a quarry.

7.3 Property Geology

At Pueblo Viejo, there are three Formations outcropping.

- Los Ranchos Formation, covering most of the area to the north and east.
- The Hatillo Formation hosts the limestone rocks in the mining concession and is overlaying the Los Ranchos Formation.
- And finally, to the southwest corner of the concession the Las Lagunas Formation is present.

Figure 7-3 shows the local geology map and main rock units.

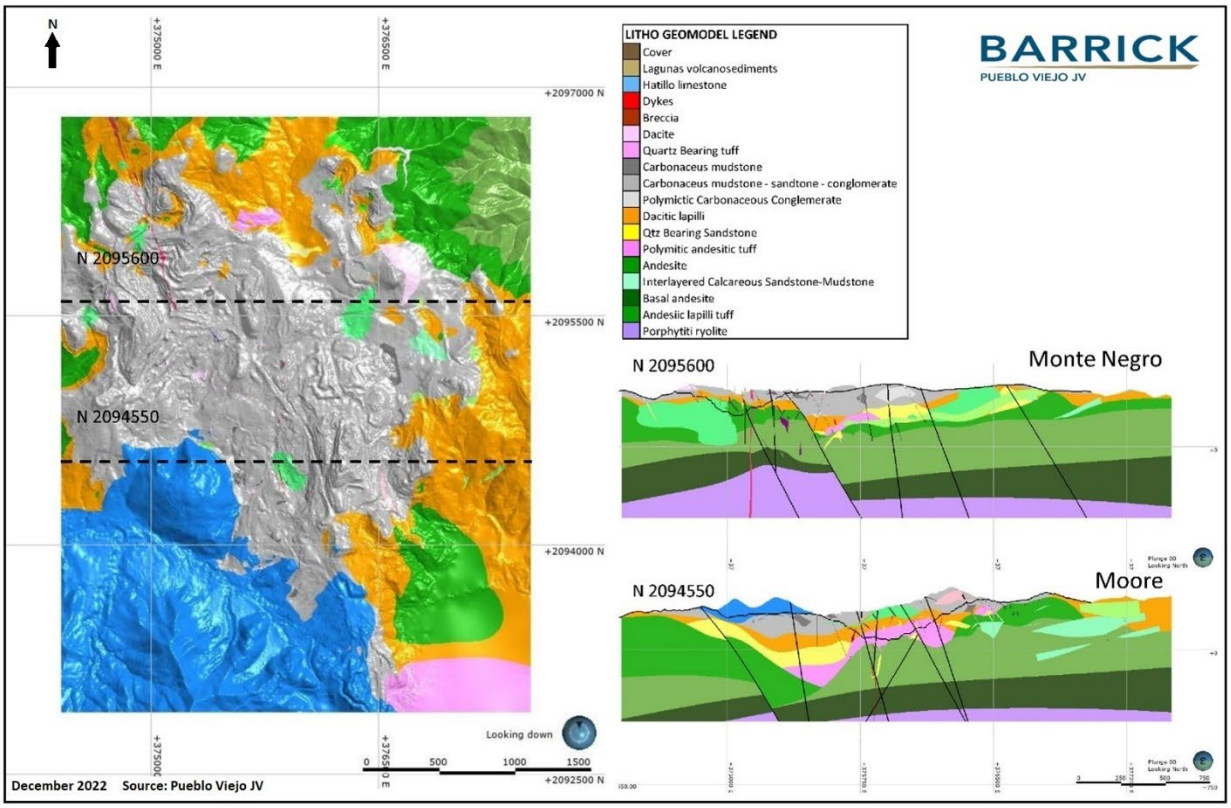
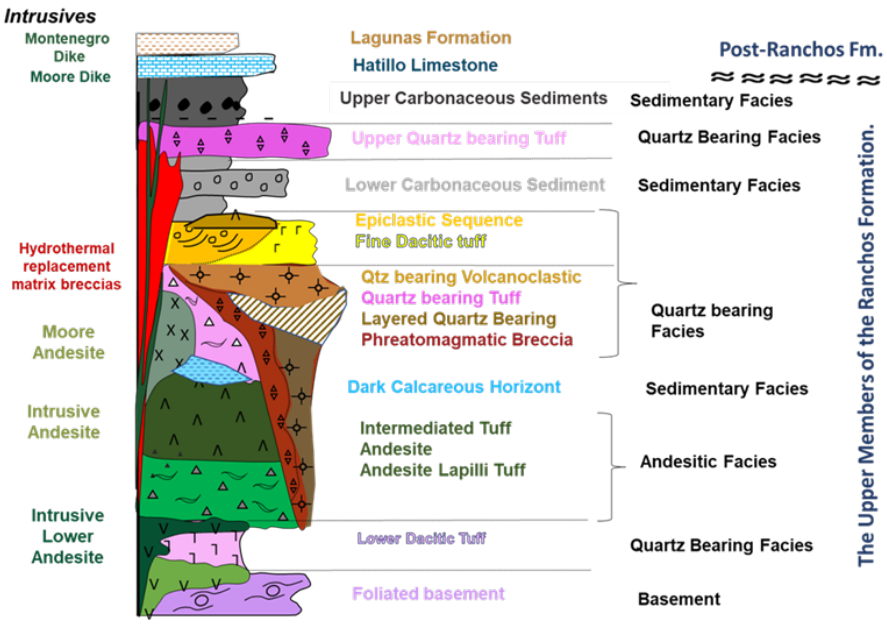


Figure 7-3 Geology Surface Map of PV Property

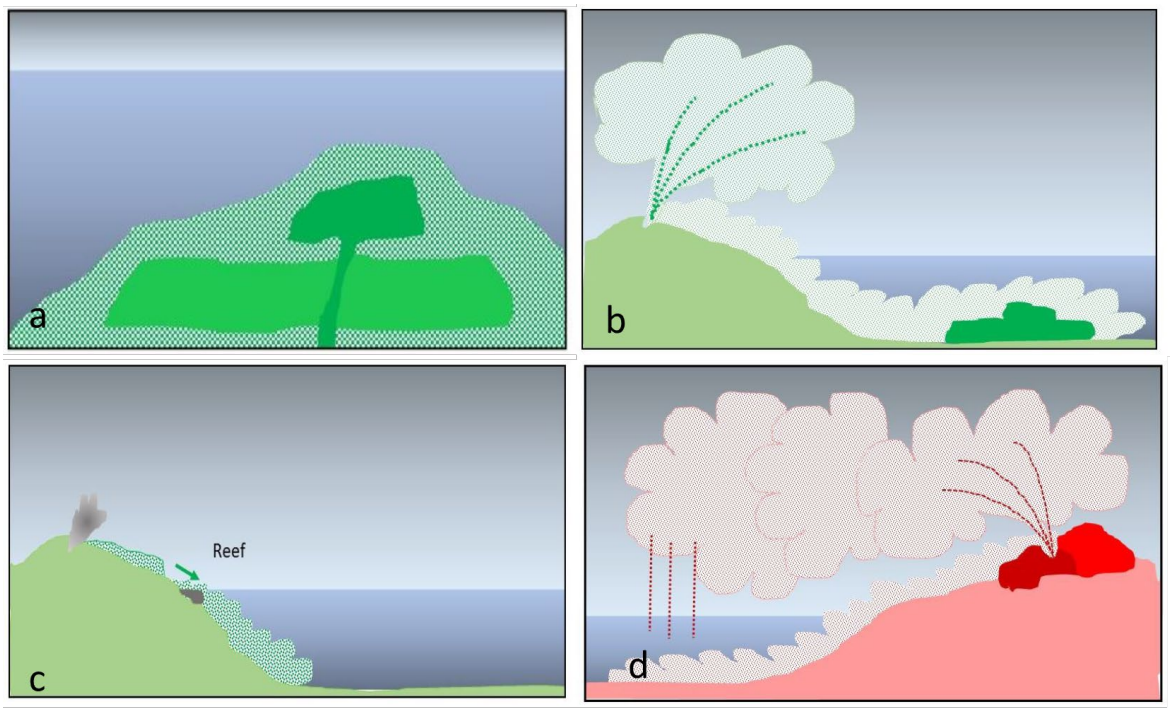
Figure 7-4 shows a simplified stratigraphic column of the Pueblo Viejo deposit. At Pueblo Viejo, all mineralization is hosted in the Los Ranchos Formation. The lithologies are classified into three facies according to the main composition of the rock units. The Sedimentary facies contain carbonaceous sediments; the Quartz Bearing facies are characterized by epiclastic, and volcanoclastic rocks; and finally, the Andesitic facies are defined by extrusive volcanic rocks of intermediate composition.



Source: Barrick, 2019

Figure 7-4 Stratigraphy Column Interpreted and Modelled

Figure 7-5 is a visual description showing the general volcanic sequences of mineralization followed by a complex depocenter filling, aggradation, and a growing fault system.



Source: McPhie, 2020

a) Intrabasinal subaqueous andesitic coherent lavas, dome with clastic polymictic breccia;
b) explosive eruption at and extra basinal andesite volcano generating pyroclastic density currents that crossed the shoreline;
c) re-sedimentation of subaerial andesitic deposits into Pueblo Viejo submarine depocenter;
d) dome-seated, felsic explosive eruptions, generating pyroclastic density currents and atmospheric ash in which accretionary lapilli were formed.

Figure 7-5 Simplified Facies Architecture of the Pueblo Viejo Succession

The sedimentary facies overlay the quartz bearing facies at the central part of the basin and the andesite facies at the border. A lower sedimentary horizon is interpreted as remnant of a sub-basin with a dominant calcareous composition and is interlayered in the andesite facies.

A narrow flat andesite layer at the Moore deposit is overlaying the quartz bearing facies. Intermediate dikes appear to be proof of a last volcanic episode that occurred near the end of the hydrothermal mineralization event, e.g., the Monte Negro dike.

The Hatillo limestone is in thrust contact with the carbonaceous sediments of the Los Ranchos Formation towards the west of the San Juan quarry. In the quarries, it is also possible to see the thrusted contact between the sedimentary sequence of the Las Lagunas Formation over the Hatillo limestone.

7.4 Mineralization

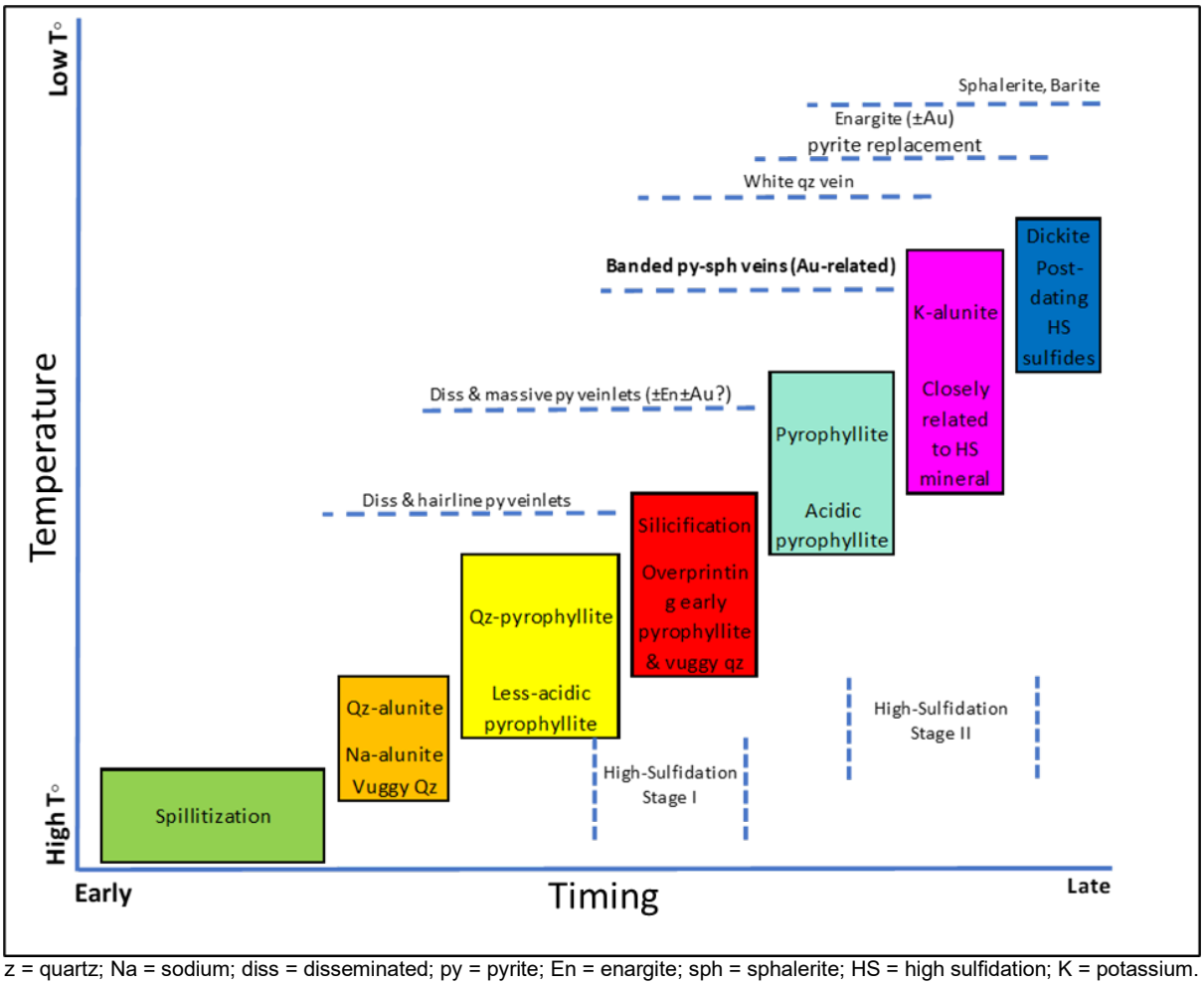
Mineralization in Pueblo Viejo is found in several separate deposits, including Moore, Monte Negro, Mejita, Cumba, and ARD1.

The Hatillo Formation hosts the limestone, which has been historically mined from the Quemados quarry and currently from the active Lagunas and San Juan quarries. There is potential for other limestone quarries to be developed towards the west of the MNFR.

All the lithologies at the Pueblo Viejo deposit are expected to have some argillic alteration with quartz, pyrophyllite and pyrite as the primary sulfide, minor sphalerite, local enargite with minor amounts of barite, rutile, telluride, and lead-sulfides.

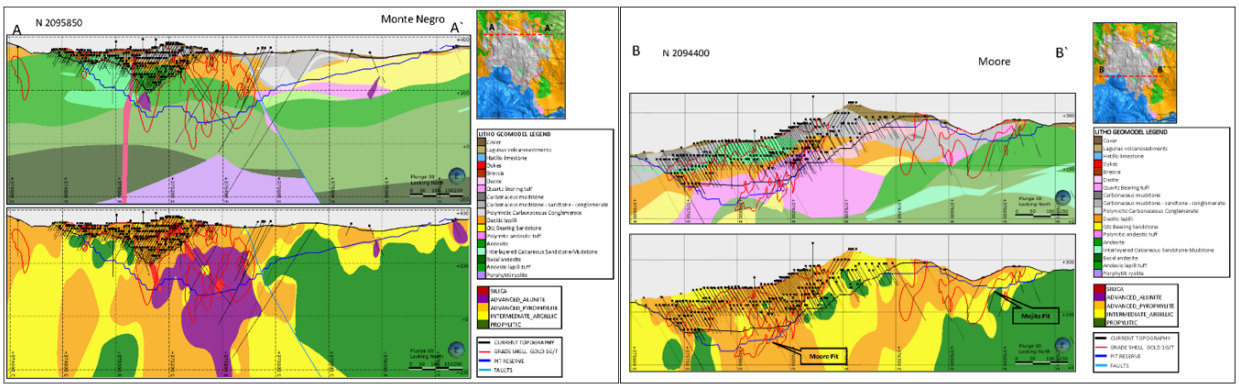
The other sulfides, sphalerite, and enargite (with some antimony replacing arsenic), are present with pyrite, mainly in veins and filling fractures.

Mineralization events are strongly related to the alteration sequence, with disseminated pyrite occurring in an early event and sulfide veinlets occurring in a later event. Mineralization has also been considered to have occurred during or close to the end of the sedimentation in the basin. The presence of typically centimetre scale subvertical mineralized veinlets cutting the bedding or hosted conformably in the deformed sediments (bedding plane continuity) are evidence of this. The density of these centimetre scale veinlets is directly related to gold grades, and form the trends required within the models. Figure 7-6 shows the main stages of mineralization along with the development of the different types of alteration present in the ore body, and Figure 7-7 shows the geometry of the mineralization controls. Sulfide veins can be found conformably hosted in the carbonaceous sediments experiencing post-deformation and others cutting across folded rocks.



z = quartz; Na = sodium; diss = disseminated; py = pyrite; En = enargite; sph = sphalerite; HS = high sulfidation; K = potassium.
Source: Muntean et al., 1990

Figure 7-6 Mineralization- Alteration Sequence.



Source: PV, 2022

Figure 7-7 Mineralization Controls of the Monte Negro (left) and Moore (Right) Ore Bodies

The QP has reviewed the mineralization within the PV ore bodies, and confirms that the controls are well understood, sampled appropriately, and modeled accurately within the known geometry of the mineralization style.

8 Deposit Types

Pueblo Viejo is a Cretaceous high sulfidation epithermal gold, silver, copper, and zinc deposit. High sulfidation deposits have a high metal to sulfur ratio and are mainly characterized by minerals including pyrite, minor sphalerite, and enargite. The presence of pervasive and vuggy silica related to hydrothermal alteration is indicative of strong acid conditions. High sulfidation deposits are spatially related to volcanic centres and sometimes represent the upper levels of porphyry deposits, which for the Pueblo Viejo deposit, still requires further investigation.

The Pueblo Viejo system indicates that hydrothermal fluids were enriched in magmatic volatiles and gold migrated upwards along faults and permeable horizons. These ascending boiling fluids cooled down as they moved into a low-pressure environment, where they changed composition during the mixing with near-surface fluids, ultimately resulting in the deposition of the metal that was suspended in solution.

The Pueblo Viejo deposits are funnel-shaped zones containing rocks with advanced argillic alteration assemblages surrounded by a propylitic assemblage (chlorite-albite-calcite-epidote). An envelope of coexisting alunite and pyrite at deeper zones and quartz-pyrophyllite to kaolinite is present at the central part of the deposit, which is trending N-S in Moore and NW in Monte Negro.

The mineral assemblage of this epithermal system resulted from multiple events of highly acidic and high sulfidic fluids inside a structural depocenter. Hydrothermal fluids flowed along a channel-way swamping the entire rock leaching and leaving residual silicon dioxide (SiO_2) and aluminium oxide (Al_2O_3). At the same time, pre-existing iron-bearing minerals (Siderite) in the carbonaceous sediments were totally sulfidized and replaced by pyrite.

A depocenter system built the sequence of Pueblo Viejo that hosts the mineralization, (Figure 8-1). The structural basin is the product of an extensional system with grown normal fault which controlled the deposition of volcanic rocks and shallow organic sedimentation. A set of faults like Monte Oculto in Monte Negro and Carlos fault in Moore with dextral movement are interpreted as part of a pull-apart system. The presence of a large carbonaceous mudstone sequence and an over-thrusted limestone acting as a cap favoured the deposition and preservation of the mineralized fluids that migrated upwards and laterally in Pueblo Viejo.

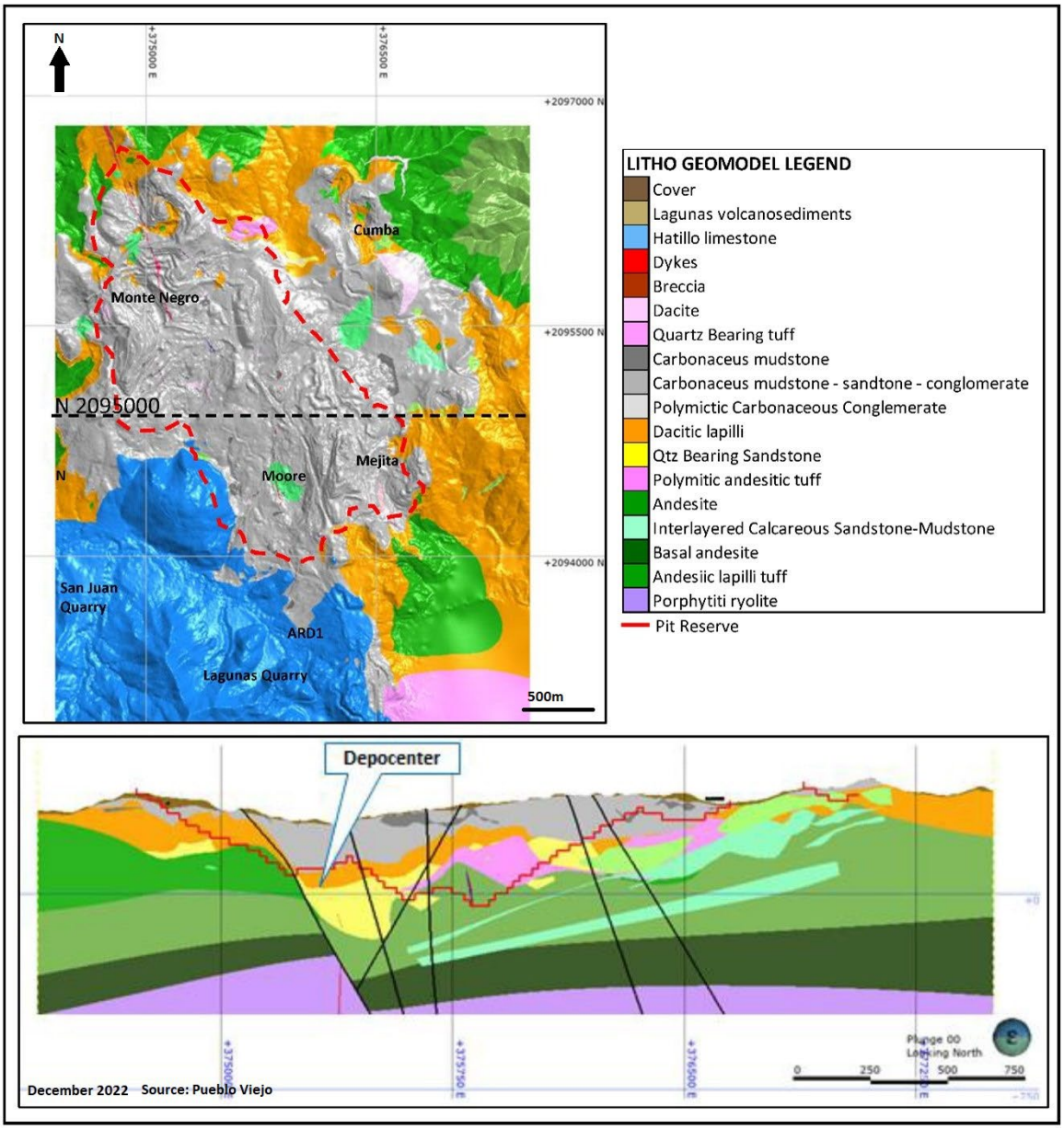
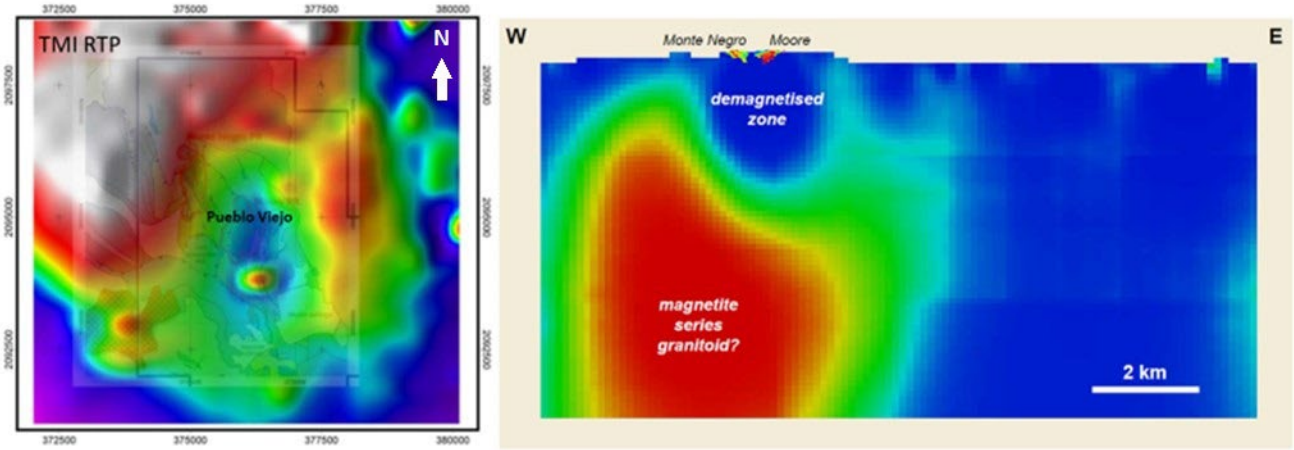


Figure 8-1 Depocenter Section into an Extensional Fault System

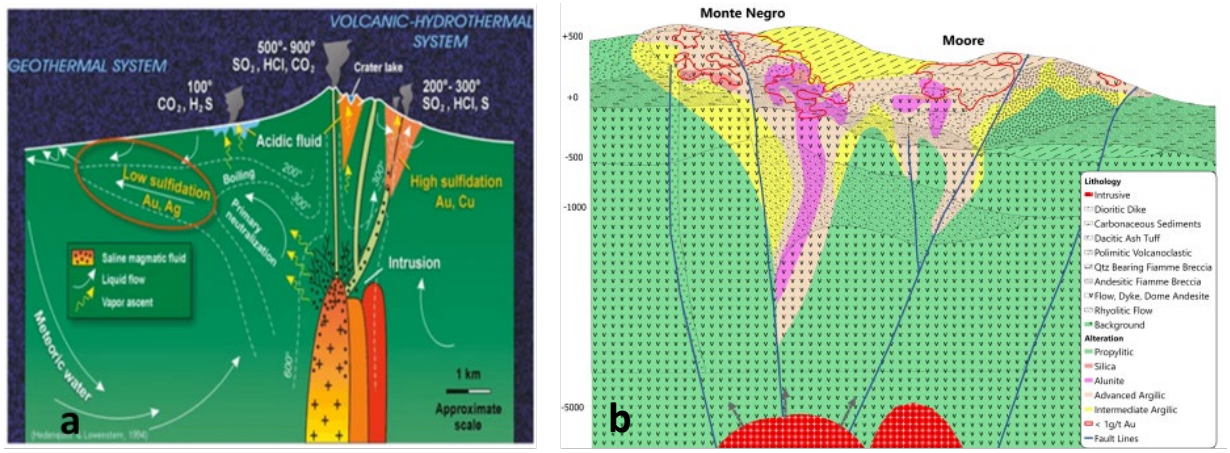
The Pueblo Viejo deposits are situated above an extensive sub-surface magnetic source interpreted as a magnetite series granitoid, which is supported by an airborne geophysics survey that reported a total magnetic intensity (TMI) magnetic anomaly. Moore and Monte Negro lie near the centre of a broad zone of demagnetization due to alteration that extends to a depth of two to three km. Figure 8-2 shows the surface and a section where ground magnetic data indicates that all magnetic minerals have been destroyed by alteration near the deposit.



Source: BHP Airborne Geophysical 1996

Figure 8-2 Surface and Section 3D Magnetic Inversion

Fluid inclusion measurements show that the formation of ore was at approximately 300°C, which is a typical temperature for a high sulfidation deposit. Figure 8-3 (a) shows the Hedenquist & Lowenstern 1984 Hydrothermal System model. This model aligns with the fluid inclusion temperatures, alteration mineral assemblages, and typical distance from magmatic emplacement seen at Pueblo Viejo. All of these pieces of information allow the Pueblo Viejo deposits to be defined as high sulfidation type deposits. Figure 8-3 (b) is an overlaid lithology-alteration model that shows the similarities between the classic high sulfidation model (a) and the Pueblo Viejo section through deposits Monte Negro and Moore (b). The gold emplacement is localized at approximately 250 m below sea level and is associated to intense acid leaching and subsequent silicification (pervasive and vuggy silica) and advanced argillic alteration mineral assemblages (quartz-pyrophyllite±dickite, quartz-alunite±dickite).



a) Hydrothermal system from Hedenquist & Lowenstern, 1984; b) Current Pueblo Viejo High Sulfidation Model (Barrick, 2022).

Figure 8-3 Model Type Deposit for Pueblo Viejo

8.1 Main Deposits

Pueblo Viejo is composed of several deposits; Moore and Monte Negro represent the main deposits along with small satellite deposits including Cumba, Mejita, and ARD1, as shown in Figure 8-4 and described further below.

Moore

Moore forms the depocenter basement located at the southeast margin of the Pueblo Viejo deposit. The carbonaceous sequence is well developed with a thickness of more than 150 m. Mineralization is pyrite-rich, gold-bearing veins with an average width of four cm, steeply dipping with a trend typically to the NNW. There is a secondary pyrite vein set that trends N-S and N-NE. The orientation of pyrite veins and steep faults is similar.

Thin bedded carbonaceous siltstones and dacitic ash tuffs in the West Flank dip shallowly to the west. Dip increases towards the west where north trending thrust faults displace the bedding.

Quartz veins with gold trend NW, oblique to the pyrite veins, have a similar strike to the interpreted contact with the overlying Hatillo limestone. They also occur as tension gash arrays in cm-scale dextral shear zones that trend north-northwest.

Faults create cm-scale displacement of bedding and pyrite-sphalerite veins occur along steep north-northeast trending faults. Two main NNE faults were mapped across the West Flank, sub-parallel to the Moore dacite pyroclastic contact. Displacement of veins preserves the evidence of lateral, sinistral movement.

The hydrothermal alteration is well developed and shows the four assemblages typical from Pueblo Viejo deposit. The core is advanced alunite, surrounded by an advanced pyrophyllite halo; this transitions into a propylitic halo and finally into an intermediate argillic envelope, which is the most exterior alteration.

Monte Negro

Monte Negro is located at the northwest portion of the Pueblo Viejo deposit. It is the distal area of the basin where the carbonaceous sequence is thinner and not as developed as it is in Moore.

In the Monte Negro central area, pyrite-rich veins with gold mineralization are sub-vertical and have different trends creating conjugate sets; the average width is two centimetres. The north-northwest trending set is sub-parallel to the strike of the bedding and fold axes, indicating a possible genetic relationship between folding and mineralization. Enargite and sphalerite gold bearing veins trend dominantly to the north-northeast and have an average width of three centimetres. The combination

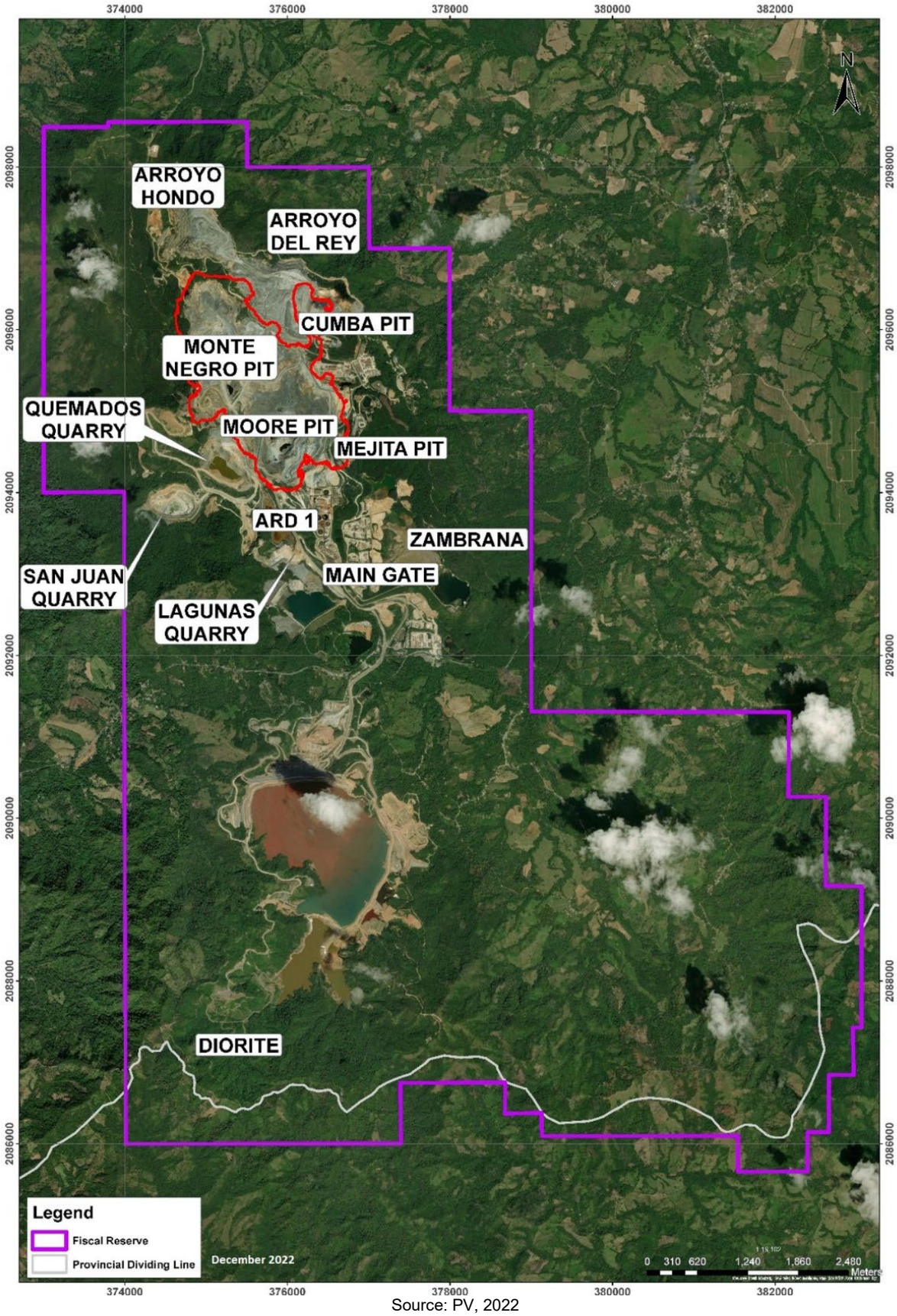
of vein trends forms a high-grade gold zone which extends 500 m north-northwest, 150 m wide, and up to 100 m thick.

The fault pattern is dominated by steep NNW trending faults sub-parallel to the dominant pyrite vein set.

Mineralized veins in the south of Monte Negro are relatively pyrite-poor, sphalerite-rich, and show an average width of five centimetres. The veins are sub-vertical and trend NW. The episodic vein fill demonstrates a clear paragenesis (massive pyrite-enargite-sphalerite-grey silica).

Shallow-dipping bedding and sub-vertical sphalerite-silica veins on the southern margin of Monte Negro South are cut by a west-dipping thrust. The thrust has brought thinly bedded pyritic sedimentary rocks into contact with andesitic volcanic and volcaniclastic rocks.

The hydrothermal alteration is well developed and shows the same four assemblages typical for Pueblo Viejo, which are the same as those described in Moore.



Source: PV, 2022

Figure 8-4 Overview Map Showing Main Ore Bodies and Satellites Deposits

8.2 Satellite Deposits

Cumba

The Cumba satellite orebody is located northeast of Monte Negro. The mineralization is hosted within an andesitic rock where a silicified orebody is developed and contains the main mineralization associated with pyrite, enargite, tetrahedrite and covellite with some sphalerite.

The structural trend is northwest to east-west and seems to control the mineralization. A major structure trending northeast is limiting the mineralization to the south. Hydrothermal alteration is predominantly silica-pyrophyllite with traces of dickite in the center and illite-chlorite as the exterior envelope.

Mejita

The Mejita satellite orebody is located southeast of Moore. It is an extension of Moore, where the mineralization is hosted in the carbonaceous sediments (the upper part of the sequence) with some levels of dacitic pyroclastic rocks and a basement of andesitic flows.

Mineralization occurs in the contacts between carbonaceous sediments/andesitic flows and pyroclastic dacitic/andesitic flows. Some deeper mineralization with high values of gold and silver is associated with a cruciform textured quartz vein with pyrite-sphalerite.

ARD1

The ARD1 orebody is located southwest of Moore. The mineralization is hosted in the carbonaceous sediments and the underneath polymictic volcaniclastics that are overlayed by the Hatillo limestone. The ore consists of pyrite and sphalerite veins that follow the bedding of the carbonaceous sediments. Hydrothermal alteration consists of a halo of advanced pyrophyllite with some dickite traces, surrounded by an intermediate argillic alteration.

9 Exploration

There were several companies prior to 2006 that completed some exploration work on the property. From 1969 to 1992, Rosario/AMAX identified the Monte Negro, Mejita and Cumba deposits by soil sampling and reverse circulation (RC) drilling. An airborne electromagnetic (EM) survey was flown over much of the Maimon Formation to the south and west of Pueblo Viejo. GENEL JV spent US$6M between 1996 and 1999 on studies that included diamond drilling, developing a new geological model, mining studies, evaluation of refractory ore milling technologies, socio-economic evaluation, and financial analysis. In 1997, MIM completed a diamond drilling campaign of 35 diamond drillholes (DDH) for a total of 4,600 m and collected metallurgical samples. They also carried out detailed pit mapping, completed an IP geophysical survey over the known deposits, and organized aerial photography over the mining concessions to create a surface topography. Between 2002 and mid-2005, Placer completed extensive work on Pueblo Viejo, including drilling, structural pit mapping of Monte Negro and Moore pits, and a mineral resource/reserve estimation. Placer also mapped and sampled a 105 km^2 area around the concessions as part of an ongoing environmental baseline study to identify acid rock drainage sources outside the main deposit areas. A geotechnical study of El Llagal valley included 20 DDH and outcrop samples.

In 2006, PV began to review the entire geological potential of the Pueblo Viejo Mine. The 2006 exploration program included:

- Data compilation and integration.
- Rock sampling (300 samples) and pit mapping.
- Alteration studies on 1,427 soil samples, 3,591 rock samples and 5,249 core samples.
- Geophysical surveys:
    - 41 km of IP Pole – Dipole.
    - 132 km of ground magnetic readings on a 200 m grid.
- Geochemical survey with 1,482 samples collected for gold and inductively coupled plasma (ICP) assaying.
- Two-phase diamond drilling program:
    - Phase 1: 13 DDH, total of 3,772 m.
    - Phase 2: 40 DDH, total of 6,334 m.
- Updated Mineral Resource estimate.

The 2006 program provided better definition of the deposit geology and significantly increased the number of ounces in both the Moore and Monte Negro deposits. The 2007 exploration program

resulted in the discovery of new deeper mineralization on the east side of Monte Negro and additional mineralization in the west part of the Moore pit. In 2008, definition drilling was carried out to increase resources at Monte Negro North and between the Moore and Monte Negro pits. In 2009, a major relogging program of all historical drill core, detailed geological mapping of pits and construction excavations, and a reinterpretation of the geological model were completed by PV. From 2010 to 2014, detailed geological pit mapping continued and an infill RC grade control drilling program took place. A small number of water wells were also drilled.

In 2014, a drilling program in areas north of Monte Negro and Cumba was completed. In 2015, PV carried out drilling in Monte Negro North, Monte Negro South, and Moore East areas and a resource definition drilling program in the Cumba area. The drilling confirmed the continuity of mineralization for Monte Negro North and Cumba. In 2016, PV continued a drilling campaign in Monte Negro North and the Monte Negro 10 North extension area was completed. Results did not confirm the extension of the mineralization in the Monte Negro North 10 area.

In 2017, Mejita, Monte Negro Feeder, and Monte Negro down-dip extension targets were drilled. The last two projects focussed on investigating the continuity of the Monte Negro mineralization at depth. PV also performed drilling in the ARD1 area to explore for mineralization underneath the Hatillo limestone. Some drill holes intersected gold mineralization below the limestone in the same host rocks as in the Moore and Monte Negro pits. The 2017 exploration program successfully delineated and confirmed that these areas had good exploration potential.

From 2018 to 2021, different areas of interest, including exploration for construction material, were identified and drilled. Those areas are Mejita North, Cumba NW, ARD1, Arroyo Hondo, Zambrana, and Diorite. Successful results from Mejita resulted in its inclusion in Mineral Reserves, and positive results from ARD1 support further exploration to better understand and delineate the orebody. Diorite drilling results also confirmed the potential for construction and filter material sources; further drilling efforts are continuing.

In 2022, exploration efforts were focused on drilling near-mine targets such as Main Gate, Arroyo del Rey, and Zambrana, quarry sources of limestone, and diorite and tonalite for dam construction material. Additional Mineral Reserves definition drilling targeting high-grade zones was completed using a combination of diamond drilling and reverse circulation in Moore and Monte Negro.

9.1 Discussion

PV has a detailed SOP Manual for Exploration and Drilling Practices that provides standardisation and consistency for all field technical personnel to ensure the collection of quality data. The Exploration Manager and Mineral Resource Manager are very experienced in the deposit style of the region. In the QP's opinion, this work is appropriate for the style of mineralization as demonstrated by historical Mineral Reserve replacement rates.

10 Drilling

Drilling campaigns have been conducted by most of the participating companies during the history of the Pueblo Viejo Mine, including Rosario, GENEL JV, MIM, and Placer Dome. In 2006, PV began its first core drilling campaign to evaluate the mine. From 2006 to 2022, PV drilled 3,279 exploration holes 1,516 DDH and 1,763 RC holes totalling 559 km. The database cut-off date for the Mineral Resource Estimate was 17 May 2022.

The drilling is summarized in Table 10-1, and the drill holes are shown in Figure 10-1. Overall, a total of 6,404 drill holes totalling 721 km were completed on the property from the 1970s to 2022, including geotechnical, limestone, diorite, tonalite, and water management drilling.

PV also drilled a significant number of RC grade control drill holes from 2010 to 2022. In addition to the drilling listed in Table 10-1, 24,146 close-spaced (15 m by 10 m grid) RC grade control drill holes totalling 1,042 km have been completed.

Generally, after core is retrieved from the core barrel and placed in core trays, the core boxes are taken from the drill site to the logging shed, where initial photos are taken before the core is washed. The lengths are marked in core trays and spacers are inserted with downhole lengths added by a technician. The core trays are laid out in order of depth, the core loss is then verified, and the correct depths are marked in the tray. Recovery information is captured in this step and entered in acQuire®. Photos of the core are taken, and the IMAGO Capture X software is used to store this information in the IMAGO cloud server. Geologists can later access the imagery repository using personal credentials.

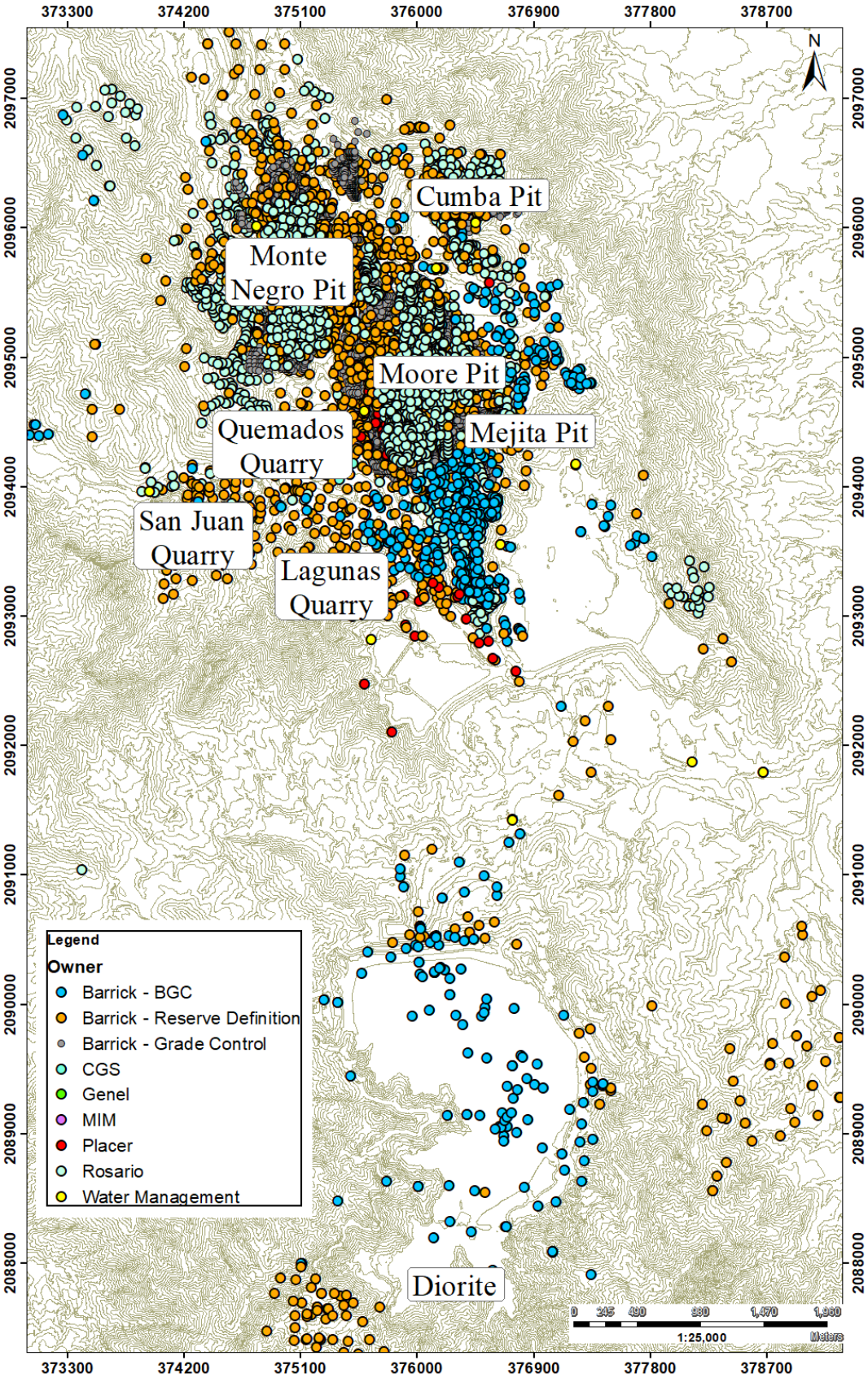
The geologist logs lithology, structures, mineralization, alteration and both recovery and RQD at the core shed. This information is captured and stored in acQuire. Once the core is logged and the samples are marked, the core is transported to the cutting area. Samples are taken every 1.5 m or 2 m depending on the lithology, alteration, and mineralization. The core is split into halves, one half is sent to the lab and the other half is kept in the core box. All the core boxes are kept in the core shed and stored in the hangar in a specific location in the racks. The hangars have the capacity to store up to 60,000 core boxes which is the equivalent to 240 km of drilling. Sample batches are collected, including quality controls (standards, blanks, and duplicates) and sent to the PV lab for assays. All drill holes collar locations are surveyed with high precision GPS, and downhole surveys utilize a Reflex Gyro.

Table 10-1 Pueblo Viejo Drilling Summary

Year	Operator	Percussion		RAB		DDH		RC		RC Grade Control		Total Holes	Total Meters
		No. Holes	Meters	No. Holes	Meters	No. Holes	Meters	No. Holes	Meters	No. Holes	Meters		
1970	Rosario Dominicana	343	8,706	115	6,571	-	-	-	-	-	-	458	15,277
1980		-	-	1,002	26,657	-	-	-	-	-	-	1,002	26,657
1990		-	-	325	26,419	181	23,015	67	10,090	-	-	573	59,523
1991		-	-	630	24,784	-	-	-	-	-	-	630	24,784
1995		-	-	-	-	13	477	-	-	-	-	13	477
1996		-	-	-	-	29	3,570	-	-	-	-	29	3,570
1997	MIM	-	-	-	-	31	4,600	-	-	-	-	31	4,600
1998	Genel	-	-	-	-	14	1,519	-	-	-	-	14	1,519
2001		-	-	-	-	6	238	-	-	-	-	6	238
2002	Placer Dome	-	-	-	-	64	4,379	-	-	-	-	64	4,379
2003		-	-	-	-	1	70	-	-	-	-	1	70
2004		-	-	55	1,230	167	18,470	-	-	-	-	222	19,700
2005		-	-	3	318	79	1,360	-	-	-	-	82	1,678
2006	Barrick	-	-	-	-	85	15,220	-	-	-	-	85	15,220
2007		-	-	-	-	387	70,150	-	-	-	-	387	70,150
2008		-	-	-	-	271	42,696	2	27	-	-	273	42,723
2009		-	-	-	-	18	649	-	-	-	-	18	649
2010		-	-	-	-	36	3,164	45	7,148	1,638	60,462	1,719	70,774
2011		-	-	-	-	-	-	1	30	1,034	28,002	1,035	28,032
2012		-	-	-	-	-	-	106	16,231	1,517	59,236	1,623	75,467
2013		-	-	-	-	1	151	100	17,355	1,612	67,620	1,713	85,126
2014		-	-	-	-	-	-	245	40,874	1,654	74,192	1,899	115,066
2015		-	-	-	-	-	-	225	38,601	2,286	92,002	2,511	130,603
2016		-	-	-	-	12	1,099	284	40,804	2,535	115,811	2,831	157,714
2017		-	-	-	-	49	12,995	239	40,234	1,862	85,528	2,150	138,757
2018		-	-	-	-	94	22,796	236	38,433	1,692	82,586	2,022	143,815
2019		-	-	-	-	157	40,909	200	28,594	2,042	94,930	2,399	164,433
2020		-	-	-	-	115	25,132	23	4,480	2,170	100,626	2,308	130,238

2021		-	-	-	-	114	19,089	15	2,038	2,207	92,790	2,336	113,917
2022		-	-	-	-	177	24,611	42	5,158	1,897	89,131	2,116	118,900
Total		**343**	**8,706**	**2,130**	**85,979**	**2,101**	**336,360**	**1,830**	**290,098**	**24,146**	**1,042,916**	**30,550**	**1,764,059**

Note: numbers may not add due to rounding.



Source: PV 2023

Figure 10-1 Pueblo Viejo Drillhole Location Map

10.1 Pre-PV Drilling

Rosario Drilling

Rosario employed several drilling methods, including DDH, RC, and rotary air blast (RAB) drill holes. Geological information was recorded on paper logs or graphic logs for all holes.

Geology was recorded for deeper holes and for some of the shallow holes. As was common practice in the 1970's and 1980's, no photos of the core were taken. Most holes were vertical with a drill hole spacing ranging from 20 m to 80 m. Downhole surveys were not performed and the type of instrumentation used for surveying collar locations is not documented.

Core recoveries were reported to be approximately 50% in areas of mineralization and within silicified material. Fluor evaluated this in 1986 with the following observations:

- Gold grades varied with different recovery classes. In zones of 80% to 100% recovery, gold values decreased with decreasing core recovery. In zones of 60% to 80% recovery, gold values increased with decreasing recovery. For recoveries less than 60%, gold values were generally low.
- Silver values were not affected by recovery.
- Zinc grades exceeding 1.5% decreased with decreasing core recovery. Zinc grades below 1.5% appeared to be unaffected by core recovery.

Fluor concluded that poor core recovery affected gold grades but in both positive and negative ways. It also concluded that in the context of the whole deposit, statistical noise was apparent, but the data was not biased.

With respect to RAB and RC drill holes, Fluor concluded that, except for the P-series RC holes and the RS series of holes below the 250 m elevation in the West Flank of the Moore deposit, there was no systematic high bias in RC gold values versus core gold values. Zinc values appeared to be affected by "placering" in overflowing RC sampling devices, resulting in a low bias in RC holes. In any case, most of the shallow Rosario holes were drilled in oxide areas now mined out and have only limited, if any, influence on sulfide mineral resource estimates.

GENEL JV Drilling

In 1996, the GENEL JV drilled 20 holes at Pueblo Viejo, eleven in the Moore deposit and nine in the Monte Negro deposit. All holes were drilled using HQ core and at an angle. Downhole surveys were performed, but there is no record of the type of instruments used for the surveys. The GENEL JV used a GPS system to locate drill holes and to survey the existing pits.

AMEC verified 5% of the assay data from these holes in 2005 and found no errors in the database.

MIM Drilling

In late 1996 and 1997, MIM drilled 31 holes at Pueblo Viejo, 15 in the Moore deposit and 16 in the Monte Negro deposit. Core size was HQ with occasional reductions to NQ as necessary to complete the holes. Five holes were vertical and 26 were drilled at an angle. There were no downhole surveys performed on these holes. There is no record of instrumentation used to survey collar locations.

Placer Drilling

Placer completed 3,039 m of core drilling in 19 holes in 2002 and 15,331 m of core drilling in 115 holes in 2004. The drilling used thin-walled NQ rods that produce NTW (57 mm) core. All but one of the holes was angled, allowing the vertical sulfide veining to be better represented in the drill hole intercepts. Placer drilled with oriented core to calculate the true orientations of bedding, veining, and faulting in the deposit areas.

Drill pads were located using GPS or surface plans where the GPS signal was weak. After completion, a professional surveyor surveyed the drill hole locations in UTM coordinates, translated them into the mine coordinate system, and entered the drill hole database.

Two or three downhole surveys were completed in all drill holes using a Sperry-Sun single-shot survey camera. Surveys were spaced every 60 m to 75 m, and the deviation of the drill holes was minimal. Azimuth readings were corrected to true north by subtracting 10°.

Drill holes were logged on paper forms using codes, graphic logs, and geologists' remarks. Geological information related to assay intervals was recorded on a geology log. A second log was used to record structural information and a third log was used to record geotechnical information. Coded data and remarks were typed into MS Excel spreadsheets and edited on-site by geology technicians. Coded data was later imported into Gemcom software to generate sections for resource modelling. Logging core features and criteria are shown in Table 10-2.

Table 10-2 Placer Dome Logging Criteria

	Logging feature	Description Criteria
Geological	Lithology	Type, interval in metres
	Assay	Interval, sample number (interval normally 2 m but intervals were also cut at lithology changes or major structures)
	Oxidation	Oxide, transitional, or sulfide facies
	Alteration	Type, intensity
	Veining	Type, estimated percentage
	Disseminated sulfides	Type, percentage
Structural	Oriented Interval	Core interval oriented by crayon mark
	Structure Interval	Downhole depth of structure
	Structure description	Type, true thickness (mm), oxidized (Y/N)
	Structure angle	Alpha angle to core axis (0-90°), beta angle from bottom of the core to the downhole apex of the structure (0-360°)
	Vein composition/dominance	Minerals in vein listed in order of abundance
Geotechnical	Drill interval	From-To and length in metres of block-to-block intervals; 1.5 m under normal drilling conditions
	Core recovery	Measured in block-to-block intervals
	RQD	Sum of core pieces greater than 10 cm (rock quality designation, or RQD), measured from block-to-block intervals
	Fracture count	Number of natural fractures per interval
	Oriented	Whether drill interval was successfully marked with orienting crayon

Prior to making geotechnical measurements, the entire core interval was removed from the core box and placed in a long trough made of angle-iron. The fractures in the core were lined up and artificial fractures were identified. This process allowed the technician to mark the orienting line on the core for a better estimate of core recovery and RQD.

10.2 Evaluation of Drilling Programs

Validation of the historical drilling information was addressed as part of AMEC's 2005 Pueblo Viejo Technical Report (AMEC, 2005). To evaluate the possible biases between drill types and to validate the historical Rosario and MIM drilling information, Placer and AMEC performed two tests prior to the 2006 Barrick drilling. The first test compared assays from Placer and previous drilling programs. The second test was a cross sectional review.

The following conclusions were summarized in Barrick (2007):

- Approximately 2.5% of the Rosario data have been verified against original documents. Extensive evaluations of the possible bias introduced by various drilling procedures have been undertaken by Fluor, Pincock Allen & Holt, Placer, and AMEC. After reviewing the drill data,

AMEC was of the opinion that the Rosario core, RC, and some Rosario conventional rotary data (pre-1975 and some Rosario RS-series) are generally reliable. There may be some bias in the RC data, but those holes have been individually evaluated and obvious problems have been eliminated. The risk involved in using those data is judged to be acceptable. Drilling types that have produced questionable results, such as P-series percussion holes, ST-series rotary holes and select RC holes, have been excluded from the database and are not used in the resource estimate.

- GENEL JV data have been verified against original documents and are believed to be reliable.
- MIM data have not been verified against original documents and there is some risk involved with using those data. AMEC compared those data to nearby Placer data and found that the MIM holes indicated mineralized zones with very similar tenors and thicknesses as the Placer and Rosario data. The risk involved with using the MIM data is considered acceptable.
- Placer data have been verified against original documents and are believed to be reliable.

PV further reviewed the historical drill hole data prior to updating the 2007 and 2022 resource estimates, see Section12.1 Data Verification.

10.3 PV Drilling

PV completed a drilling campaign in 2006 to 2010 with 428 DDH's for a resource confirmation program and other purposes. The details of the drillhole campaign and purpose are described in Table 10-3.

Table 10-3 PV Drilling Campaign Summary (2006-2010)

Year	Number of Drillholes	Meters	Purpose/Target
2006	6	1,506	Testing mineralization high-grade trend near the pits
	42	7,293	Inferred Resources definition at pit edges
	5	1,216	Testing mineralization at the bottom pit
2007	230	63,340	Confirming mineralization at the east of Monte Negro and west of Moore Pit
2008	145	35,886	Testing mineralization at Moore and Monte Negro areas and Geotech purpose
2010	1,638	60,462	Grade control program at Moore and Monte Negro pit area

In 2010, PV started a close-spaced RC grade control program focused on the Moore and Monte Negro pit shells to better delineate the ore and improve grade prediction on a bench scale in the mining areas.

- Grid spacing was northing 15 m by easting 10 m for ore and 30 m by 20 m spacing in waste areas.
- Targeting multiple benches from 24 m to 48 m angle drill hole depth.

- Sampling interval every 2 m.

This RC grade control program continues to be employed at PV as part of the production mining cycle.

PV undertook no further exploration drilling until 2014. Since then, multiple targets have been drilled within and near the main deposits of Moore and Monte Negro, such as Monte Negro 10 North, Cumba and Mejita. Successful results are included as part of Mineral Reserves. In the following years, other campaigns were drilled related to deeper targets such as Monte Negro Feeder and Monte Negro down-dip extension projects, both without conclusive results. Also, additional satellite ore bodies, such as ARD1, have positive results that may lead to further study and investigation. In recent years, drilling programs were also completed on quarries for limestone resources definition and potential construction material, such as diorite and tonalite.

In the QP's opinion, the drilling and sampling procedures at PV are robust, suitable for the style of mineralization, and are at, or above, industry standard practices. There are no drilling, sampling, or recovery factors that could materially impact the accuracy and reliability of the results.

11 Sample Preparation, Analysis and Security

11.1 Sampling Collection and Preparation Methods

The company has implemented a best practice process to validate and approve data for geological modelling and Resource estimation. An audit of sample collection and chain of custody through laboratory analyses expose no material risks. In total, there are 6,824 holes maintained in the database, with 2,987 utilized in geologic interpretation and grade estimation models.

Below are details known to PV on sample collection and preparation methods employed by each of the previous owners. Some programs do not appear to have QA-QC checks, do not pass PV validations, and are consequently excluded from the Mineral Resource database. Four systematic drillhole filters are applied to exports, which are summarized below and detailed in Section 12.1.

- Drilling from low quality drill methods such as rotary or churn holes is filtered out.
- Collar locations that appear not to utilize the current mine grid, that are infeasible (e.g., under current topography) or have no coordinates are eliminated.
- Records with no logging or assays are filtered out.
- Holes are filtered out by company for campaigns that lack QA-QC or show systematic uncertainty.

Pre-Placer Drilling

There is minimal procedural documentation available to PV that details the historic sampling methods or chain of custody used by Rosario Resources, GENEL JV and Mount Isa Mines (MIM) in their drilling campaigns. Review of these procedures indicate drilling and sampling were following generally acceptable practices. The historical records indicate core samples are mostly two-meter intervals, with some sample intervals broken on lithology. RC holes were generally sampled on two-meter intervals.

The GENEL JV drilling core was split into thirds, and one-third was used for the analytical sample. The remainder could be archived or split again for metallurgical test work.

The average sample intervals for the pre-Placer drill campaigns are summarized in Table 11-1.

Table 11-1 Sample Interval Data for Rosario, Genel JV and MIM drillholes

Drill Hole Series	Company	Avg. Sample Interval (m)	Min Sample Interval (m)	Max Sample Interval (m)	No. Samples Taken	Avg. Au Grade (g/t)
R	Rosario	2.18	0.20	4.60	1,489	2.49
RS	Rosario	1.99	1.00	6.00	9,959	1.79
RC	Rosario	2.00	1.00	2.00	5,003	1.77
DDH	Rosario	2.20	0.08	14.41	8,910	2.02
GEN	GENEL JV	2.00	1.40	2.30	520	2.51
MIM	MIM	1.97	0.20	8.00	2,309	2.21

Placer Diamond Drilling

Placer sample intervals were normally two meters, with adjustments at lithology or alteration contacts. Core samples were photographed, and the rock was logged for RQD prior to quick-logging. The core was marked for splitting, honoring geological characteristics and contacts. Geo-technicians then marked the sample intervals and assigned sample numbers. After the sample intervals were marked, the geologist detail logged the core prior to sending it for splitting using a core saw.

PV Drilling

The sample intervals are generally two m with splits along major geological contacts resulting in some short samples. In areas of low recovery, the sample interval is over drill run markers. See Table 11-2 for sample length summary.

Table 11-2 Sample Length Average

Location	Median sample length (m)	Number of Samples	Minimum Length (m)	Maximum Length (m)
Pueblo Viejo Mine	1.5	769,276	0.3	3.0
Limestone Quarry	2.0	18,520	0.5	5.0
Diorite Quarry	2.0	2,250	0.5	4.0

The core samples are cut lengthwise by a diamond saw. One-half of the core is sampled, and the other half remains for reference. Samples are collected in heavy-duty clear plastic sample bags sealed with tying tape. The sampling process is completing using a standard procedure to assure the quality of the process and avoid any contamination.

RC is carried out using 5 ¾ in (146 mm diameter) and 5 ⅝ in (143 mm diameter) bits. Sample intervals are constant regardless of the geological logging. The sample intervals are fixed to 2.00 m. In areas of low recovery, the sample interval is skipped. The chip samples are collected in the field using Sandvick's Sampler Rotaport Control.

Samples from 2006 and early 2007 were shipped directly to ALS Laboratories, an independent laboratory located in Lima, Peru which is accredited by ISO 1725:2018 and compliant with ISO

45001:2018. Chemical analyses were performed by the standard fire assay (FA) method. A 32-element ICP analysis was done on all samples. All the LECO furnace assays for 2006 and 2007 were done at Acme Analytical Laboratories Ltd., Vancouver (ACME) (certified in ISO 9001), an independent laboratory.

11.2 Laboratory Security and Analyses

Rosario

The samples were analyzed for gold and silver by fire assay, for carbon and sulfur by LECO combustion furnace, and for copper and zinc by atomic absorption spectrometry (AAS). It was reported in a feasibility study undertaken for Rosario by Stone & Webster International Projects Corporation in 1992 (Stone & Webster, 1992) that the analytical procedures used up to that time were of industry standard. However, most of the area drilled is now depleted; therefore, this study does not have a material impact on Pueblo Viejo's Mineral Resource and Mineral Reserves.

For the sulfide drilling program that started in 1984, external verification programs were performed with the Colorado School of Mines Research Institute (CSMRI), Hazen Research (Denver) and the AMAX Research and Development Laboratory (Golden).

GENEL JV

It is garnered from GENEL JV documentation that samples were prepared on-site by GENEL JV personnel. Sample splitting was done by crushing one-third split of the core to minus 10 mesh, homogenized by passing through a Gilson splitter three times and sub-sampled to about 400g. The sub-sample was packaged and sent to an independent laboratory, Chemex Laboratories Ltd. In Vancouver, British Columbia, Canada (now a division of ALS) for analysis. Samples were analyzed for gold, silver, zinc, copper, sulfur, and carbon and 32-element ICP analysis (G-32 ICP).

MIM

No details are available on the sample preparation, analytical procedures, or security measures for the MIM samples. MIM did not insert standards, blanks or duplicates into the sample stream. MIM chose to twin three drill holes as a part of their data validation program. Two of the holes were their own core holes, while the third was a Rosario RC hole.

Placer

During the 2002 and 2004 programs, drill core was cut in half with a diamond blade saw at site. Half of the core was archived and stored on-site in suitable storage conditions for future reference. In 2002, the second half of the core was used for metallurgical test work. In 2004, the second half of the core was sent to Vancouver using airfreight and were received by ALS (formerly Chemex Labs Ltd.), an independent laboratory. No record was kept of the state of the security tags when logged into ALS.

The samples were prepared using industry standards by crushing the entire sample to 2 mm and splitting off 250 g.

Samples were prepared according to industry standards and assayed utilizing ore grade analyses for gold, silver, copper, zinc, carbon, sulfur, and iron; summarized in Table 11-3. In addition to these elements, multi-element 4-acid digestion ICP analysis was performed on 80 samples from drill hole PD02-003. In 2004, every other sample from that campaign was also analyzed using aqua regia ICP.

All drill core samples from the Placer Dome drilling programs were analyzed for total carbon by ALS's C IR07 LECO furnace procedure. To ensure that the total carbon values represented organic carbon, a suite of 114 samples was reanalyzed by the C-IR6 procedure, which removes all inorganic carbonate by leaching the sample prior to LECO analysis. The sample suite represented all lithologies found in the deposit area. All exhibited advanced argillic alteration or silicification of varying intensities. The results showed that the total carbon analysis was representative of organic carbon in samples with advanced argillic alteration or silicification.

Table 11-3 ALS Analytical Protocols for Placer Samples

Element	ALS Method Code	Description	Range
Au	Au-GRA21	30 g fire-assay, gravimetric finish	0.05-1,000 ppm
Ag	Ag-GRA21	30 g fire-assay, gravimetric finish	5-3,500 ppm
Cu	AA46	Ore grade assay, aqua regia digestion, AA finish	0.01-30%
Zn	AA46	Ore grade assay, aqua regia digestion, AA finish	0.01-30%
C	C-IR07	Total Carbon, LECO furnace	0.01-50%
S	S-IR07	Total Sulfur, LECO furnace	0.01-50%
Fe	AA46	Ore grade assay, aqua regia digestion, AA finish	0.01-30%

PV

Core samples are placed in plastic core boxes. The core is collected from the drill rig by Pueblo Viejo's field assistants and taken to the core shed at Mejita for logging and sampling.

The core is logged and marked for sampling by the Pueblo Viejo geologist. The core samples are cut lengthwise, and one-half of the core is sampled. The other half is left in the core box for reference. Pueblo Viejo's sampling technicians in the field collect rock chip samples in plastic bags. Coarse samples and chip trays are also collected by Pueblo Viejo's field assistants and taken to the core shack at Mejita for logging.

Core and rock chip samples are sent to Pueblo Viejo's on-site Assay Laboratory (PV Assay Lab) for preparation and analysis. The PV Assay Lab is accredited by Supremas Qualitas to ISO 17025:2017.

11.3 Sample Preparation and Analysis

Samples are prepared by marking all bags with a bar code, drying, weighing, crushing the entire sample to a particle size smaller than 2 mm (mesh No.10), and splitting off 250 g. The split is pulverized to 85% passing 75 µm (mesh No.200) and used for analysis. The remaining sample is stored at Pueblo Viejo. See Figure 11-1, which shows a flowchart of the PV procedure for Assay Lab Sample Preparation.

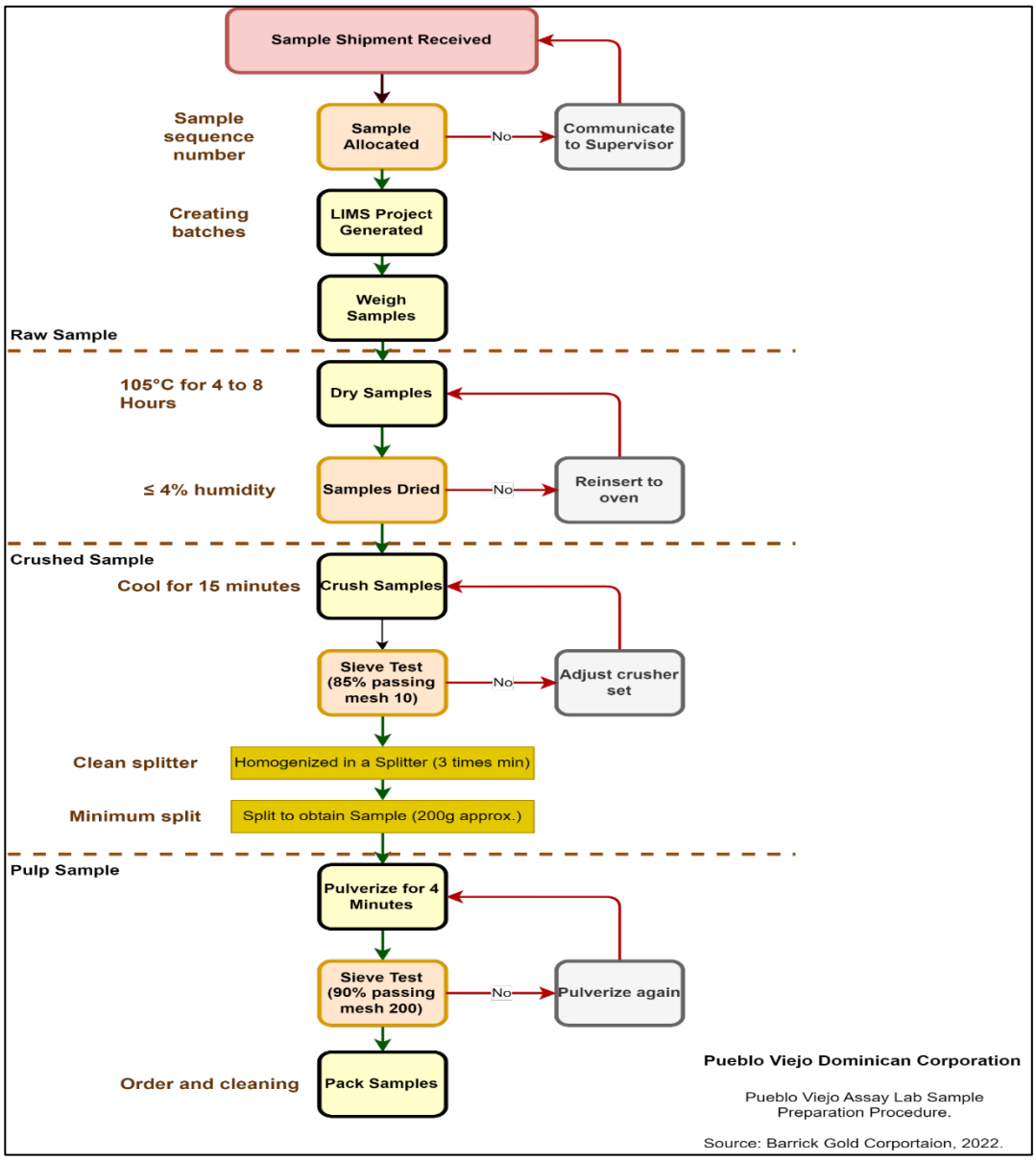


Figure 11-1 PV Assay Lab Sample Preparation Procedure

Historic Rosario Quality Assurance and Quality Control (QA/QC)

The number of check assays completed for the Rosario drill holes is limited but provides a level of confidence for specific drill holes. In general, Rosario did not insert duplicates, blanks, or standards; however, they did send replicates in 1978 and 1985 to outside laboratories. In 1978, Rosario sent 1,586 replicate samples from ten drill holes to Union Assay Laboratory in Salt Lake City, Utah. The gold check assays exhibited substantial scatter, including several obvious outliers. Some of the scatter may have been due to sample swaps, but most of it was unexplained. There was a small bias outside a reasonable acceptance limit of 5%. Overall, excluding obvious outliers, the data corresponded reasonably well. The silver data was similar to the gold data with respect to the significant amount of scatter and a large number of outliers. There was a small (5%) bias between

the laboratories. Copper exhibited a small amount of scatter and no appreciable bias between the laboratories. Zinc exhibited more scatter than copper but less than gold and silver, although some of the outliers appeared to be sample swaps. There was about a 7% bias between the laboratories, with the direction of bias not stated (AMEC, 2005).

In 1985, Rosario sent samples to three laboratories for gold, silver, carbon, and sulfur assay validation, including:

- 391 samples were sent to the CSMRI for check assaying of the Au and Ag values in three batches.
- 236 samples were sent to Hazen Laboratories for sulfur and carbon analysis.
- 154 samples were sent to AMAX Research and Development Laboratory for sulfur and carbon analysis; the results for these checks have not been located.

AMEC (2005) reviewed the CSMRI check and reported that gold results generally corresponded well, but there were several outliers, possibly caused by sample swaps.

The bias between the laboratories is about 7%, which is slightly outside generally acceptable limits (5% bias is a general limit within the industry). The bias may be the result of differences between the analytical procedures, but it is not possible to accurately determine the cause at this time.

Historic GENEL JV QA/QC

The GENEL JV used a combination of duplicate and certified reference materials (CRMs) to monitor the quality of its assays. A detailed review of the results found that the relative error of the 171 duplicates at the 90th percentile was 14%, which is very good precision for gold mineralization. The standard results were generally within acceptable limits (AMEC, 2005). However, the standard dataset includes many results that exceed the accepted limits, and it is unknown whether these samples were re-analyzed.

Historic MIM QA/QC

The MIM samples have no known QA/QC data.

Historic Placer QA/QC

In 2002, Placer inserted CRMs as every 20th sample to the primary laboratory, ALS. The CRMs were commercially purchased for gold only and corresponded to the average grade and cut-off grade at the time. Plots of gold versus batch number showed that the majority of the CRMs returned values within two standard deviations of their established means.

In 2004, Placer began inserting one blank (barren limestone) in addition to one CRM with every batch of 20 samples. All these standards and the blank were assayed for gold, silver, carbon, sulfur, copper, iron, and zinc and provided a basis to evaluate the performance of those elements. AMEC (2005) calculated best values for all elements in each sample based on the results from ALS. Gold was the only certified value, and the best value calculated from the ALS data were indistinguishable from the certified values indicating that ALS generally performed well. The blank data (380 analyses) generally showed blank values except for ten anomalies, which were attributed to inadvertent switches with CRMs.

Placer also monitored the ALS internal quality control results for its blanks, duplicates, and CRMs. Placer sent approximately ten sample pulps from every drill hole, resulting in 187 samples, or 13% of the total samples, from the 2002 drill program to ACME. An additional 247 sample pulps were shipped during the 2004 drilling program and were analyzed for gold only. CRMs were not inserted into the external check pulp shipments. Gold, copper, and zinc results indicated no significant biases between the two laboratories. However, the ALS silver assays averaged approximately 12% lower than ACME. Figure 11-2 shows Placer's CRM performance for gold assays.

Current ALS Laboratory QA/QC

ALS conducts analytical quality control in its laboratory by inserting calibration standards, blanks, and duplicates into every sample run, with validation rules and QA/QC reviewed internally prior to customer release by laboratory staff. Examples of validations rules include fractional analyses, e.g. sulfide, not higher than the total assays, in this case total sulfur, or totals not exceeding 100%. In addition, samples submitted to ALS have certified reference material, blanks, and duplicates inserted as routine QA/QC checks.

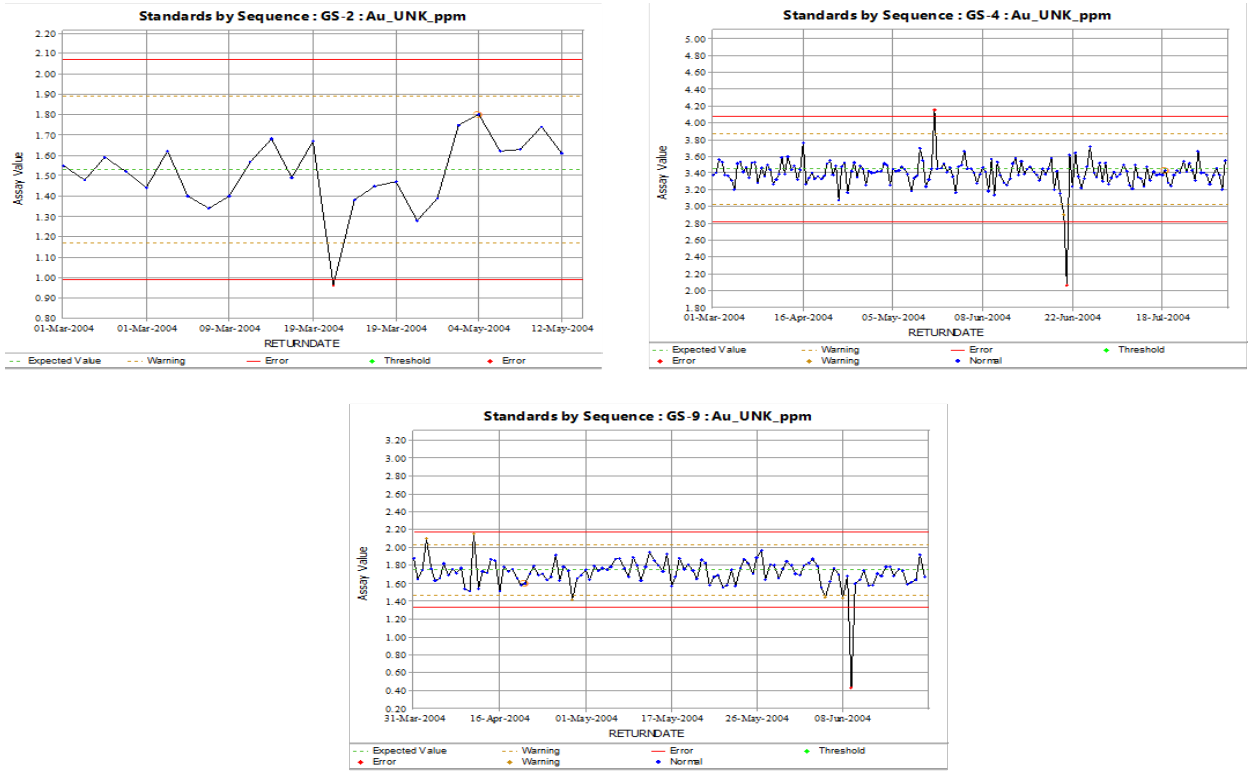


Figure 11-2 Placer CRM Gold Assay Performance.

Current PV QA/QC

For exploration Phase 1 completed in 2006, Pueblo Viejo inserted two blanks, two standards (commercial and custom), and two core duplicates into each batch of 75 samples sent to ALS. For exploration Phase 2, Pueblo Viejo inserted two blanks, three standards (commercial and custom), two half-core duplicates, two coarse duplicates and seven cleaning blanks into each batch of 76 samples sent to ACME.

Pueblo Viejo currently inserts three CRMs, three field duplicates, and two coarse blanks into each batch of 60 samples. This is in addition to the 2% of umpire check pulp samples. Consequently, 15% of the samples in each batch of 60 samples are quality control samples. Figure 11-3 and Figure 11-4 shows field duplicate and coarse blank performances, respectively. The HARD chart below shows that 15% of the samples have a deviation of more than 20% from the original sample.

A series of in-house CRMs have been produced since 2018 from site rock matrix at head grades appropriate for the site plant feed (1 g/t to 8 g/t Au). Pulp preparation, homogenization, and round robin analyses were overseen by Smee Consulting, who certified all in-house reference material. Round robins generally included eight or more laboratories representing a minimum of four companies, including ALS, ACME, Bureau Veritas, SGS, and TSL Laboratories Inc. Site geologists insert in-house and commercial CRMs at regular intervals along with other QC samples. The commercial CRMs had failure rates in the 4% to 8% range, whereas in-house standards had less

than 2% failure rates. No gold assaying bias is evident from the standard quality control charts (Figure 11-5). Monitoring is completed on a batch-by-batch basis. For check samples that fell outside of the established control limits, PV reviewed the cause and, if found not to be the result of sample number switch, the relevant portion of the batch was re-assayed. Corrective actions taken by PV are detailed in its in-house resource database and reports.

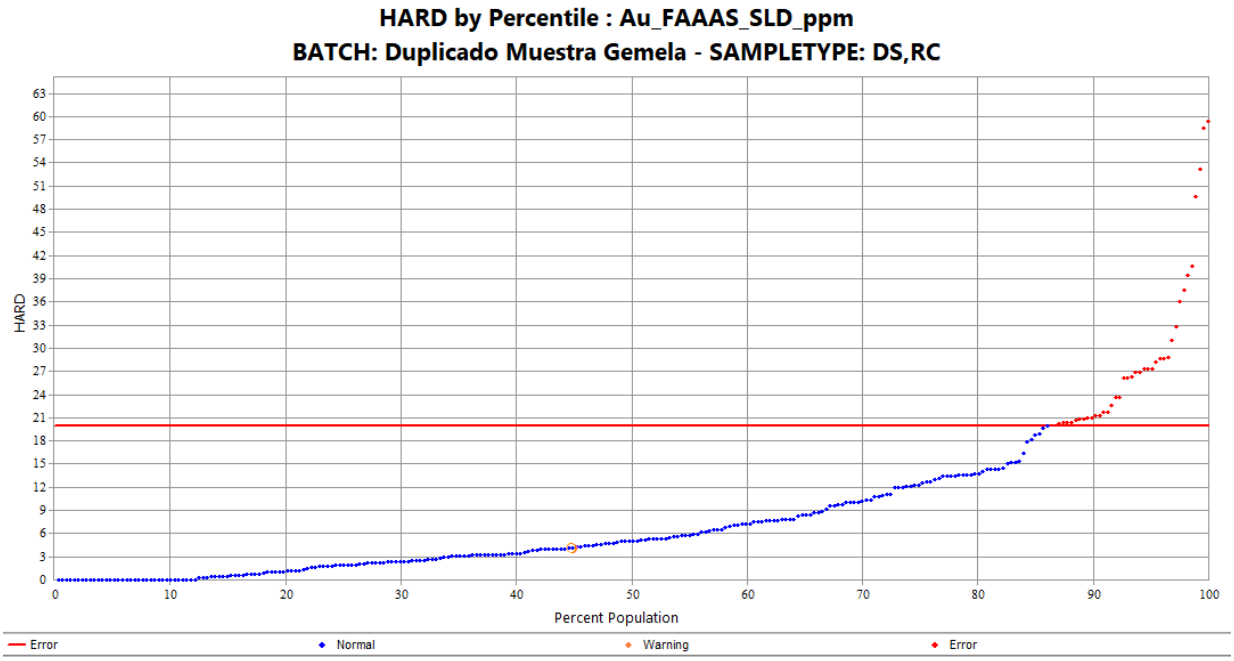


Figure 11-3 Pueblo Viejo Field Duplicate Performance

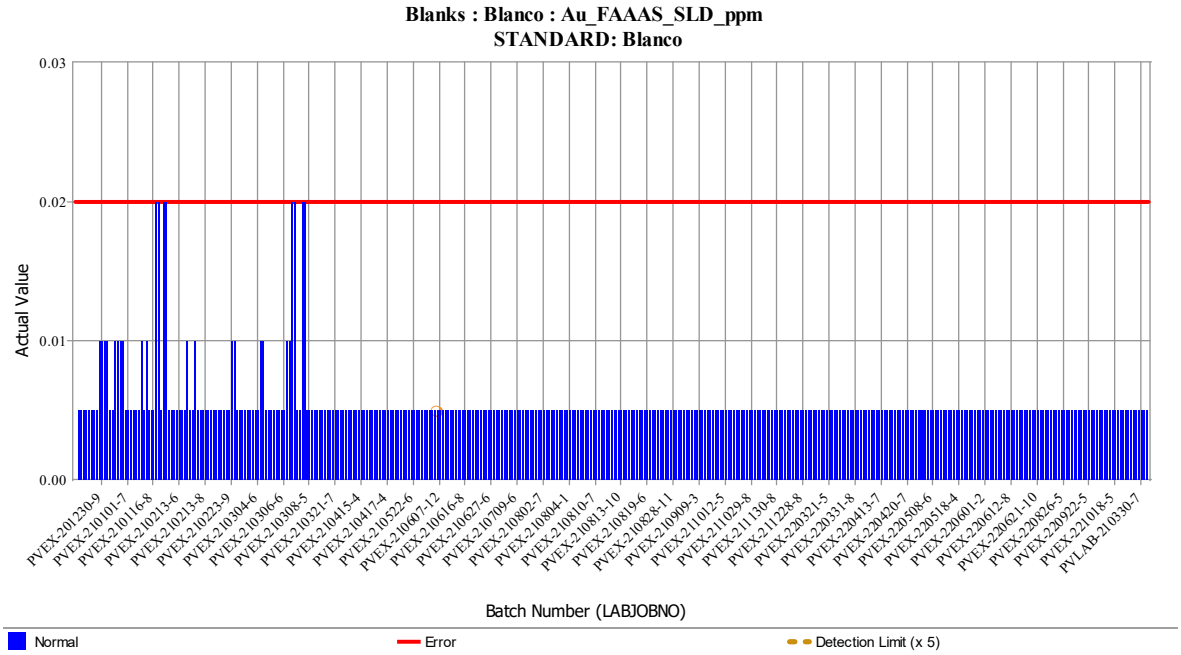


Figure 11-4 Pueblo Viejo Gold Assay Coarse Blank Performance

Figure 11-5 Standard Quality Control Charts

11.4 Database

PV has configured two main datasets:

- Exploration for data associated with mine exploration, reserve definition; and
- Condemnation drilling and production or infill drilling for Grade Control.

Both datasets are built and managed using acQuire for geoscientific data management around the natural resource characteristics. GIM Suite system is bundled with acQuire for data flow management and Arena® for reporting services. There are native validations that help to ensure the quality and integrity of the data. Examples of validations include controls on coordinates, sampling interval to not permit overlaps or gaps, survey excessive deviations, and validity of assays.

Drill hole planning execution is measured by the difference between planned and actual (flagged) coordinates in the field. The total distance between both coordinates (x, y, z) has a tolerance of five m. If the difference exceeds the tolerance limit, an investigation occurs where the name and coordinates are confirmed and documented within the database.

Downhole survey deviation is programmed and applied to drillholes whose total depth exceeds 100 m. During the 2021 campaign, all drillholes were surveyed, and the validation process was developed into a database to ensure quality parameters and accuracy. The survey readings take place every 5 m interval. If an interval measurement returns an outlier value, an investigation takes place to solve and assure the correct value for the drillhole.

Drillholes sampling intervals are set according to the drilling type. For RC drillholes, each sample is collected at 2 m intervals ranging from 5 kg to 8 kg of weight. The sample collection units on the drill rigs that are currently in use at PV are the Sandvik and Progradex. Both sampling units allow dry bulk samples without discarding fine particles from a multiple tray sorter. Field duplicates for RC are taken with the same unit by collecting chips from the opposite tray. For DDH holes, the core is split in half, and the default sample interval is 1.5 meters for ore intercepts and 2 meters for non-ore intervals, respecting the geological contacts. Field duplicates are taken by splitting the sampled core in half; this process is done alongside the main core sampling process.

CRMs are created by pre-selecting bulk sample rejects returned from the lab with a given gold, silver, and sulfur values intervals according to the grade values established at the time. These samples are submitted to Smee and Associates Consulting Ltd. To be evaluated and certified with a certified mean and two standard deviation values between labs. A small group of “off the shelf” standards has been purchased from CDN Labs for Multi-Element Methods assays such as ME-ICP. For validation, returned assays regarding CRM are evaluated in a sequential scatter plot between three standard deviation ranges. Any assay returned out of the third standard deviation is sent to re-assay along with six samples from the same batch.

Coarse blanks are prepared on-site using limestone from the quarries. To discard any possibilities of contamination, blanks are evaluated in a box plot with a maximum tolerance limit set of 1.2 times above the detection limit based on fire assays at the site lab.

The preparation sample process is based on a batch of 60 samples for chemical analysis. The process uses a QA/QC guideline which includes blanks, duplicates, and standard material samples inside the batch for evaluation, assurance, and control of chemical analysis. As a standard process, 15% of the despatched samples (three standards, two coarse blanks and three field duplicates) in each batch are check samples.

All samples are submitted for assays to the PV Assay Lab, located on-site since 2020.

The PV Assay Lab applies internal QA/QC protocols following the best practices and international industrial standards. The protocols use control samples (blanks, duplicates, CRM) from physical preparation until final chemical analysis. A total of 12 samples over the original 60 sample batch submitted by PV is used in the protocol.

Sampling and assay data are completed in each batch; as a result, an individual QA/QC report is generated after importing the data. For each control sample check whose values exceed the tolerance limit, PV evaluates the cause and corrective actions are taken accordingly. If the issue is not found, a partial tray is submitted to the lab for re-assay.

PV recently incorporated a new QA/QC workflow to pre-validate the import using a pending assay import that requires review before assays can be accepted or rejected depending on whether they pass or fail the validations. Every re-assay record from 2020 and 2021 has been imported, with failing records downgraded so they cannot be exported.

The QP is of the opinion that the sample collection, preparation, analysis, and security used at PV are performed in accordance with best practice and industry standards and are appropriate for the style of deposit.

The QA/QC procedures and management are consistent with industry standards and the assay results within the database are suitable for use in Mineral Resource estimation. The QP has not identified any issues that could materially affect the accuracy, reliability, or representativeness of the results.

12 Data Verification

12.1 Data Verification

All drill core, survey, geological, geochemical, and assay information used for the resource estimation have been verified and approved by the PV geological staff and maintained in an acQuire database since 2007 by an on-site database administrator. The validations below reflect data identified and filtered out of the final exports for creating geologic wireframes and the resource model. The data checks confirm that the filtered-out data is unfit for geological interpretation and Mineral Resource estimation use, as described in Section 11.1 Sampling Collection and Preparation Methods. In total, 2,320 holes are used in the 2022 Resource model.

Four systematic filters are applied to all exports for geologic and Resource estimation. These filters were created from a series of validation checks run on the collar, down-hole survey, and interval data. The filters are:

- Missing collar coordinates.
- Drill type Core, RC, or Pre-Collar only.
- Company name only in Barrick, Genel, MIM, Placer, or Rosario.
- Flagged as excluded (with or without reason for exclusion).

A number of relatively minor issues were identified in routine data checks completed prior to estimation. Findings such as stockpile drilling coded as colluvium were addressed by excluding from the estimate. Positive dips and horizontal drilling are understood to be dewatering holes. Some of these, such as deviations in downhole surveys, may lead to minor local inaccuracies in the estimate. None of the issues identified were considered material to the Resource estimate.

The routine validations with action items for resolution of the issues are summarised in Table 12-1.

Table 12-1 Validations and Action Items for Drillholes

Identified issue	Action Item
Missing coordinates (375 holes)	Find original certificates
Data significantly above topography (1,056 holes)	Determine if on hard rock, adjust topography; if in stockpile, code for stockpile
Duplicated holes (20 holes, 1 triplicate)	Merge data into single hole
Excessive azimuth and/or inclination deviation (>5° between intervals) (139 surveys)	Review original certificates
Including positive and horizontal dip holes (7 holes)	Review if positive dips are correct
Missing downhole survey information (508 holes)	Review for planned or final surveys
Stockpile drilling logged as in-situ material	Code stockpile material as stockpile
Repeated assays against certificates (449 intervals)	Review certificates for accuracy or if the assay breaks are correct
Assays and logging not extending to hole depth (2,373 holes)	Review EOH for all tables
Very small intervals in logging (<10cm) should be checked (150 intervals)	Review core photos
Gaps in lithology logging (46 holes)	Log or use interpretation to fill gaps
13 holes with possible decay, no systematic decay or contamination apparent	Review spatially and determine if assays should be excluded

12.2 Comments on Data Verification

The QP's have reviewed and completed checks on the data and are of the opinion that the data verification and QA/QC programs undertaken on the database for the project adequately support the geological interpretations and Mineral Resource estimation process. The site and regional teams have a series of controls in place to generate a consistent set of best data for use in geologic and Resource estimations that are satisfactory. PV has a plan in place to work through identified issues and resolve any uncertainties.

13 Mineral Processing and Metallurgical Testing

13.1 Existing Operation

The Pueblo Viejo Mine consists of two principal open pits: Moore and Monte Negro, with five metallurgical ore types, two at Moore and three at Monte Negro. Table 13-1 summarizes the metallurgical ore types.

Table 13-1 Metallurgical Ore Types

Text Code	Ore Type	Preg-Robbing	Description
MO-BSD	Moore black sediments	Moderate	Fine interbeds of carbonaceous shale and siltstone. Bedding is sub-horizontal and is intersected by vertical sulfide veins.
MO-VCL	Moore volcaniclastics	No	A group of volcanic (andesitic) lithology units in the Moore pit. Units include massive and fragmental volcanic flows and sedimentary units composed primarily of volcanic material. These units typically have lower organic carbon content.
MN-BSD	Monte Negro black sediments	Moderate	Interbeds of carbonaceous shale, siltstone, and volcanic flows. Beds are up to three meters thick and have a shallow dip to the south. The carbonaceous beds are similar to MO-BSD and comprise more than 50% of MN-BSD.
MN-VCL	Monte Negro volcaniclastics	Weak	Similar to MN-BSD, except that the unit is less than 30% carbonaceous beds.
MN-SP	Monte Negro spilites	No	Volcanic spilite (andesite) flows are found at depth.

The process plant is currently designed to process approximately 24,000 tpd of ROM refractory ore. The primary unit operations are crushing, grinding, high-pressure oxidation, washing, neutralisation, and a CIL circuit. The design basis for the oxygen plant is to provide the oxygen required to oxidize approximately 80 tph of sulfide sulfur. This is equivalent to 1,200 tph of feed containing 6.79% sulfide sulfur, assuming a design factor of 2.2 t of oxygen per tonne of sulfide sulfur.

Laboratory tests on the various ore types showed that only 10% to 50% of the gold and silver content are liberated and recoverable by the CIL process at cyanide concentrations ranging from 2 kg/t to 5 kg/t. The remaining gold and silver occur as sub-microscopic particles encapsulated within the pyrite mineralization and as solid solution chemically bonded into the pyrite matrix. In addition to the refractory nature of the ore, it also contains significant amounts of cyanide-consuming copper and zinc minerals and preg-robbing carbonaceous materials in the black sedimentary ore types. The ore contains insignificant amounts of carbonate minerals. It is generally weakly acidic with a natural pH of approximately 4 to 5. The ore contains between 3% to 20% sulfur. Laboratory tests also showed that pressure oxidation of the whole ore followed by CIL cyanidation of the autoclave product will recover 88% to 95% (average 91.6%) of the gold.

After investigating several process alternatives (bio-oxidation of flotation concentrate, heap bio-oxidation of whole ore and alkaline pressure oxidation of flotation concentrate), whole ore pressure oxidation was chosen as the most cost-effective process. This process has a higher power and capital cost than other alternatives but also provides the highest recoveries. Additionally, pressure oxidation is a proven technology.

A summary of the most relevant historical test work is shown in Table 13-2.

Table 13-2 Metallurgical Studies

Metallurgical testing and studies	Date
AMTEL (Chryssoulis, S.). Deportment of Gold in Pueblo Viejo Ore Composites	March 2003
AMTEL (Chryssoulis, S.). Deportment of Gold in Monte Negro Black Sediment Bio-OX Leach Residue - Report 03/21.	July 2003
A.R. MacPherson Consultants Ltd. (McKen, A.). An Investigation into the Grinding Characteristics of Five Samples from the Pueblo Viejo Deposit.	February 2004
Outokumpu Technology Canada (Edwards, T.). High-Rate Thickening of CCD Feed (Hot Cure Discharge) – Testwork Report TH-328.	April 2004.
Canadian Environmental & Metallurgical Inc. (CEMI), ARD Treatment Pilot Plan Study of High Density Sludge Process	April 2004
SGS Lakefield Research (Ferron, J. and Seidler, J.). The Pressure Oxidation and Carbon-in-Leach Treatment of Five Pueblo Viejo Ore Samples - Phase III – CIL and HDS Pilot Plants	July 2004
CyPlus GmbH. Testwork Program to Evaluate Cyanide Destruction Options Using SO2/Air and Peroxygen-Based Technologies for the Treatment of Pueblo Viejo Leach Effluent - Testwork Final Report.	August 2004
AMTEL (Chryssoulis, S.). Silver Occurrence in Pueblo Viejo AC/CIL Residues - AMTEL Report 04/40	December 2004
University of British Columbia (Parry, J. and Klein, B.). Fine Grinding and Neutralization Using Limestone from Pueblo Viejo Site - Testwork Final Report.	December 2004
AMEC (Tomlinson, Marcus). Heat Balance in Hot Cure Circuit - Internal Report.	March 2005
SGS MinnovEX (Clarete, R.). Grinding Circuit Design Simulation for the Barrick Gold Pueblo Viejo Project.	June 2006
Barrick Technology Centre, Pueblo Viejo Carbon-in-Leach Pilot Plant - Draft Report 590000-002	September 2006

Two additional stages were included to allow satisfactory processing of the Pueblo Viejo ore as follows:

- A hot cure stage, where slurry from pressure oxidation is held in tanks for extended periods (up to 12 hrs) to dissolve and remove the basic ferric sulfate ahead of CIL cyanide leaching, thereby reducing lime consumption in CIL to less than 10 kg CaO/t ore.
- A lime boil stage, which involves heating (to 85ºC). The hot cured and washed slurry is followed by lime addition (35 kg CaO/t) to break apart the jarosite and release silver for CIL recovery.

During 2004 and onwards, more tests were completed using representative samples from each of the five ore types, as described in Table 13-1.

Collected samples were assayed for gold, silver, and other elements. A brief summary of the key contents is presented below:

- The gold content of the ore samples ranged from 2.10 g/t to 6.60 g/t.
- The sulfur content ranged from 6.9% to 9.7%.
- The ores contained insignificant amounts of elemental sulfur and sulfates.
- The black sedimentary ore types (MO-BSD and MN-BSD) contained from 0.5% to 0.7% organic and graphitic carbon, which caused preg-robbing in the later leaching tests. The other ore types have very weak or no preg-robbing characteristics.
- The carbonate content varied from 0.05% to 0.37% CO_2 but averaged 0.19% CO_2.
- The aluminum content ranged from 7% to 10%.
- The mercury content ranged from 8 g/t to 14 g/t. The extent of mercury dissolution during pressure oxidization (POX) varied significantly according to the ore type.
- The arsenic content ranged from 260 g/t to 1,650 g/t. Most of the arsenic was dissolved and precipitated during POX.

Tests were completed for each unit operation of the process from comminution to CIL 'gold and silver' recoveries. Results from the tests are summarized below:

Comminution

Work index (Wi) measurements on the five main rock types undertaken in 2004 indicated that the Bond Ball Mill Wi (BWi) of the ore ranged from 12.8 kWh/t to 16.1 kWh/t (average 14.4 kWh/t), while the Bond Rod Mill Wi (RWi) from 14.9 kWh/t to 18.6 kWh/t. Supplementary test work undertaken on 58 different samples in April 2006 for Semi-Autogenous Grinding (SAG) Power Index (SPI) and Wi returned consistently higher Wi values (Table 13-3). Additional testing conducted in 2019 confirmed the previous results.

Table 13-3 Modified BWi (kWh/t)

Ore Type	BSD	SP	VCL	All Ore Types
Average	17.05	18.17	15.62	16.73
80th Percentile	18.37	18.97	17.92	18.28

The ball mill Bond Wi used to size the grinding mills was the average Wi for the hardest of the five ore types (MN-SP) and approximately the 80th percentile Wi of all ore types.

Whole Ore Pressure Oxidation

Four pressure oxidation pilot plant testwork campaigns were completed:

- SGS Lakefield (two runs), in 2003 and 2004.
- Barrick Technology Centre, in 2006.
- In November 2006 at SGS Lakefield.
- In July 2007 (SGS Lakefield), to produce Counter Current Decantation (CCD) overflow to produce basic zinc sulfate.

The Pueblo Viejo ore oxidized rapidly during pressure oxidation at 230°C with 700 kPa oxygen partial pressure. The relationships between CIL gold recovery and the degree of sulfur oxidation are shown in Figure 13-1 and Figure 13-2 for the two most common ore types: MO-BSD and MO-VCL, respectively. Each point on the graph represents one slurry sample taken from one autoclave compartment during the continuous pressure oxidation pilot plant operation. After being washed thoroughly, each sample was batch-leached in CIL. The following graphs were generated from a continuous pressure oxidation regime, 230°C, 689 kPa oxygen partial pressure, 60 min retention time and 80 µm 80% passing (P80) particle size. CIL was performed in batch mode with pulp densities of 30% and 35% for MO-BSD and 40% for MO-VCL.

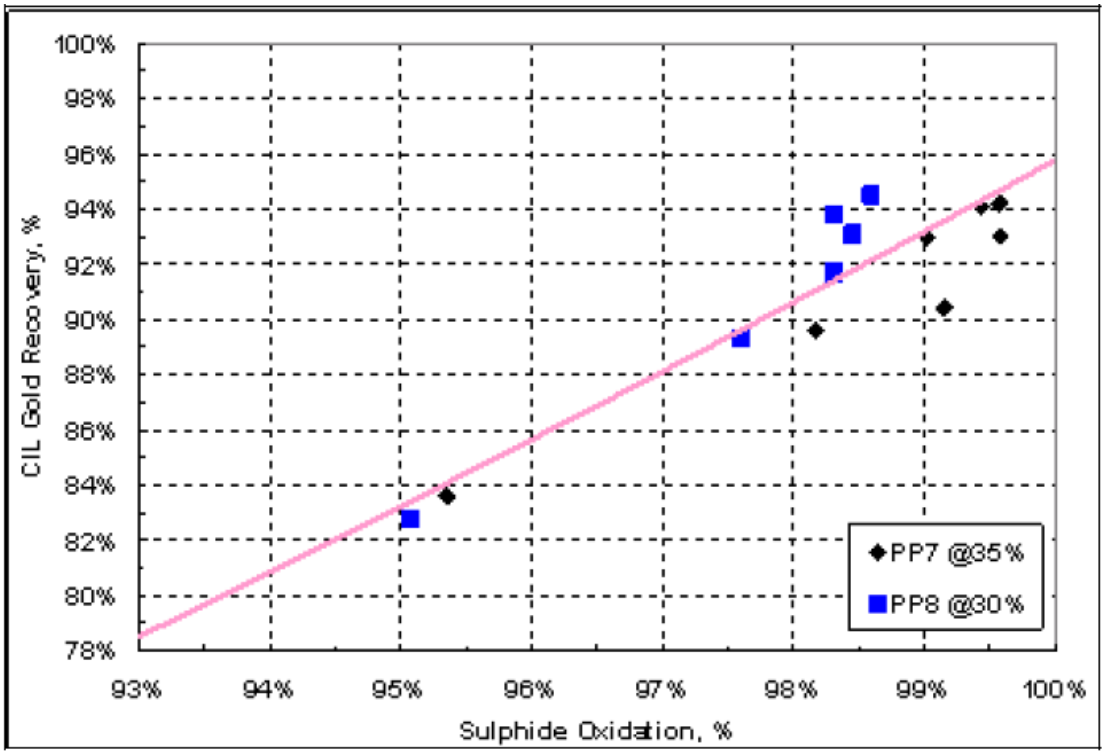


Figure 13-1 MO-BSD CIL Gold Recovery vs. Degree of Sulfide Oxidation

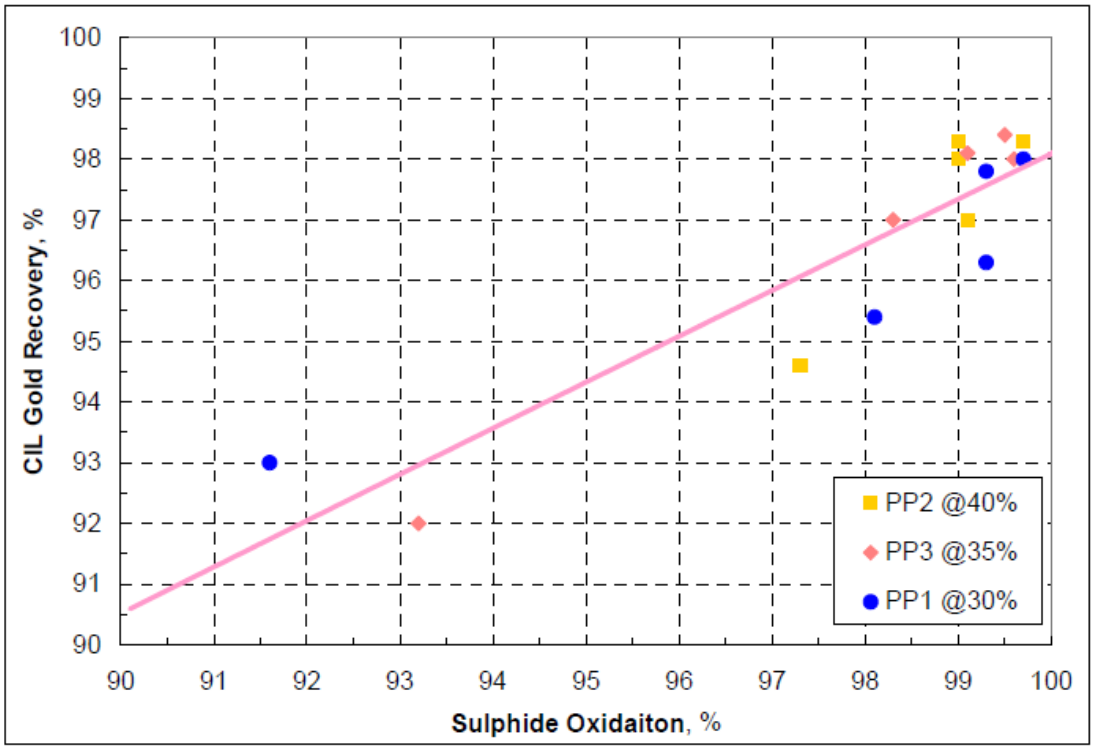


Figure 13-2 MO-VCL CIL Gold Recovery vs. Degree of Sulfide Oxidation

Approximately 99% sulfur oxidation is required to assure a consistently high gold recovery. When sulfur oxidation drops from 99% to 95%, gold recovery is expected to drop by 10% for the MO-BSD ore type and by 4% for the MO-VCL ore type. The larger reduction in gold recovery for the MN-BSD ore type is attributed to the organic carbon content in the solids after POX.

The test work demonstrated that the destruction of organic carbon during pressure oxidation did occur, but at a slow pace. Reduction of organic carbon content by extended residence time, coincidentally corresponding to a higher sulfur oxidation, reduces the degree of preg-robbing seen with the black sedimentary ores and thereby improves gold recovery, as shown in Figure 13-3.

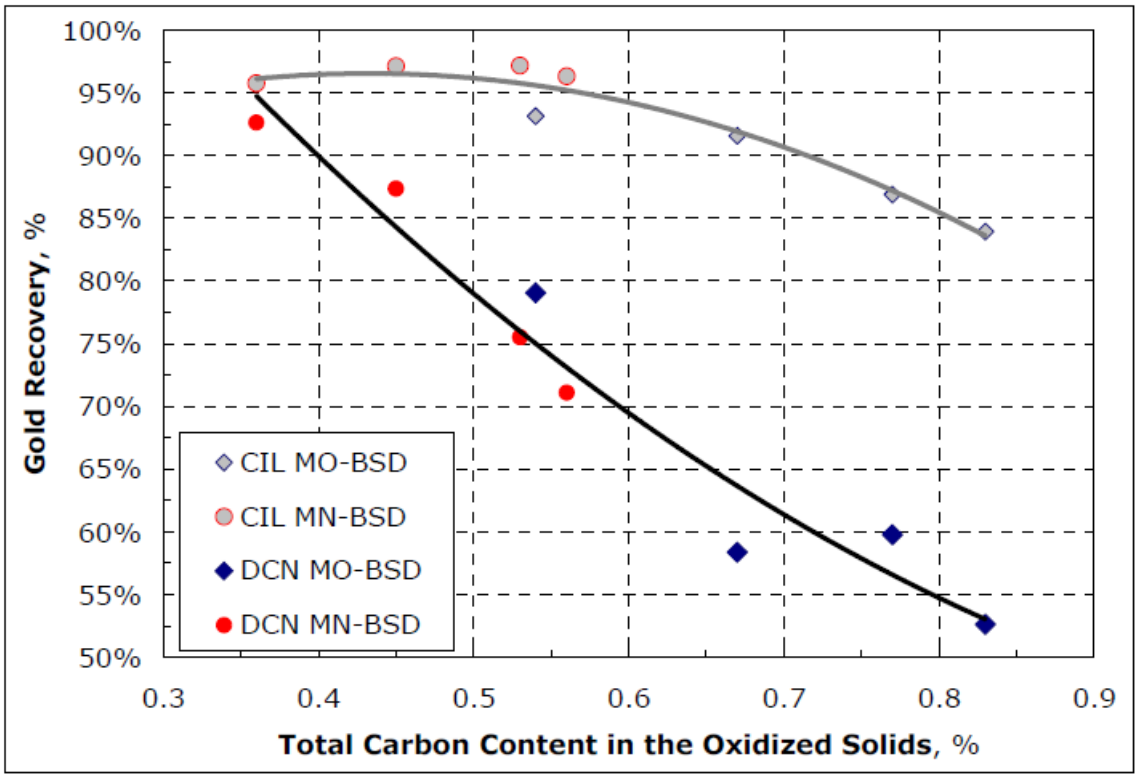
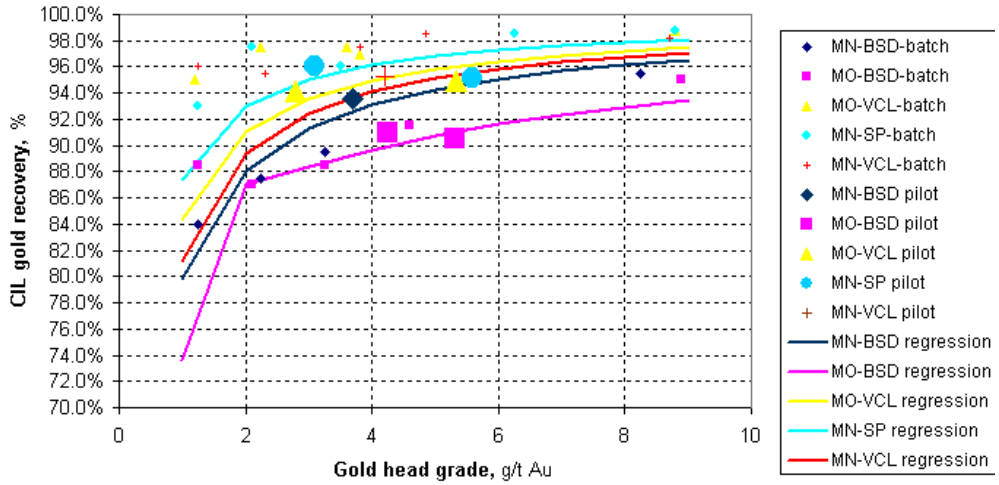


Figure 13-3 Relationship Between Gold Recovery and Organic Carbon Content in Oxidised Solids

The effect of gold head grade and CIL gold recovery is shown in Figure 13-4.

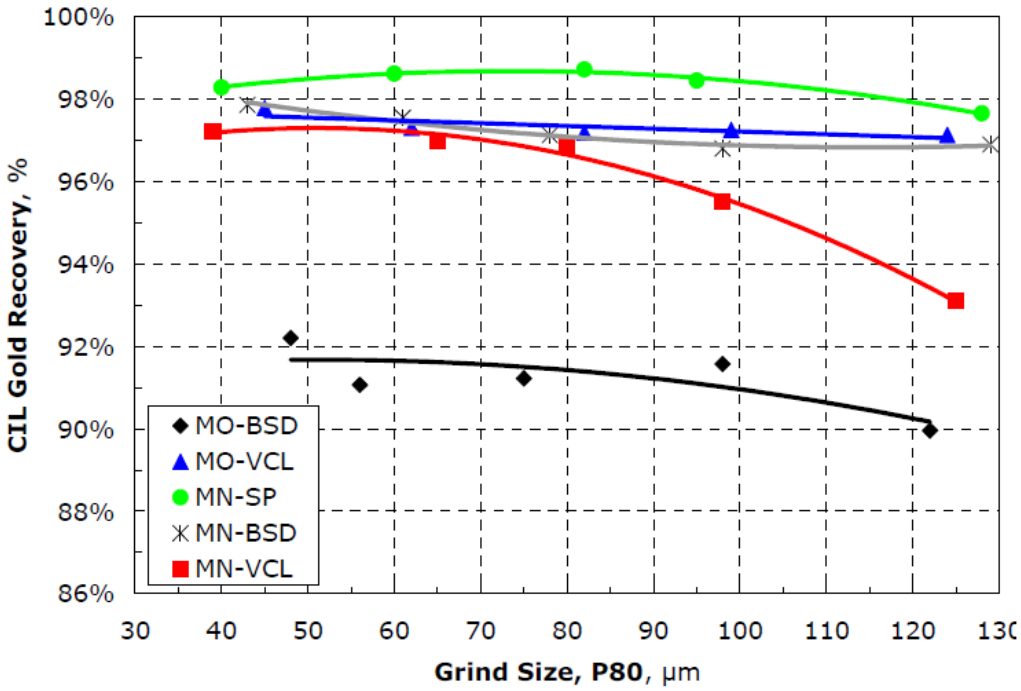


Notes:

1. Small points in the graphic represent the batch test results – 2L autoclave, 30% pulp density, 230°C, 100 PSI O_2 partial pressure, 60 min retention time, and grind size P80 of 80 µm.
2. Significant points in the graphic represent the pilot plan results in 2003, 2004, and 2006 - 35% pulp density, temperature 230 C, 100 PSI O_2 partial pressure, 55 to 70 min retention time and grind size P80 of 80 µm.
3. Continuous lines are the regression curves.

Figure 13-4 Effect of Gold Head Grade on Gold Recovery

The CIL recovery is impacted by the primary grind size, as shown in Figure 13-5. Both technical (e.g., liberation) and economic variables (e.g., gold price, operating and sustaining costs) influence the grind size selection. The operation currently considers a P80 of 80 µm as the optimum primary grind size.



Batch tests performed at 230°C, 100 PSI O2 partial pressure, 60 minutes retention time, 30% pulp density

Figure 13-5 CIL Gold Recovery vs Primary Grind Size

Hot Cure

The test work showed that by holding the autoclave flash discharge slurry for 12 hrs between 85°C and 100°C, the basic ferric sulfate solids formed in the autoclave re-dissolved to form ferric sulfate in solution. The formed ferric ions are washed away from the CIL feed in the three-stage CCD washing thickener circuit.

In addition, the hot cure makes it possible to remove the effects of high lime consumption in lime boil/CIL and concentrate on optimizing the POX process.

Counter Current Decantation (CCD)

Three-stage CCD washing was tested as part of the pressure oxidation pilot plant operation in 2006. Based on this test work, 99.3% wash efficiency was observed with an average thickener underflow density of 40% solids. Historical CCD performance is shown in Figure 13-6.

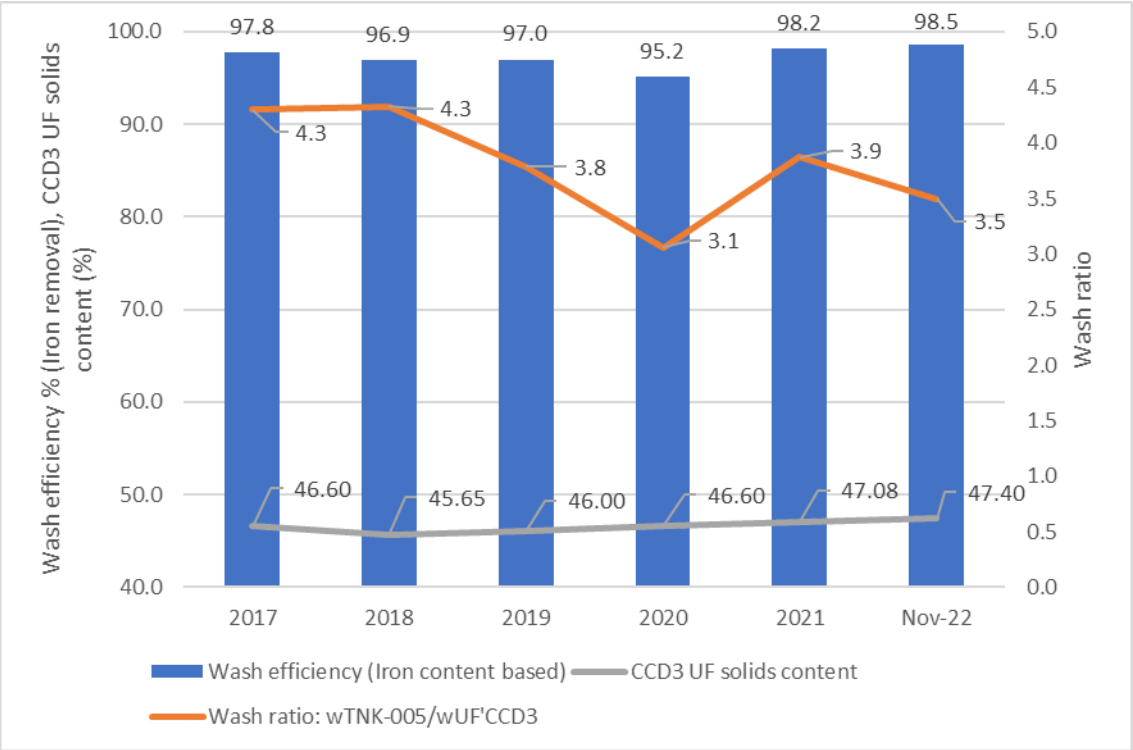


Figure 13-6 Iron Removal Efficiency, Wash Ratio and CCD#3 Underflow Solids Content (%)

Lime Boil

In 2006, a lime boil/CIL study was undertaken to improve the silver recovery. Bench scale testing indicated that the process must be carried out at 95°C to minimize lime consumption and achieve the highest gold and silver extraction rates. The current silver liberation is shown in Figure 13-7.

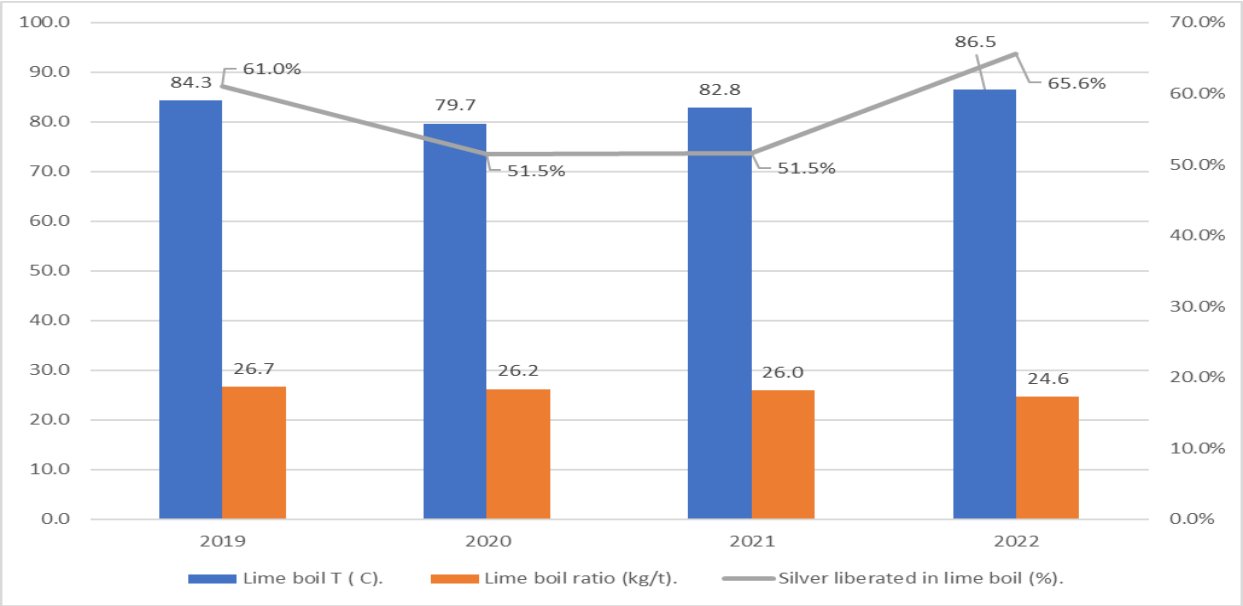


Figure 13-7 Silver Liberation in Lime Boil with Temperature and Lime Ratio

Carbon-in-Leach

CIL pilot plant runs were undertaken by PV in June 2006 on three ore types to determine maximum precious metal loadings on carbon and gold and silver extractions. Average gold recoveries ranged from 90.5% (MO-BSD) to 95.2% (MN-SP) with silver recoveries ranging from 84.4% (MO-BSD) to 89.9% (MO-VCL). See Table 13-9 for annual gold and silver recoveries. Silver recovery is lower due to other key factors not considered in the test work such as CIL feed temperature and CIL carbon activity.

Copper Recovery

Following a decision to suspend marginally economic copper production at the mine, contained copper was removed from Pueblo Viejo's Mineral Resources and Mineral Reserves as of 31 December 2018. There is no plan to resume copper recovery at PV.

Cyanide Destruction

The test work and existing operation have demonstrated that INCO's SO_2-Air process, where, at PV, sulfur is oxidised to sulfur dioxide gas, then injected with air into two parallel configured detoxification tanks, effectively reduces the residual weak acid dissociable cyanide to below 1.0 mg/L.

Neutralization of Autoclave Acidic Liquors

Significant amounts of sulfuric acid and soluble metal sulfate salts are produced during POX. Using limestone and lime, the plant can effectively neutralize soluble sulfate salts and sulfuric acid. It has been demonstrated that 92.5% of the sulfate, 99.9% of aluminum and copper, 100% of iron, and 86.8% of the zinc can be removed by the current neutralization method. After limestone / lime neutralization total metal content of the solution reduces to less than 1 mg/L. The sulfate level in the clarifier overflow was 1,800 mg/L for the removal of 94% of the sulfate. Manganese removal was 89.8% at a final concentration of 1.6 mg/L.

13.2 Expansion Project

The Pueblo Viejo Mine is undergoing an Expansion Project designed to both expand processing operations from 8.6 Mtpa to a minimum of 14 Mtpa to economically treat lower grade ore, as well as increase the tailings storage capacity at the asset, thereby increasing the Mineral Reserve base and extending the LOM. The Expansion Project entails supplementary milling, a new flotation circuit, modifications to the existing autoclaves (planning for increased sulfide feed), additional oxygen generating capacity, and several enhancements or additions to the downstream circuits to

accommodate for this increase in capacity. The process plant expansion portion of the Expansion Project is currently under construction, and commissioning has commenced in the first quarter of 2023.

Metallurgical testing was completed before 2020 to support a feasibility study for expanding the process plant and supporting a minimum annual gold production profile of approximately 800,000 oz after 2022 (on a 100% basis). The related testing programs had three main goals, as per the following:

To increase the oxidation capacity of the plant:

Work focused on alternative methods with the potential to provide a lower CAPEX and OPEX without installing additional autoclaves. The alternative methods considered were heap bio-oxidation and atmospheric tank oxidation.

To maintain the current mass flows between the autoclave feed to the CIL tails discharge:

To forego additional pressure oxidation capital equipment (autoclaves), flotation instead was selected to be added to the flowsheet. The goal is to reject a lower grade tail to achieve the appropriate mass balance.

To define the geo-metallurgical variability of the ore in an expanded pit:

Focusing on precious metal recovery and ore hardness, a drilling campaign was completed for the large low-grade stockpiles to define the stockpile better and to collect metallurgical samples of weathered material. The geochemical database was used to target a representative set of drill core intervals for material within the expanded pit. Tests were completed on these samples using conditions developed for flotation and pressure oxidation.

Metallurgical Sampling

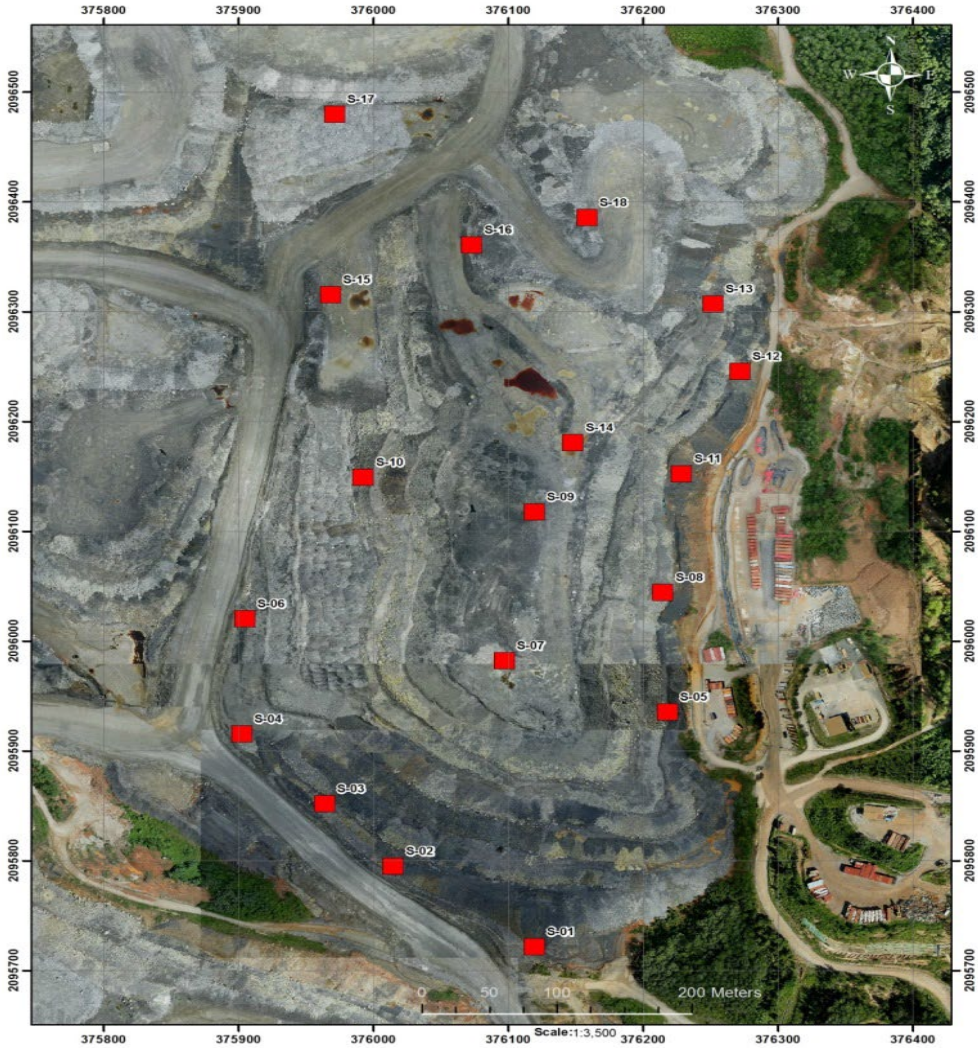
Metallurgical evaluations were completed using material from two different bulk samples representing the low-grade stockpiles. The medium-grade and high-grade stockpiles were not included in the sampling and drilling programs since these would be processed in the current plant before the expansion is completed.

2017 Low Grade Stockpile Bulk Sample

In 2017, a representative bulk sample was prepared by combining trench samples collected from 18 locations around the stockpiles, shown in Figure 13-8. Bulk samples were sent to three different laboratories; assay results of the samples are given in Table 13-4.

Table 13-4 2017 Bulk Sample Head Assays by Lab

Element	Unit	2017 Bulk Sample Head Assays		
		AUTEC	McClelland	XPS
Au	g/t	2.60	2.54	2.48
Ag	g/t	19.2	14.1	16.6
Cu	%	0.094	0.097	0.064
Zn	%	0.743	0.666	0.800
C tot	%	1.07	1.11	NA
C org	%	0.34	0.46	NA
S tot	%	6.89	6.69	7.62
S_2	%	6.62	5.56	NA



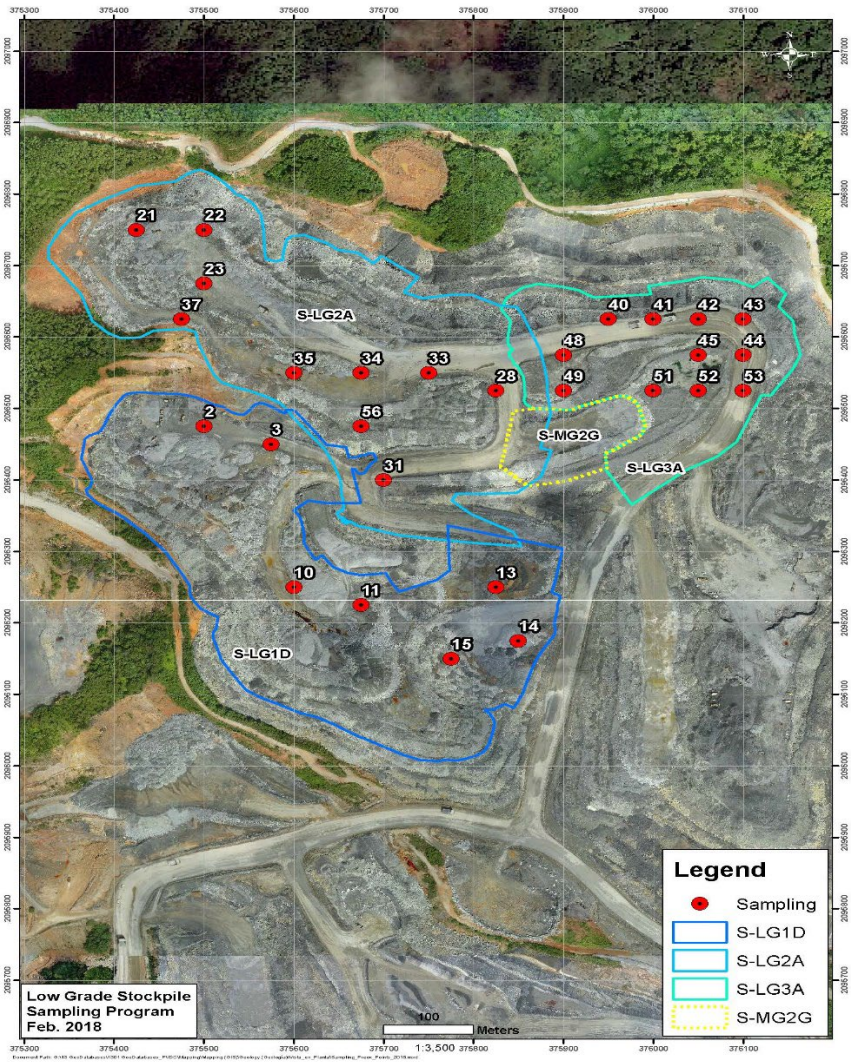
Source: Pueblo Viejo, 2017

Figure 13-8 2017 Low Grade Stockpile Bulk Sample Locations

2018 Low Grade Stockpile Bulk Sample

During January and February 2018, new representative bulk samples were collected from the low-grade stockpile. A total of 27 sampling points were selected, as shown in Figure 13-9. The bulk samples were used for testing in 2018 and 2019 at the following laboratories:

- McClelland Laboratories, USA – Biological heap leach oxidation.
- FLSmidth, USA – Rapid Oxidative Leach (ROL) Scoping and Float-POX testing.
- Core Resources, Australia – Albion prefeasibility testing.
- Blue Coast Research, Canada – Flotation optimization testing.
- SGS Lakefield, Canada – Float-AtmOx-POX testing.



Source: Pueblo Viejo, 2018

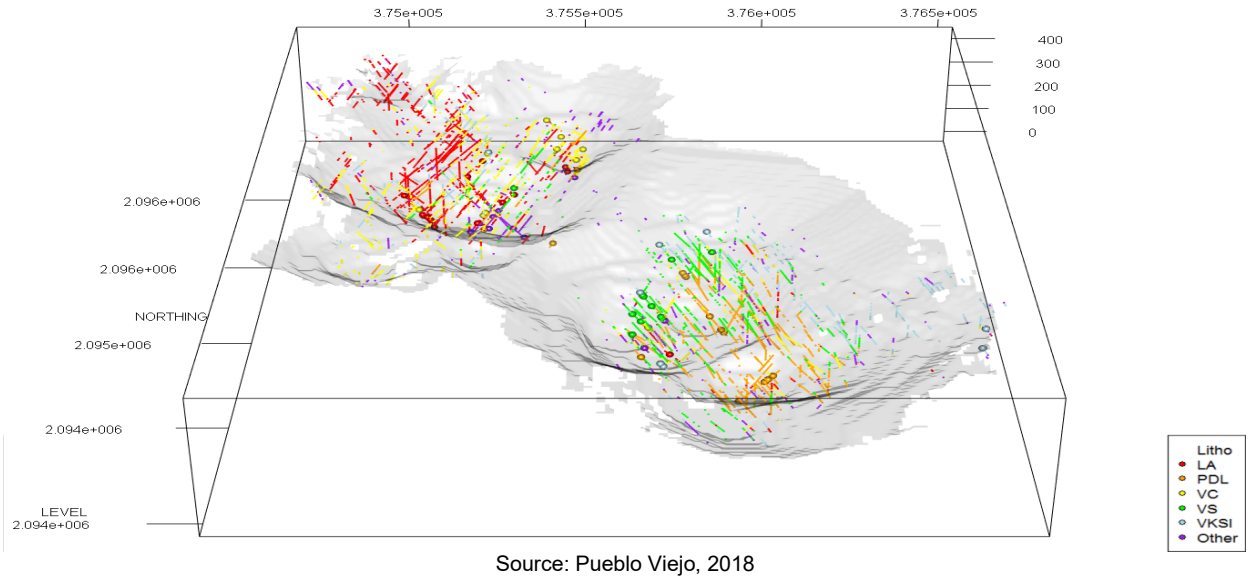
Figure 13-9 2018 Low Grade Stockpile Bulk Sample

Stockpile Sonic Core Variability Composites

In 2018, a drilling program was completed to better define the existing stockpile and to collect samples from below surface for testing. 80 drill holes were drilled targeting the low gold grade areas of the stockpile, which will be a significant amount of the feed after expansion. Of these holes, 27 were sonic holes, and 59 were RC. All holes were placed in a 100 m x 100 m grid. Holes from this grid were selected for sonic drilling in such a way that the proportions of L1, L2, and L3 (L1 < 7.0% total sulfur, L2 between 7.0% to 8.5% total sulfur and L3 > 8.5% total sulfur) stockpiled material drilled would be similar to the proportions found in the stockpiles. From these sonic holes, 47 intervals of approximately 3 m each, were selected for metallurgical testing. The comparison between the assay results from the entire stockpile drilling campaign and the metallurgical samples indicates that the sampling method was successful. The selected intervals represent the variation found in the stockpile in terms of gold, silver, copper, and total sulfur.

HQ Diamond Drill Core Variability Composites

A total of 69 intervals of 6 m each were selected from core drilling completed during the 2017 and 2018 drilling campaigns (Figure 13-10). These intervals were selected to represent the gold, carbon, and sulfur distributions in the major lithological groups in the LOM plan. Composites were divided into six groups based on lithology.



Source: Pueblo Viejo, 2018

Figure 13-10 Distribution of Assay Population Versus Selected Intervals

Test work

Significant test work has already been undertaken on the various refractory ore types, including the major stockpile inventory. Based on the test work results completed, the overall recoveries depicted for the Mine are considered realistic. A summary of the test work completed for the pre-feasibility and feasibility study is provided in Table 13-5.

Table 13-5 Referenced Metallurgical Studies, Expansion Pre-Feasibility and Feasibility Studies

Samples	Test Work Description	Laboratory	Report Name	Summary Results
2018 Low Grade Stockpile Bulk Sample	Column Heap bio-oxidation	McClelland Laboratories (2019)	4315 Column Oxidation Testing - Pueblo Viejo Bulk Ore Samples	Bio-oxidation achieved 1.5% to 21.6% oxidation in 150 days for samples crushed to 100% passing 50 or 19 mm.
	Albion Process Optimization	Core Metallurgy Pty Ltd (2019)	Albion Process Phase 2 Testwork	Grinding finer than P80 of 16 µm yielded no benefit for oxidation. 40% of the sulfide could be oxidized in 20-24 hours regardless of the concentrate sulfide content. Gold and silver recoveries by CIL on the oxidized concentrate were 83% and 87%, respectively, after 72 hrs of oxidation.
	Flotation Optimization	Blue Coast Research Ltd (2019)	PJ5254 - Barrick Gold Corporation, Pueblo Viejo Dominicana Prefeasibility Study Flotation Testwork Report	Depressant usage is essential to improve the concentrate quality but may not decrease mass pull. Recirculating loads yields marginal benefits. Optimum flotation generates concentrates with 90% of the gold in 40% of the mass.
	Pre-Float Flotation Product Mineralogy	AUTEC (2019)	R2018-141 Mineral Analysis of Pueblo Viejo Flotation Test Products	Contains pyrite, which is fine to very fine grained, mostly liberated at a P80 of 75 µm. Pre-float collects liberated particles of pyrite finer than 20 µm and particles of pyrite in pyrophyllite and quartz finer than 10 µm.
	Optimized Flotation Product Mineralogy	AUTEC (2019)	R2019-036 Mineral Analysis of Pueblo Viejo Flotation Test Products	Contains pyrite, which is fine to very fine grained, mostly liberated at a P80 of 75 µm. Later stages collect significant amounts of pyrophyllite associated with pyrite.
Whole Core Intervals	Comminution Characterization for SAG and Ball Milling	ALS Metallurgy – Kamloops (2019)	KM5915 - Comminution Test Work on Samples from the Pueblo Viejo Mine	PLI, BWI. SPI and SMC tests were completed for five whole core composites. Results consistent with other comminution testing.
Variability Master Composites	SAG Design Testing	Bureau Veritas Metallurgy w/ Starkey and Associates (2019)	SAG Design, SVT/BVT/BWI Results for 33 Samples	PV ore hardness was higher than 19.1% of others in the SAG Design Database.
Variability Drill Core Intervals and Master Composites	Variability Flotation	Blue Coast Research Ltd (2020)	PJ5277 - Barrick Gold Corporation Pueblo Viejo Dominicana Variability Study Testwork Report	Tests of 127 samples obtained an average gold recovery of 87% in 42% of the mass.

	Variability POX and Mineralogy	FLSmidth Minerals Testing and Research Center (2019)	Barrick Gold - Pueblo Viejo Variability Flotation-POX Testing	Whole ore POX gold and silver recovery averaged 93.5% and 80.6%. Gold and silver recovery from concentrates averaged 95.5% and 76.6%.
Field Samples	Microbial Characterization	University of Toronto, CERCL Ltd. (2019)	Characterization of the Iron-Oxidizing Microbial Communities at the Pueblo Viejo Gold Mine	Microbes known to be active in bio-oxidation were found in field samples collected at the Pueblo Viejo mine.
Plant Samples	Las Lagunas Plant Conditions for Trial	Las Lagunas Site Lab (2019)	190515 PV Albion Testwork	80% of gold could be recovered from a concentrate if it were run at 14 tph through Isamill and oxidation tanks.
Variability Composites	POX Pilot Campaign simulating the PV Expansion flowsheet, including pre- & post-POX circuits of flotation, hot cure, lime boil and CIL, using both whole ore as well as flotation concentrate / whole ore blends	SGS Lakefield (2020)	An Investigation into the Recovery of Gold and Silver from Pueblo Viejo Variability Samples prepared for Barrick Pueblo Viejo Dominicana Corporation - Project 17352-01, May 4, 2020	The pilot tests confirmed the viability of the proposed flowsheet.

13.3 Recovery Estimates

The actual recovery models for both Gold and Silver are presented in this section.

Current Operation

The recovery curves and formula have been updated from both the original and initial expansion feasibility studies where predicted and actual values are shown in Figure 13-11.

$$R_{Au} = \left[HG_{Au} + \frac{19.137 \cdot TC - 0.010}{HG_{Au}} - 0.169\right]$$

Where:

- HG_{Au} is the plant head grade (g/t gold).
- R_{Au} is the gold recovery.
- TC grade is the Total Carbon grade in the plant throughput (as percent).

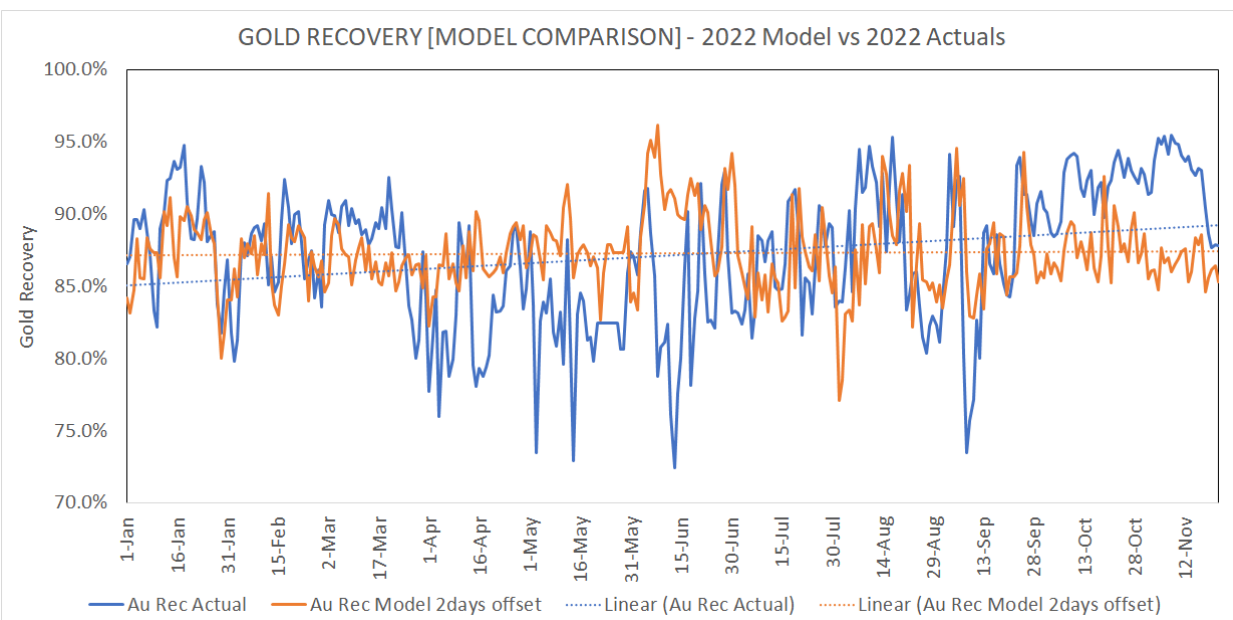


Figure 13-11 2022 Gold Recovery – Modelled Versus Actual

The silver recovery model has been updated since the initial feasibility study and more variables have been included based on the current operation. The silver recovery is influenced by different

variables, including but not limited to copper grade and retention time. The development of a new silver model is currently in progress.

Expansion Project

The Pueblo Viejo process plant expansion component of the Expansion Project is designed to increase the plant capacity to economically process low grade ore through a new flotation circuit with modifications on the existing autoclaves and thickeners, as described in Section 17 of this report. The recovery models for the process plant expansion (LOM) are described below.

POX Recovery

A total of 266 benchtop autoclave tests were completed by FLSmidth (2019) on the variability interval and master composites with a P80 of 75 µm. Of these tests, 238 (89%) reported CIL gold recoveries of 90% or greater. Comparing results of continuous with benchtop tests completed in the 2007 feasibility study showed that benchtop testing, on average, reported 2.08% higher gold recovery than continuous testing.

The recovery model was calculated by dividing the results into separate grade bins. Each grade bin contains 32 samples. The mean value for each bin was plotted, and regression lines were calculated to match the trend in the mean recovery by grade bin. This regression line was then reduced by 2.08% for all grade values. The gold recovery model based on the test work results is shown below:

$$HG_{Au} \leq 5.41\,, \qquad PR_{Au} = 0.9 \cdot HG_{Au} + 89$$

$$HG_{Au} > 5.41\,, \qquad PR_{Au} = 93.8$$

$$For\ Organic\ Carbon\ (OC) > 0.4\%\,, Discount\ = Min\left(0, \qquad \frac{(1.4 \times HG_{Au} - 17.5 \times OC)}{HG_{Au}}\right)$$

Where:

- HG_{Au} is the plant head grade (g/t gold).
- PR_{Au} is the POX gold recovery.
- OC is the Total Organic Carbon grade in the plant throughput (as percent).

A low correlation in the model for silver recovery was observed and based on the test work average results, fixed silver recovery values were considered.

Further investigations are ongoing to refine both gold and silver recovery models for the expansion.

A summary of the POX gold and silver recovery models is shown in Table 13-6.

Table 13-6 POX Recovery Formulas

Rock type	Au Recovery (%)	Ag Recovery (%)
MO-BSD	if HG ≤ 5.41, 89+0.9*HG, 93.8	75.5
MN-BSD		75.5
MO-VCL		78.3
MN-VCL		78.3
MN-SP		75.0
Stockpile		82.0

Flotation

Gold flotation recovery models (for different ore types) are based on the variability test work results generated by BlueCoast (2020). The models were built based on the gold head grade, flotation tailings grade, and sulfide content. A comparison between the modeled recovery and the test work results is shown in Figure 13-12.

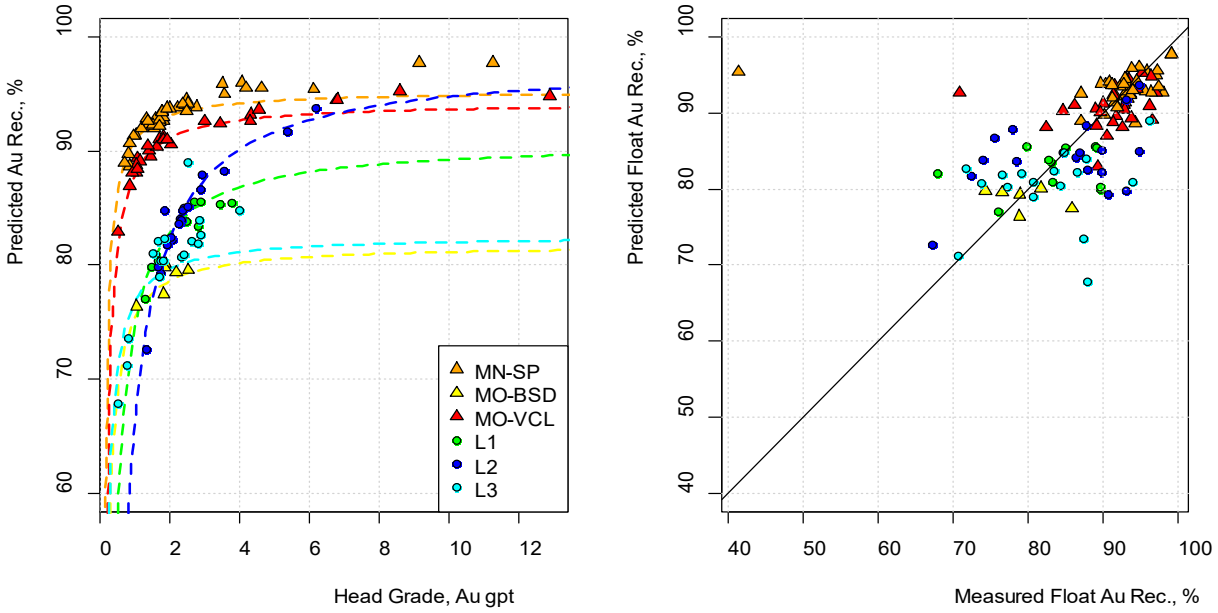


Figure 13-12 Flotation Gold Recovery, Model versus Lab Results, Blue Coast (2020)

Flotation recovery models per ore type are summarized in Table 13-7. Based on the testwork and average results, silver recovery was considered a fixed value.

Table 13-7 Mass pull and flotation recovery formulas

Ore type	Mass Pull	Au Flotation Recovery (%, (FR_{Au}))[1]	Ag Flotation Recovery (%)	S2 Flotation Recovery (%)
MO-BSD	2.02*S2+25	S2*0.586+0.202*S2/*HG* -7.5/*HG* +78.25	86.00	93.30
MN-BSD	2.02*S2+25	S2*0.586+0.202*S2/*HG* -7.5/*HG* +78.25	86.00	93.30
MO-VCL	2.02*S2+25	S2*0.184+0.202*S2/*HG* -7.5/*HG* +93.18	93.40	88.00
MN-VCL	2.02*S2+25	S2*0.184+0.202*S2/*HG* -7.5/*HG* +93.18	93.40	88.00
MN-SP	2.02*S2+25	S2*0.152+0.139*S2/*HG* -5.18/*HG* +94.38	94.30	90.70
Stockpile	1.85*S2+31.6	S2*0.241+0.666*S2/HG-24.62/*HG* +91.11	85.40	91.30

1. Where S2 is the sulfide sulfur (S_2) content (percent), and HG is the gold head grade (g/t).

Flotation Tails CIL

Bottle roll and cyanide solubility tests for gold were completed and the data was used to determine gold and silver recovery models for CIL on the flotation tailings. No correlation or relationship was observed based on these test work results. Fixed values for both gold and silver flotation tailings recoveries of 34% and 42%, respectively, were assumed based on the test work average recoveries.

Total Recoveries

There are two possible flowsheets to treat the ore depending upon its grade and characteristics: direct POX, and flotation and POX. The direct POX stream recovery model is a linear function as described previously (POX Recovery subsection). For the flotation and POX stream, the total recovery is calculated using the formula below.

$$R_{Au} = FR_{Au} \cdot min\left[93.8\,, \frac{0.9 \cdot HG_{Au} \cdot \left(\frac{FR_{Au}}{MP_{Au}}\right) + 89}{100}\right] + (100 - FR_{Au}) \cdot T_{Au}$$

Where:

- HG_{Au} is the plant throughput head grade (g/t gold).
- R_{Au} is the total gold recovery.
- FR_{Au} is the gold flotation recovery formula (Table 13-7).
- MP_{Au} is the mass pull formula (Table 13-7).
- T_{Au} is the flotation tailings CIL recovery constant (34% for gold).

The total silver recovery is calculated directly by multiplying both flotation and POX recoveries fixed values, as shown in Table 13-8.

Table 13-8 Flotation & POX Silver Recoveries

Rock Type	Ag Flotation %	Ag POX %	Ag Total Recovery (%)
MO-BSD	86.00	75.50	64.93
MN-BSD	86.00	75.50	64.93
MO-VCL	93.40	78.30	73.13
MN-VCL	93.40	78.30	73.13
MN-SP	94.30	75.00	70.73
Stockpile	85.40	82.00	70.03

13.4 PV Historical Performance

A summary of the plant performance from 2012 to 2022 is shown in Table 13-9.

The QP confirms that there are no further processing factors that haven't already been catered to in reference to deleterious elements that could have a significant effect on potential economic extraction.

Table 13-9 Historical Plant Performance

Description	Unit	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Plant Performance												
Throughput	ktpa	740	4,429	6,712	6,917	7,545	7,984	8,347	8,606	8,829	9,111	9,448
Throughput	tpd	4,023	12,135	18,390	18,951	20,616	21,875	22,867	23,578	24,103	24,962	25,886
Grade												
Gold (Au)	g/t	5.05	6.14	5.53	4.94	5.29	4.57	4.04	3.91	3.61	3.18	2.68
Silver (Ag)	g/t	39.7	42.4	31.7	34.0	22.0	23.3	25.3	19.5	20.2	17.3	14.4
Recoveries												
Gold (Au)	%	92.9%	93.0%	92.9%	86.8%	91.0%	92.3%	89.4%	89.8%	88.5	87.6	87.4
Silver (Ag)	%	48.1%	34.5%	56.3%	33.0%	63.4%	74.6%	73.9%	59.3%	47.7	47.9	49.6
Production												
Gold (Au)	oz	111,635	813,217	1,108,578	954,293	1,166,808	1,083,373	968,337	982,791	903,033	813,595	713,465
Silver (Ag)	oz	454,220	2,083,891	3,854,460	2,495,575	3,385,047	4,456,830	5,006,410	3,201,566	2,746,149	2,390,686	2,178,917

All production figures presented are 100% basis

14 Mineral Resources Estimate

14.1 Summary

This section describes the work undertaken by Barrick and PV staff to prepare the Mineral Resource models for Pueblo Viejo, including the key assumptions and parameters applied.

There were several changes to lithology and alteration modelling, estimation methodology and a significant (14%) increase in the total data relative to the previous model constructed in 2020.

The estimate was reviewed internally as well as externally and formally signed off prior to release.

The database cut-off for drilling data for input into the estimate was 17 May 2022.

Table 14-1 summarises the Pueblo Viejo Mineral Resources, inclusive of Mineral Reserves as of 31 December 2022. The Mineral Resource estimate conforms to CIM (2014) Standards.

Table 14-1 Summary of Mineral Resources – 31 December 2022

Category	Location	Tonnes	Grade		Contained	
		(Mt)	(g/t Au)	(g/t Ag)	(Moz Au)	(Moz Ag)
Measured	Monte Negro	44.3	2.00	11.17	2.8	15.9
	Moore	32.0	2.19	12.49	2.3	12.9
	Cumba	0.9	2.41	8.59	0.1	0.2
	Total	**77.2**	**2.08**	**11.69**	**5.2**	**29.0**
Indicated	Monte Negro	124.4	1.80	10.69	7.2	42.8
	Moore	92.0	2.08	11.78	6.2	34.9
	Cumba	1.8	1.70	9.82	0.1	0.6
	Stockpile	97.6	2.16	14.95	6.8	46.9
	Total	**315.8**	**1.99**	**12.32**	**20.2**	**125.1**
M&I	Monte Negro	168.7	1.85	10.81	10.0	58.6
	Moore	124.0	2.11	11.97	8.4	47.7
	Cumba	2.7	1.93	9.42	0.2	0.8
	Stockpile	97.6	2.16	14.95	6.8	46.9
	Total M&I	**393.0**	**2.01**	**12.19**	**25.4**	**154.1**
Inferred	Monte Negro	3.5	1.6	8.1	0.2	0.9
	Moore	3.8	2.0	11.1	0.2	1.4
	Cumba	0.3	1.2	32.6	0.0	0.3
	Total	**7.6**	**1.8**	**10.5**	**0.4**	**2.6**

Notes:
1. Mineral Resources are reported on a 100% basis.
2. CIM (2014) Standards and CIM (2019) MRMR Best Practice Guidelines were followed for Mineral Resources
3. Mineral Resources are estimated based on an economic cut-off value.
4. Mineral Resources are estimated using a long-term price of US$1,700/oz Au and US$21.00/oz Ag.
5. Resource block model dimensions of 10 m x 10 m x 10 m were assumed to reflect mining selectivity.
6. Mineral Resources are inclusive of Mineral Reserves.
7. Numbers may not add due to rounding.
8. The QP responsible for this Mineral Resource Estimate is Chad Yuhasz, P.Geo.

14.2 Resource Database

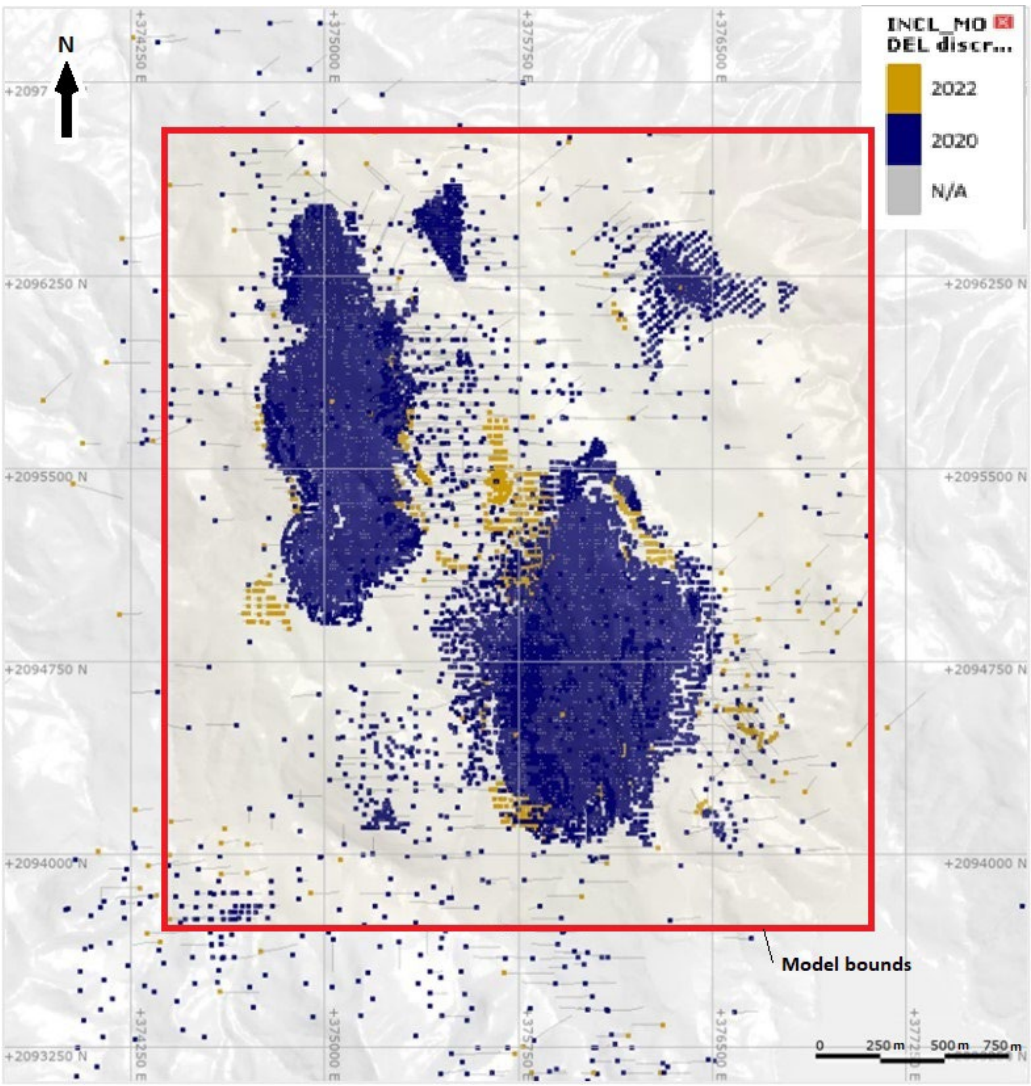
All drill core, survey, geological, geochemical, density, and assay information used for the Resource estimation have been validated and had filters applied for consistent exports. This is detailed in Section 12.1. The Resource definition database, as of 17 May 2022, consists of 6,358 holes for 706,480 m of drilling. Data was cut-off at this date to allow sufficient time for geologic and resource modelling. Holes have been drilled over several drill campaigns using a mix of RC and DDH, and RC Pre-Collar, rotary, percussion, and trench. Holes have been drilled for resource definition, hydrology, metallurgical and geotechnical purposes across 15 different project codes.

For Resource estimation, RC grade control data was included. This data was extracted from the grade-control acQuire database and merged with the Resource definition data.

This merged dataset was provided as a series of CSV format files containing collar, down-hole survey, assay, geochemical and logged lithology, and alteration for inputs into geologic modelling and Resource estimation.

The combined Resource definition and RC grade control database used for Resource estimation consists of around 25,120 drillholes for more than 1,405 km of drilling (Figure 14-1). The data is dominated by RC grade control, which makes up around 70% of the drill metres and 90% of the holes (see Figure 14-2).

A summary of drilling by year is presented in Figure 14-3.



Source: Pueblo Viejo, 2022

Figure 14-1 Plan View of Drilling

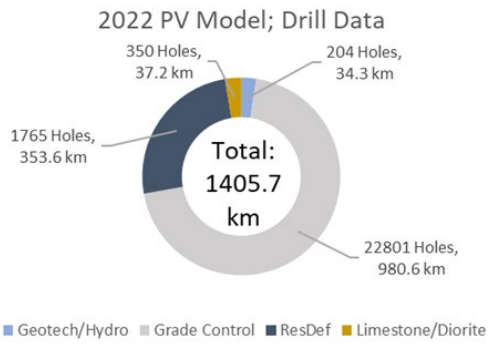


Figure 14-2 Summary of Drill Data included in Estimate

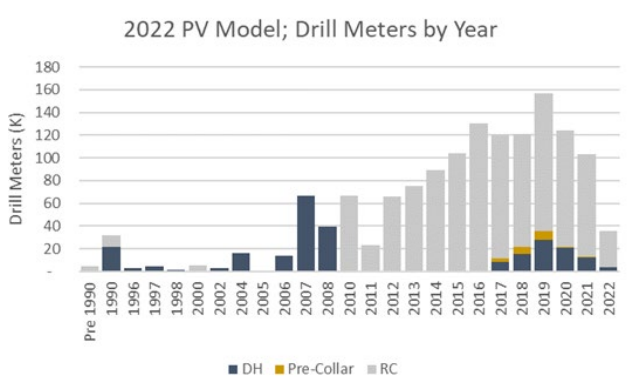


Figure 14-3 Breakdown of Drill Data by Year

Since the last model update in Q3 2020, over 3,800 additional drillholes totalling 193.3 km have been added to the data set (Figure 14-4), which is dominated by RC grade control. This represents a 14% increase over the last model.

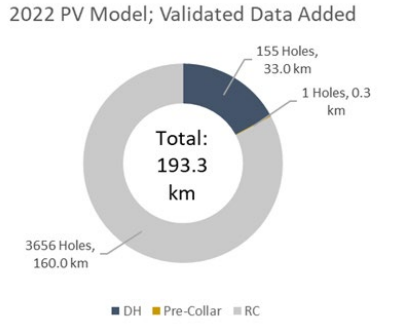


Figure 14-4 Drill Data Added

Data validation and verification are described in Section 12 Data Verification. Sulfide sulfur (S_2) and organic carbon (C_{Org}) are under-sampled relative to total sulfur (S_{Tot}) and total carbon (C_{Tot}), with only around 28% of total sulfur and 23% of total carbon assays having corresponding sulfide sulfur and organic carbon values.

Due to the mismatch in data volume and the need to ensure that the correlation between the variables is maintained, the following estimation approach was applied:

- Estimate total sulfur and total carbon (parent estimate).
- Estimate using paired assays only.
- Calculate the ratio between paired variables.
- Use defined ratios to assign sulfide sulfur and organic carbon based on parent estimate values.

A number of sulfide sulfur (5,454) and organic carbon (204) values were seen to exceed the total sulfur and total carbon assay values due to assay method detection limits. In these cases, the total sulfur and total carbon values were set to equal the sulfide sulfur and organic carbon.

14.3 Geological Modelling

All geologic models are created using a semi-implicit 3-D modelling technique in Seequent Leapfrog Geo and are periodically backed up to a cloud server system. All modelling is done using a combination of grade control, exploration logging, bench face, structural, and pit mapping. The structural model is the basis for the lithology and alteration models and is linked via the cloud projects as a dependent workflow. Geologic models exceed the spatial extents of the resource block models and utilize the best original topography available. Details of the steps for modelling the geologic interpretation are detailed below.

Structural Grouping and Modelling

The structural model was developed by the exploration team starting in 2020 and is currently maintained by the site geology team. The structural model and concepts have undergone a significant review and update since the 2020 models. The structural framework and regional concepts have been intensely scrutinized by exploration and site geology teams. The complexity of the faults has been simplified and the key fault structure showing gold offset across contacts plots was the Monte Oculto fault activated in the lithology model (Figure 14-5).

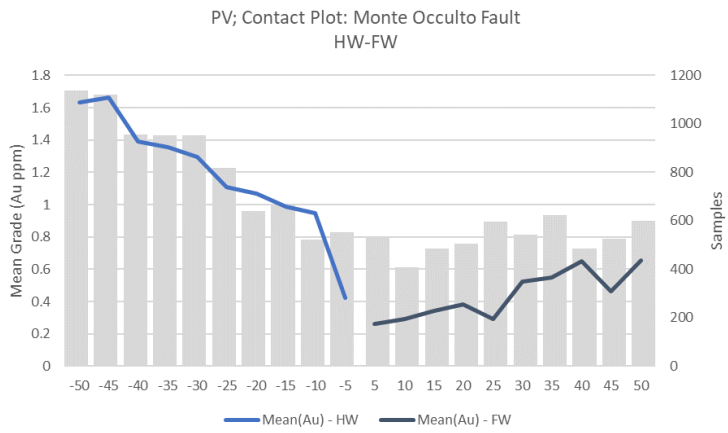


Figure 14-5 Contact Plot for Au Across Monte Oculto Fault

The Monte Oculto fault surface was created by utilizing field mapping disks with strike and dip measurements. Drillhole intercepts were tagged in a points file and used in refining the wireframe. Lastly, interpreted guide points were used to keep the trend in line with the interpretation. This results in a fault wireframe that lines up with the regional interpretation shown on the 220409_MO-MN_Litologia plan map draped to the top of the same month and year. Lithology modeling used the fault surfaces, which were imported as bounding surfaces.

Lithology Grouping and Modelling

The lithologic interpretation was created in Leapfrog Geo, peer reviewed, and released as “fit for use”.

Both the alteration and lithology models use a semi-implicit model snapped to drillhole contacts. All drillhole data are in a csv format of combined grade control and exploration data.

For the lithology model, a filtered subset of data was used on the grade control holes. This removed holes that did not intercept the current topography. This allows lithologic contact accuracy below the current topography where drilling exists but avoids potential conflicts in older logging. The current topography was flagged to drillholes to create a collar filter utilized throughout the lithology model.

There were 42 logged lithologies in the data. These were grouped into 17 lithology groups based on similar grade populations and then examined spatially to ensure they formed contiguous groups. Table 14-2 summarises the lithology groupings, with a box plot of grade by grouped lithology presented in Figure 14-6.

Table 14-2 Lithologic Grouping

Lithology Group	Lith Group Code	Logging Code	Description
Cover	CV	CV	Overburden
Lagunas Volcano-sediments	LS	LVIMS	Las Lagunas sediments
		LL	Las Lagunas limestone
Hatillo Limestone	HL	CV	Hatillo karst limestone
		MHL	Mixed Hatillo Limestone
		DHL	Dark Hatillo Limestone
		HL	Light Hatillo Limestone
		HBC	Hatillo Basal Conglomerate
Dykes	DYK	ID	Felsic coherent Dike
		DI	Dioritic Porphyritic aphanitic Dike
Diorites	DI	Mdi	Llagal monzodiorite
		GbDi	Llagal gabrodiorite
Breccia	BRX	MFBx	Monomictic Rock flour matrix breccia
		PRFBx	Polymictic Rock flour matrix breccia
		CBx	Cracked Breccia
		HB	Hydrothermal breccia
Dacitic tuff	DCT	DCT	Dacite Fine Crystal
Carbonaceous Sediments	CSC	VPCC	Volcanogenic Polymictic Carbonaceous weakly bedded Conglomerate
Carbonaceous Sediments	CLM	CLM	Carbonaceous Laminated mudstone
	CIMSC	CIMSC	Carbonaceous Interlayer mudstone – sandstone – conglomerate
Dacitic Volcaniclastics	DV	PD	Porphyritic dacite
		PES	Polymictic Interlayer thickly clast support – sandstone
		PV	Andesitic polymictic clast supported
		VPQ	Polymictic quartz-bearing poorly sorted clast support
	DAT	DAT	Dacitic fine accretionary laplli massive
	DV	MQSB	Massive Qtz Bearing Sandstone Matrix Support Breccia
		LQB	Volcanogenic Qtz Bearing Medium stratified
Dacitic Tuffs	QBT	PQLLF	Quartz- Bearing breccia fiamme massive tuff
			Undifferentiated Tuff
		PQTM	Lower Polymictic quartz-bearing fiamme breccia

Lithology Group	Lith Group Code	Logging Code	Description
		PQLT	Lower Polymictic quartz-bearing lithic breccia
	IPLT	IPLT	Intermediate andesitic fragmental tuff
Andesite Flows	ACR	ACR	Andesite coherent perlitic porphyritic-afanitic rock
	VCSM	VCSM	Volcanogenic Calcareous Sandstone Dark Mudstone
	ACR	PD/ACR	Coherent Porphyritic dacite
Andesitic Tuffs	ALT	PLT	Polymictic andesite matrix support breccia
		ALT	Andesitic flow foliated fiamme breccia
	VCSM	VCSM	Volcanogenic Calcareous Sandstone Dark Mudstone
	ALT	UFLT	Upper weakly laminated fine tuff
			Undifferentiated andesitic tuff
		FLT	Fine weakly laminated tuff
Ryolite	AFL	PA	Coherent porphyritic rhyolite
		VFLU	Felsic Foliated rhyolite spherulitic-lithofacies texture
Maimon Schists	MF	MF	Maimon metamorphic basement

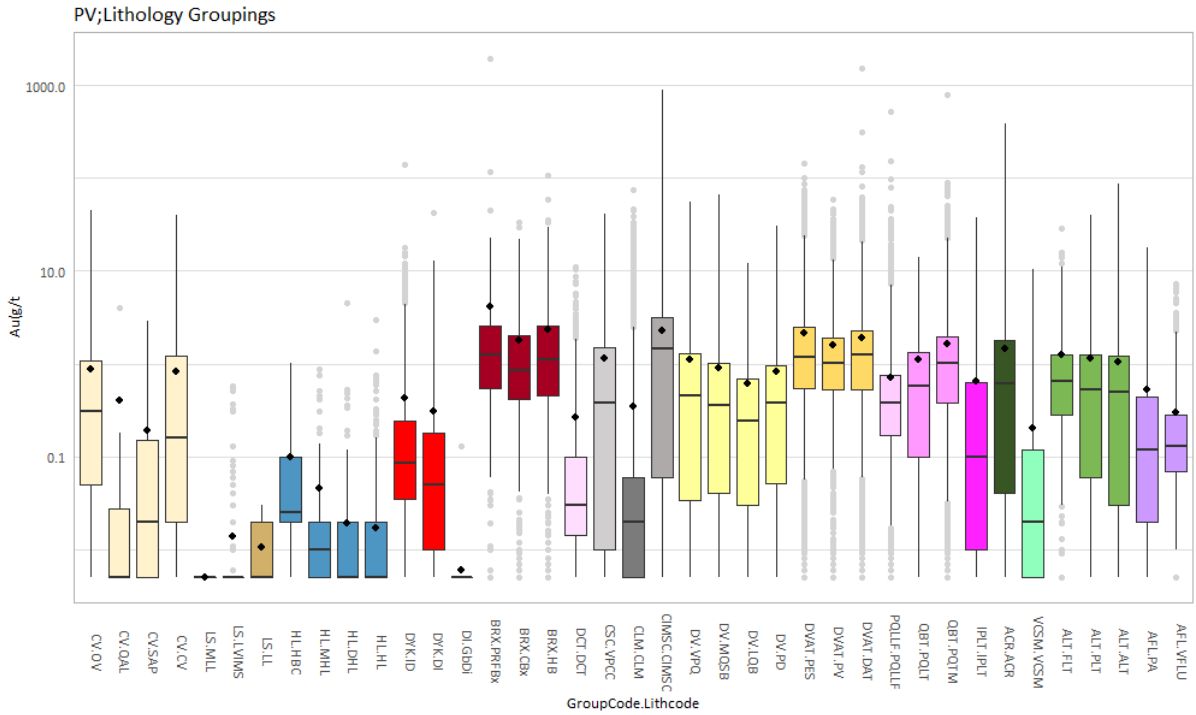


Figure 14-6 Boxplot – Grouped Lithologies

Lithologies are grouped in acQuire and incorporated into a workflow that allows selection and the ability to ignore a logged interval that is incongruous with surrounding drillhole logging.

The contact analyses in Figure 14-5 show gold offset against the Monte Oculto fault, a NE fault that separates the Monte Negro and Moore pits. This fault was activated in the lithology workflow and utilized along with the mesh topography called “topography” as the boundary. The topography is not original topography and has both depletion and stockpile. However, the surface is adequate for the purpose of creating a hard-rock model. The Monte Oculto fault is a post-deposition late-stage fault offsetting the lithologies and grades, cutting quaternary alluvium.

Alteration Grouping and Modelling

The alteration was grouped for modelling based on grade and alteration assemblage. Over 200 unique alteration codes were present in the data for grouping; only logged alterations with more than 2000 intervals were considered. This reduced the total amount of data by 6% and the number of alteration types to 27. These were subsequently grouped into five alteration groups, as summarised in Table 14-3 with a box plot of gold grade by grouped alteration presented in Figure 14-7.

Table 14-3 Alteration Groupings

Alteration Group	Alteration Code	Description
PRO	Ca	Propylitic
	Cal	
	Chl	
	Chl-Cal	
	Cl	
	Cl Ca	
	Pro	
	PROP	
PYR	IK	Pyrophyllite
	Ill	
	K	
	Ka Ill	
	P	
	Py	
	Pyr	
QA	QA	Quartz-Alunite
	QAP	
	Si-Al	
QP	Py Qz	Quartz-Pyrophyllite
	QP	
	Qz-Pi	
	Qz Py	
	Qz+Pyr	
SIL	Q	Silica
	Qz	
	SI	
	Sil	

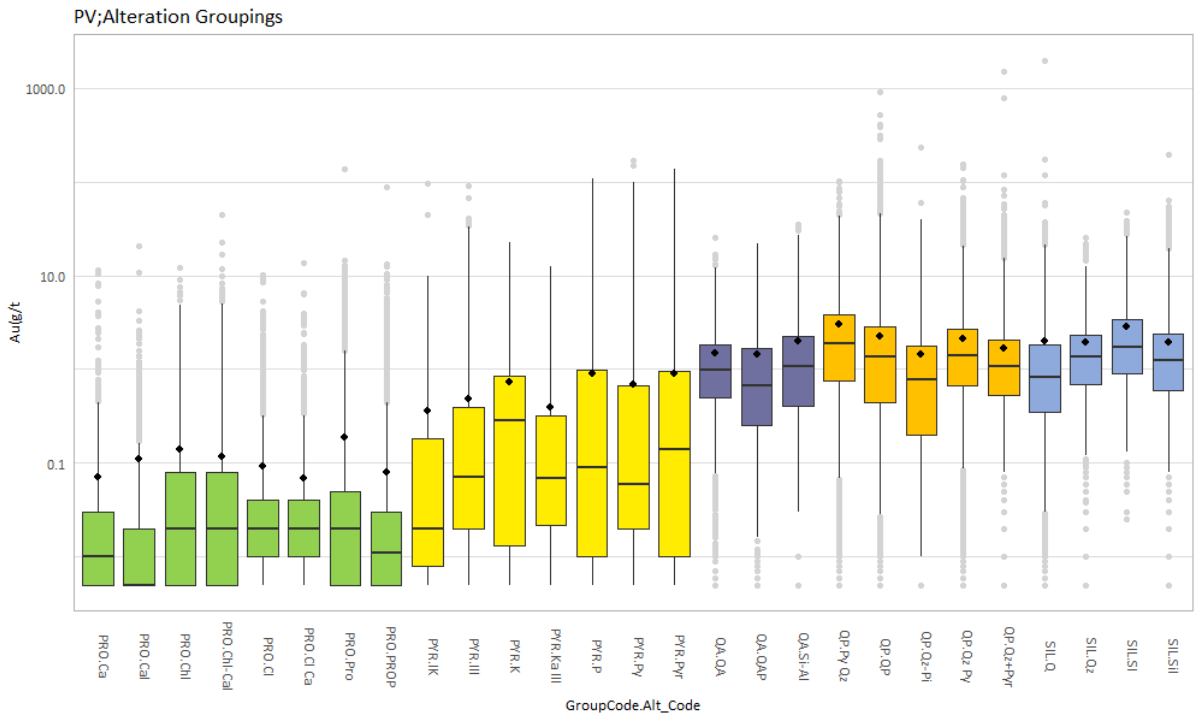


Figure 14-7 Boxplot – Grouped Alteration

Domains

Preliminary domaining was based on partitioning of the composited data using a classification tree approach. The splits determined by the partitioning were then examined statistically and spatially to ensure that the groupings were reasonable and that they defined similar populations. Example classification trees for Au and total sulfur are presented in Figure 14-8 and Figure 14-9.

No detailed review of sulfide sulfur or organic carbon domaining was completed as these are directly related to the total sulfur and total carbon populations, respectively.

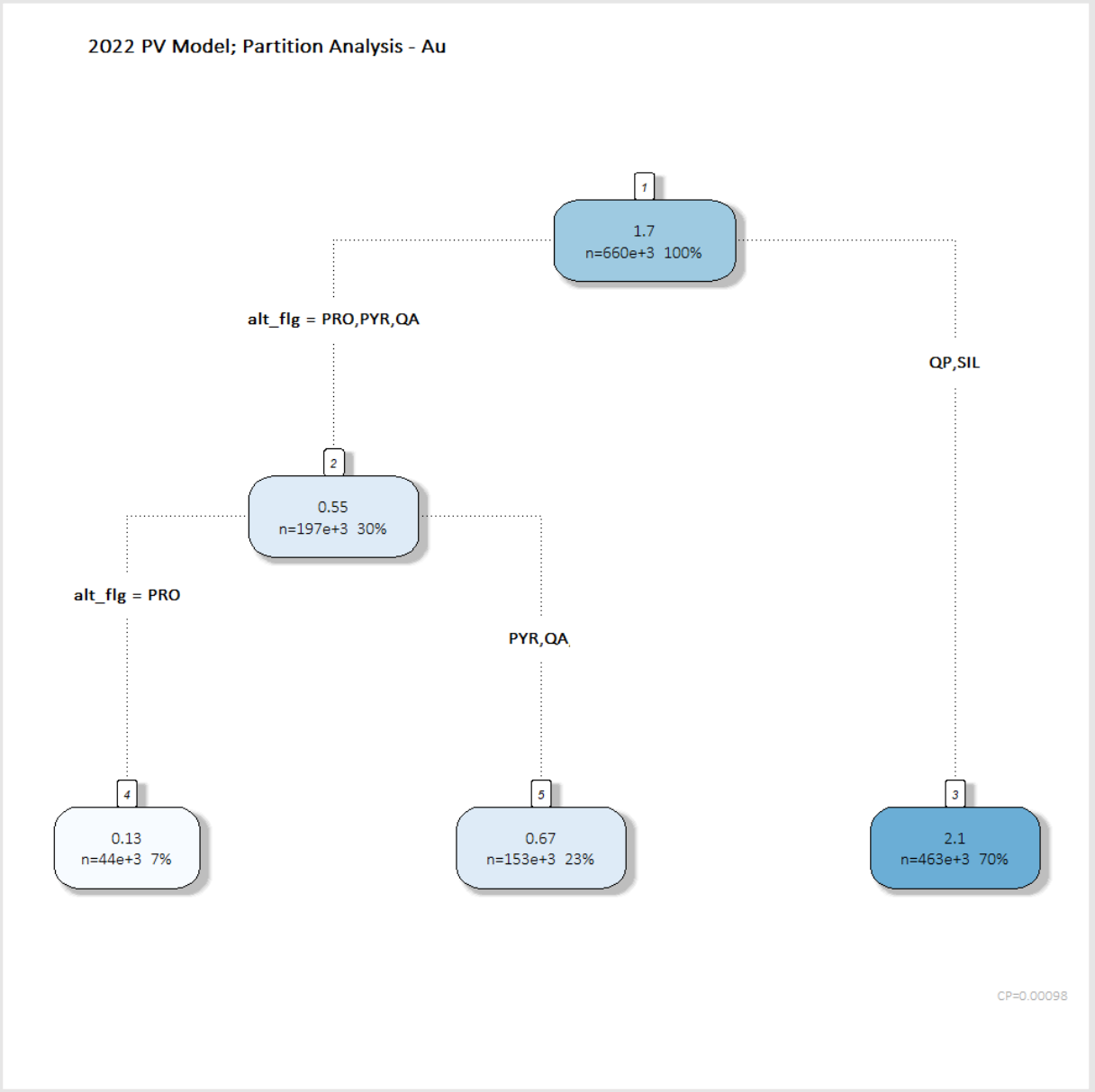


Figure 14-8 Partition Analysis – Au

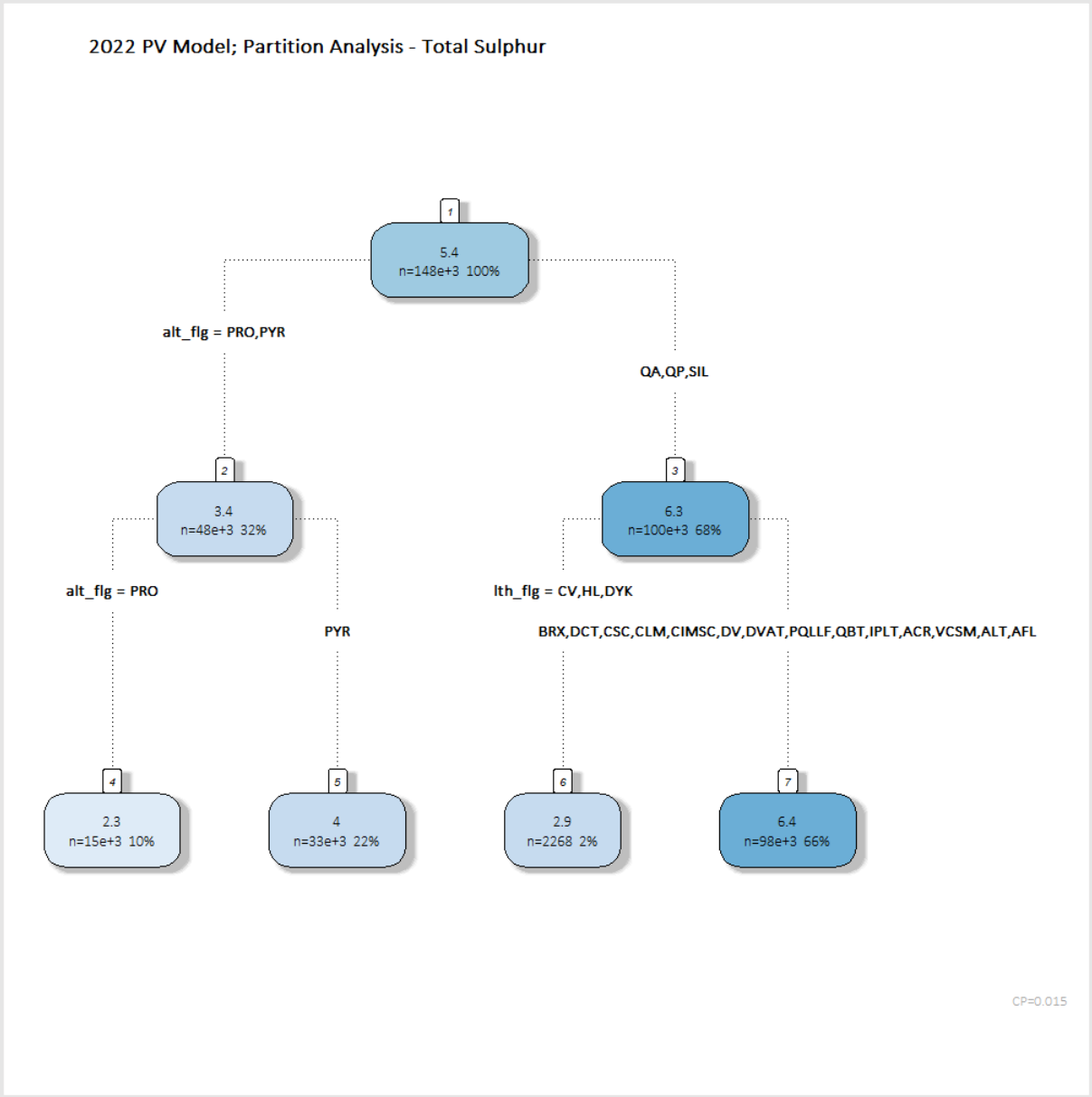


Figure 14-9 Partition Analysis – Total Sulfur

Alteration was determined to be the main driver for gold, silver, copper, and total sulfur domains, with only minor influence from lithology. For total carbon, lithology was the primary influence. In several cases, small populations (<5,000 composites) were defined which were not considered large enough for estimation. These were merged with other groups with the most similar grade distributions (for example, QA and SIL for total sulfur, have approximately 3,600 composites and 4,500 composites, respectively, and should not have a major influence on the QP Domain 92,000 composites).

Final alteration domains are summarised in Table 14-4 with the lithology groupings for the total carbon domains given in Table 14-5 and Figure 14-10. It is noted that IPLT was included with CIMSC in the C4 domain based on the mean grades and spatial association as IPLT has only limited data

(<2000 composites). Similarly, the AFL unit, which has approximately 680 composites and is in contact with the ACR units, was included in the C1 domain.

The Monte Oculto fault has an approximate throw of 100m and was observed to off-set mineralization, so the above areas were further sub-domained by this structure for estimation. Domains three and four for gold (AU3 and AU4) show some bimodality, which is thought to relate to overprinting of acid alteration (Figure 14-11); consequently, a 1.0g/t grade shell was applied to help control this for estimation.

Table 14-4 Au, Ag, Cu and S(tot) Alteration Domain Grouping

Element	Domain			
	1	2	3	4
Au	PRO	PYR	QA	QP; SIL
Ag	PRO	PYR	QA	QP; SIL
Cu	PRO	PYR	QP	QA; SIL
S(tot)	PRO	PYR	QA; QP; SIL	

Table 14-5 Lithology Grouping for C(tot) Domains

Domain	Lith Groups	
C1	ACR	AFL
	ALT	BRX
	DVAT	QBT
C2	CSC	CV*
	DCT	DYK
	PQLLF	
C3	DV	
C4	IPLT	CIMSC
C5	CLM	VCSM
C6	HL	

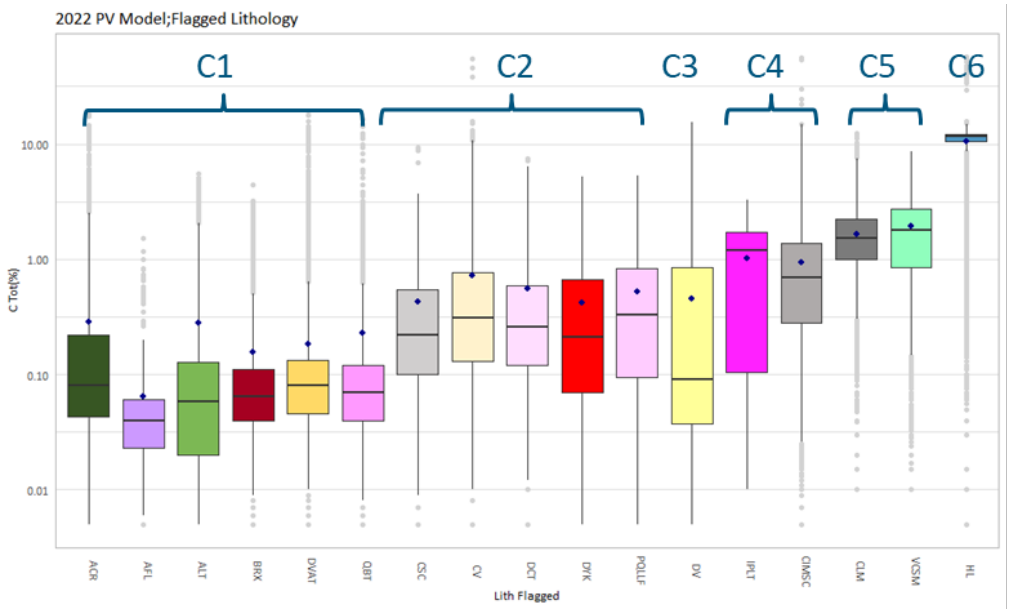
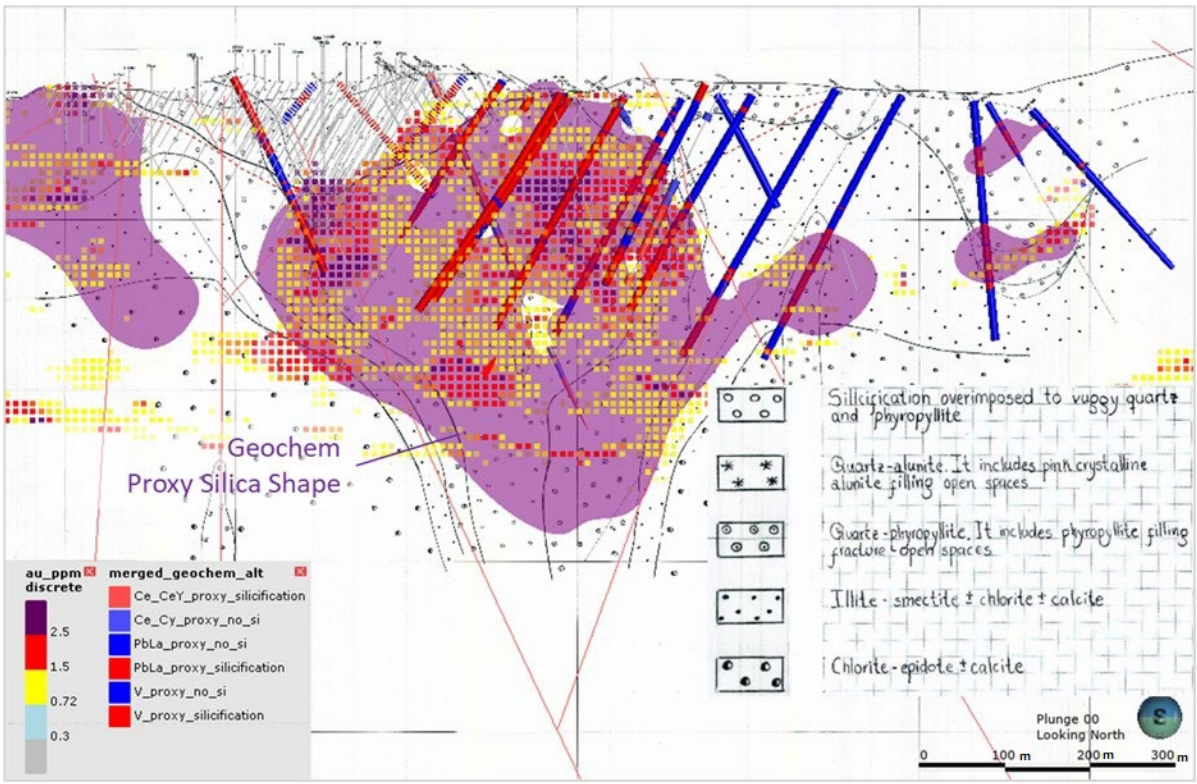


Figure 14-10 Grouped Lithologies for Total Carbon Domains



Source: Pueblo Viejo, 2021

Figure 14-11 Acid Silica Over-Printing from Geochem Proxy

Univariate statistics for raw assays by the final domains are shown in Table 14-6:

Table 14-6 Univariate Statistics Raw Assays by Domain

Element	Domain	Count	Min	Max	Mean	Q1	Med	Q3	SD	Var	CoVar	Missing
Au (g/t)	AU1	44,364	0.005	79.95	0.13	0.01	0.02	0.05	0.78	0.61	5.80	105
	AU2	129,338	0.001	173.20	0.62	0.01	0.05	0.46	2.01	4.03	3.23	173
	AU3	16,416	0.005	34.82	1.35	0.42	0.85	1.64	1.73	2.99	1.28	16
	AU4	456,974	0.001	1967.64	2.15	0.47	1.30	2.69	5.32	28.31	2.48	378
Ag (g/t)	AG1	44,140	0.005	234.00	0.76	0.01	0.15	0.40	4.55	20.69	5.98	329
	AG2	129,130	0.005	2037.55	3.93	0.15	0.70	2.00	16.98	288.32	4.32	381
	AG3	16,395	0.005	1156.80	7.22	1.60	3.40	7.60	16.44	270.18	2.28	37
	AG4	422,445	0.005	2690.00	12.76	1.50	5.30	13.00	31.44	988.52	2.46	655
S Total (%)	S1	35,967	0.005	44.01	2.51	0.65	1.85	3.84	2.38	5.67	0.95	8,502
	S2	118,416	0.005	53.00	4.71	2.20	4.65	6.77	3.07	9.42	0.65	11,095
	S3	442,326	0.005	46.40	7.29	5.05	6.74	8.82	3.81	14.53	0.52	31,458
C Total (%)	C1	345,975	0.005	19.36	0.23	0.04	0.07	0.14	0.44	0.20	1.94	25,345
	C2	19,805	0.005	9.26	0.47	0.09	0.25	0.69	0.56	0.31	1.18	1,240
	C3	7,692	0.005	15.34	0.42	0.04	0.08	0.74	0.73	0.54	1.77	2,660
	C4	212,455	0.005	53.50	0.93	0.27	0.70	1.36	0.85	0.72	0.92	8,108
	C5	19,441	0.005	12.36	1.68	0.98	1.54	2.27	1.00	1.00	0.59	953
	C6	3,624	0.005	15.51	10.32	10.68	11.75	12.14	3.59	12.85	0.35	466

14.4 Bulk Density

The density database consists of 1,744 density measurements from 285 drillholes. This is a greater than 50% increase from the 2020 dataset; however, density is still considered under sampled, and a program to increase density coverage has been started.

Due to the lack of data, previous models used a regression-based relationship between total sulfur and density to calculate block density values based on the estimated sulfur grade. This relationship was last updated in 2008 and was based on 854 samples.

The available data was merged with lithology and alteration for further evaluation and then analysed for outliers using modified Z-Score methodology. This flagged 24 values (≤ 2.201 and ≥ 3.347) as outliers, which were excluded from further analysis.

Lithology showed the largest variation in density; however, there were several lithology groups that contained no or very limited density measurements (< 10), so lithology was considered unsuitable for density assignment. Instead, the regression formula was updated based on the additional outlier trimmed data and is presented below along, with a scatterplot in Figure 14-12.

The calculated regression is Density = 2.714 + 0.017 * S%

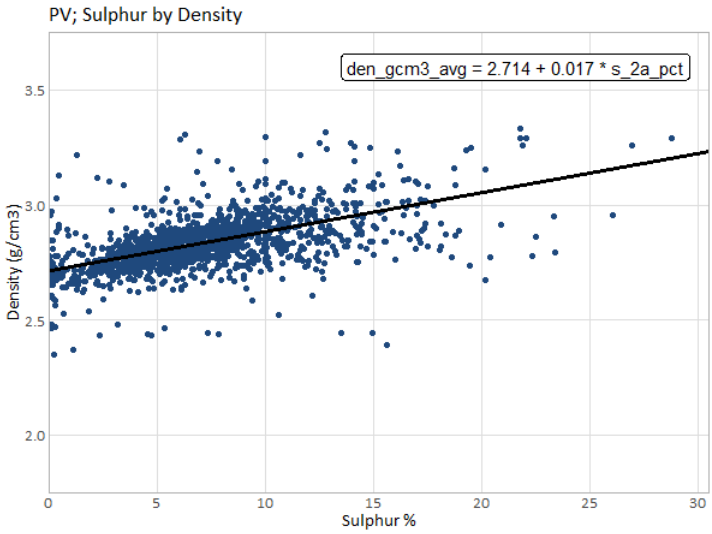


Figure 14-12 Scatterplot – Total Sulfur against Density

The measured density was also compared against the 2008 dataset and the updated regression (Figure 14-13) by the sulfur bins used for ore routing. The updated formula (den_calc) aligns better with measured values, particularly for the very low and high bins.

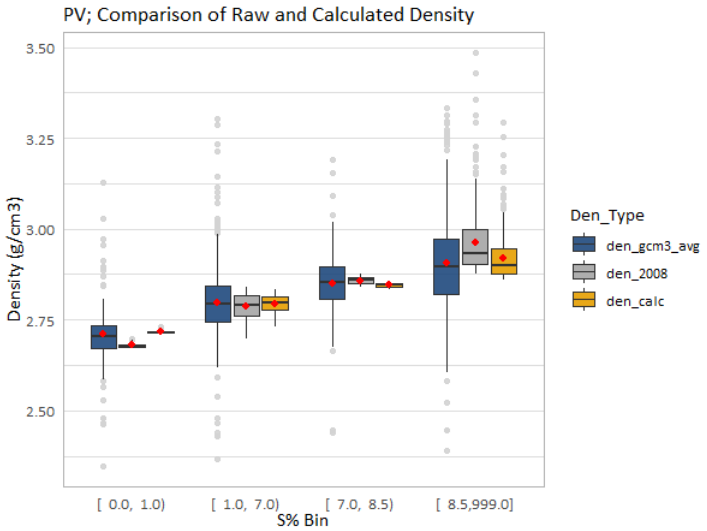


Figure 14-13 Comparison of Measured and Calculated Density by Sulfur Bin

14.5 Compositing

The raw assay data was composited to two-meter down-hole composites independent of lithology and alteration. The two-meter length was based on the mean gold assay length (Figure 14-14). Missing values (grade = -99) were excluded from the compositing. Composites less than one meter were merged with the previous interval to limit the influence of short length composites and provide more equal support.

As the mean sample length is the same as the chosen composite length, there is no significant difference in the univariate statistics between the raw assays and the composited data (Figure 14-15).

The composites were then flagged by the alteration and lithology wireframes and domains assigned based on the flagged values. Univariate statistics of composited data by domain is given in Table 14-7.

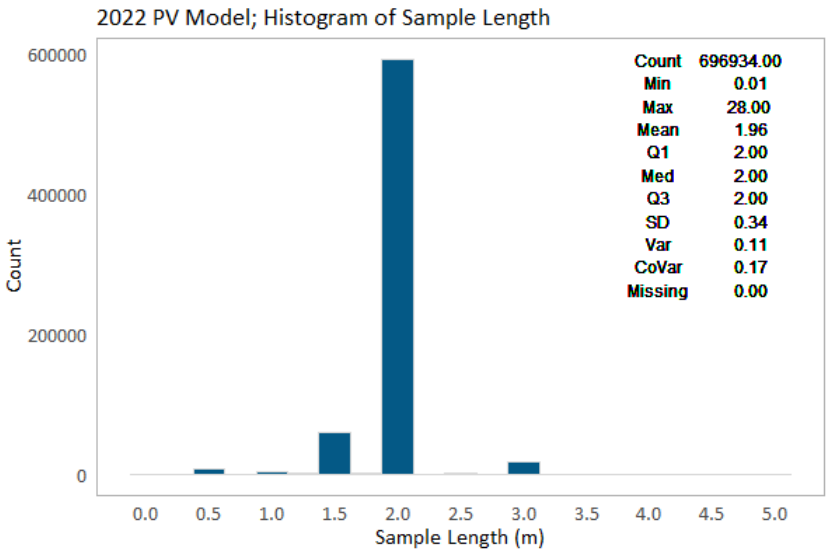


Figure 14-14 Histogram – Raw Sample Length

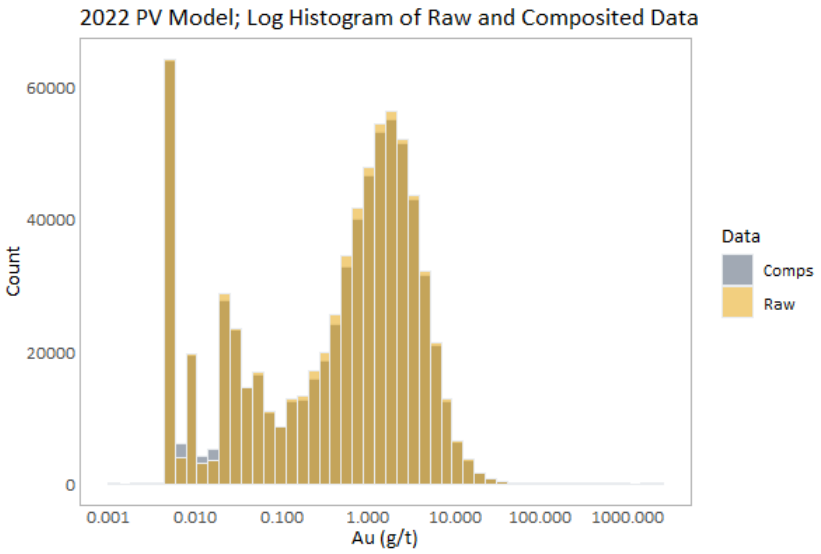


Figure 14-15 Histogram Comparing Raw and Composited Data

Table 14-7 Univariate Statistics 2m Composites by Domain

Element	Domain	Count	Min	Max	Mean	Q1	Med	Q3	SD	Var	CoVar	Missing
Au (g/t)	AU1	47,529	0.005	79.95	0.12	0.01	0.02	0.05	0.73	0.54	5.98	6,147
	AU2	129,849	0.001	142.85	0.61	0.01	0.05	0.45	1.95	3.80	3.19	4,240
	AU3	11,572	0.005	23.00	1.33	0.48	0.91	1.66	1.48	2.18	1.11	90
	AU4	445,039	0.001	899.05	2.15	0.47	1.31	2.71	4.30	18.51	2.00	4,241
Ag (g/t)	AG1	47,610	0.005	234.00	0.69	0.01	0.07	0.40	4.25	18.09	6.20	6,066
	AG2	129,806	0.005	2037.55	3.88	0.15	0.60	1.95	16.94	286.93	4.36	4,283
	AG3	11,554	0.005	1156.80	7.41	1.95	4.00	8.20	16.62	276.38	2.24	108
	AG4	411,191	0.005	2604.59	12.79	1.50	5.40	13.10	31.12	968.70	2.43	3,564
S Total (%)	S1	39,009	0.001	40.52	2.30	0.44	1.62	3.58	2.33	5.42	1.01	14,667
	S2	119,222	0.001	53.00	4.63	2.08	4.58	6.72	3.08	9.48	0.67	14,867
	S3	430,343	0.001	46.40	7.21	5.02	6.70	8.71	3.75	14.09	0.52	30,599
C Total (%)	C1	334,287	0.005	19.36	0.24	0.04	0.08	0.15	0.46	0.21	1.92	24,804
	C2	14,821	0.005	9.26	0.50	0.10	0.27	0.72	0.59	0.35	1.18	1,009
	C3	9,326	0.005	15.34	0.57	0.04	0.12	1.09	0.82	0.67	1.42	3,170
	C4	211,598	0.005	56.59	0.93	0.28	0.70	1.37	0.87	0.77	0.94	8,421
	C5	19,501	0.01	12.36	1.68	0.99	1.54	2.27	0.99	0.98	0.59	1,152
	C6	9,773	0.005	56.93	10.44	10.60	11.61	12.15	4.34	18.82	0.42	2,014

14.6 Treatment of High-Grade Outliers (Top Capping)

The composited and domained data was examined both statistically and spatially to determine an appropriate cap value to control risk metal in each of the domains. Two capping methodologies (probability plots and decile analysis) were used to statistically assess the data; the top 5% of data by domain was also reviewed both statistically and spatially.

It is noted that capping was assessed for gold and silver only. No top cuts were applied to sulfur (total or sulfide sulfur) or carbon (total or organic carbon) as the actual quantum of these elements is essential for ore processing and blending, therefore non-capping generates an appropriately conservative estimate.

Capping was applied to composites.

14.7 Gold and Silver

The cap value determined by each method for both gold and silver are summarized by domain, along with the number of composites and percentage of data capped in Table 14-8 and Table 14-9.

The cumulative probability approach was chosen as the final cap value for gold and silver as it was judged that the decile analysis top-cuts removed either too much metal, or in the case of AU3, no metal. For gold, the probability plot approach capped between 0.01% and 0.17% of the data in the domains (globally 0.03%) and reduced the metal globally by 0.7%. Capping in the lower grade domains removed a larger proportion of the metal, which represents the risk metal in these domains.

Caps for silver show similar reductions as for gold, with globally 0.03% of the data (199 data) and 0.9% of the metal.

Table 14-8 Comparison of Capping Methods – Au

DOM	Prob. Plot					Parrish (Decile Analysis)				
	Cap Value (Au g/t)	Count	%Capped	Metal Red. (len x grade)	Metal Red. (%)	Cap Value (Au g/t)	Count	% Capped	Metal Red. (len x grade)	Metal Red. (%)
AU1	10.0	43	0.09%	514	4.4%	5.7	122	0.26%	1,152	9.9%
AU2	25.0	71	0.05%	3,206	2.0%	11.8	385	0.30%	7,648	4.8%
AU3	12.0	20	0.17%	138	0.4%	N/A	0	0.00%	-	0.0%
AU4	90.0	43	0.01%	11,893	0.6%	45.0	197	0.04%	20,194	1.1%

Table 14-9 Comparison of Capping Methods – Ag

DOM	Prob. Plot					Parrish (Decile Analysis)				
	Cap Value (Ag g/t)	Count	% Capped	Metal Red. (len x grade)	Metal Red. (%)	Cap Value (Ag g/t)	Count	% Capped	Metal Red. (len x grade)	Metal Red. (%)
AG1	75.0	38	0.08%	2,600	4.0%	20.0	230	0.48%	12,455	19.1%
AG2	350.0	34	0.03%	16,639	1.7%	62.5	1036	0.80%	144,402	14.3%
AG3	110.0	22	0.19%	4,597	2.7%	85.0	45	0.39%	6,113	3.6%
AG4	600.0	123	0.03%	85,550	0.8%	130.0	3629	0.88%	776,504	7.4%

Spatially the top 5% of data in the lower-grade domains (AU1-2 and AG1-2) is well disseminated throughout the domains, with only limited clustering along individual drill holes. The high-grade domains (AU and AG4) show clustering of the data related to RC grade control data. Several N and NNW trends are evident (Figure 14-16), which are broadly aligned with modelled structural trends and the locally varying anisotropy (LVA) model.

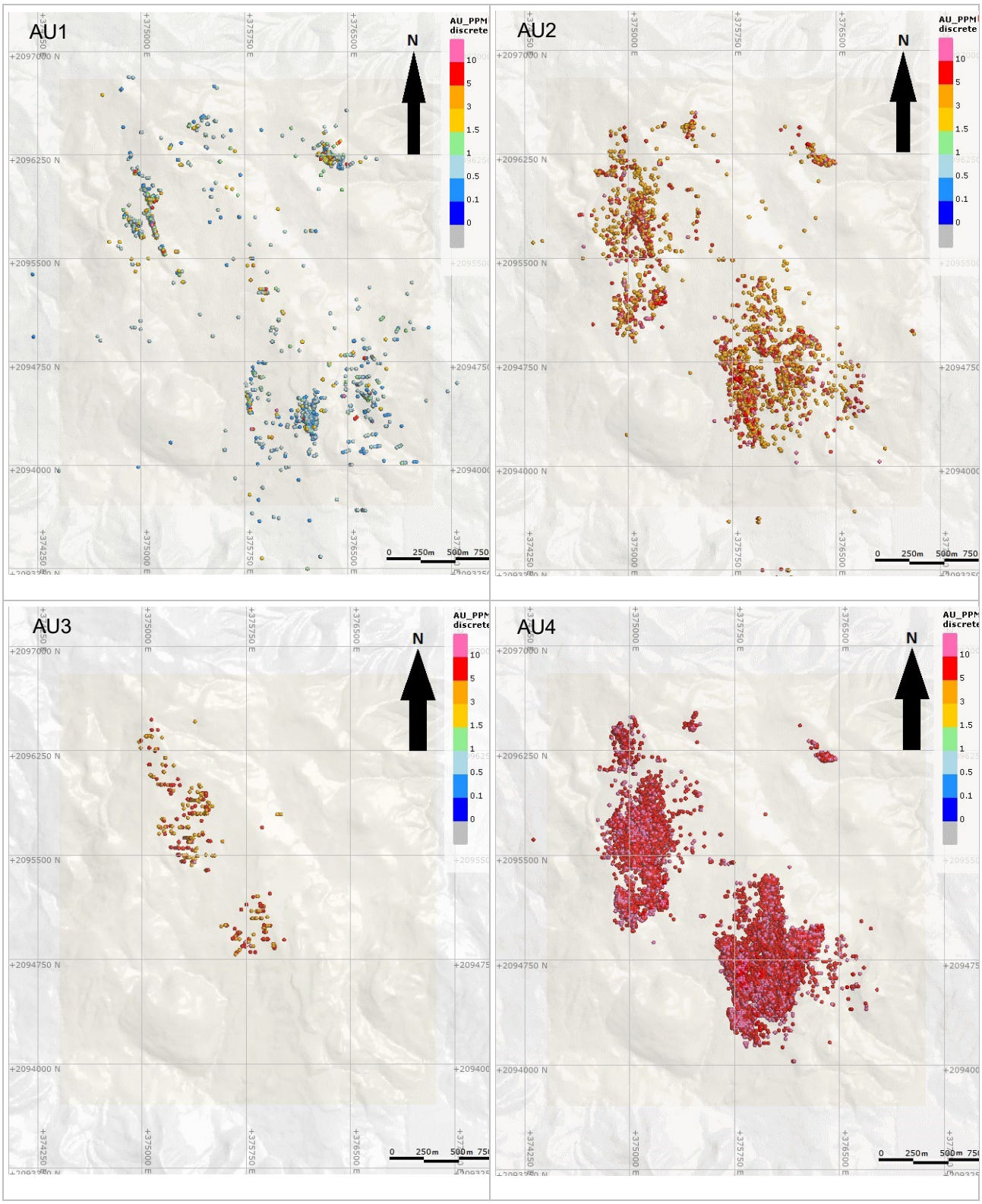
Statistically (Table 14-10 and Table 14-11), the lower grade domains for gold and silver all showed in excess of 50% of the metal and more than 50% of the mean grade was from the top 5% of data in the domains. The higher-grade domains had 23-28% of both the metal and mean grade for this portion of the population for gold, and 32-39% for silver. Overall, for silver, 41% of the metal and mean grade was from the top 5% of data, while for gold, 30% of the metal and 29% of the mean came from this portion of the data. This contribution is not considered excessive. Reducing the influence of this data is one of the primary reasons for applying top cuts, especially in lower grade domains.

Table 14-10 Univariate Statistics – Top 5% of Composites by Domain (Au)

Dom	Data	Count	Min.	Max.	Mean	Var.	Std. Dev.	Metal	% Metal	Cont. to Mean	Cont. to Var
AU1	Top 5%	2,396	0.42	80.0	1.6	8.1	2.9	7,879	68%	67%	22%
	All	47,529	0.01	80.0	0.1	0.5	0.7	11,647			
AU2	Top 5%	6,512	3.07	142.9	6.2	36.9	6.1	80,263	51%	50%	41%
	All	129,849	0.01	142.9	0.6	3.8	1.9	158,647			
AU3	Top 5%	579	3.94	23.0	6.1	6.4	2.5	7,049	23%	23%	52%
	All	11,572	0.01	23.0	1.3	2.2	1.5	30,742			
AU4	Top 5%	22,285	6.83	899.1	11.8	226.0	15.0	528,108	28%	28%	25%
	All	445,039	0.01	899.1	2.1	18.5	4.3	1,910,915			
Total	Top 5%	31,772	0.42	899.1	9.8	177.7	13.3	623,299	30%	29%	23%
	All	633,989	0.00	899.1	1.7	14.4	3.8	2,111,950			

Table 14-11 Univariate Statistics – Top 5% of Composites by Domain (Ag)

Dom	Data	Count	Min.	Max.	Mean	Var.	Std Dev.	Metal	% Metal	Cont. to Mean	Cont. to Var
AG1	Top5%	2,426	2.00	234.0	9.3	275.3	16.6	44,919	69%	67%	20%
	All	47,610	0.01	234.0	0.7	18.1	4.3	65,299			
AG2	Top5%	6,525	16.50	2037.6	45.3	3738.1	61.1	591,683	59%	58%	30%
	All	129,806	0.01	2037.6	3.9	286.9	16.9	1,007,997			
AG3	Top5%	579	23.65	1156.8	47.3	3394.6	58.3	54,786	32%	32%	29%
	All	11,554	0.01	1156.8	7.4	276.4	16.6	171,073			
AG4	Top5%	20,586	45.50	2604.6	100.3	9682.6	98.4	4,130,298	39%	39%	40%
	All	411,191	0.01	2604.6	12.8	968.7	31.1	10,516,377			
Total	Top5%	30,116	2.00	2604.6	80.1	8481.9	92.1	4,821,687	41%	41%	33%
	All	600,161	0.01	2604.6	9.8	752.9	27.4	11,760,747			



Source: Pueblo Viejo, 2022

Figure 14-16 Top 5% of Data by Domain – Au

Univariate statistics for capped gold and silver by domain are given in Table 14-12 and Table 14-13.

Total Sulfur and Total Carbon

No capping was applied to total sulfur or total carbon values. The total sulfur values were checked to ensure none exceeded 53%, which is the maximum value expected from pure pyrite. As described in Chapter 14.6, total sulfur and sulfide sulfur are considered significant for ore processing and blending, as such, non-capping generates an appropriately conservative estimate.

Table 14-12 Univariate Statistics – Capped Au by Domain

DOM	Count	Min	Max	Mean	Q1	Med	Q3	SD	Var	CoVar	Missing	Metal (len X grade)
AU1	47,529	0.005	10.0	0.1	0.01	0.02	0.05	0.5	0.3	4.6	6,147	11,133
AU2	129,849	0.001	25.0	0.6	0.01	0.05	0.45	1.6	2.5	2.6	4,240	155,441
AU3	11,572	0.005	12.0	1.3	0.48	0.91	1.66	1.4	2.0	1.1	90	30,604
AU4	445,039	0.001	90.0	2.1	0.47	1.31	2.71	3.1	9.7	1.5	4,241	1,899,022
Total	633,989	0.001	90.0	1.7	0.05	0.81	2.15	2.8	8.0	1.7	14,718	2,096,200

Table 14-13 Univariate Statistics – Capped Ag by Domain

DOM	Count	Min	Max	Mean	Q1	Med	Q3	SD	Var	CoVar	Missing	Metal (len X grade)
AG1	47,610	0.005	75.0	0.7	0.01	0.07	0.40	3.5	11.9	5.2	6,066	62,699
AG2	129,806	0.005	350.0	3.8	0.15	0.60	1.95	14.1	199.6	3.7	4,283	991,358
AG3	11,554	0.005	110.0	7.2	1.95	4.00	8.20	10.8	115.9	1.5	108	166,476
AG4	411,191	0.005	600.0	12.7	1.50	5.40	13.10	27.8	770.3	2.2	3,564	10,430,827
Total	600,161	0.005	600.0	9.7	0.60	3.00	9.80	24.4	594.3	2.5	14,021	11,651,360

14.8 Contact Analysis

The grade profiles across domain boundaries were examined to assess the appropriate boundary type for estimation using contact plots (examples given in Figure 14-17). A mix of boundary types was observed, summarised in Figure 14-18. In the cases where only limited samples were in contact, hard boundaries were applied.

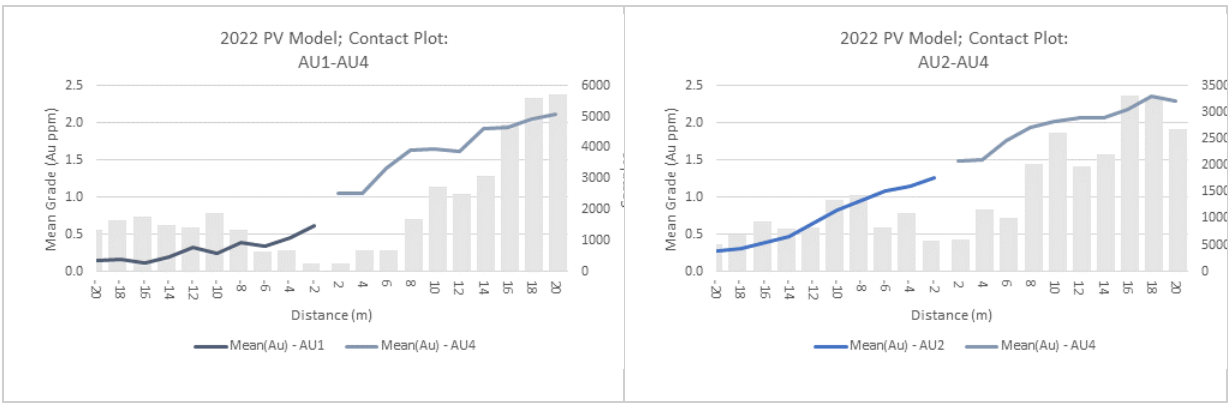


Figure 14-17 Example Contact Plots by Domain

	AU1	AU2	AU3	AU4
AU1		Soft	Hard	Hard
AU2			Soft	Soft
AU3				Soft
AU4				

	AG1	AG2	AG3	AG4
AG1		Soft	Hard	Hard
AG2			Soft	Soft
AG3				Soft
AG4				

	S1	S2	S3
S1		Soft	Hard
S2			Soft
S3			

	C1	C2	C3	C4	C5	C6
C1		Hard	Hard	Hard	Hard	Hard
C2			Hard	Hard	Hard	Hard
C3				Hard	Hard	Hard
C4					Hard	Hard
C5						Hard
C6						

Figure 14-18 Summary of Contact Boundary Types

14.9 Variography

Gold and Silver

Three dimensional correlogram models were generated for gold and silver using Sage2001® software.

The nugget effect was based on the apparent nugget from the down-hole correlograms and used to fit the final model. The modelled nugget was between 0.15 and 0.3 for gold and between 0.2 and 0.3 for silver, which is considered appropriate for this style of mineralization.

The parameters applied when calculating the correlograms are given in Table 14-14. Note that Vulcan® GSLIB (ZXY, LRL) rotations conventions are used. The variogram ellipses were visualized to check that they were aligned with the structural and alteration controls on mineralization. The final modelled correlograms are given in Table 14-15 and Table 14-16, with an example for the AU4 domain presented in Figure 14-19.

Table 14-14 Sage2001 Correlogram Calculation Parameters

Directional Increments	Azimuth	30°
	Dip Angle	15°
Lag Specifications	Distance	25m
	Max No.	50
Bandwidths	Horizontal	25
	Vertical	30
Tolerances	Lag	0.45
	Angular	22.5°

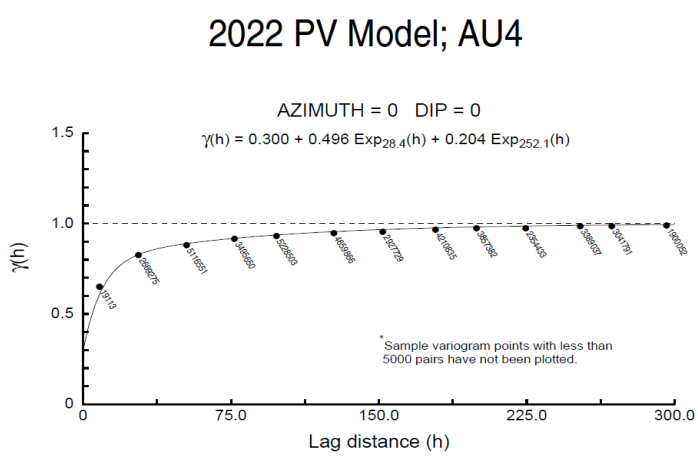


Figure 14-19 Example Correlogram - AU4

Table 14-15 Modelled Correlograms – Au

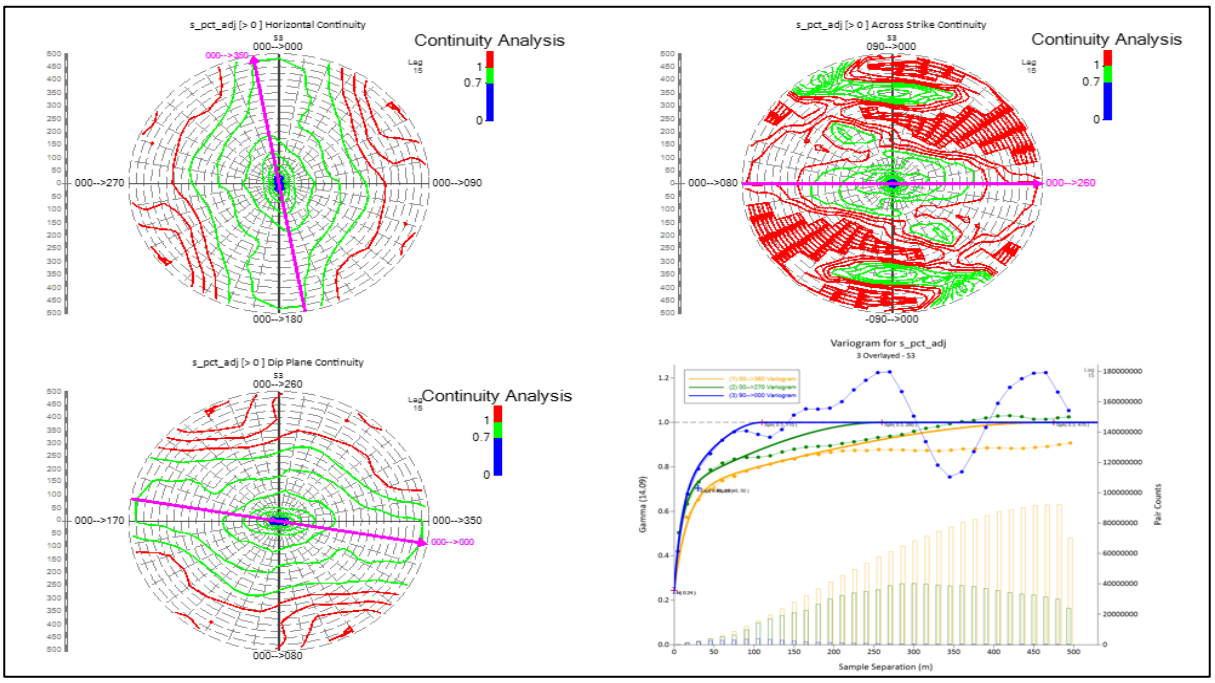
Domain	Type	Str.	Sill	Ranges			Rotation (ZXY, LRL)		
				Major (m)	Minor (m)	Semi (m)	Z'	X'	Y'
AU1	-	C0	0.25	-	-	-	-	-	-
	Exp	C1	0.684	46.7	73.4	11.7	1	-2	85
	Exp	C2	0.066	283.4	60.6	223.8	5	101	-41
AU2	-	C0	0.15	-	-	-	-	-	-
	Exp	C1	0.602	43.5	28.0	20.9	-8	3	29
	Exp	C2	0.248	385.3	208.5	153.7	-8	3	29
AU3	-	C0	0.25	-	-	-	-	-	-
	Exp	C1	0.338	23.2	9.6	14.8	-24	13	52
	Exp	C2	0.412	218.6	111.7	120.6	-24	13	52
AU4	-	C0	0.3	-	-	-	-	-	-
	Exp	C1	0.503	32.1	20.3	16.8	-8	9	3
	Exp	C2	0.197	272.8	151.4	129.3	-8	9	3

Table 14-16 Modelled Correlograms – Ag

Domain	Type	Str.	Sill	Ranges			Rotation (ZXY, LRL)		
				Major (m)	Minor (m)	Semi (m)	Z'	X'	Y'
AG1	-	C0	0.2	-	-	-	-	-	-
	Exp	C1	0.775	27.3	22.5	121.3	4	-1	-4
	Exp	C2	0.025	186.5	90.9	214.2	4	-1	-4
AG2	-	C0	0.25	-	-	-	-	-	-
	Exp	C1	0.41	41.1	16.4	12	-50	1	32
	Exp	C2	0.34	180.4	104.3	152.1	-1	37	-2
AG3	-	C0	0.3	-	-	-	-	-	-
	Exp	C1	0.499	72.8	27.9	16.3	-12	13	-24
	Exp	C2	0.201	453.8	119.4	185.2	-24	10	-22
AG4	-	C0	0.2	-	-	-	-	-	-
	Exp	C1	0.545	18.6	11	9.8	5	-23	23
	Exp	C2	0.255	257.8	127.6	91.5	-7	18	40

Total Sulfur

Experimental variograms were calculated and modelled in Snowden Supervisor® software. Variography for total sulfur was done by domain using the 2-meter composite database. Nugget values were determined from downhole variograms, and spatial continuity directions and models were obtained from variogram maps. Examples are presented below, along with the final models in Figure 14-20 and Table 14-17.



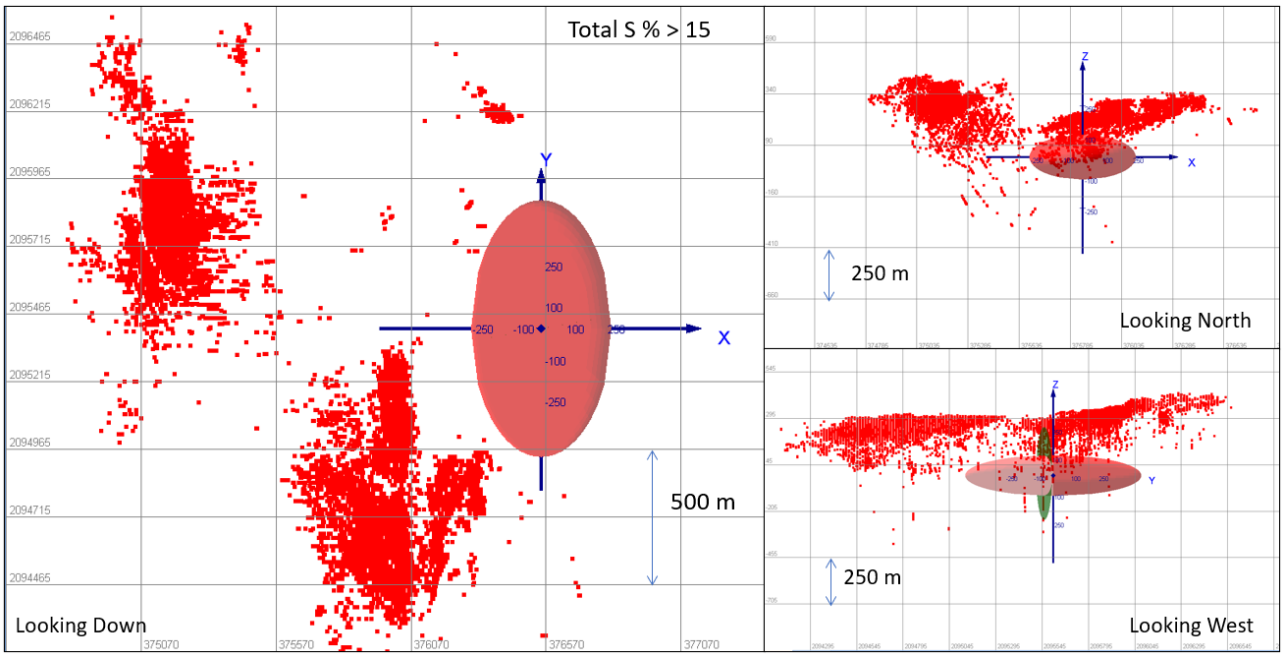
Source: Pueblo Viejo, 2022

Figure 14-20 S3 Domain Variogram Maps and Model in the Three Main Directions

Table 14-17 Total Sulfur Domains Variogram Model Parameters

Domain	Type	Str.	Sill	Ranges			Rotation (ZXY, LRL)		
				Major	Minor	Semi	Z'	X'	Y'
S1	-	C0	0.14	-	-	-	-	-	-
	Sph	C1	0.26	20	15	10	315	0	10
	Sph	C2	0.6	285	90	75			
S2	-	C0	0.14	-	-	-	-	-	-
	Sph	C1	0.26	20	20	15	189	-7	-19
	Sph	C2	0.6	410	185	124			
S3	-	C0	0.24	-	-	-	-	-	-
	Exp	C1	0.46	50	30	30	-12	13	-24
	Sph	C2	0.3	475	269	110	360	0	0

Directions of spatial continuity modelled were compared visually with the extension of high-grade zones from the composites and the distances observed from the correlation ranges from the variogram models (Table 14-17). Plan and section views of the anisotropy model are given in Figure 14-21 below.

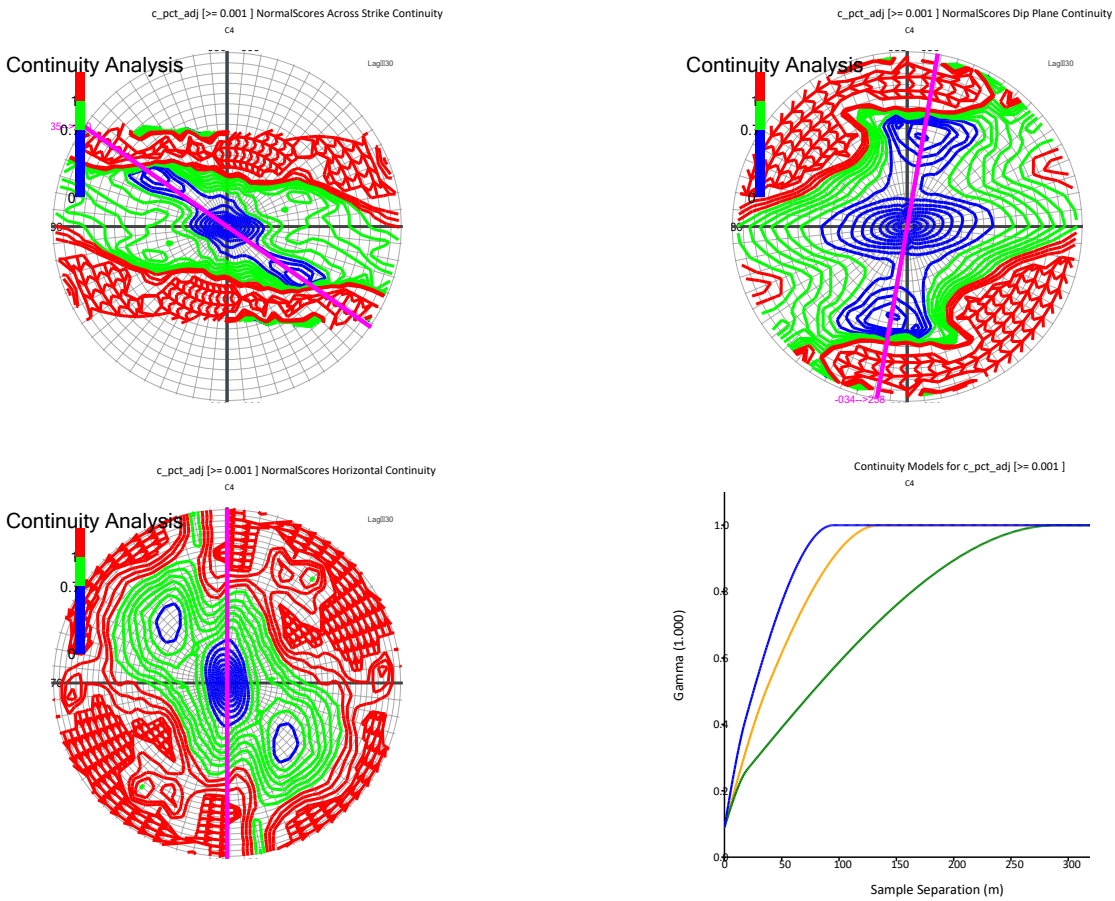


Source: Pueblo Viejo, 2022

Figure 14-21 Plan View and Cross Sections of >15% Total Sulfur Composites and Anisotropy Model

Total Carbon

Where directional continuity was not obvious, e.g., Domain C1, a visual review of grades and lithology trends were utilized to maximize the continuity. Continuity analyses coupled with normal score variograms for total carbon in domain C4 are shown Figure 14-22.



Source: Pueblo Viejo, 2022

Figure 14-22 C4 Domain Variogram Maps and Model in the Three Main Directions

14.10 Resource Estimation

There were several changes to the estimation approach and modelling methodology from the previous model, including:

- Sub-blocking to match wireframe volumes better.
- LVA was used to control the search at a block scale.
- Accounting for correlation between variables.
- Change-of-Support based on HERCO (Hermite Correction).

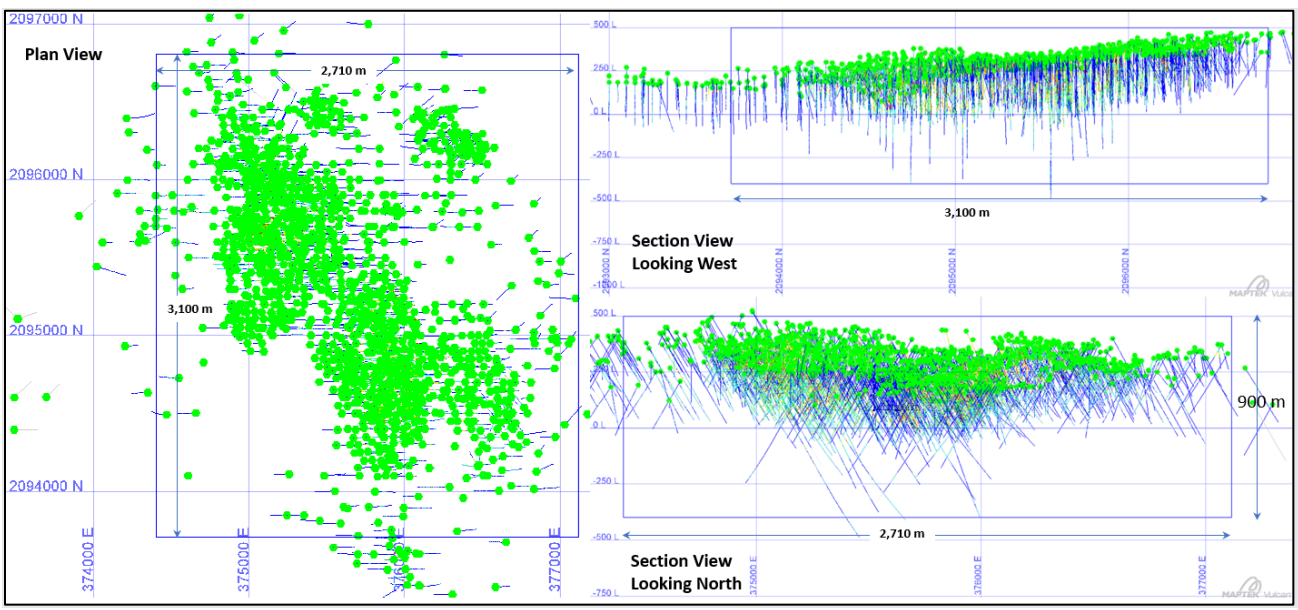
These changes have not materially changed the estimation results; however, they were undertaken to generate a more transparent and reproducible model.

Block Model

An orthogonal (non-rotated), sub-blocked model (*pv_model_2022_subcel_exclude_air.bmf*) was constructed in Vulcan using the origin and rotation parameters outlined in Table 14-18. Two sub-cell schemas (5x5x5 m and 2.5x2.5x2.5 m) were defined to honour the volume and shape of the lithological and hydrothermal alteration models, particularly the hydrothermal breccia (HBRX) lithology model, which is narrow and poorly captured in the regularized model. Defined block model extents in the horizontal and vertical directions is enough to capture most of the drilling (Figure 14-23) and encompasses the Monte Negro, Moore, Cumba and Upper Mejita areas.

Table 14-18 Geometric Definition of the Block Model

Coordinates	East (UTM)	North (UTM)	Elevation (UTM)			
Minimum	374,407.5	2,093,705.0	-400.0			
Maximum	377,117.5	2,096,805.0	500.0			
Extension (m)	2,710.0	3,100.0	900.0			
Cell Type	Block Size (m)			Number of Blocks		
	East	North	Elevation	East	North	Elevation
Parent	10	10	10	271	310	90
Sub Cell 1	5	5	5	542	620	180
Sub Cell 2	2.5	2.5	2.5	1,084	1,240	360



Source: Pueblo Viejo, 2022

Figure 14-23 Block Model Bounds and Exploration and Resource Definition Drilling

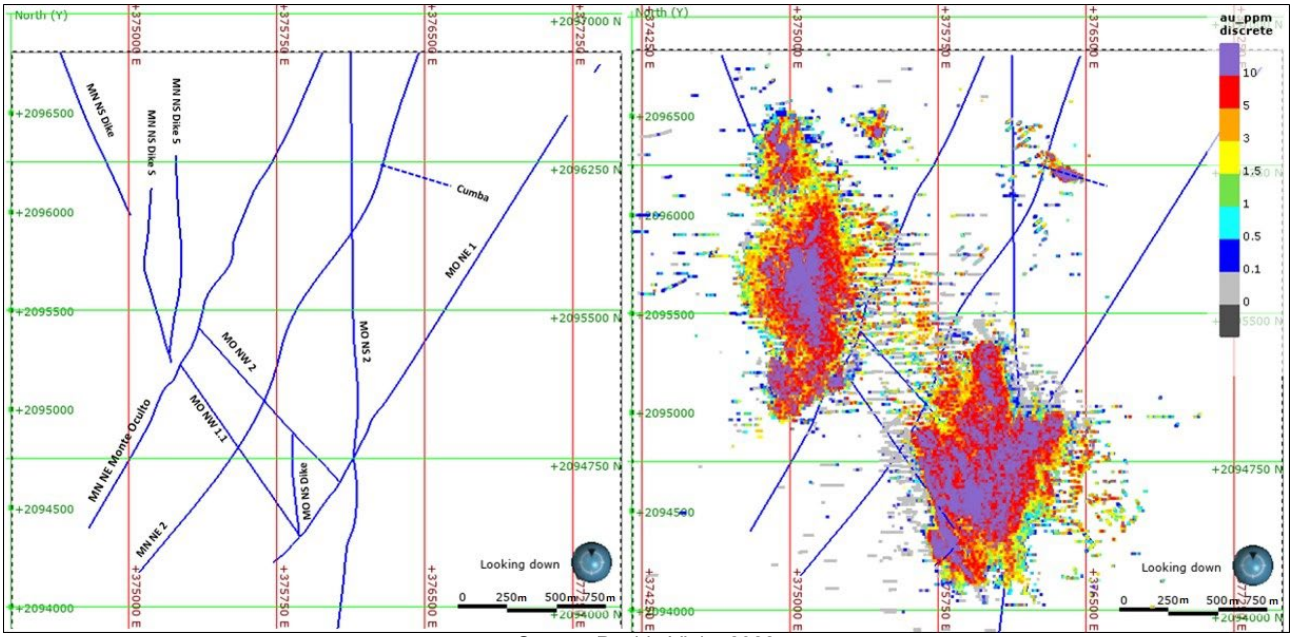
The wireframe volumes were compared to the block volumes for lithology and alteration to ensure that the modelled geometry was adequately captured in the block model. In all cases, there was minimal resolution loss, with less than a 1% difference between the wireframe and block volumes.

Block model included several variables to store estimated grades for gold, silver, copper, total and sulfide sulfur, total and organic carbon, average distances of composites, number of drillholes and other estimation parameters for validation and post-estimation processing.

Locally Varying Anisotropy (LVA)

To better represent local controls on grade orientation, it was decided to utilize an LVA style approach to defining the search orientation.

A strong spatial relationship between high gold grades and some main faults is observed in both the Monte Negro and Moore pits (Figure 14-24). In the Cumba area, the ore body is elongated in an NW to EW orientation. Table 14-19 outlines the faults from the structural model used to build the LVA field. The strike and dip angles for each triangle were calculated using the Three-Point method, and these values, along with the triangle centroid, were used to generate a nearest neighbor (NN) estimate of strike and dip in the block model.



Source: Pueblo Viejo, 2022

Figure 14-24 Faults and Lineaments Used to Guide the LVA Search Orientations

Table 14-19 Faults and Lineaments Used to Guide the LVA Search Orientations

Pit Area	Fault/Lineament
Monte Negro	NS Dike
	NS Dike 5
	NS 5
	NE 2
	NE Monte Oculto
Moore	NS 2
	NS 3
	NS Dike
	NE
	NW 1_1
	NW 2
Cumba	NW to EW

Grade Estimation

This model represents a significant improvement to the methodology from the previous models. Historically, an indicator grade shell approach was used, along with domaining based on fault blocks; this approach was overly complicated for reasons including:

- The fault blocks generally did not show any offsets to mineralization.
- The estimates were not linked to lithology or alteration.
- Resulted in bimodal grade populations.
- Some “domains” were estimated with exceptionally small numbers of samples.

A more data-driven modelling methodology has been adopted with estimation plans linked to change-of-support., specifically:

- Regrouping of the alteration and lithology models based on statistical and spatial reviews.
- Removal of indicator grade shell as a basis for domaining.
- Rationalization of the faults to include only faults with offset and/or clear structural control on mineralization.
- Locally Varying Anisotropy (LVA) is used to control the search at a block scale.
- Change-of-Support based on theoretical grade-tonnage curve derived using HERCO.

Previous models did not account for the necessary correlation between total sulfur and sulfide sulfur and total carbon and organic carbon, leading to sulfide sulfur and organic carbon block values exceeding the total sulfur and total carbon values in the same block. Organic carbon and sulfide sulfur was not available from PV’s preferred assay laboratory until 2019. However, some sulfide

sulfur records from Exploration Phase 1 exist (2006), but only for sporadic drill holes. The disconnect between total sulfur and sulfide sulfur and total carbon and organic carbon is addressed in this model by estimating only paired data and calculating ratios based on this data.

Copper has been estimated historically; however, it is no longer recovered, does not form a part of the revenue stream, and is not publicly disclosed. There are currently no plans to resume copper recovery; doing so would require further engineering studies and plant modification. On this basis, copper is not detailed in this report.

Gold and Silver

Gold and silver grades were estimated in Vulcan using ordinary kriging (OK). Estimation parameters for the first pass gold estimate are summarised in Table 14-20.

Table 14-20 First Pass Au Estimation Parameters

Dom	Grid Shell	Discretization			Par Cell Est.	Search (m)			Composites			High Yield Limit					Soft Boundaries		
		X	Y	Z		Maj	Semi	Min	Min	Max	Per Hole	Use ?	COG	Distance (m)			Use ?	Domains	Max Dist (m)
														X	Y	Z			
AU1	N/A	2	2	5	Y	75	75	15	2	14	2	N					N	AU2	4
AU2	Out	2	2	5	Y	75	75	15	3	12	2	N					N	AU2	4
	In	2	2	5	Y	75	75	15	3	10	2	N					N	AU3; AU4	4
AU3	Out	2	2	5	Y	75	75	15	4	12	2	Y	3	30	30	30	Y	AU3; AU4	4
	In	2	2	5	Y	75	75	15	3	12	2	N					N	AU4	4
AU4	Out	2	2	5	Y	75	75	15	4	8	2	Y	3	50	50	50	Y	AU3	4
	In	2	2	5	Y	75	75	15	3	12	2	N					N	AU3	4

The final estimation plan for each domain was derived by refining the estimate to match the theoretical distribution from HERCO (see **Change-of-Support**) below.

The estimates were sub-divided into the footwall (FW) and hanging wall (HW) of the Monte Oculto Fault and internal and external to the 1.0 g/t gold grade shell where appropriate. All other relevant estimation parameters are presented in the block estimation files. The silver estimate used the same parameters as the gold estimate, except for the high-yield limit values.

Second and third estimation passes, using expanded searches and reduced composite requirements were also run to fill blocks. Any estimated blocks remaining were manually set to 0.005 g/t for both gold and silver by script.

The percentage of blocks filled in each pass is presented in Figure 14-25. The higher grade, well-drilled domains (AU3 and AU4) showed approximately 40 to 45% of blocks estimated in the first pass and between 60% to 80% in the second pass. Domains AU1 and AU2, which are peripheral to the main mineralized zones and have sparse drilling, had around 60% of blocks filled in passes 1-3, with most of the un-estimated blocks at depth.

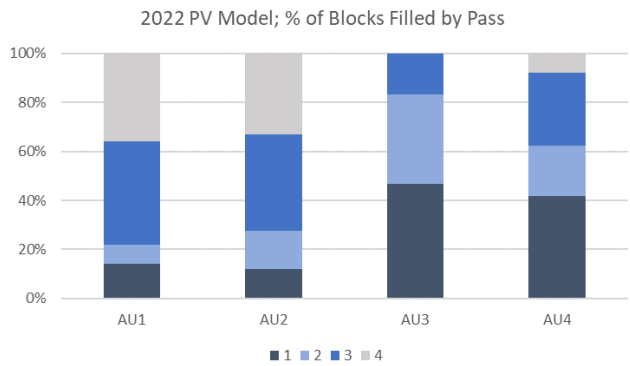
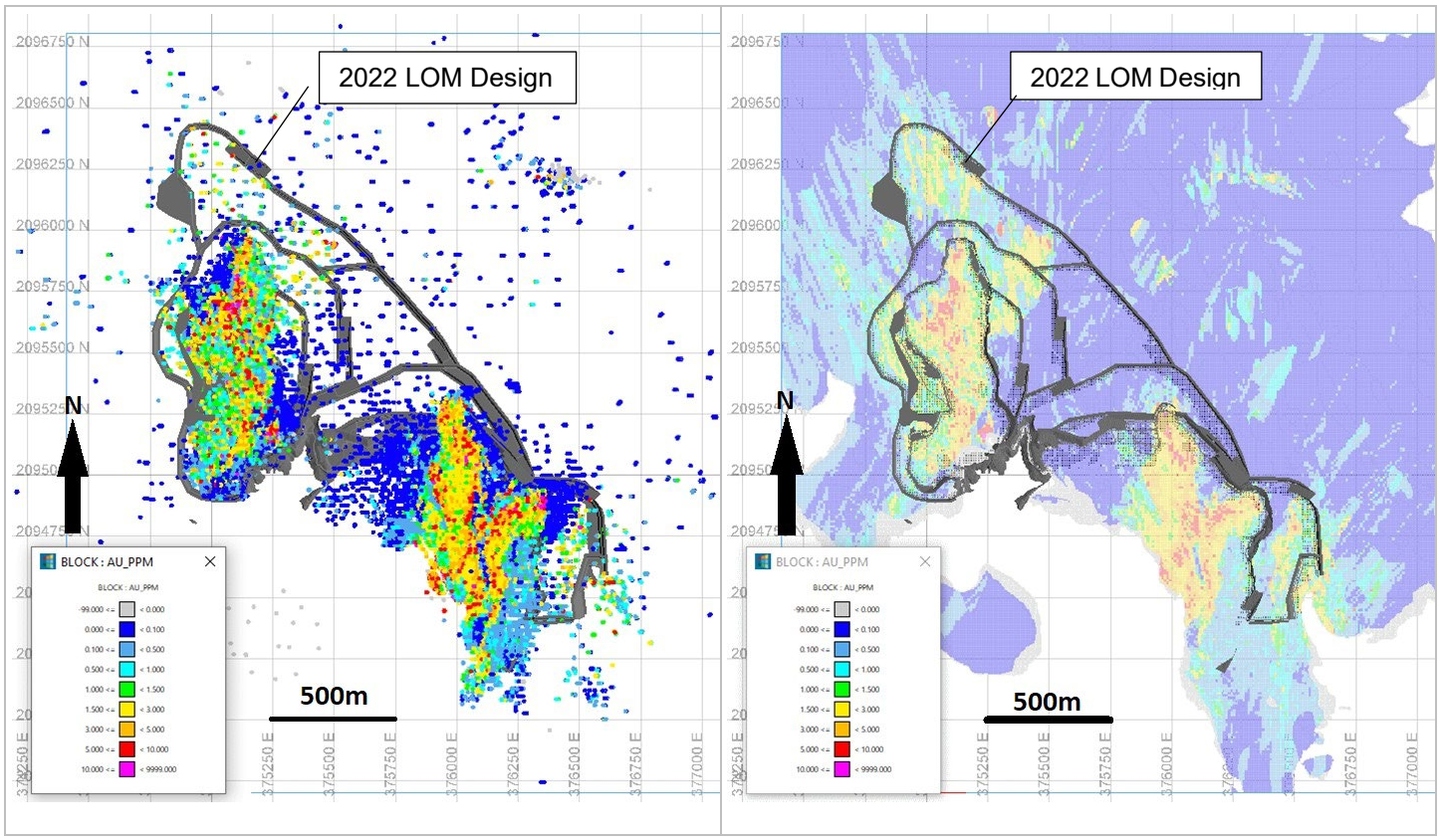


Figure 14-25 Percentage of Blocks Filled by Estimation Pass

In addition to the above estimates, the following were also completed for validation purposes:

- A nearest neighbour estimate (AU_NN and AG_NN) on capped 10 m composites to provide a declustered distribution for HERCO and swath plots.
- An Inverse Distance (ID3) estimate (AU_ID_C and AG_ID_C) as an alternative estimation method.
- An uncapped estimate (AU_OK_UNC and AG_OK_UNC) to quantify the amount of metal removed by capping.

An example plan view slice through the gold estimate, comparing the estimate to composites, is given in Figure 14-26.



Source: Pueblo Viejo, 2022

Figure 14-26 Plan (250RL) Comparing Composites and Block Grades

14.11 Total Sulfur and Sulfide Sulfur

Due to the low overall volume of sulfide sulfur assays, relative to total sulfur, estimates were completed in two phases. Initially, a total and sulfide sulfur estimate was performed using only paired data. This estimate used Ordinary Kriging in Vulcan, with the estimation plan outlined in Table 14-21.

A total sulfur estimate was also completed using all available total sulfur data and the estimation plan shown in Table 14-21. The linear relationship derived from the paired estimate was then used to calculate a sulfide sulfur value against this estimate.

The number of blocks estimated by pass is presented in Figure 14-27.

Table 14-21 Total and Sulfide Sulfur estimation plan

Dom	Est. Run	Discretization			Par. Cell Est.	Search (m)			Composites					Soft Boundaries		
		X	Y	Z		Maj.	Semi	Min.	Min.	Max	Per Hole	Min. Holes	Max. Holes	Use	Dom	Max Dist (m)
S1	1	2	2	5	Y	75	75	15	2	15	5	2	5	Y	S2	10
	2					150	150	60				2	5			
	3					325	325	120				1	5			
S2	1	2	2	5	Y	75	75	15	2	15	5	2	5	Y	S3	10
	2					150	150	60				2	5			
	3					325	325	120				1	5			
S3	1	2	2	5	Y	75	75	15	2	15	5	2	5	Y	S2	10
	2					150	150	60				2	5			
	3					325	325	120				1	5			

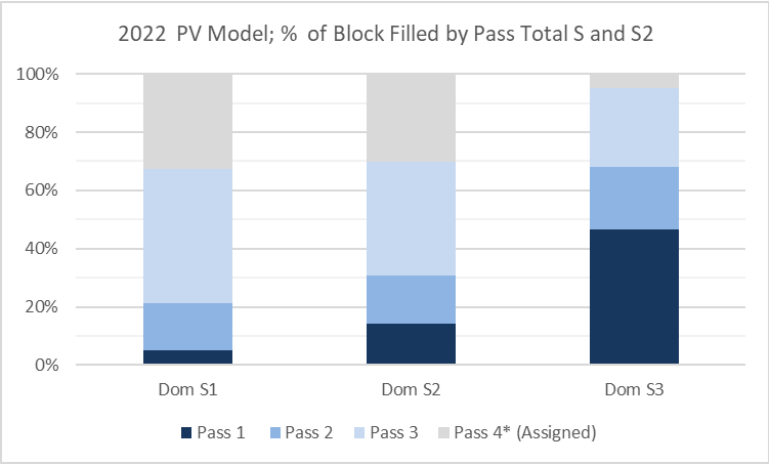


Figure 14-27 Percent of Blocks Estimated by Estimation Pass - Sulfur

Total and Organic Carbon

Carbon was estimated in the model using OK, using the estimation plan outlined in Table 14-22 below. Total carbon was estimated using all available carbon data, producing the best possible estimate for carbon. There are about ten times more total carbon values than there are organic carbon values, which creates a significant disconnect between the data sets and does not allow for a co-estimation of organic carbon with total carbon. Estimating organic carbon independently or as a co-estimated variable would result in a disconnect between assays in the block, or many un-estimated organic carbon blocks. To generate a carbon – organic carbon estimate that maintains the paired ratios but utilizes as much data as possible, the following method was utilized for carbon-organic carbon like that used for sulfide sulfur.

1. Estimate completed using only paired total and organic carbon assays.
2. Ratio between paired total and organic carbon calculated.
3. Estimate completed using only total carbon assays.
4. Organic carbon calculated at block level using ratio from 2 and estimated total carbon value from 3.

Un-estimated blocks for carbon and assigned organic carbon were set to ½ lower detection limit (0.01%).

Table 14-22 Total Carbon Estimation plan

DOM	Est. Run	Discretization			Par. Cell Est.	Search (m)			Composites					Soft Boundaries		
		X	Y	Z		Maj.	Semi	Min.	Min.	Max	Per Hole	Min. Holes	Max. Holes	Use	Dom	Max Dist (m)
S1	1	2	2	5	Y	75	75	15	2	15	5	2	5	Y	S2	10
	2					150	150	60				2	5			
	3					325	325	120				1	5			
S2	1	2	2	5	Y	75	75	15	2	15	5	2	5	Y	S3	10
	2					150	150	60				2	5			
	3					325	325	120				1	5			
S3	1	2	2	5	Y	75	75	15	2	15	5	2	5	Y	S2	10
	2					150	150	60				2	5			
	3					325	325	120				1	5			

Validations of this approach using grade-tonnage curves of estimated organic carbon, paired organic carbon, calculated organic carbon, and nearest neighbour organic carbon showed similar grades at a zero cut-off, implying no global bias. The estimate of organic carbon compared to the co-estimated organic carbon is very similar, with the only differences being due to the estimate and not the data.

Change-of-Support

HERCO was used to account for the change in support from the 2.0 m composites to a 10x10x10 m smallest mining unit (SMU), and to determine an appropriate amount of smoothing for the estimate to ensure the estimate is adequately reflective of mining recoverable SMU volumes. The analysis was used to derive the final estimation parameters and was limited to Measured, Indicated, and Inferred material only. Change of support was completed for gold and silver estimates only.

The estimation plan, primarily the minimum and maximum composites per block, were adjusted to target a relative difference in metal to within 10% of the HERCO distribution at a 1.0 g/t gold cut-off grade.

Figure 14-28 gives some example tonnage-grade curves comparing the theoretical HERCO distribution to the final OK estimates and the relative difference in tonnes, grade, and metal.

The target of ±10% difference in tonnes, grade and metal was not always achieved, particularly in the low-grade/waste domains; however, this was not considered material to the estimate.

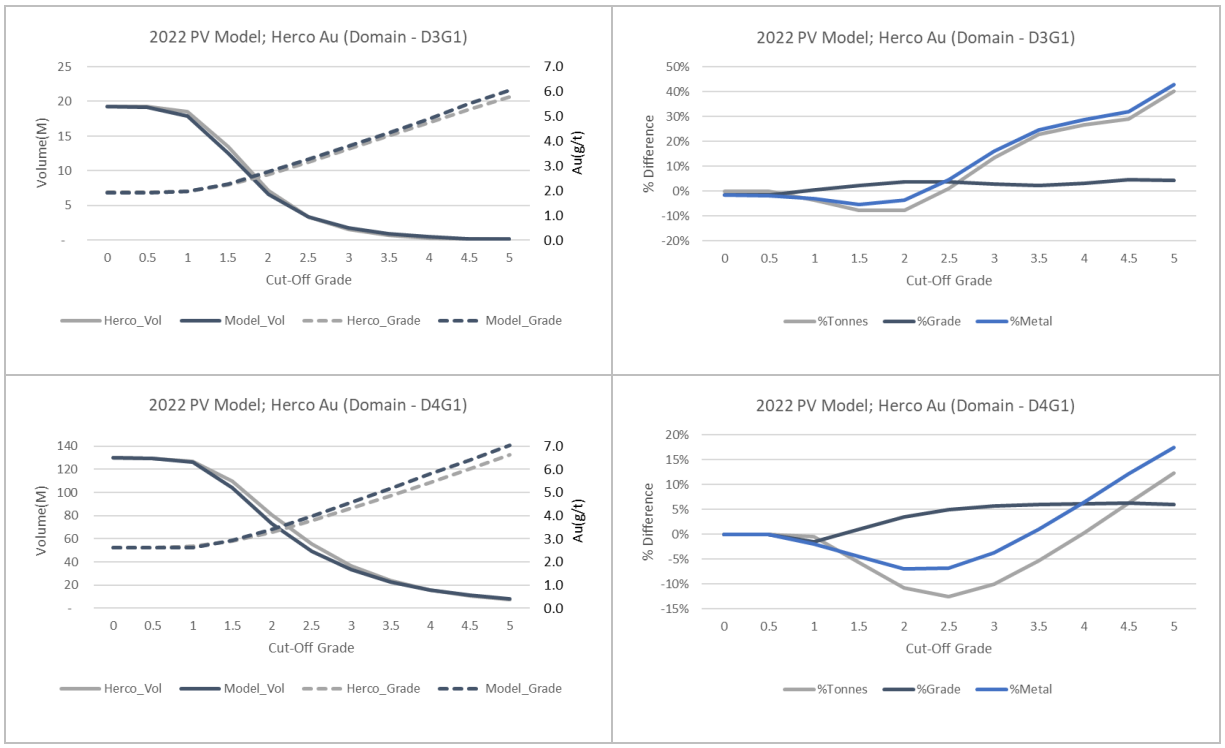


Figure 14-28 Example HERCO Tonnage-Grade Curves and % Difference Plots

14.12 Resource Classification

Resource classification was decoupled from the estimate and assigned to blocks on the basis of the average distance to data from the block centroid and the number of holes used to estimate a block. Classification criteria (Table 14-24) were based on a drill hole spacing analysis completed in 2021.

The spacing study approach uses kriging variance (KVAR) to determine confidence intervals for quarterly and annual production volumes at different data spacings. The calculated error at the different spacings is then compared against the generally accepted criteria for resource classification (Table 14-23) to determine appropriate data spacing.

Table 14-23 Resource Classification Criteria

Resource Classification	Criteria
Measured	±15% Error in tonnes, grade and metal at 90% confidence for quarterly volumes
Indicated	±15% Error tonnes, grade and metal at 90% confidence for annual volumes
Inferred	±30% Error in tonnes, grade and metal for annual volumes

The classification was calculated by setting up an estimate with an isotropic search and requiring a minimum and maximum of three holes to estimate a block (Table 14-24). The stored average distance was then used to flag a classification code to the model (CLASS_RAW variable).

This raw classification was then smoothed (cleaned) to remove isolated blocks using the Vulcan Categorical Smoothing (BlockMaps) tool and a 3x3x3 moving window. The smoothed classification was stored in the CATEG variable. The smoothing modified approximately 2% of the blocks (Table 14-25).

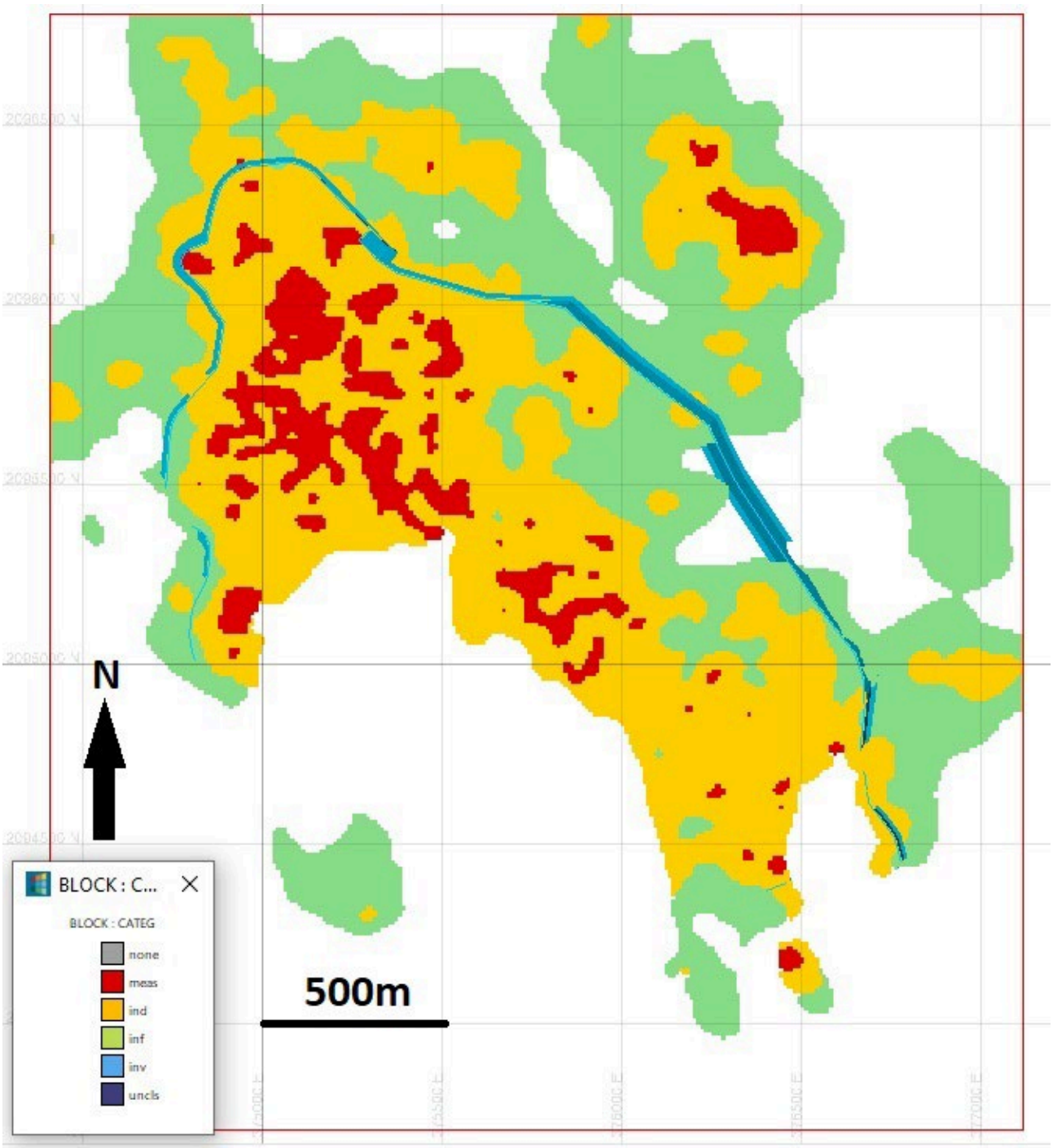
An example slice at 290RL is given in Figure 14-29.

Table 14-24 Resource Classification Parameters

Classification	Block Code	Drill Hole Spacing	No. of Holes	Average Distance
Measured	1	≤ 30 m	3	21 m
Indicated	2	≤ 70 m	3	49 m
Inferred	3	≤ 150 m	3	105 m

Table 14-25 Summary of Blocks Modified by Smoothing

Classification	Total Blocks	Blocks Modified	% Modified
Measured	121,346	42,395	35%
Indicated	592,454	26,821	5%
Inferred	1,130,364	28,661	3%



Source: Pueblo Viejo, 2022

Figure 14-29 Example Resource Classification (290RL)

Post the categorical cleaning process, the QP then reviewed the data to apply an additional manual smoothing (cleaning) process to logically modify non-material, isolated and discontinuous blocks close to the margins of the pit designs. This process modified <1% of the total tonnes. Figure 14- shows the locations of these blocks.

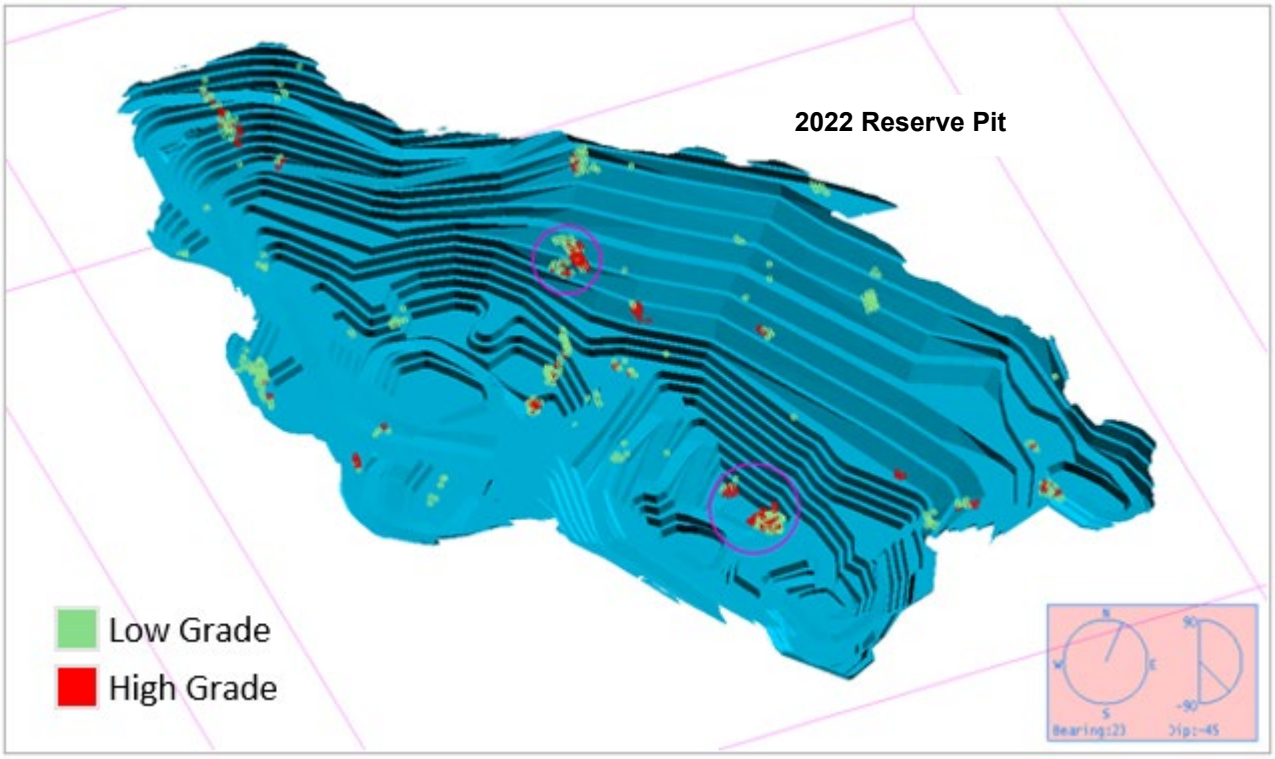


Figure 14-30 Spatial Location of Manually Modified Ore Blocks in Pit Design

14.13 Block Model Validation

Several checks were carried out to ensure that the estimate was valid; these included, but were not limited to:

- Visual checks of the estimate, in both plan and section, against composite data and the NN estimate.
- Checks for global bias by comparison of mean grades at zero cut-off against the NN model.
- Checks for local bias by swath plots in easting, northing, and elevation.
- Comparison of OK estimates to an alternative inverse distance weighted (IDW) estimate.
- Comparison of the top 5% of blocks against high-grade composites.
- HERCO analysis to validate estimate smoothing against the SMU.

Examples of validation results are presented in the sections following.

Global Bias-Checks

The mean grade of the OK estimated was compared, by domain, with NN and IDW estimates at a zero-cut-off grade (Table 14-26 and Table 14-27) as a check on the global bias of the mineral resource estimate.

For both gold and silver, the differences were within commonly accepted limits of ±7%, except for the AU1/AG1 domains. These are low-grade, peripheral to the main mineralized zones, and relatively sparsely drilled. There was good agreement between the OK and IDW estimates, so the difference in the NN is driven by higher grade outliers in the very low-grade and waste domains. On this basis, this difference was not considered material.

Table 14-26 Global Comparison of OK, ID and NN Estimates - Au

Dom	OK (Au g/t)	IDW (Au g/t)	NN (Au g/t)	% Difference	
				(OK-ID)/OK	(OK-NN)/OK
AU1	0.075	0.074	0.065	1.3%	13.3%
AU2	0.339	0.337	0.329	0.6%	2.9%
AU3	1.297	1.308	1.308	-0.8%	-0.8%
AU4	1.264	1.267	1.267	-0.2%	-0.2%

Table 14-27 Global Comparison of OK, ID and NN Estimates - Ag

Dom	OK (Ag g/t)	IDW (Ag g/t)	NN (Ag g/t)	% Difference	
				(OK-ID)/OK	(OK-NN)/OK
AG1	0.423	0.419	0.372	0.9%	12.1%
AG2	2.397	2.372	2.307	1.0%	3.8%
AG3	6.647	6.691	6.718	-0.7%	-1.1%
AG4	7.957	7.951	7.954	0.1%	0.0%

Swath Plots

Swath plots were constructed to check for local biases in the estimate and compare the declustered (NN) data to the kriged estimate by domain. Swath sizes were:

- 30 m (3 blocks) in the east direction.
- 30 m (3 blocks) in the north, and
- 30 m (3 blocks) in the vertical direction.

Analysis was limited to Measured, Indicated, and Inferred material only.

As expected, the kriged estimated is smother than the NN estimate, and the main departures from the declustered distribution were in areas of limited data. This is especially evident in the AU1 and AG1 domains.

Example swath plots in the easterly direction are presented in Figure 14-31.

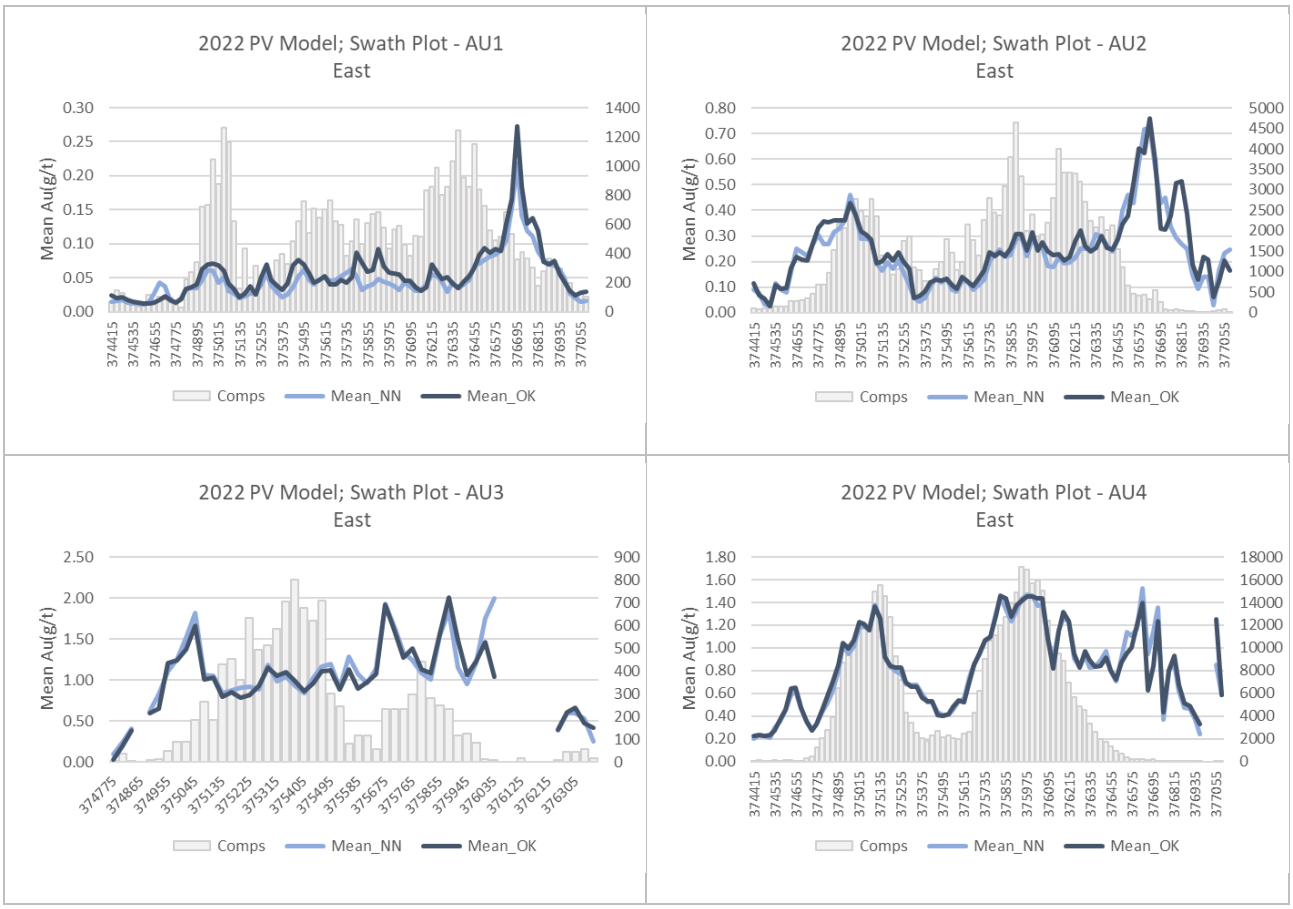


Figure 14-31 Swath Plots – Gold

Metal Reduction

The effective amount of metal removed from the estimate by capping was evaluated by comparing the uncapped estimate with the capped estimate. This comparison was limited to the first pass estimate.

For gold, globally, there was a 0.6% reduction in the mean grade due to capping (Table 14-28). This is in line with the expected change from the capping analysis (0.7%).

Table 14-28 Comparison of Capped and Uncapped Estimates - Au

Domain	Mean Capped Au (g/t) (au_ok_c)	Mean Uncapped Au (g/t) (au_ok_unc)	% Difference (Capped-Uncapped)/Capped
AU1	0.079	0.08	-1.3%
AU2	0.415	0.419	-1.0%
AU3	1.337	1.341	-0.3%
AU4	1.31	1.315	-0.4%
Total	0.721	0.725	-0.6%

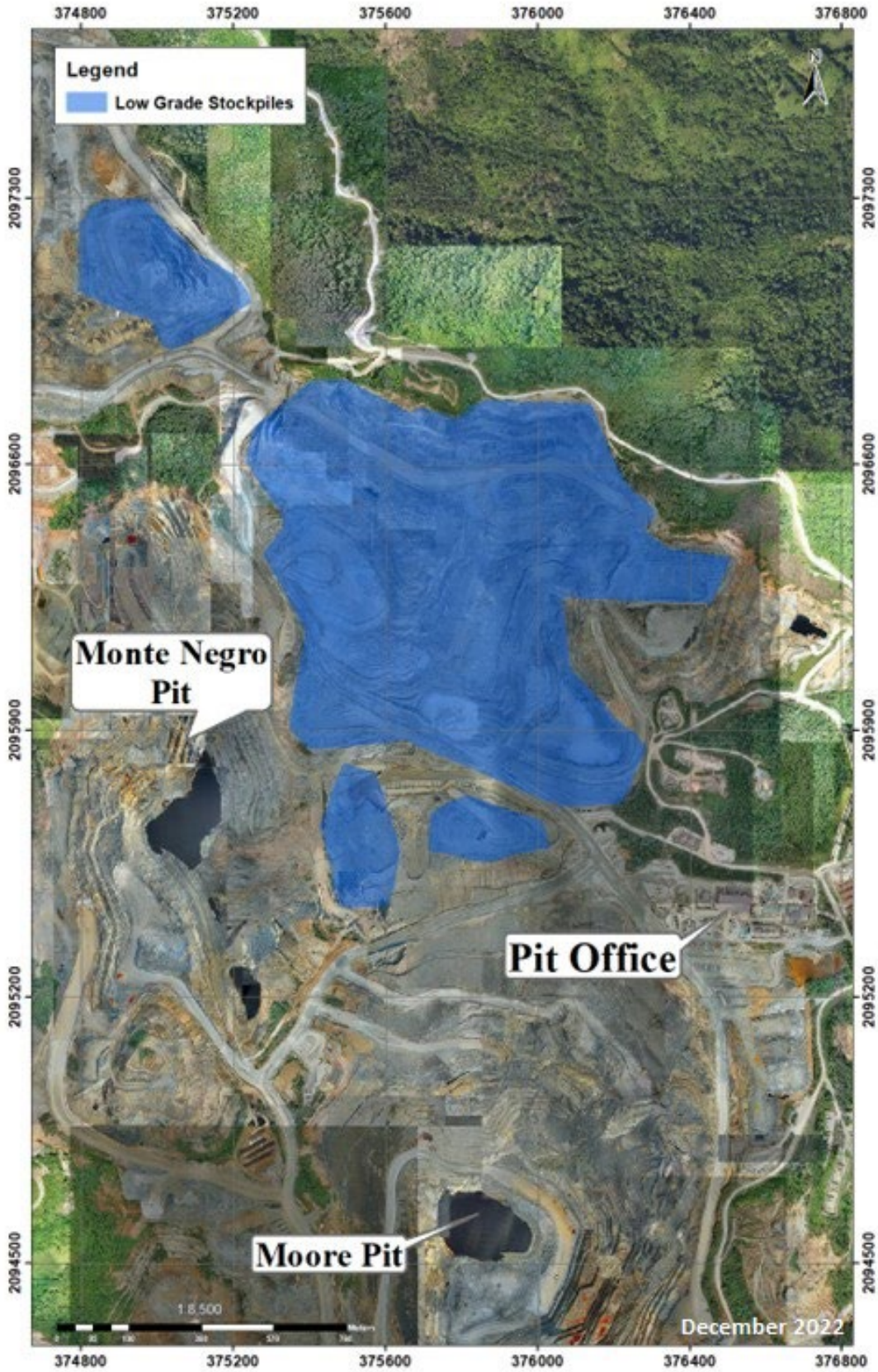
Silver saw a 0.7% reduction in mean estimated grade from capping (Table 14-29). This is in line with the expected reduction from capping (0.9%)

Table 14-29 Comparison of Capped and Uncapped Estimates - Silver

Domain	Mean Capped Ag (g/t) (ag_ok_c)	Mean Uncapped Ag (g/t) (ag_ok_unc)	% Difference (Capped-Uncapped)/Capped
AG1	0.464	0.483	-4.1%
AG2	2.805	2.835	-1.1%
AG3	6.86	6.96	-1.5%
AG4	8.202	8.243	-0.5%
Total	4.539	4.57	-0.7%

14.14 Stockpile Resources

Mineralized material from mining has been stockpiled on-site and segregated for future processing. The stockpiles are modelled using a combination of surveys to create volumes, and ore-control grade and material types, which are tracked from the source polygon to the dumped location. This information is collated into a stockpile block-model for reporting and reclaim planning. The stockpile locations are displayed in Figure 14-32.



Source: Pueblo Viejo, 2022

Figure 14-32 Stockpile Location

14.15 Resource Cut-Off Grades

PV uses a cash-flow optimisation methodology for cut-off determination. The revenue for each block within the Resource pit limit is compared to the cost of processing the specific block. Those blocks that produce a revenue greater than the processing costs are flagged as potential plant feed and included as Resources. Blocks whose revenue does not exceed the processing cost are flagged as waste. This methodology results in a variable cut-off grade due to the dependence of costs on sulfur grades.

For revenue calculations, the assumed metal prices are advised by Barrick corporate guidance and for Resource estimation are US$1,700/oz for gold and US$21.00/oz for silver. Only Measured, Indicated, and Inferred blocks were attributed revenue.

14.16 Mineral Resource Statement

Table 14-30 summarises the Pueblo Viejo Mineral Resources, inclusive of Mineral Reserves, as of 31 December 2022.

Table 14-30 Summary of Mineral Resources (100% Basis) - 31 December 2022

Category	Location	Tonnes	Grade		Contained Metal	
		(Mt)	(g/t Au)	(g/t Ag)	(Moz Au)	(Moz Ag)
Measured	Monte Negro	44.3	2.00	11.17	2.8	15.9
	Moore	32.0	2.19	12.49	2.3	12.9
	Cumba	0.9	2.41	8.59	0.1	0.2
	Total	**77.2**	**2.08**	**11.69**	**5.2**	**29.0**
Indicated	Monte Negro	124.4	1.80	10.69	7.2	42.8
	Moore	92.0	2.08	11.78	6.2	34.9
	Cumba	1.8	1.70	9.82	0.1	0.6
	Stockpile	97.6	2.16	14.95	6.8	46.9
	Total	**315.8**	**1.99**	**12.32**	**20.2**	**125.1**
M&I	Monte Negro	168.7	1.85	10.81	10.0	58.6
	Moore	124.0	2.11	11.97	8.4	47.7
	Cumba	2.7	1.93	9.42	0.2	0.8
	Stockpile	97.6	2.16	14.95	6.8	46.9
	Total M&I	**393.0**	**2.01**	**12.19**	**25.4**	**154.1**
Inferred	Monte Negro	3.5	1.6	8.1	0.2	0.9
	Moore	3.8	2.0	11.1	0.2	1.4
	Cumba	0.3	1.2	32.6	0.0	0.3
	Total	**7.6**	**1.8**	**10.5**	**0.4**	**2.6**

Notes:
1. Mineral Resources are reported on a 100% basis and inclusive of Mineral Reserves.
2. CIM (2014) Standards and CIM (2019) MRMR Best Practice Guidelines were followed for Mineral Resources.
3. Mineral Resources are estimated based on an economic cut-off value.
4. Mineral Resources are estimated using a long-term price of US$1,700/oz Au and US$21/oz Ag.
5. Resource block model dimensions of 10m x 10m x 10m were assumed to reflect mining selectivity.
6. Numbers may not add due to rounding.
7. The QP responsible for the Mineral Resource Estimate is Chad Yuhasz, P.Geo.

14.17 2022 Versus 2020 End of Year Model Comparison

Due to the numerous changes in lithology and alteration grouping, domaining, density and estimation approach, along with the significant increase in data, direct comparison between models is difficult. The tonnage-grade curve within the LOM plan (Figure 14-33) shows mainly tonnage related changes, driven by additional data, between 0.5 and 1.0 g/t Au. As no model update was completed in 2021, comparisons are made to the 2020 model, which was used for the previous LOM plan.

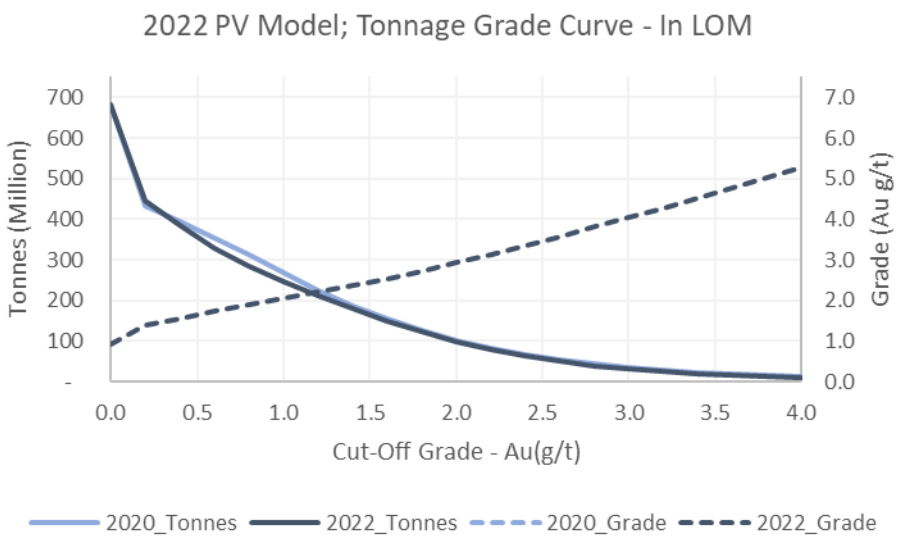


Figure 14-33 Tonnage-Grade Curve within LOM

Within the 2022 LOM design, at a 1.0g/t gold cut-off grade, this model represents a 1.3Moz reduction (-7.5%) in contained gold relative to the 2020 model on a 100% basis (Table 14-31). Note that 1g/t approximates the revenue-based cut-off grade and was used for comparative purposes only.

This reduction is in line with reduced ounces currently seen at an operational level, particularly in the Moore Pit, with grade control drilling finding lower tonnes and grades than the 2020 model.

Table 14-31 Comparison of 2020 and 2022 Models (inside LOM 1.0g/t Au COG)

Class	2020			2022		
	Tonnes (M)	Au (g/t)	Cont. Au (Moz)	Tonnes (M)	Au (g/t)	Cont. Au (Moz)
Meas	97.0	2.13	6.64	74.8	2.14	5.14
Ind	130.4	2.01	8.43	168.5	2.02	10.95
Total M&I	**227.4**	**2.06**	**15.07**	**243.3**	**2.06**	**16.09**
Inf	**38.9**	**1.94**	**2.42**	**2.8**	**1.82**	**0.17**

Notes:
1. The inventory tabulation above is for internal comparative purposes only and does not conform to any reporting standards. The figures represent raw inventory above a cut-off inside the Shell.
2. No dilution or other modifying factors have been applied.
3. Actual mining cut-off grades will differ from the 1.0g/t cut-off grade reported here.
4. Totals may not add due to rounding.

The bulk of this change is driven by additional data, with 2022 data having a lower mean grade than data used for the 2020 model (Figure 14-34 and Figure 14-36), influencing the geologic and alteration models (Figure 14-36). Changes to the estimation parameters partially offset these reductions.

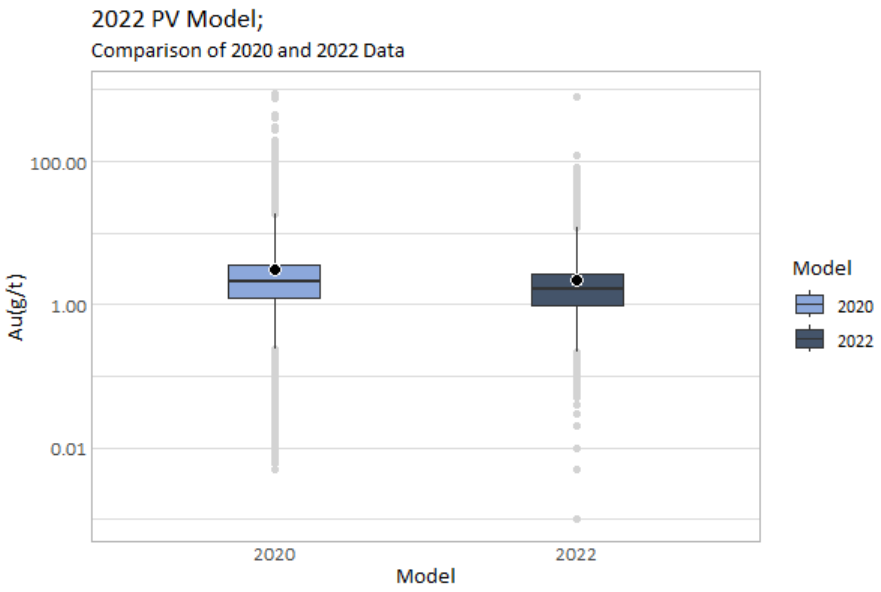


Figure 14-34 Boxplot comparing 2020 and 2022 Gold data within a 1g/t Grade Shell

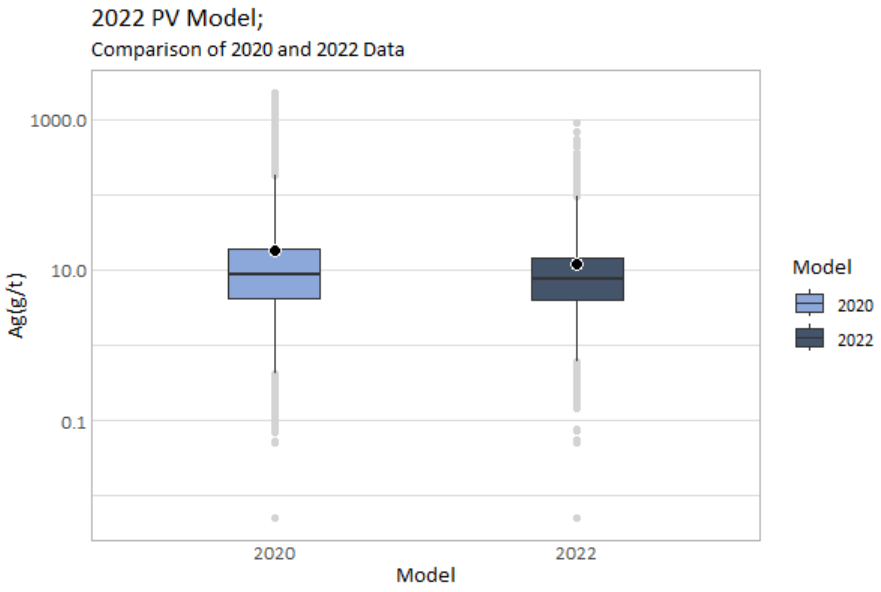


Figure 14-35 Boxplot comparing 2020 and 2022 Silver data within a 1g/t Grade Shell

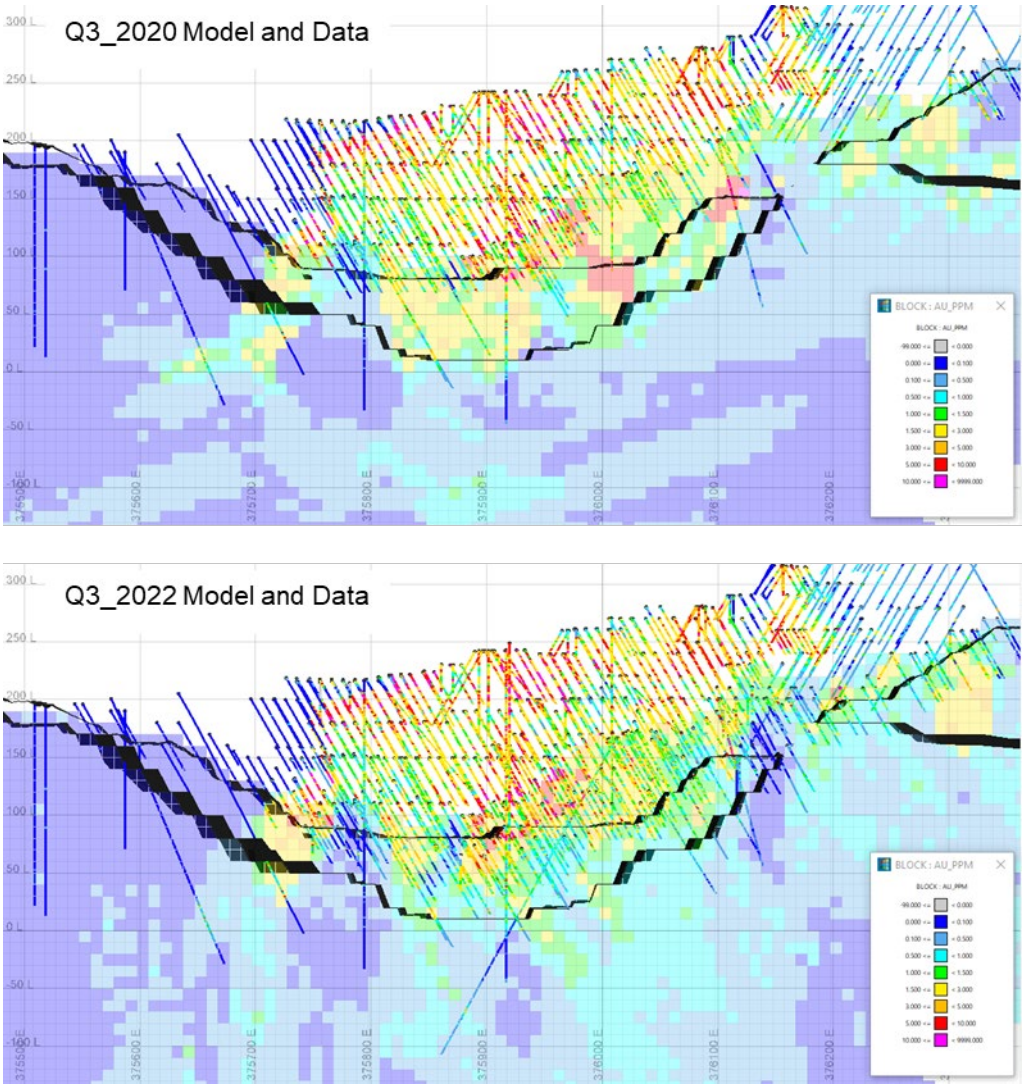


Figure 14-36 Section Comparing 2020 and 2022 models (2094550E)

14.18 Declared Resources Change 2021 to 2022

A comparison of the previously declared resources to the updated declared resources, was undertaken to ensure variances were understood and appropriate. A waterfall chart showing the model-to-model comparison within the LOM is presented in Figure 14-37. The overall impact on Resources are explained as:

- 0.8Koz Au contained removed from 2022 production depletion.
- 2.1Koz Au contained increase due to updated models and additional drilling.
- 1.9Koz Au contained increase due to metal price increase from $1,500/oz Au (2021) to $1,700/oz Au (2022).
- 4.7Koz Au contained decrease due to cost increases and optimization of geotechnical inputs.

In addition to the overall changes, a conversion of Inferred resources to Indicated resources was realized from the results of ongoing infill drilling.

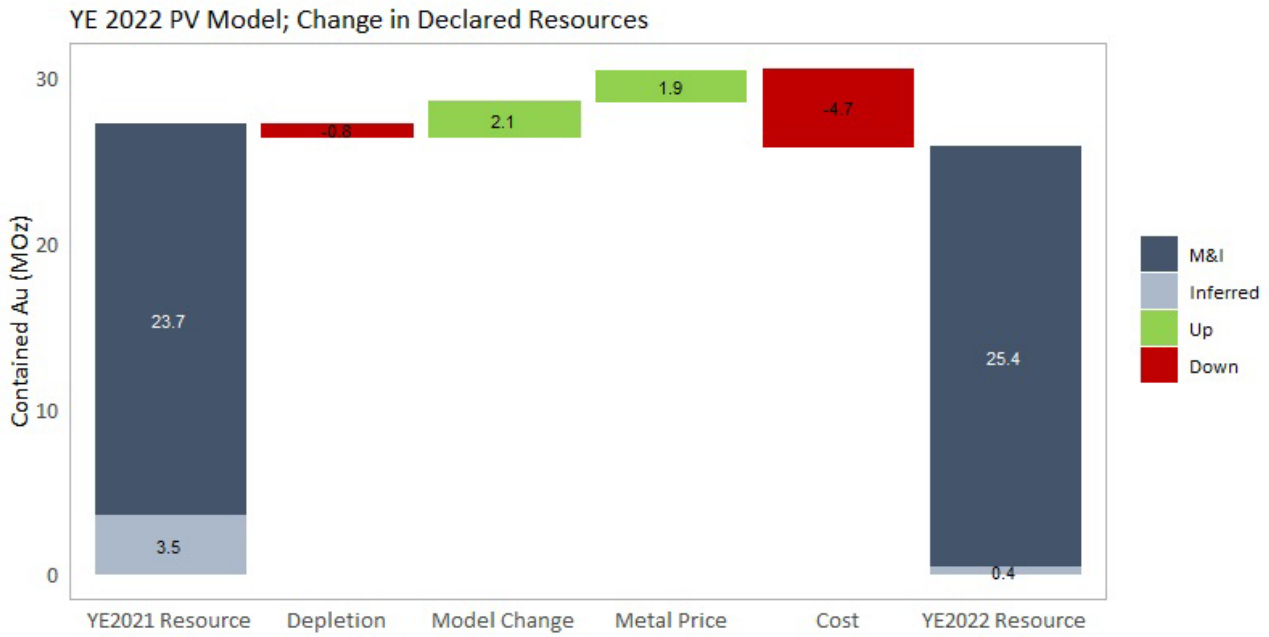


Figure 14-37 Waterfall chart - Change in Contained Au oz in Declared Resources

14.19 Discussion

The validations conducted on the Resource estimate support an unbiased estimate. Visually the assays and composite grades are reasonable compared to the blocks, and the estimate is smooth against the SMU. The QP is of the opinion that the Mineral Resources for Pueblo Viejo have been estimated, validated, and classified using industry best practices and conform to the requirements of CIM (2014).

The QP is not aware of any environmental, permitting, legal, title, taxation socioeconomic, marketing, political, metallurgical, fiscal, or other relevant factors, that could materially affect the Mineral Resource estimate.

Future work plan includes updates to geologic wireframes, testing sensitivities exclusive of grade control, and updating drillhole codes and stockpiles to the original topography at the database level.

External Mineral Resource Audits

In November/December 2022, SnowdenOptiro Ltd. (SO) completed an independent review of the inputs to the geologic and resource modelling processes at Pueblo Viejo and the resultant models. The final review document is still pending, however, the preliminary report indicated that the inputs

and mineral resource estimation processes conform to industry best practices and that no material issues were identified.

SO made several recommendations to Pueblo Viejo to be considered for the next mineral resource estimate, including:

- Review the classification of the resource, currently based on distance to drill hole and minimum number of drill holes.
- The grade capping strategy needs to be reviewed as the current approach is considered to be aggressive.
- It is recommended that additional density data be acquired to improve the quality of the Mineral Resource Estimate.

15 Mineral Reserve Estimate

15.1 Mineral Reserves Statement

As of 31 December 2022, the total Proven and Probable Mineral Reserves in open pits and stockpiles (100% basis) are estimated at 291.6 Mt with an average grade of 2.19 g/t Au and 13.60 g/t Ag, containing approximately 20.5 Moz gold metal and 127.5 Moz silver metal.

The total project Mineral Reserves as of 31 December 2022 are summarised in Table 15-1.

Table 15-1 Pueblo Viejo Mineral Reserves as of 31 December 2022 (100% Basis)

Type	Category	Tonnes (Mt)	Au Grade (g/t Au)	Contained Gold (Moz Au)	Ag Grade (g/t Ag)	Contained Silver (Moz Ag)
Stockpiles	Probable	95.4	2.17	6.7	15.10	46.3
Open Pits	Proven	58.8	2.29	4.3	12.94	24.5
	Probable	137.4	2.15	9.5	12.84	56.7
	Proven and Probable	196.1	2.19	13.8	12.87	81.1
Total Mineral Reserves	Proven	58.8	2.29	4.3	12.94	24.5
	Probable	232.8	2.16	16.2	13.76	103.0
	Proven and Probable	**291.6**	**2.19**	**20.5**	**13.60**	**127.5**

Notes
1. Proven and Probable Mineral Reserves are reported on 100% basis. Barrick's and Newmont's attributable shares of the Mineral Reserves are 60% and 40%, respectively.
2. The Mineral Reserve estimate has been prepared according to CIM (2014) Standards and using CIM (2019) MRMR Best Practice Guidelines.
3. Open pit Mineral Reserves are reported at a gold price of US$1,300/oz Au and US$18.00/oz for silver.
4. A cash-flow method for ore/waste categorisation was used applying appropriate costs and modifying factors.
5. Block model dimensions are 10m x 10m x 10m to reflect mining selectivity. No additional mining recovery or dilution factors are applied.
6. Stockpiles are classed as Probable to reflect metallurgical recovery uncertainties.
7. All reported metal is contained before process recovery; metal recoveries are variable based on material type, sulfur grades, and sulfide grades.
8. Contained metal is reported in millions of troy ounces.
9. Numbers may not add due to rounding.
10. The QP responsible for this Mineral Reserve Estimate is Mike Saarelainen, FAusIMM.

The Mineral Reserve estimates have been prepared according to the CIM (2014) Standards as incorporated with NI 43-101. Mineral Resource estimates were also prepared using the guidance outlined in CIM (2019) MRMR Best Practice Guidelines.

The Mineral Reserves have been estimated based on the final pit design and those ounces contained in stockpiles. They consist of Measured and Indicated Mineral Resources and do not include any Inferred Mineral Resources. The estimate uses updated economic factors, the latest Mineral Resource and geological models, geotechnical and hydrological inputs, as well as metallurgical processing and recovery updates.

For the open pit, economic pit shells were generated using the Lerch-Grossman algorithm within Whittle® software. The resulting shells were then used in the open pit mine design process and for estimation of Mineral Reserves. The final pit limit selection and design process are outlined in Sections 15.3 and 16.2, respectively.

A site-specific financial model was populated and reviewed to demonstrate that the Mineral Reserves are economically viable.

The year-end 2022 Mineral Reserves estimate shows a net increase of 11.5 Moz gold compared to the declared estimate for year-end 2021 (on a 100% basis). This is primarily due to the completion of Pre-Feasibility Studies supporting the new Naranjo tailings storage facility which facilitates the conversion of Resources into Reserves.

The QP responsible for the Mineral Reserves has directly supervised the estimation process, has performed an independent verification of the estimated tonnes and grade, and in their opinion, the process has been carried out to industry standards and uses appropriate modifying factors for the conversion of Mineral Resources to Mineral Reserves.

The QP is not aware of any environmental, legal, title, socioeconomic, marketing, mining, metallurgical, infrastructure, permitting, fiscal, or other relevant factors that could materially affect the Mineral Reserve estimate. As noted in Section 4, while the permitting process for the Expansion Project is not finalised, Barrick sees no impediment to obtaining all required permits in the normal course of business.

15.2 Mineral Reserves Estimation Process

Open Pit

Mineral Reserves inside the ultimate pit limits were estimated using a block value calculation. The value of each block in the resource model categorised as Measured or Indicated was estimated using an assumed metal price, recoveries, limestone mining costs, processing costs, administration costs, and others. Blocks with positive values were flagged as ore for processing and the remainder were classified as waste.

The process and inputs for determining the ultimate pit are outlined in Section 15.3.

Stockpiles

Stockpiles are comprised of mineralized material stored at various surface locations, originating from prior open pit production. The tonnage contained in stockpiles is a significant portion of the Mineral

Reserves. The stockpiles were typically established with similar material types, although given the large volumes and limited areas for storage, there are various ore types and grade categories interspersed throughout the stockpiles; occasionally with low grade material stockpiles overlaying higher grade portions.

Existing stockpiles have been classified as Probable Mineral Reserves due to uncertainty on carbon estimates and sulfur degradation impacting process recoveries.

To assist with optimising the reclaim sequence, a block model was created for the stockpiles using the dumping data from the fleet management system (Jigsaw) and then validated with a specialised drill campaign. This model is used for LOM ore reclaim planning.

The location of the ore stockpiles is shown in Figure 14-32.

Mineral Reserves Detail

Detail of the Mineral Reserves by location and category is shown in Table 15-2.

Table 15-2 Pueblo Viejo Mineral Reserves Detail

Area/Category	Tonnage (Mt)	Grade		Contained Metal	
		(g/t Au)	(g/t Ag)	Gold (Moz)	Silver (Moz)
Monte Negro Pit					
Proven	32.2	2.23	12.45	2.3	12.9
Probable	70.7	2.03	12.59	4.6	28.6
Monte Negro P&P	102.9	2.09	12.54	6.9	41.5
Moore Pit					
Proven	26.2	2.35	13.57	2.0	11.4
Probable	66.4	2.29	13.10	4.9	28.0
Moore P&P	92.6	2.30	13.23	6.9	39.4
Cumba Pit					
Proven	0.4	2.67	11.26	0.0	0.1
Probable	0.3	2.10	11.80	0.0	0.1
Cumba P&P	0.7	2.43	11.49	0.1	0.3
Stockpiles					
Probable	95.4	2.17	15.10	6.7	46.3
Totals					
Proven	58.8	2.29	12.94	4.3	24.5
Probable	232.8	2.16	13.76	16.2	103.0
Proven + Probable	**291.6**	**2.19**	**13.60**	**20.5**	**127.5**

Notes
1. Proven and Probable Mineral Reserves are reported on 100% basis. Barrick's and Newmont's attributable shares of the Mineral Reserves are 60% and 40%, respectively.
2. The Mineral Reserve estimate has been prepared according to CIM (2014) Standards and using CIM (2019) MRMR Best Practice Guidelines.
3. Open pit Mineral Reserves are reported at a gold price of US$1,300/oz Au and US$18.00/oz for silver.
4. A cash-flow method for ore/waste categorisation was used applying appropriate costs and modifying factors.
5. Block model dimensions are 10m x 10m x 10m to reflect mining selectivity. No additional mining recovery or dilution factors are applied.
6. Stockpiles are classed as Probable to reflect metallurgical recovery uncertainties.
7. All reported metal is contained before process recovery; metal recoveries are variable based on material type, sulfur grades, and sulfide grades.
8. Contained metal is reported in millions of troy ounces.
9. Numbers may not add due to rounding.
10. The QP responsible for this Mineral Reserve Estimate is Mike Saarelainen, B.Eng., FAusIMM

15.3 Open Pit Optimisation

Determination of ultimate pit limits was undertaken using Whittle pit optimization software. Results presented in the following sections correspond to the latest work completed by PV in early October 2022. This work was independently validated by an external consultant.

Pit shell generation was constrained by infrastructure and permitting limits where applicable. Grades relevant to the economic value calculation for each block are gold, silver, sulfide, and sulfur.

Various economic parameters were used to estimate the block value and resultant ore or waste categorisation of the blocks within the ultimate pit shell. It should be noted that most of the optimisation cost input parameters have been based on 2022 LOM cost forecast information and corporate guidance.

The general process of determining the value is to estimate the revenue of the block and subtract the costs to process the block as ore; those blocks that have a positive value are flagged as ore and included in the Mineral Reserves estimate; the remaining blocks are treated as waste and provide no revenue to the project.

Given the processing costs are dependent on the sulfur grade and recoveries vary with material type, the cut-off grade for a block with an average sulfur grade of 8.3% can vary from approximately 1.27 g/t Au (equivalent) to 1.41 g/t Au (equivalent).

Resource Model

The Mineral Reserve estimates and optimisation process use a block model prepared by the site geology team and is the same model used for Mineral Resource estimation. This model is then modified with the addition of variables, which are populated with data specifically for scheduling and Reserve estimation purposes.

Metal Price

Metal prices used for the Mineral Reserves estimate are the Barrick corporate guidance assumptions for the long-term metal price. These are in US dollars per troy ounce:

- Gold - US$1,300/oz; and
- Silver - US$18.00/oz.

There are currently no plans to recover any other metals at PV in the LOM plan.

Mining Recovery and Dilution Factors

The Resource block model used for mine planning at PV has a regular block size of 10 m x 10 m x 10 m which represents the practical SMU suitable for the equipment in use at the operation. Grades are smoothed over this block size, with the mining recovery and dilution being considered inherent with the SMU block of the Resource model. No additional mining recovery or dilution assumptions are applied for the optimization and block value calculations.

Geotechnical Slope Parameters

Between 2020 and 2022, PV undertook detailed geotechnical and hydrogeological studies, including a review of slope performance history to produce an operations level geotechnical assessment for pit slopes at the Pueblo Viejo open pit. These studies were completed internally and with the use of external consultants to produce geotechnical inputs used for open pit optimization. These inputs are further detailed in Section 16.3.

Mining Costs

Mine operating costs for pit optimization were based on an earlier LOM plan developed as part of Barrick's internal forecasting process. This forecast was developed in June 2022 (June 2022 Forecast).

Typically, there is a difference in the cost of mining material as ore versus mining the material as waste. Ore is taken to a near pit ROM pad for blending, or long-term stockpile for later reclaim. Waste is scheduled to be co-disposed in the TSF facility, which due to distance and handling characteristics, has a higher cost than mining the material as ore. As such, the average incremental difference in mining cost is applied per tonne of ore processed; this is effectively a credit to the total cost of ore because the ore mining cost is lower.

Mining operating costs for the Whittle pit optimization are summarized in Table 15-3.

Table 15-3 Mining Operating Costs

Material	Value (US$/t mined)
Ore	3.10
Waste	3.91

Incremental Ore Mining Cost

The incremental ore mining cost is calculated as shown below and applied as a cost per ore tonne.

Incremental Mining Cost = (Ore Mining Cost– Waste Mining Cost) = US$-0.81/t

Processing Costs

Processing costs were split between fixed and variable costs. The fixed costs were averaged by year and divided by the design plant throughput to estimate a unit cost for all tonnes processed.

Nominal plant throughput varies throughout the LOM based on sulfur feed grade and other constraints. Under the expansion scenario, the average throughput for the LOM is 13.7 Mtpa (with a maximum planned throughput rate of 14.4 Mtpa). To ensure fixed period costs were adequately

accounted for in the pit optimization, these costs were calculated as unit costs per ore tonne processed. These fixed costs are outlined in Table 15-4, which also shows the annual fixed cost assumptions for general and administration (G&A) costs, community and social responsibility (CSR) costs (as described in **General and Administration and Community and Social Responsibility Cost**), and the total unit fixed cost applied to the process ore tonnes.

Table 15-4 Fixed Costs Applied to Ore Processing Tonnes

Item	Unit	Value
Processing & Power	US$M / yr	250.4
G&A	US$M / yr	56.9
CSR	US$M / yr	3.4
Total Fixed	US$M / yr	310.6
Total Fixed Unit Cost (Processing+Power+G&A+CSR)	**US$ / t processed**	**22.67**

The variable processing operating cost formulas were provided by the PV processing team and consider the sulfur content of the ore block being estimated for the milling, power, and other cost components; additionally, there is the cost of limestone mining and stripping, which is a necessary component for processing and tailings storage. These variable costs are outlined in Table 15-5.

There is also a cost credit made for services costed to the processing cost centre but shared with other departments, “Process Cost Allocation”. This is predominately PV Assay Lab costs reallocated to geological grade control activities.

Table 15-5 Ore Variable Costs for Flotation and POX

Item	Value (US$/t milled)
Process Plant [1]	-1,911.22*S^4+857.27*S^3-128.24*S^2+11.24*S+6.83
Power [1,2]	(794.98*S+22.33)*P
Limestone for processing	2.25
Ore Rehandle	1.47
Closure Cost	0.75
Process Cost Allocation	-0.15

Where:
S = Total sulfur grade (fraction)
P = Power unit cost ($0.098/kWh)

General and Administration and Community and Social Responsibility Cost

G&A and CSR period costs were extracted from the June 2022 Forecast.

The average annual G&A costs were apportioned to the processing plant throughput and included as a cost per tonne of ore processed.

CSR obligations were treated similarly, with the average annual cost apportioned to the tonnes of ore processed.

These costs are outlined in Table 15-5 above.

Ore Rehandle Costs

Most ore mined is taken to a ROM stockpile location for blending to improve the processing throughput by smoothing or stabilising the sulfide grades. Based on the LOM stockpile reclaim plan and historical cost data, the ore rehandling costs are estimated to be US$1.47/t of processed ore.

TSF Sustaining Capital

An allowance was included for the cost of constructing and raising the proposed TSF to store process tailings and potentially acid generating (PAG) waste rock. Construction costs were calculated per tonne of ore and waste by apportioning the total estimated costs from the Pre-Feasibility Study (PFS) study to the volume required. This was then used to estimate the sustaining capital unit cost by tonne of ore and waste expected to be stored inside the TSF. These costs are summarised in Table 15-6.

Table 15-6 TSF Sustaining Capital Costs

Item	Value (US$/t mined)
Sustaining capital cost for ore per tonne mined	3.86
Sustaining capital cost for waste per tonne mined	1.46
Incremental TSF sustaining capital cost (ore and waste)	2.40

Other Sustaining Capital

Allowances for other sustaining capital were included in the pit optimization. Recurring items were identified and included items such as replacement for equipment and major components, lime kilns rebrick and continuous improvement projects for infrastructure. Other sustaining capital expenditure was added to both the mining cost and ore costs in the optimization and is shown in Table 15-7.

Table 15-7 Other Sustaining Capital

Item	Value (US$/t mined)
Waste sustaining capital	0.38
Ore sustaining capital	0.79
Total Sustaining	1.17

Closure Costs

Closure costs of US$0.75/t ore mined were calculated and applied.

Metallurgical Recoveries

Metallurgical recoveries vary depending on the process stream to which the material is directed. Two streams are considered in the process plant expansion:

- Direct POX and
- Flotation and POX

The pit optimization and block value calculation assumed a “conservative” case using the more expensive stream of flotation and POX for costs and recoveries rather than using the most profitable of the two possible processing streams. In practice, ore routing to either direct POX or flotation and POX will be driven by short term operational plant constraints and not by pre-determined destinations assigned in the block model. This approach simplified the optimisation process and provides an opportunity for upside during operations.

The metallurgical recovery expressions used in the optimisation are detailed in Section 13.3. LOM plan average process recoveries for pit and stockpile feed are 90.1% for gold and 65.3% for silver.

Royalties and Selling Costs

Bullion transport and refining costs are based on current contracts and were calculated at US$0.49/oz of recovered gold and silver.

Royalty costs of 3.2% were applied to the gross value less the selling costs of the gold and silver metal produced.

Cost Summary

The pit optimisation utilised a cash flow methodology for determining whether a block is ore or waste. This method compares the cash flow produced by processing it as ore against the cash flow produced by mining it as waste. If the cash flow from processing is higher, the material is treated as ore; otherwise, it is treated as waste.

Total mining cost for pit optimization is summarized in Table 15-8

Table 15-8 Total Mining Cost for Pit Optimization

Item	Value (US$/t mined)
Waste mining operating cost	3.91
Mining sustaining capital cost	0.38
Waste TSF sustaining capital cost	1.46
Total mining cost for pit optimization	5.75

The ore processing cost applied in Whittle varies with sulfur grade. For a nominal block from the resource model with an average total sulfur grade of 8.06%, the total ore cost per tonne milled is illustrated in Table 15-9.

Table 15-9 Total Ore Cost Example Flotation & POX

Measure	Value (US$/t milled)
Variable Ore Costs (at S = 8.06%)	
Incremental Mining Cost (Ore-Waste differential cost)	-0.81
Ore Rehandle Cost	1.47
Variable Ore Processing Cost	17.83
Ore Sustaining Capital	0.79
Incremental TSF Sustaining Cost (Ore – Waste)	2.40
Closure	0.75
Fixed Costs	
Process Fixed Cost	18.27
G&A Cost	4.15
CSR Cost	0.25
Total Ore Cost	45.09

Note: Totals may not add due to rounding.

Optimisation Results

The optimization was run allocating revenue to Measured, Indicated, and Inferred categories. This was to provide an ultimate shell boundary with the expectation that PV will be able to upgrade all Inferred material to Measured or Indicated with grade control drilling. The inclusion of Inferred material is only for ultimate pit limit determination purposes, and no Inferred material is converted to Mineral Reserves or contributes to revenue in the cost modelling supporting the Mineral Reserves estimate.

Table 15-10 lists the tonnages for the series of nested pit shells obtained in the optimization. Results are reported from a topographic surface depleted to the end of July 2022.

Table 15-10 Pueblo Viejo Pit Optimization Results

Gold Price (US$/oz)	Total Tonnes (kt)	Ore Tonnes (kt)	Au Grade (g/t)	Ag Grade (g/t)	Contained Gold (koz)
900	113,246	38,463	2.76	16.87	3,410
1,000	372,201	98,390	2.56	14.85	8,104
1,100	508,877	138,342	2.43	14.09	10,791
1,200	611,775	171,599	2.32	13.36	12,801
1,300	723,423	209,828	2.22	12.8	14,969
1,400	767,089	229,212	2.15	12.32	15,837
1,500	821,737	252,830	2.08	11.92	16,912
1,600	865,442	272,572	2.03	11.6	17,748
1,700	915,032	292,447	1.97	11.29	18,568
Stockpile		92,734	2.21	15.46	6,580

Final pit shell selection

The final pit shell selected and used as the basis for further detailed mine design was the shell using US$1,300/oz for gold and US$18.00/oz for silver; this is aligned with guidance from Barrick regarding the long-term metal price assumptions for Mineral Reserves.

15.4 Sensitivity

A series of sensitivities were performed on the selected optimised shell by adjusting gold metal price, ore processing costs, and mining costs independently. The results on the total pit tonnes (Total Rock) and the contained gold ounces within the optimised shell for each sensitivity is shown in Figure 15-1 through Figure 15-3.

As is demonstrated, the ore tonnes and contained gold ounces within the selected optimised pit shell is most sensitive to a lower long-term gold price with a lesser impact resulting from an increased gold price (Figure 15-1). Gold price is considered a proxy for gold grade with changes in metal prices being representative of changes in grade.

Processing costs sensitivity (Figure 15-2) shows that variances in the processing costs are inversely related to the change in contained ounces. i.e., a 10% increase and decrease in processing costs results in an 11% reduction and 10% increase in contained gold within the optimised shell, respectively.

Mining cost sensitivity (Figure 15-3) shows a relatively minor inverse effect of mining costs to the contained gold with a 10% increase in mining costs resulting in a less than 5% decrease in contained ounces within the optimised shell.

It is the opinion of the QP that these sensitivities are representative of the expected changes in Mineral Reserves that would be seen with changes to the various modifying factors.

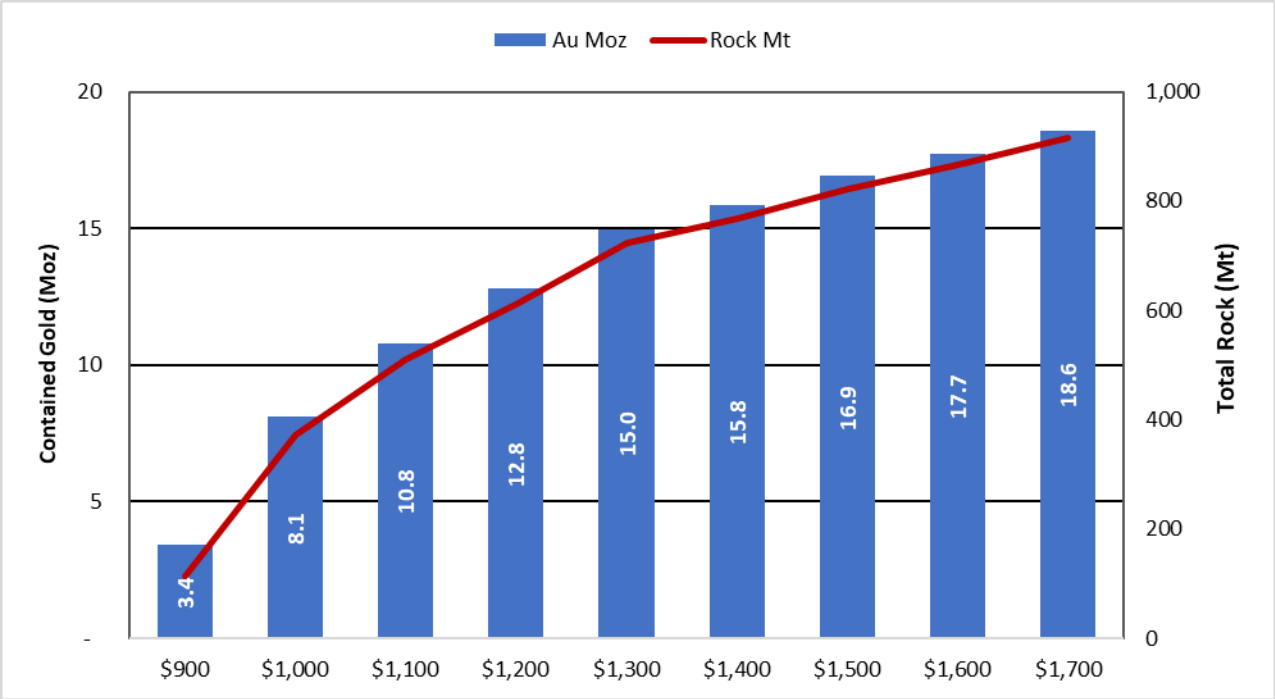


Figure 15-1 Gold Price Sensitivity Within the Optimised Shell

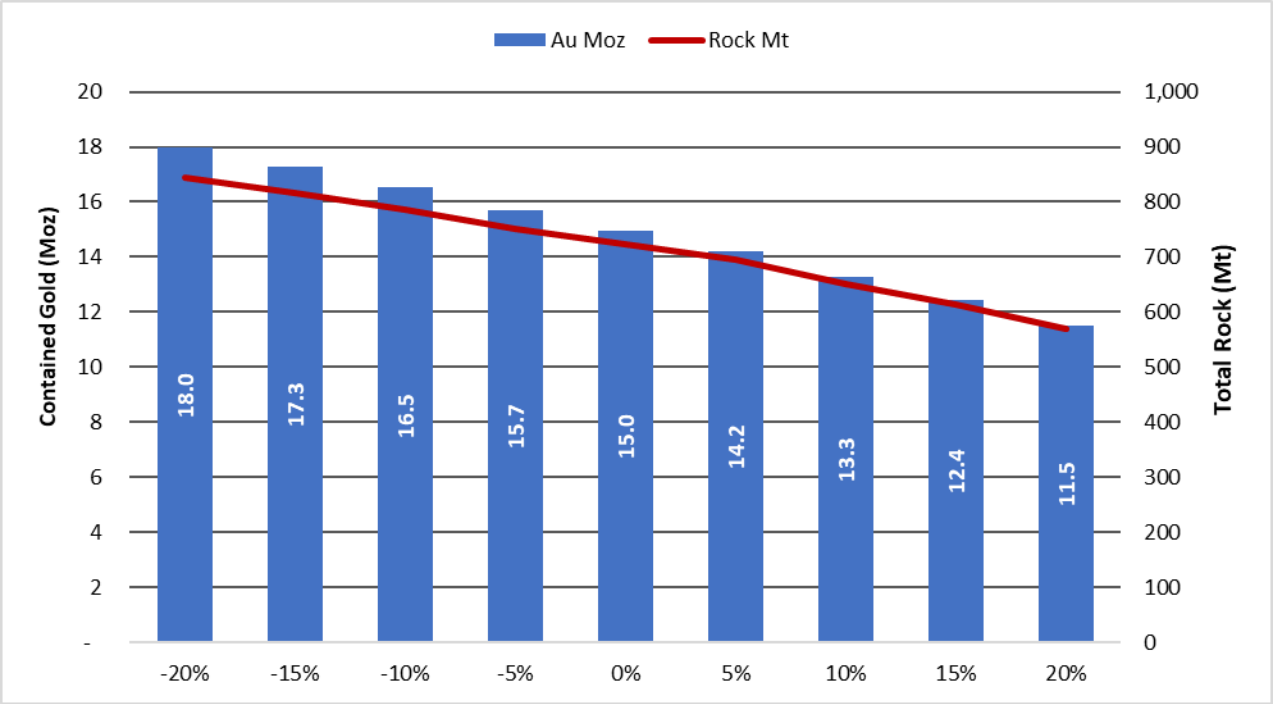


Figure 15-2 Processing Cost Sensitivity Within the Optimised Shell

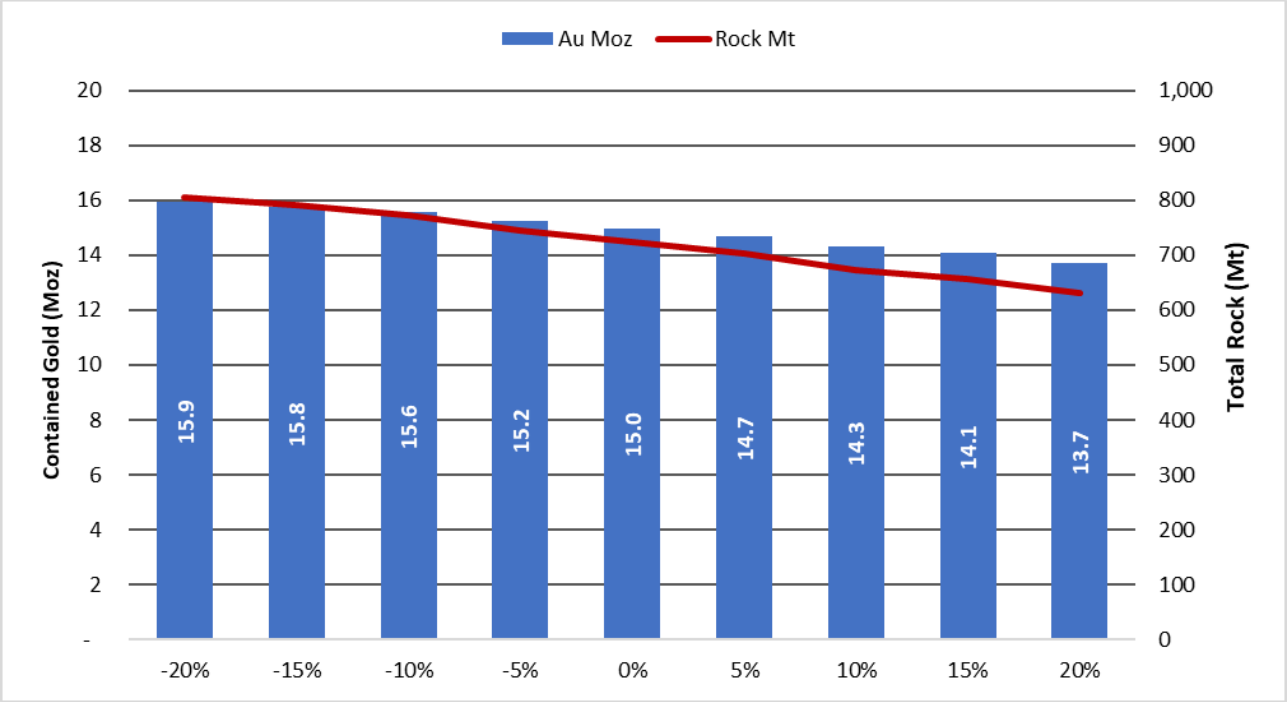


Figure 15-3 Mining Cost Sensitivity Within the Optimised Shell

15.5 Reconciliation

PV has a standard end-of-month (EOM) and end-of-quarter production measurement system that reports and provides a reconciliation between grade control and monthly mine production.

The measurement system tracks daily, weekly, monthly, quarterly, and year-to-date production grade control results versus the plant. The system tracks open pit production against the block model. Summary reports are prepared weekly, monthly, and quarterly.

The year-to-date reconciliation between the mine call and plant check-out as of 31 December 2022 is 100% for tonnes, 100% for gold ounces and 99% for silver ounces. The highest variance within the year is related to mill tonnes calibration and truck factor adjustments.

Table 15-11 shows the EOY Mine Call Factor (MCF) reconciliation.

Table 15-11 2022 EOY Total Reconciliation

Recon Ore Mine, Stockpiles, and Plant	2022 YTD				
	Tonnes (kt)	Au (g/t)	Ag (g/t)	Au (koz)	Ag (koz)
Opening Stocks	93,519	2.20	15.49	6,610	46,566
Stocks to Crusher	5,007	2.23	12.90	359	2,076
Closing Stocks	95,411	2.17	15.10	6,666	46,310
Crusher Feed Actual	9,373	2.69	14.59	812	4,397
- Pits to Crusher	4,446	3.17	12.75	454	1,822
- Stocks to Crusher	4,927	2.26	16.25	358	2,574
Opening Plant Cone	263	2.58	13.97	22	118
Closing Plant Cone	76	2.21	14.74	5	36
Cone Change	-187	2.73	13.66	-16	-82
GC Call Mill	9,423	2.69	14.61	815	4,427
Mill Check-in	9,448	2.72	14.35	827	4,360
Mill Check-out	9,448	2.68	14.39	814	4,372
Mine Call Factor (MCF)	100	100	99	100	99

Table 15-12 and Table 15-13 summarize the annual comparison of the Resource Model (or Long-Term Model, LTM) against the Grade Control Model (GCM) for gold and silver, respectively.

Table 15-12 Grade Control Model versus Resource Model - Gold

Period	Grade Control Model			Resource Model			(GCM / LTM)		
	Tonnage (Mt)	Au (g/t)	Au (koz)	Tonnage (Mt)	Au (g/t)	Au (koz)	Tonnage (%)	Grade (%)	Metal (%)
2021	11.9	2.50	952.5	12.2	2.46	962.1	97%	102%	99%
2022	12.5	2.29	917.8	12.9	2.32	960.0	97%	96%	95%

Table 15-13 Grade Control Model versus Resource Model - Silver

Period	Grade Control Model			Resource Model			(GCM / LTM)		
	Tonnage (Mt)	Ag (g/t)	Ag (Moz)	Tonnage (Mt)	Ag (g/t)	Ag (Moz)	Tonnage (%)	Grade (%)	Metal (%)
2021	11.9	12.18	4.6	12.2	11.91	4.7	97%	102%	100%
2022	12.5	10.37	4.2	12.9	10.56	4.4	97%	98%	95%

For the 2021 production year, gold grades between GCM and the Resource Model reconciled to 102% (2.50 g/t gold versus 2.46 g/t gold), tonnage reconciled to 97% (11.9 Mt versus 12.2 Mt), and gold ounces reconciled to 99% (953 koz versus 962 koz). For the 2022 production year, gold grades reconciled to 96% (2.29 g/t gold versus 2.32 g/t gold), tonnage reconciled to 97% (12.5 Mt versus 12.9 Mt), and gold ounces reconciled to 95% (918 koz versus 960 koz). Similar results were obtained for silver grades.

As shown in Figure 15-4, the reconciliation between the mine call and plant check-out gold grade was within an acceptable range, averaging 100% MCF for the entire year.

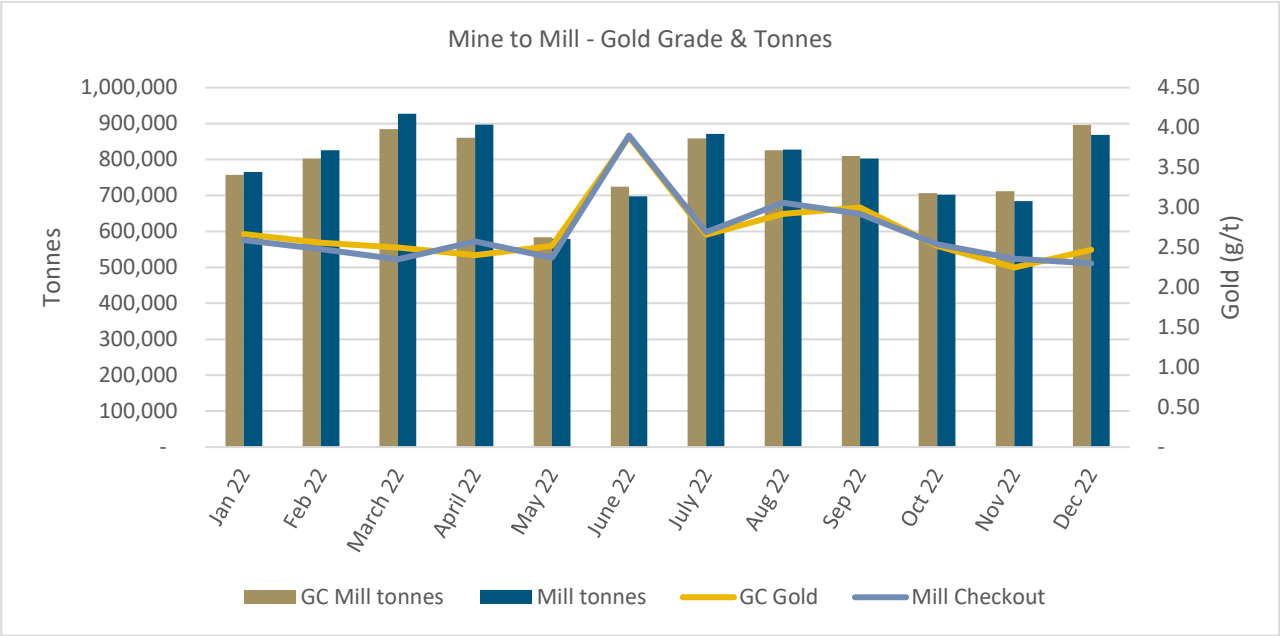


Figure 15-4 2022 Monthly Grades and Tonnes Comparison
(Mine Call Grade versus Plant Check Out Gold Grade)

As shown in Figure 15-5, the reconciliation between the mine call and plant check-out silver grade was within an acceptable range, averaging 99% MCF for the entire year. The highest variances during the year were related to local variability within stockpile grades.

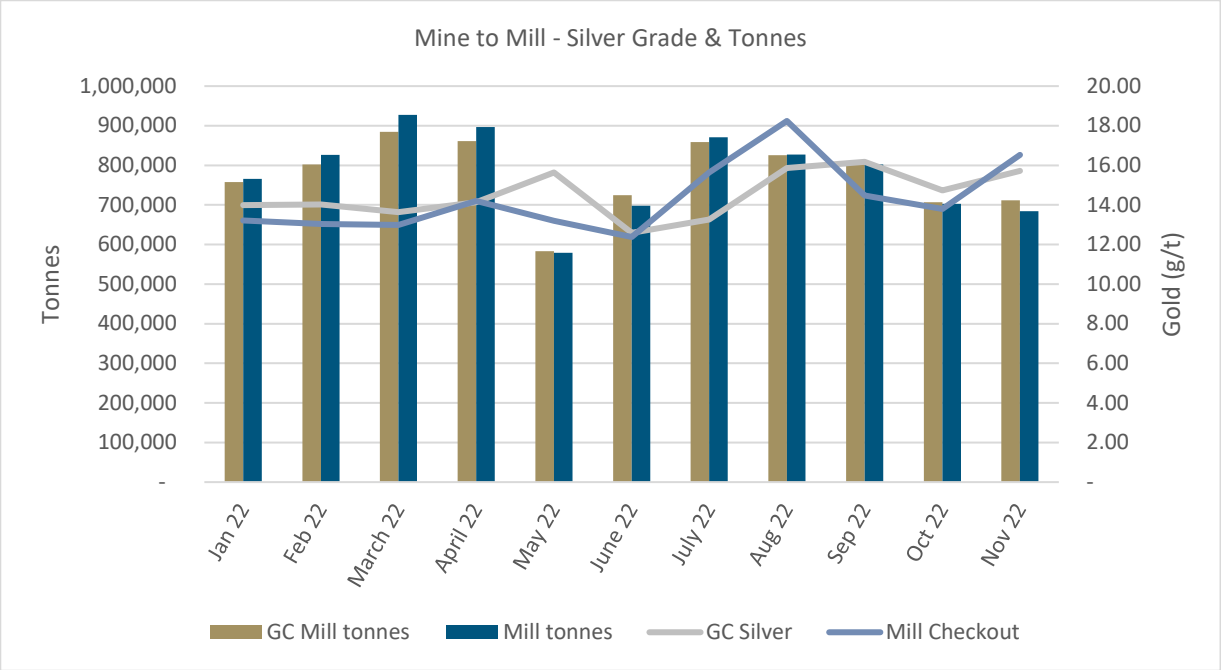


Figure 15-5 2022 Monthly Grades and Tonnes Comparison
(Mine Call Grade versus Plant Check Out Silver Grade)

Table 15-14 and Table 15-15 summarize the annual Resource Model against production data from the plant for gold and silver, respectively.

Table 15-14 Mill Production versus Resource Model – Gold

Period	Mill Production			Resource Model			(Mill /Resource Model)		
	Tonnage (Mt)	Au (g/t)	Au (koz)	Tonnage (Mt)	Au (g/t)	Au (koz)	Tonnage (%)	Grade (%)	Metal (%)
2021	9.1	3.18	931.5	9.1	3.26	953.3	100%	98%	98%
2022	9.4	2.68	814.1	9.5	2.78	853.2	99%	96%	95%

Table 15-15 Mill Production versus Resource Model - Silver

Period	Mill Production			Resource Model			(Mill /Resource Model)		
	Tonnage (Mt)	Ag (g/t)	Ag (Moz)	Tonnage (Mt)	Ag (g/t)	Ag (Moz)	Tonnage (%)	Grade (%)	Metal (%)
2021	9.1	17.34	5.1	9.1	17.67	5.2	100%	98%	98%
2022	9.4	14.42	4.4	9.5	13.51	4.1	99%	107%	106%

For the 2021 production year, actual production gold grades versus the Resource Model reconciled to 98% (3.18 g/t gold versus 3.26 g/t gold), tonnage reconciled to 100% (9.1 Mt versus 9.1 Mt), and gold ounces reconciled to 98% (0.932 Moz versus 0.953 Moz). For the 2022 production year, actual production gold grades versus Resource Model reconciled to 96% (2.68 g/t gold versus 2.78 g/t gold), tonnage reconciled to 99% (9.4 Mt versus 9.5 Mt), and gold ounces reconciled to 95% (0.814 Moz versus 0.853 Moz).

It is the QP's opinion that the recent reconciliation results for PV support the use of a 100% MCF for the Mineral Reserves estimation.

15.6 Discussion

The QP responsible for the Mineral Reserves has directly supervised the estimation process, has performed an independent verification of the estimated tonnes and grade, and in their opinion, the process has been carried out to industry standards and uses appropriate modifying factors for the conversion of Mineral Resources to Mineral Reserves.

The QP is not aware of any environmental, legal, title, socioeconomic, marketing, mining, metallurgical, infrastructure, permitting, fiscal, or other relevant factors that could materially affect the Mineral Reserve estimate. As noted in Section 4, while the permitting process for the Expansion Project is not finalised PV sees no impediment to obtaining all required permits in the normal course of business.

16 Mining Methods

16.1 Summary

Pueblo Viejo was the site of gold mining operations under the ownership of Rosario until March 2002. The operations of Rosario were based on the exploitation of the oxide zone in two principal mineralized areas, Monte Negro and Moore. Mining in the Moore deposit stopped early in the 1990s due to ore hardness and high copper content, resulting in high cyanide consumption. In the Monte Negro deposit, mining ceased in 1998 and stockpile mining continued until July 1999, when the operation was shut down. During these 24 years of historical production, the Pueblo Viejo Mine produced a total of 5.5 Moz of gold and 25.2 Moz of silver.

Mine development of the current operations by Barrick began in August 2010. Current mine activity is in the Monte Negro and Moore pits. Mining is by conventional drill, blast, truck, and shovel methods.

The ore stockpiles are classified as high-grade, medium-grade, and low-grade material. At the end of December 2022, the total ore on stockpile was 95.4 Mt.

The remaining pit only Mineral Reserves are estimated at 196.1 Mt of ore with a strip ratio 2.6:1. Total Mineral Reserves (pit plus stockpiles) are estimated to be 291.6 Mt at a strip ratio of 1.8:1. The combination of direct feed and stockpile re-handle is the current blending strategy at the mine. Ore blending for early processing of high-grade ore with consideration to sulfide content is practiced to maximize the NPV. Stockpile management and ore control practices are a key consideration.

The pit stages have been designed to optimize the early extraction of the higher-grade ore. Notwithstanding, the sulfur grade is an important consideration because the metallurgical aspects of the processing operation, the recoveries achieved, and the processing costs strongly depend on sulfur content in the plant feed, with benefits from consistency and low variability.

PAG waste rock from the pits is hauled to dedicated waste dump locations (currently the Hondo dump). From 2025 onwards, a crushing, conveying, and stacking system will transport and place PAG waste mined from the pit directly into the new Naranjo TSF. The PAG waste material deposited in Hondo is intended to be rehandled into completed pit void locations when available, and the remainder will be rehandled into the PAG handling system to the Naranjo TSF after pit mining is completed.

Mineral processing requires a significant amount of limestone slurry and lime derived from high quality limestone. Limestone quarries, located adjacent to the mine, have been in production since 2009 to supply material for TSF construction and the process plant.

The remaining pit life, based on the Mineral Reserves estimate. Is projected to be 19 years, until 2041, with the processing of low-grade ore stockpiles and limestone mining continuing until 2044. To maximize project economics, higher grade ore is processed in the early years, while lower grade ore is stockpiled for later processing. Stockpiled ore is mined with a reclamation sequence to maximize ore delivery and revenue.

16.2 Mine Design

The shell resulting from the optimisation described in 15.3 using US$1,300/oz for gold and US$18.00/oz for silver is the basis of the final pit design. The mine design process uses the shell as a foundation and adjusted by inclusion of access ramps, geotechnical berms, hydrogeological considerations, etc. to produce a practicable final pit design.

Pit Design parameters

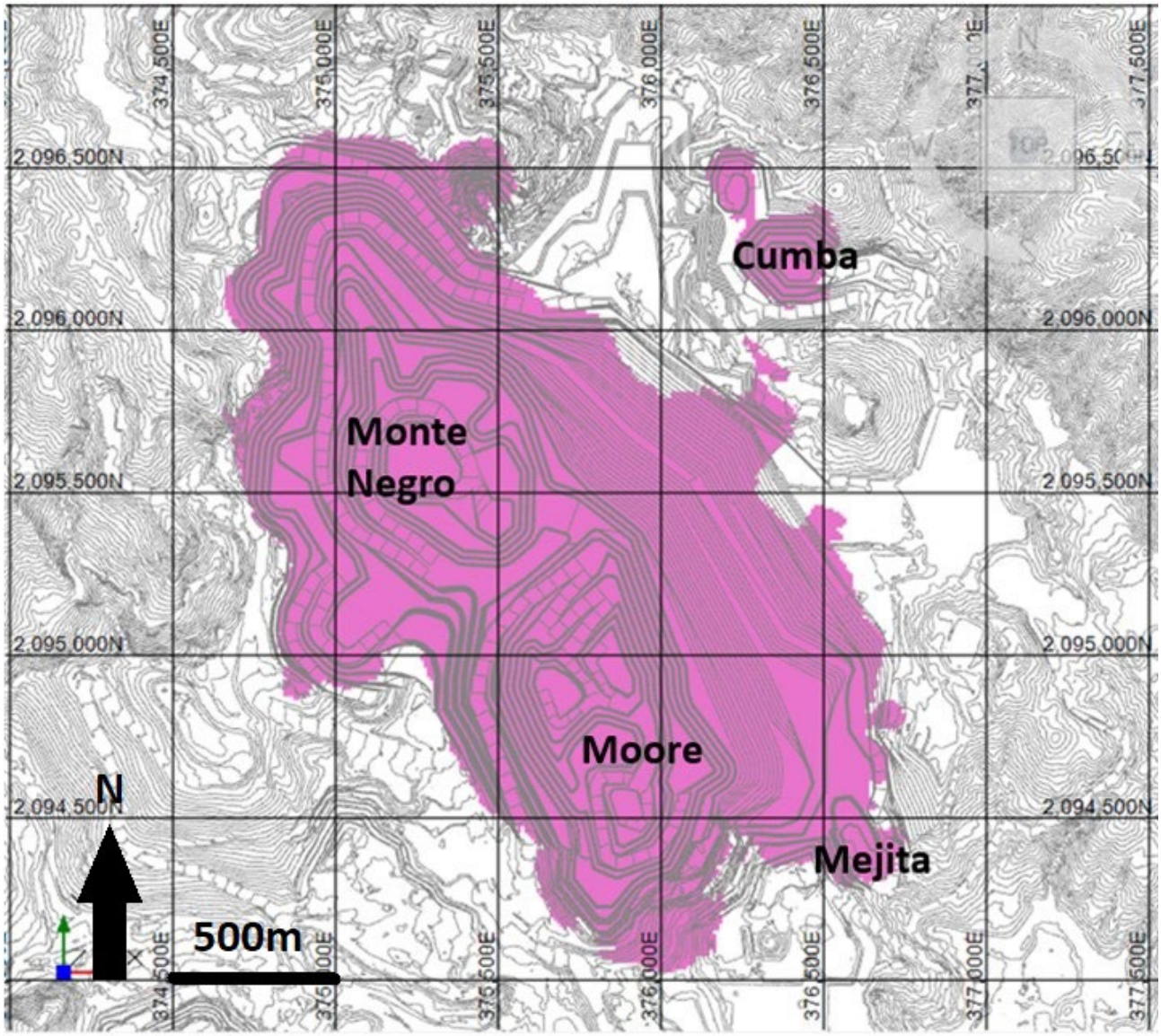
The final pit design is based on the following parameters:

- Bench height is 10 m with single and double benching by sectors.
- Main haul roads are designed with 35 m width and maximum 10% gradient.
- Roads within the carbonaceous sediments geotechnical domain are designed with a width of 40 m to account for residual geotechnical risk.
- In-pit single-lane haul roads (typically to within 3 x 10 m benches of pit bottom) have a design width of 20 m and a maximum gradient of 12%.
- The minimum mining width for phase design is generally targeted to be 60 m; however, locally can be narrowed to 40 m.

The geotechnical parameters are described in more detail in section 16.3.

Ultimate Pit Design vs Whittle

The resulting final pit design is shown in Figure 16-1. The comparison of this design with the selected Whittle pit shell is presented in Table 16-1.



Source: Pueblo Viejo, 2022

Figure 16-1 Final Pit Design Versus Whittle Shell Comparison

Table 16-1 Final Pit Design Versus Pit Shell Comparison

Item	Unit	Whittle Pit Shell (US$1,300/oz)[1]	Pit Design	% Variance
Ore	kt	202,852	196,174	-3%
Au Grade	g/t	2.22	2.19	-1%
Ag Grade	g/t	12.88	12.87	0%
Au Contained	koz	14,490	13,826	-5%
Waste	kt	505,777	518,528	2%
Total	kt	708,629	714,703	0.80%

Whittle Pit Shell differs from Optimisation Results presented in 15.3 due to depletion using 2022 EOY survey surface for valid comparison against Reserve totals.

Quarries

Pueblo Viejo operations require significant amounts of limestone to operate the processing facility and construct the TSF facilities. PV exploits limestone resources adjacent to the gold and silver bearing pits to meet these requirements. PV utilises a Whittle type optimisation for guidance on the quarry designs and extents to maximise the resource extraction and minimise the mining costs.

The limestone resource is classified and optimised using the classification scheme shown in Table 16-2.

Table 16-2 Limestone Classification

Description	Type	Criteria
MQ (Lime)	Metallurgical Rock	% CaO > 51, SiO2 < 1.75%, No Clay
LQ1	Construction Clean Rock	No Clay 100% < 1,000 mm
LQ2	Road Base	Clay < 10%
LQ3	Rock Fill	Clay < 20%
W1	All Other	Clay > 20%

The predominate users of limestone are:

- Processing (MQ).
- TSF wall construction for the Lower Llagal and Naranjo TSF (LQ1 and LQ2).
- Construction, such as internal roads, diversion channels, and additional dams (LQ2 and LQ3).

Waste rock from the quarries is generally non-acid generating (NAG) and taken to dedicated NAG dumps.

Waste Dumps

As part of the closure requirements pertinent to environmental permitting, all PAG waste must be stored in anaerobic conditions to minimise the acid generating potential. This is typically achieved by co-disposing PAG and tailings in the TSF facilities but can also be achieved by backfilling the pits to an elevation below the natural water table level. Due to sequencing of the completion of the Lower Llagal TSF and the planned commissioning of the Naranjo TSF, there has been a necessity to store PAG in above-ground dumps temporarily. The PAG will be ultimately rehandled into in-pit voids and the Naranjo TSF.

Typical PAG waste dump design considers a 20 m bench height and a 14 m bench width. NAG waste dumps are designed considering final reclamation slopes and surface drainages for revegetation and closure.

The Hondo PAG dump has been designed to temporarily store over 150 Mt of PAG waste and low-grade ore. The key design considerations for this dump are ARD surface water runoff management and geotechnical constraints.

NAG material is also stored onsite in conventional surface dumps and backfilled into mined-out quarries. NAG waste does not have the ARD considerations relevant to PAG waste.

Stockpiles

The mine design and scheduling strategy at Pueblo Viejo focuses on maximizing net present value. An elevated cut-off grade strategy is employed where ore is mined at a faster rate than can be processed. The higher gold grade ore is preferentially fed to the process plant, while the lower grade ore is stockpiled.

Stockpiles are designed to be reclaimed in various phases throughout the LOM. A stockpile optimization was performed as guidance for the phase sequence. Typical stockpile design considers a 10 m bench height and a 7 m berm width.

16.3 Geotechnical, Hydrogeological Parameters and Stability Analysis

Geotechnical Input - Slope Angles

Between 2020 and 2022, PV undertook detailed geotechnical and hydrogeological studies, including a review of slope performance history, to produce an operations level geotechnical assessment for pit slopes at the Pueblo Viejo open pit. These studies were completed internally and use external consultants to produce geotechnical inputs for open pit optimization.

Slope Stability Analysis and Design - Geotechnical Parameters

During 2020 and 2021, PV undertook site investigations and technical study programs to update the geotechnical model. This included:

- Additional investigative drilling and ground characterization and the installation of pore pressure monitoring instrumentation were performed by SRK Consultants (SRK, 2022a) and PV (2022a).
- Pit wall mapping and photogrammetry completed by PV.

- A rock mass and minor structure model update by Red Rock Geotechnical (RRG, 2021), which was based on all available data from 2004 to 2020, a review of slope performance history and incorporation of learnings from instabilities on interim pit slopes.
- Groundwater model updates based on actual pore pressure monitoring data from pit slopes completed by PV (2022b).

In 2022, a detailed numerical model was developed by SRK Consultants (SRK, 2022b) to replicate historic and predict future groundwater levels and pore pressures in the pit slopes. Red Rock Geotechnical (RRG, 2022) undertook three- and two-dimensional stability assessments for life-of-mine open pit slopes to update slope design parameters.

The findings of the 2020 to 2022 studies were used to update the life-of-mine plan in combination with practical elements considering slope design execution and operability.

In overview, there are four key geotechnical domains at PV of contrasting material properties:

- Cover and clays (COV & Q-CL).
- Carbonaceous sediments (CS-P & CS-T).
- Volcanics (VOL).
- Limestone (LS-P & LS-RM).

Cover materials, including saprolites, highly weathered rocks in the open pit, and quarry clays, are very weak with an unconfined compressive strength (UCS) of 2 MPa or less.

The carbonaceous sediments are weak to very weak, with UCS typically ranging from 8 to 20 MPa and a geological strength index (GSI) in the order of 37 to 48. The materials are highly anisotropic with an extremely weak and persistent fabric of bedding planes and sub-parallel faults and shears dipping to the south-west with friction angles typically ranging from 17° to 19°. Carbonaceous sediments are low permeability and difficult to depressurize in a tropical setting with continuous groundwater recharge from precipitation. The north and east walls of the pit require active dewatering and horizontal drains to maintain reduced pore pressures. The majority of outcrops in the LOM plan occur on the north and east walls within the Moore and Monte Negro regions, where susceptibility to instability along the extremely weak fabric is most prominent and has occurred several times in previous interim pit slopes. Inter-ramp slope angles (IRA) in these regions have been commensurately reduced.

Volcanics consist of multiple rock types, including andesites and tuffs with various alteration types. UCS exceeds 30 MPa, and GSI ranges from 50 to 65. Volcanics are generally considered isotropic, with geological structures being less persistent and more variable in their orientation. There is a narrow transition between the carbonaceous sediments and volcanics in which volcanoclastic

stratification is sympathetic to the sedimentary bedding; however, essentially, there is no dominant fabric that will dictate pit slope stability.

Limestones are stronger and generally less fractured than the volcanics, with a typical UCS of 70 MPa and GSI of 60. Limestone is a mildly anisotropic material with south-west dipping bedding.

The volcanics and limestones are considerably more permeable than the carbonaceous sediments and dewater and depressurize relatively quickly with the existing pumping and horizontal drilling practices.

Slope design parameters shown in Table 16-3 have been derived from stability analyses and validated with over ten years of slope performance history. The slope design parameters have three distinct divisions based on the geotechnical domains and expected ground behavior:

- Shallow slopes (IRA: 16°) for carbonaceous sediments susceptible to sliding along weak fabrics and governed by the need to achieve stable inter-ramp and overall slopes.
- Moderate slopes (IRA: 26-38°) in cover and clays of up to four benches and for carbonaceous sediments that are not susceptible to sliding along weak fabrics.
- Steep slopes (IRA: >40°) in volcanics and limestones are governed by the need to manage short-term rock fall risks and maintain productivity.

Figure 16-2 shows a plan of the geotechnical domains used in the pit optimization and design.

Table 16-3 Geotechnical Slope Design Parameters

Geotechnical Domain	Pit Slope Orientation (Slope Dip Direction)	Bench Height (m)	Min. Bench Width (m)	Max. Bench Face Angle (°)	Max. IRA: Inter-Ramp Angle (°)	Max. Inter-Ramp Height (m)	Min. Geotech. Berm (m)
COV	All	10	7	60	38.1	80	14
Q-CL	All	10	7	37	26.3	40	14
CS-P	135° to 315°	20	15	20	16	80	20
CS-T	000° to 135°	20	10	50	36.8	80	20
LS-P	210° to 270°	10	8	70	41	80	20
LS-RM	000° to 210°	20	10	70	49	80	20
VOL	All	20	12	70	45	80	20

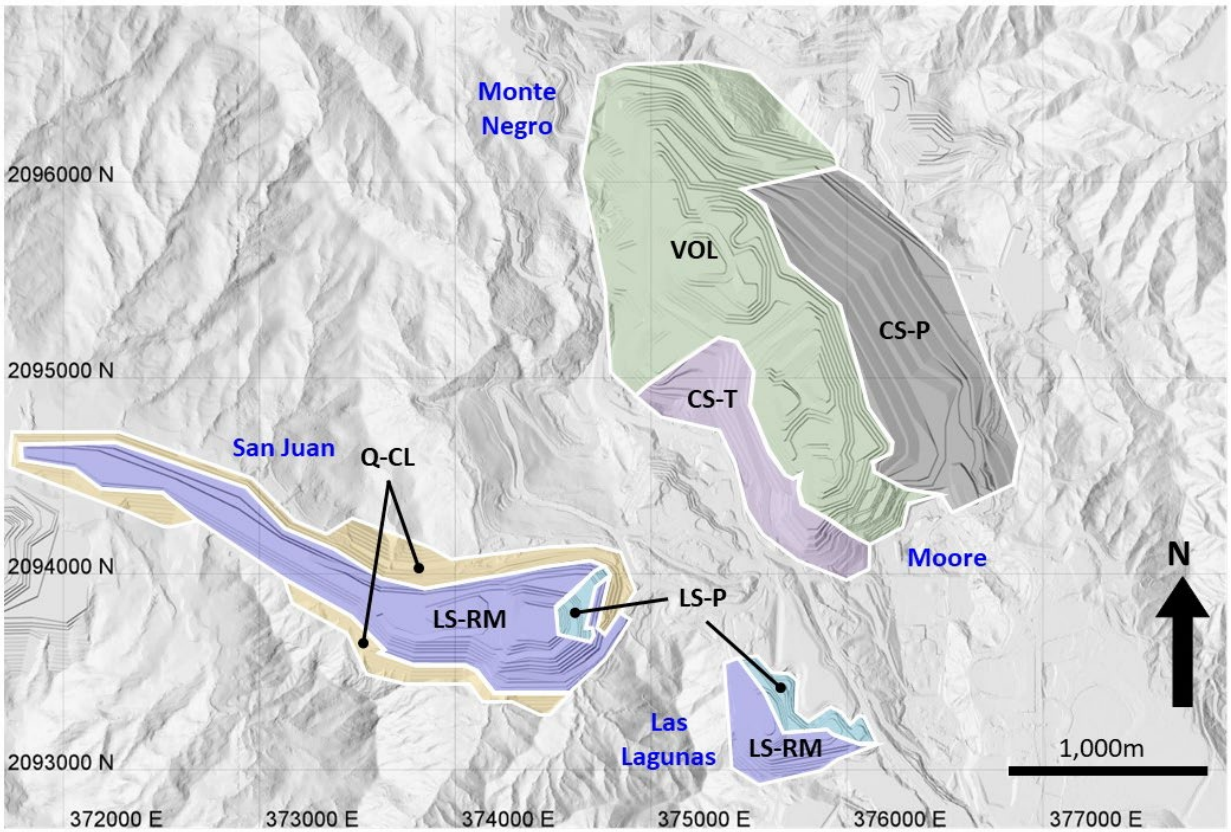


Figure 16-2 Geotechnical Domains and 2023 Ultimate Shell and Quarries

Pit Dewatering and Slope Depressurization

The current dewatering network comprises 13 active vertical dewatering wells currently pumping and another 14 vertical dewatering wells available but not actively pumping. Additional drilling and installation is ongoing each year to expand the capacity and replace ineffective or destroyed wells. They are generally located along the perimeters of the active mining areas, mostly outside the active footprint of pits and quarries. The main objective is to reduce pore pressure and phreatic water surface behind the pit slope. Specific locations are defined based on target pore pressures and mine planning.

Pumping rates for the existing pits in Monte Negro and Moore pit range from 7-10 L/s and 12-17 L/s, respectively, depending on availability of storage and pumps utilization.

Vertical pumping wells that are placed low in the pit permit proactive dewatering of the pit floor prior to deepening. These wells target permeable and interconnected major fracture systems for in-pit active dewatering wells. The performance of these is closely connected to their interaction with the local geological structures.

A key factor for slope stability is the pore pressure which can be significant especially in the materials with low storativity and transmissivity such as the carbonaceous sediments and the interlayered clays

and silts. The response of these units to dewatering from distant abstraction wells is typically poor due to the low transmissivity. As a result, active horizontal depressurization of high walls is needed and employed at PV. This is achieved by drilling and installing sub-horizontal drains into the slopes on benches at different levels targeting the most critical areas in terms of slope stability and incremental movements. This is based on the adjustment of a distribution and spacing analysis according to the hydraulic conductivity of each unit.

The effectiveness of depressurization on the pore pressure is evaluated by the analysis of data from instruments (vibrating wire piezometers) installed across previously selected critical profiles. They respond to the depressurization showing a decrease in pore pressure which in turns is converted to a hydraulic head. This allows the creation of pore pressure maps and groundwater levels contour maps.

In 2020, about 17 km of horizontal drain holes (HDHs) had been installed. This was increased to 37 km and 40 km of HDHs in 2021 and 2022 respectively to improve slope depressurisation. This depressurisation drilling will continue in the pits (and quarries as necessary) as mining advances.

The design of each drilling campaign focuses on targeting key geological structures understood to act as barriers or preferred conduits for the flow, as well as slopes sensitive to pore pressure for stability. Given the low permeability and low porosity of the upper units (predominantly carbonaceous sediments) in the Monte Negro and Moore pits, HDHs will continue to be the most efficient form of depressurization. The effects of both pumping wells and horizontal drains are observed in both Monte Negro and Moore pits by a reduction in head gradient.

Geotechnical Discussion

Overall, the slope design parameters and depressurisation strategy adopted for the LOM plan are considered appropriate for the Project. They are considerably more conservative than in previous years and additionally cater for residual risks and uncertainty through the introduction of geotechnical berms (or slope decoupling berms). Geotechnical berms associated with maximum inter-ramp slope heights (or stack heights) have been introduced into the designs to improve overall mine design reliability by vertically separating slopes for planned geotechnical risk management and as a provision for mine dewatering infrastructure.

16.4 Production Schedule

General Strategy

The duration of pit mining in the LOM is projected to be nineteen years until 2041, while limestone mining and processing will continue until 2044.

PV employs an accelerated mining strategy where the total tonnes of ore mined annually is generally well in excess of the annual processing capacity. This enables higher grade material to be preferentially fed into the processing stream. Higher grade ore is processed in the early years, while lower grade ore is stockpiled for later processing to maximize the Project economics.

The total ore material mined from the pits is estimated to be 196 Mt at an average grade of 2.19 g/t gold, 12.87 g/t silver and 8.7% sulfur. The ore stockpiles are classified as high-grade, medium-grade, and low-grade material. As of 31 December 2022, the total ore on stockpile is 95.4 Mt. Stockpile material is scheduled to be blended with direct feed ore maximizing grades. The LOM plan considers a detailed blend sequence incorporating stockpile reclaim phases and deposition schedule.

The combined total processed ore material in the LOM schedule is 291.6 Mt at an average grade of 2.19 g/t gold, 13.6 g/t silver and 8.23% sulfur. The contained metal is 20.5 Moz of gold and 127.5 Moz of silver.

Waste Dump Sequencing

PAG waste is currently being transported to temporary ex-pit waste dumps, which will be rehandled into both the Naranjo TSF facility and the mined pit voids below the water table. Pit backfilling is expected to start in 2030 and continue until the end of mine life with a planned capacity of 163Mt of PAG waste. The Naranjo TSF is expected to be able to start receiving PAG waste in 2025, ahead of tailings storage in 2027. To minimize mining costs, a near pit crusher with an overland conveyor system to a bulk material stacking system will be constructed.

NAG waste material is currently placed in-pit voids. After 2025, all NAG material resulting from the quarries and pits will be deposited in a NAG stockpile northwest of the mine or quarry voids when available.

Limestone Production

Limestone is required for ore processing and TSF construction. Limestone is sourced from quarries adjacent to the mining pits and is classified as either quality limestone or waste (NAG waste). A combined total of 474Mt of material is mined from the quarries over the LOM plan; of this, 293Mt is considered quality limestone for processing and other requirements such as TSF construction.

The limestone quarry production schedule was based on the processing plant requirements and the material requirement for TSF construction activities.

LOM Schedule Summary

A summary of the mining and processing schedule is provided in Table 16-4.

Table 16-4 Mining and Processing LOM Schedule

		LOM	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Mining - Pits													
Ore Mined	kt	196,174	14,394	8,124	1,411	4,316	8,930	8,148	7,486	7,701	13,811	13,211	13,880
Waste Mined	kt	516,922	16,721	5,725	30,408	43,412	36,371	22,584	17,853	27,396	48,317	44,145	26,063
Total Mined - Pits	kt	713,096	31,115	13,849	31,819	47,728	45,301	30,733	25,339	35,097	62,127	57,355	39,943
Mining - Quarries													
Quality Limestone	kt	292,798	14,562	17,093	19,193	19,596	19,982	15,013	9,902	14,077	16,095	15,649	13,931
Waste Limestone	kt	181,427	12,282	3,448	12,478	10,123	4,917	1,515	6,614	2,504	557	1,028	3,064
Total Quarry Mined	kt	474,225	26,844	20,540	31,670	29,720	24,899	16,528	16,515	16,581	16,652	16,678	16,995
Total Rehandle	kt	625,371	19,303	24,337	24,713	24,034	20,742	32,088	37,195	37,576	19,049	23,392	33,194
Total Moved	**kt**	**1,812,693**	**77,262**	**58,726**	**88,203**	**101,482**	**90,942**	**79,348**	**79,049**	**89,255**	**97,828**	**97,425**	**90,132**
Milling													
Stockpile Feed		184,654	5,883	10,682	13,533	12,946	10,967	10,331	10,829	10,720	6,688	4,944	5,972
Pit feed		106,932	5,836	3,118	578	1,439	3,418	4,054	3,556	3,665	7,697	9,441	8,413
Total Ore Milled	**kt**	**291,585**	**11,719**	**13,800**	**14,111**	**14,385**	**14,385**	**14,385**	**14,385**	**14,385**	**14,385**	**14,385**	**14,385**
Ore Au Grade	g/t	2.19	2.51	2.49	2.24	2.31	2.62	2.23	2.34	2.30	2.26	2.20	2.40
Ore Ag Grade	g/t	13.60	14.55	15.49	13.04	16.75	18.32	14.26	13.81	16.46	13.36	12.69	15.46
Ore S Grade	%	8.27%	7.78%	7.75%	6.57%	7.20%	7.20%	6.32%	6.99%	7.30%	8.33%	7.52%	8.88%
Contained Au	koz	20,492	944	1,104	1,017	1,069	1,211	1,030	1,081	1,064	1,046	1,020	1,108
Contained Ag	koz	127,458	5,484	6,873	5,918	7,749	8,473	6,597	6,386	7,613	6,178	5,868	7,150
Au Recovery	%	90.1%	89.3%	90.7%	90.6%	90.6%	90.0%	89.9%	90.4%	90.6%	89.8%	89.8%	90.2%
Ag Recovery	%	65.3%	63.6%	68.4%	68.8%	71.6%	63.8%	63.3%	71.8%	72.4%	71.1%	61.1%	58.2%
Recovered Au	**koz**	**18,472**	**843**	**1,001**	**921**	**968**	**1,090**	**927**	**977**	**964**	**939**	**916**	**999**
Recovered Ag	**koz**	**83,210**	**3,489**	**4,704**	**4,069**	**5,546**	**5,407**	**4,174**	**4,584**	**5,515**	**4,391**	**3,585**	**4,159**

		LOM	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044
Mining - Pits													
Ore Mined	kt	196,174	14,383	11,343	14,385	14,385	12,946	12,947	12,946	1,427	0	0	0
Waste Mined	kt	516,922	24,353	39,016	47,968	35,248	20,397	17,634	12,805	506	0	0	0
Total Mined - Pits	kt	713,096	38,735	50,359	62,353	49,633	33,343	30,580	25,752	1,933	0	0	0
Mining - Quarries													
Quality Limestone	kt	292,798	11,426	17,420	14,841	15,882	11,023	4,513	1,211	4,507	15,276	21,608	0
Waste Limestone	kt	181,427	5,406	4,986	1,575	6,288	12,152	19,043	22,900	25,970	19,833	4,742	0
Total Quarry Mined	kt	474,225	16,831	22,406	16,417	22,170	23,175	23,556	24,112	30,477	35,109	26,350	0
Total Rehandle	kt	625,371	42,871	24,256	20,014	17,640	25,570	32,879	31,350	42,500	31,837	36,783	24,050
Total Moved	**kt**	**1,812,693**	**98,438**	**97,021**	**98,783**	**89,443**	**82,088**	**87,015**	**81,213**	**74,910**	**66,946**	**63,133**	**24,050**
Milling													
Stockpile Feed		184,654	5,286	7,555	4,216	6,048	4,924	7,038	4,686	11,145	11,598	11,050	7,611
Pit feed		106,932	9,099	6,830	10,169	8,276	7,309	6,096	7,648	291	0	0	0
Total Ore Milled	**kt**	**291,585**	**14,385**	**14,385**	**14,385**	**14,324**	**12,233**	**13,134**	**12,333**	**11,436**	**11,598**	**11,050**	**7,611**
Ore Au Grade	g/t	2.19	1.98	1.92	2.17	2.24	2.34	2.12	2.09	1.71	1.69	1.68	1.91
Ore Ag Grade	g/t	13.60	16.19	12.99	12.52	12.00	11.23	12.49	11.83	10.88	9.23	9.61	12.72
Ore S Grade	%	8.27%	7.04%	7.13%	7.67%	9.37%	8.61%	8.97%	10.51%	10.86%	10.87%	11.16%	11.48%
Contained Au	koz	20,492	914	890	1,002	1,032	920	896	827	627	630	597	467
Contained Ag	koz	127,458	7,489	6,008	5,790	5,527	4,418	5,275	4,692	4,001	3,444	3,415	3,112
Au Recovery	%	90.1%	89.9%	89.9%	90.4%	90.4%	90.3%	90.1%	90.1%	89.8%	89.7%	89.9%	90.0%
Ag Recovery	%	65.3%	66.6%	67.4%	67.9%	64.1%	62.4%	68.6%	64.0%	59.7%	48.8%	55.7%	55.7%
Recovered Au	**koz**	**18,472**	**822**	**800**	**906**	**933**	**830**	**807**	**745**	**563**	**564**	**537**	**420**
Recovered Ag	**koz**	**83,210**	**4,991**	**4,047**	**3,931**	**3,542**	**2,755**	**3,617**	**3,002**	**2,387**	**1,681**	**1,902**	**1,733**

Totals may not add due to rounding

16.5 Mine Equipment

The Mine operations use conventional drilling, blasting, truck, and loader methods with various support ancillary equipment; Table 16-5 summarizes the current primary loading, hauling, and drilling equipment fleet.

Table 16-5 Primary Production Equipment

Activity	Equipment	Current Number	Peak Number
Loading	CAT 994 Loaders	3	3
Loading	Hitachi 3600 Hydraulic shovels	3	4
Hauling	CAT 789 C/D Rear-dump trucks (177t)	46	66
Drilling	Sandvik D55SP	5	5
SP Rehandle	CAT 994 Loaders	2	2

As mining quantities increase, the number of trucks required will also increase to a maximum of 66 in 2034. An additional Hitachi 3600 class shovel will be required in 2025.

The average planned availability and utilization of the primary production fleet are summarized in Table 16-6.

Table 16-6 Planned Equipment Availability and Utilization

Equipment	Average Planned Availability	Average Planned Utilization
CAT 994 Loaders	84%	86%
Hitachi 3600 Hydraulic shovels	87%	86%
CAT 789 C/D Rear-dump trucks	85%	86%
Drills	83%	84%

Ore rehandling activities are performed by PV and utilize the Cat 994 loaders and haul truck primary production equipment. Mining of the limestone quarries is also undertaken using the primary production fleet.

Blasting patterns are designed to accommodate various drilling equipment with consideration to factors including geomechanics, material type and/or hardness, and ore location. Blast holes are drilled using a variety of drill hole diameters and hole depths based on the objective and expected results.

Explosives are supplied and loaded into blast holes by an explosive's contractor. Emulsion or ANFO is used, depending on the blasting conditions, together with various packaged explosives and initiation systems as required. Appropriate powder factors are used to match ore, and waste types based on required fragmentation and other outcomes.

Ancillary activities are performed using various equipment by PV and other contractors. This equipment consists of small excavators, CAT D10 dozers, wheel dozers, CAT 16 motor graders, 777 water carts, and smaller front-end loaders.

Pit dewatering is performed using a series of surface piping and diesel dewatering pumps. Water is pumped from the pits and sediment control structures to ARD1 where it is treated for use in the process plant or discharged after meeting regulatory discharge standards.

16.6 Workforce

The permanent and contractor employee breakdown for the Exploration, Mining Operations, Mobile Mine Maintenance, and Mineral Resource Management departments is shown in Table 16-7 and Table 16-8.

Table 16-7 PV Direct Employees circa 31 December 2022

Classification	Department	Employees
Mining	Exploration	11
	Mineral Resources Management	77
	Mining Operations	560
Mobile Maintenance	Mobile Equipment Maintenance	396
Total		**1,044**

Table 16-8 PV Contractor Employees circa 31 December 2022

Department	Employees
Mining Operations	313
Mineral Resources Management	160
Mine Maintenance	159
Total	**632**

16.7 Discussion

It is the opinion of the QP's responsible for this section that the mining methods, the mining equipment and productivities, the mine design and input parameters are suitable for PV and estimation of Mineral Reserves.

17 Recovery Methods

17.1 Existing Operation

The processing plant is designed to process approximately 24,000 tpd of ROM refractory ore. The oxygen supply is one of the key plant bottlenecks. The design basis for the oxygen plant is to provide the oxygen required to oxidize approximately 80 tph of sulfide sulfur. This is equivalent to 1,200 tph of feed containing 6.79% sulfide sulfur, assuming a design factor of 2.2 tonnes O_2 per tonne sulfide sulfur.

The process plant consists of the following unit operations:

- Ore crushing circuit.
- SAG and ball mill with pebble crusher (SABC) grinding circuit.
- Pressure oxidation circuit.
- Oxygen plant.
- Hot cure circuit.
- Counter current decantation (CCD) wash circuit.
- Ferric precipitation circuit (partial neutralisation).
- Neutralisation and solution cooling circuit.
- Lime boil and slurry cooling circuit.
- Carbon-in-Leach (CIL) cyanidation circuit.
- Carbon acid washing, stripping and regeneration circuits.
- Refinery.
- Cyanide destruction circuit.
- Tailings effluent and acid rock drainage water treatment plant circuit.
- Tailings disposal facility.

The ROM ore is crushed to a P80 of 130 mm in a primary gyratory crusher which is reclaimed from the crushing station dump pocket by an apron feeder and conveyed directly to the coarse ore stockpile. Ore is reclaimed from the coarse ore stockpile using apron feeders located in a tunnel under the stockpile. The apron feeders discharge onto a conveyor belt feeding the SAG mill. The ore is ground to the optimum grind size of P80 of 80 µm in a SABC circuit. The SAG mill is in a closed circuit with a vibrating screen and a pebble crusher, while the ball mill is in a closed circuit with hydrocyclones. The cyclone overflow is thickened to approximately 50% solids and pumped to the

autoclave feed storage tanks, which also serve to blend the ore to allow a more gradual and constant sulfur feed grade to the pressure oxidation circuit.

This ore slurry is pumped to the autoclaves to ensure an optimum reaction. The ore is oxidized for 60 min at a temperature of 225°C and a pressure of 3,100 kPag (500 PSIG). The oxidized slurry is flash discharged, and the steam produced is condensed in the quench tower and scrubber systems.

The oxidized slurry is sent to the hot cure tanks, where it is maintained at more than 90°C for 12 hrs. In this process, the basic ferric sulfate will be redissolved into the solution, which allows for a much lower neutralization cost using limestone.

The cured slurry is washed in a three-stage CCD circuit to remove the dissolved metal sulfates and sulfuric acid from the slurry.

The washed slurry is pumped to the lime boil preheat vessel, which is reheated to 95°C using steam from the autoclave flash discharge. The reheated slurry is treated with lime and maintained at more than 85ºC to break down the jarosites to liberate silver.

The lime boil slurry is then cooled to 50°C in a slurry cooling tower and pumped to the CIL cyanidation circuit, where gold and silver are extracted using cyanide and activated carbon.

The CCD wash thickener overflow, containing more than 99% of the dissolved metal sulfates and sulfuric acid, is used to condense the flash vapour in the autoclave quench systems and consequently contributes to reducing emissions to the atmosphere. The solution, at 95 to 100°C, is sent to the ferric iron precipitation tanks for partial neutralisation using limestone. The resulting slurry is pumped to and treated with limestone and lime in a high-density-sludge (HDS) neutralization circuit to precipitate the remaining metal sulfates. The sludge is thickened and pumped to the tailings facility after blending with the CIL tailings. The HDS thickener overflow is cooled in a series of solution cooling towers to less than 40°C and recycled back to the CCD wash circuit.

The lime and limestone required for the lime boil and neutralization process are produced on-site. Limestone quarries southwest of the open pits are developed to supply the required limestone for the process and TSF construction.

The limestone and lime plant consist of the following:

- Limestone crushing and screening circuit.
- Limestone grinding-SAG and ball mills.
- Vertical lime kilns.
- Lime slaking ball mill circuit.

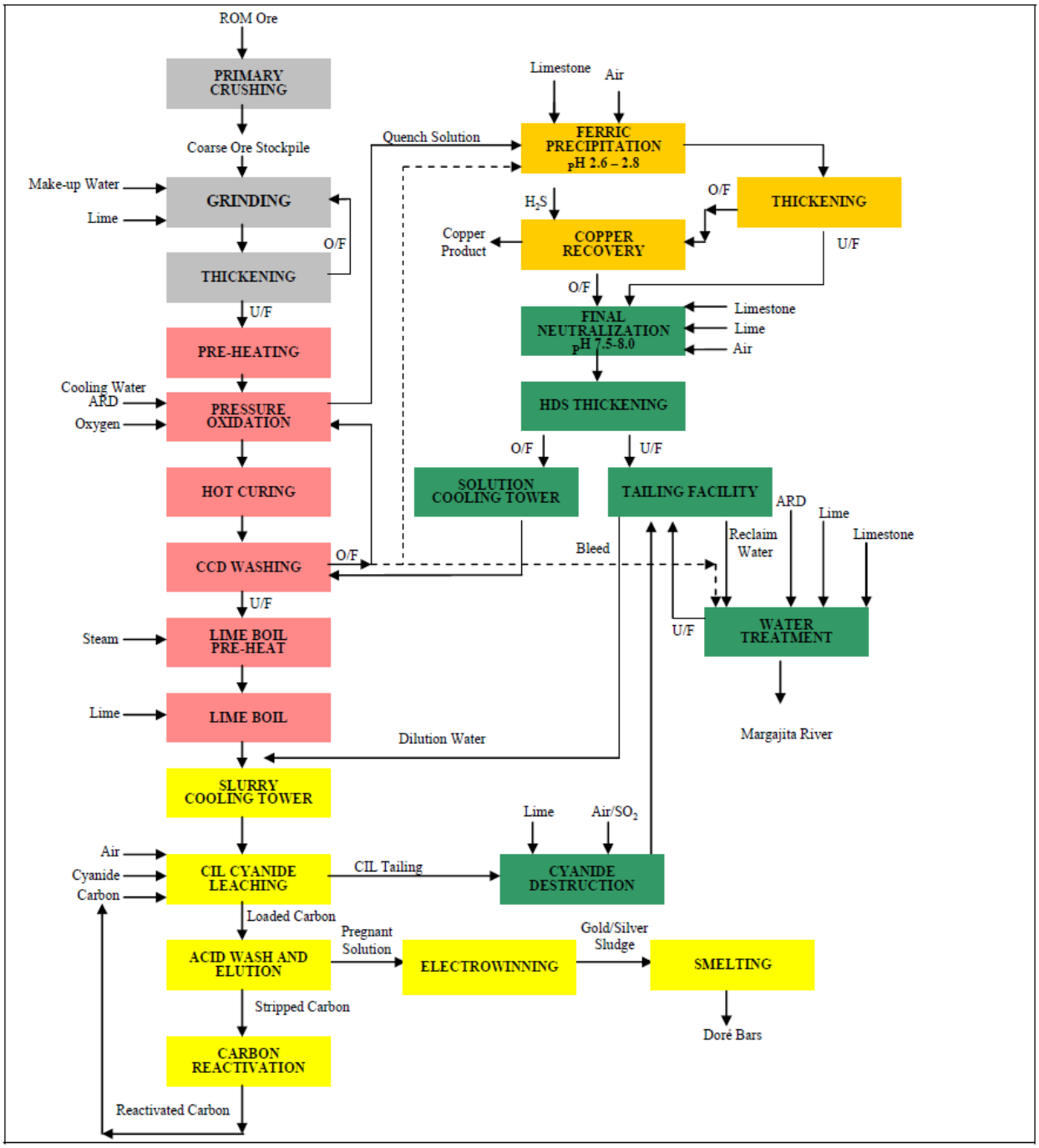
The limestone used for the process is first crushed in a gyratory crusher and then conveyed to a vibrating screen to separate the material between 50 mm to 100 mm, which will be suitable for the lime kilns. The finer and coarser materials are sent to the limestone grinding circuit, where it is ground in a SAG/ball mill circuit to produce a fine limestone slurry with a P80 of 60 µm used in the neutralization and ARD treatment processes.

The midsized limestone is conveyed to three large lime vertical kilns, fired by heavy fuel oil to produce lime which is subsequently slaked to produce the milk of lime used in the grinding, lime boil, effluent treatment, and final neutralization processes.

The loaded carbon from CIL is acid-washed and stripped using the Zadra elution process. Gold and silver in the pregnant eluate are recovered by electrowinning (EW). Finally, the gold sludge is dried, retorted to remove the mercury, fluxed, and smelted to produce doré bullion bars. The stripped carbon is reactivated in horizontal carbon kilns and recycled back to the CIL cyanidation circuit. The carbon kilns are equipped with mercury absorbers to remove mercury from the off-gases.

The plant includes a cyanide destruction process for the CIL tails slurry. The INCO process, which includes the use of sulfur dioxide and air as the cyanide destruction reagents. Sulfur dioxide is supplied from a sulfur burner plant. A copper sulfate solution is added to provide the copper ions that act as a catalyst during the detoxification process.

The existing Pueblo Viejo processing plant flowsheet is shown in Figure 17-1.



Source: PV, 2020

Figure 17-1 Pueblo Viejo Simplified Process Flow Diagram

17.2 Expansion Project

The Expansion Project is designed to both expand processing operations from 8.6 Mtpa to approximately 14 Mtpa to economically treat lower grade ore, as well as increase the tailings storage capacity at the asset, thereby increasing Mineral Reserves and extending the mine life. The intention is not to install an additional autoclave but rather to upgrade the low-grade ore by installing a flotation

circuit and to modify the existing four autoclaves by including a flash recycle thickening circuit, which will assist in increasing the capacity and the residence time in the autoclaves.

The process plant expansion includes a new primary crusher and single-stage SAG (SS-SAG) milling circuit that is being added parallel to the existing grinding circuit. The existing SABC circuit will have the capability to feed the flotation plant as required. A dedicated crushed ore stockpile will feed the new SS-SAG milling circuit. The overflow from the primary cyclones in the SS-SAG milling circuit will be fed into two parallel flotation trains, each consisting of a surge tank, a conditioning tank and a rougher-scavenger bank. Additionally, approximately one third of the total feed material could bypass flotation and report directly to the POX feed thickener. The flotation tails will be thickened, and gold further recovered in a float tails CIL (FTCIL) circuit. The FTCIL tails will be sent for cyanide destruction before final disposal to the TSF.

The flotation concentrate will be thickened in the grinding thickener before being pumped to the existing autoclave feed tanks. The concentrate will then be pressure-oxidised in the autoclaves and discharged into a cooling tank then fed to the hot cure circuit, dissolving any ferric sulfate that forms during pressure oxidation.

The hot-cured slurry will be gravity fed to a CCD washing circuit to remove sulfuric acid and dissolved metal sulfates.

The underflow from the CCD will be pumped to a lime boil preheat vessel and then to lime boil tanks for the liberation of silver. The lime boil slurry will be cooled in slurry cooling towers and pumped to the existing CIL circuit.

The CCD thickener overflow will be used to quench the off-gas and steam from the autoclave circuit. The heated solution will be gravity fed to the ferric precipitation, where limestone and air are used to precipitate iron from the solution. The iron sludge will be sent from the iron precipitation reactors to neutralisation to treat the remaining acid and dissolved metals to form a HDS. The HDS will be thickened and pumped to the tailing facility.

The PV process plant expansion flowsheet has been periodically subjected to professional review via independent consultants, resulting in several confirmatory reports.

The expanded plant will include the following:

- New gyratory crusher.
- Grinding (SS-SAG).
- Flotation.
- Flotation Tails CIL (FTCIL).
- Cyanide destruction.

- Vertical regrind mill for the limestone plant.

The following thickeners are being repurposed:

- Copper sulfide thickener is being repurposed to assist in the production of HDS.
- Iron precipitation thickener is being repurposed as the flash recycle thickener.

The following areas are being expanded:

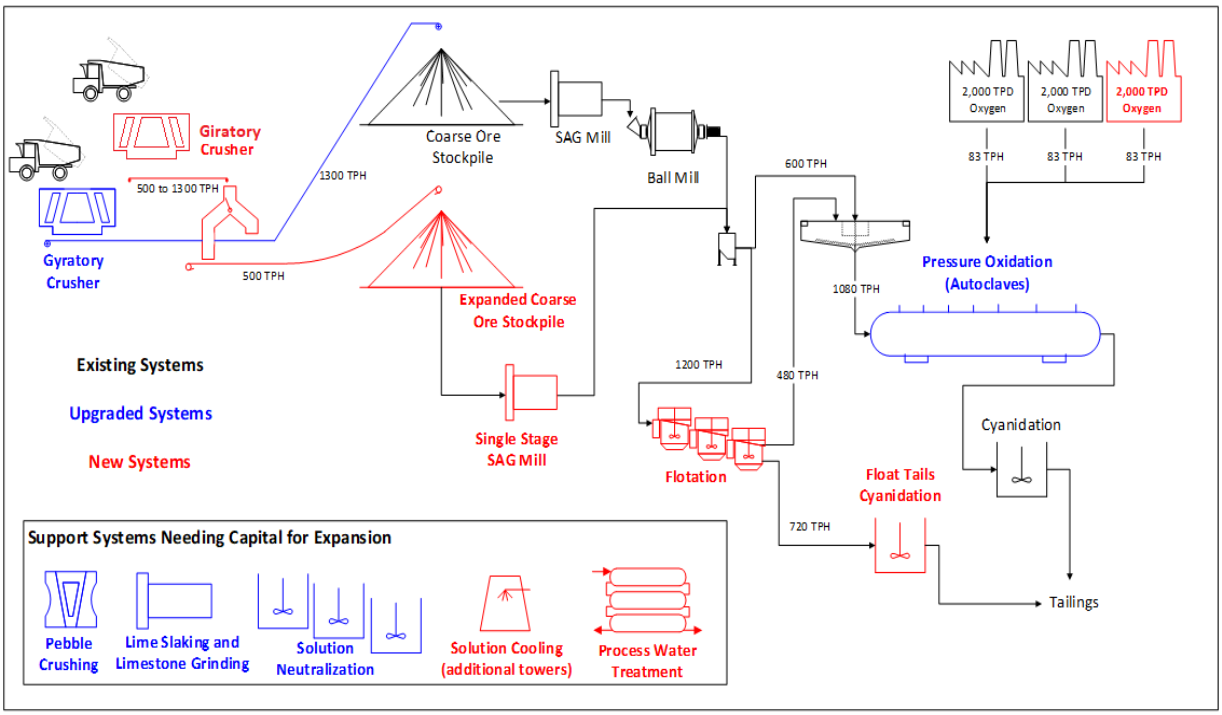
- Ferric precipitation.
- Solution cooling.
- Limestone and Lime.
- Oxygen plant.

The main current and expansion equipment including: the second primary crusher, the second SAG mill, flotation cells, new GEHO pumps, new oxygen plant, and vertical limestone mill, are shown in Table 17-1.

Table 17-1 Main Equipment

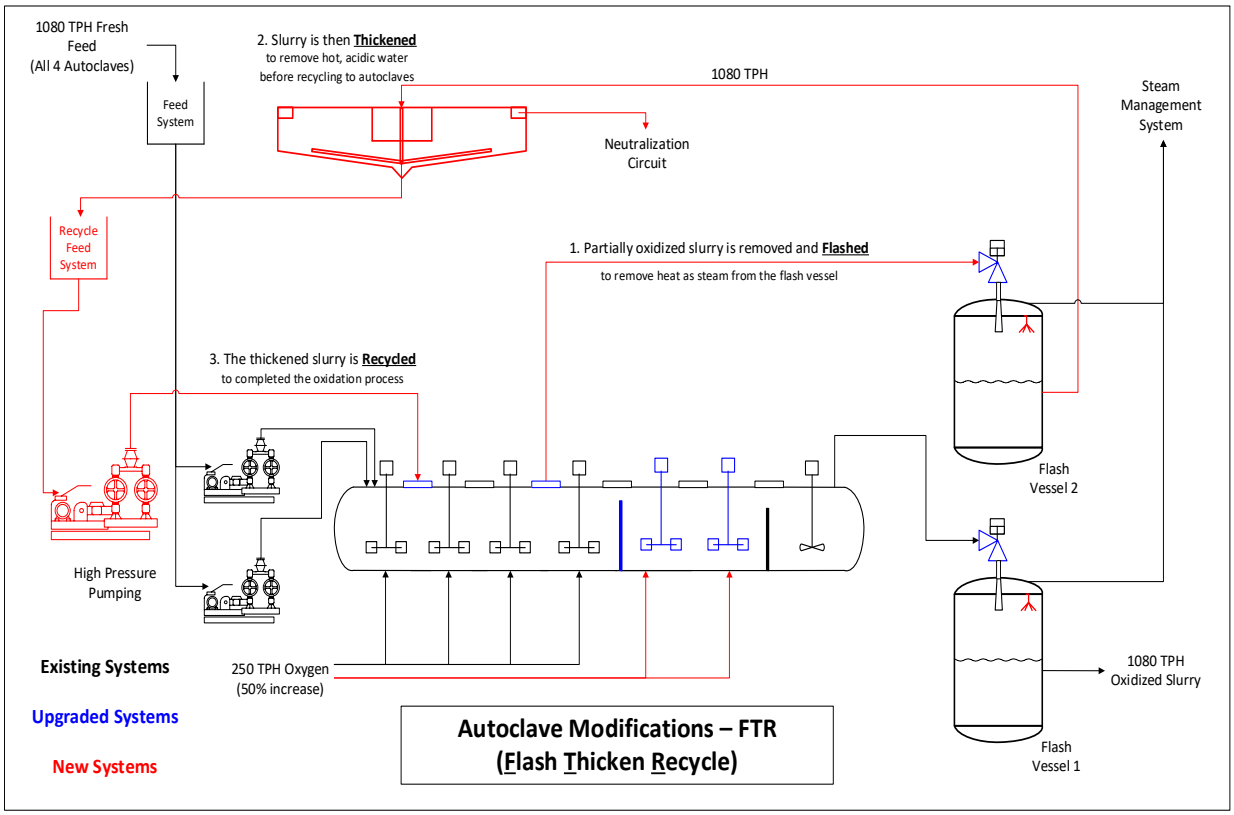
Ore crushing		Capacity/Power	
Primary Crushing 1	Gyratory	375	kW
	Nominal	1,309	tph
	Design	1,645	tph
	Max- Flush Rate	2,000	tph
Primary Crushing 2	TSU 1100x1800		
	P80 – 100mm (P99 – 178mm)	1,500	tph
	P80 – 120mm (P99 – 203mm)	1,890	tph
	P80 – 145mm (P99 – 305mm)	2,350	tph
Ore grinding		**Capacity/Power**	
SAG mill	D=9.7m x L=4.8m	9,000	kW
Ball mill	D=7.92m x L=12.4m	16,400	kW
SAG mill 2	D=11.5m x L=7.3m	23,000	kW
Flotation		**Capacity/Power**	
Flotation cell	2 train of 5 cells	600	m^3
POX		**Capacity/Power**	
Fresh Feed GEHO AC Feed Pumps		246	m^3/h
Flash Recycle GEHO AC Feed Pumps		450	m^3/h
Flash Recycle Thickening (Repurposed Iron Precip Thickener)		60	m
Oxygen Plant		**Capacity/Power**	
Total Existing Plant Oxygen		4,152	tpd
Additional Oxygen Required for Expansion		2,602	tpd
Additional Oxygen Required for Downstream Processes		330	tpd
Recommended Additional Oxygen Plant Capacity		3,000	tpd
Limestone crushing		**Capacity/Power**	
Limestone crusher	Gyratory		
	Actual Crushing rate	820	tph
Limestone grinding		**Capacity/Power**	
Limestone SAG mill	D=6.3m x L=3.66m	2,610	kW
Limestone Ball mill	D=5.49m x L=9.75m	3,542	kW
Vertical mill		3,020-3,630	kW

Simplified process flow diagrams with the key process plant expansion modifications are shown in Figure 17-2 and Figure 17-3.



Source: PV, 2020

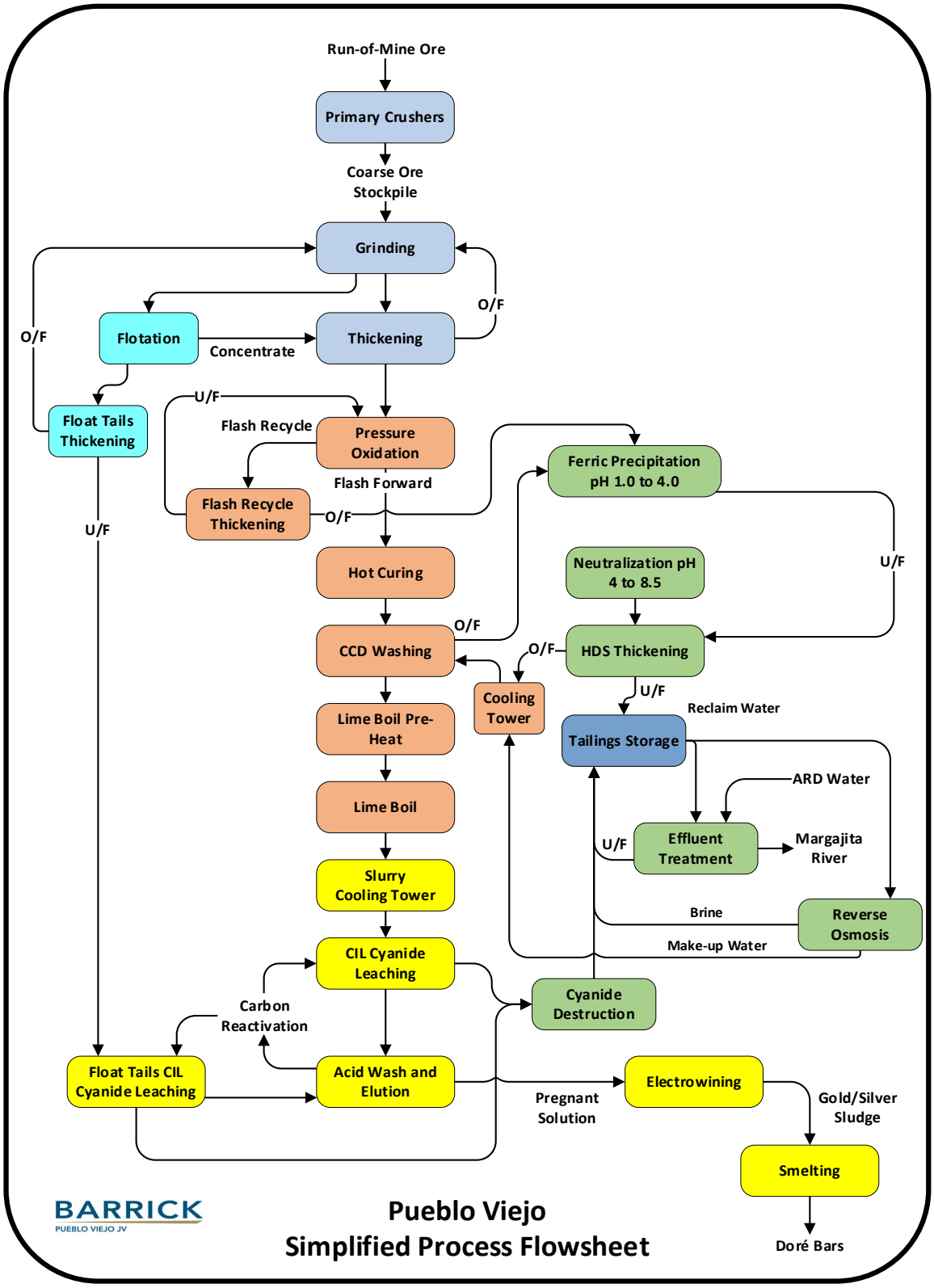
Figure 17-2 Simplified Process Flow Diagram with the New Systems to be Installed and Systems Requiring Upgrades



Source: PV, 2020

Figure 17-3 Simplified Process Flow Diagram for the Modifications Needed for the Autoclave System

The simplified process flowsheet after the expansion is shown in Figure 17-4.



Source: PV, 2020

Figure 17-4 Simplified Process Flowsheet for the Expanded Plant

Design Criteria

The process design criteria (PDC) have been split into the front-end and back-end of the circuit. The front-end includes crushing, milling and flotation. The back end includes the POX circuit and the affected downstream circuits.

The information used in the PDC was derived from various sources including:

- PV operational basis.
- Metallurgical test work.
- Calculated data.
- Vendor data or recommendation.
- SENET.
- Industry standard or practice.
- Engineering handbook.
- Assumption based on experience.
- External consultants.

The process plant expansion is divided into two phases (Z1 and Z2). The first phase (Z1) aims to optimise the existing equipment, and the second phase (Z2) includes the installation of additional equipment to achieve the increased throughput.

Z1 consists of the existing single-stage crushing circuit and the existing primary crushed ore stockpile, which feeds the existing SABC milling circuit. An additional cyclone cluster is also installed on the existing SAG mill; the cyclone underflow is sent to the existing ball mill feed chute and the overflow is sent to the POX feed thickener.

Z1 also includes installation of one of the parallel flotation trains and a flotation tails thickener. The flotation tails are sent to an FTCIL circuit for additional gold recovery. The FTCIL tails are sent to a new cyanide destruction circuit utilising sulfur dioxide gas and air.

Z2 includes an extension onto the existing crushed ore stockpile and reclaim, a single stage milling circuit (with classification and desliming cyclones), and the second parallel flotation train. A flash thicken return (FTR) circuit is included on the POX autoclaves as an alternative to direct dilution or cooling in the first stage of the autoclave.

Phase 3 is mainly related to the increase of sulfide in the ore in the year 2032 from 6.4% to 7.4% sulfide with no significant changes in the design.

Table 17-2 shows the process design criteria for the front-end of the plant:

Table 17-2 Front-End Process Design Criteria

Description	Unit	Existing	Phase 1 (Z1)	Phase 2 (Z2)	Phase 3
Maximum Lump Size F100	mm	1,050			
Ore Grade – Gold (Average)	g/t Au	3.90	3.88	2.70	2.50
Ore Grade – Silver (Average)	g/t Ag	22.62	22.50	15.66	14.50
Ore Grade – Sulfur	% S	8.37	8.92	8.0	9.25
Ore Grade – Sulfide Sulfur	% S_2	6.70	7.14	6.4	7.4
Moisture Content	%	5.0	5.0	5.0	5.0
Specific Gravity of Ore	t/m^3	2.80	2.80	2.80	2.80
Bulk Density of Crushed Ore	t/m^3	1.65	1.65	1.65	1.65
Bond Crusher Work Index	kWh/t	17.0	17.0	17.0	17.0
dWi	kWh/m^3	4.1	4.1	4.1	4.1
Rod Mill Work Index	kWh/t	10	10	10	10
Ball Mill Work Index	kWh/t	13.5	17	17	17
Abrasion Index		0.510	0.510	0.510	0.510
Operating Schedule					
Annual Tonnage Treated	Mtpa	8.6	10.0	14.0	14.0
Ore Processing Tonnes per Month	t/month	716,667	833,333	1,166,667	1,166,667
Primary Crushing					
Overall Availability/Utilisation	%	70	70	70	70
Annual Operating Time	hrs	6,132	6,132	6,132	6,132
Crushing Throughput	tph	1,402	1,631	2,283	2,283
Design Crushing Throughput	tph	1,683	2,740	2,740	2,740
Rest of Plant					
Overall Utilisation	%	91.3	91.3	91.3	91.3
Throughput	tph	1,075	1,250	1,750	1,750
Crushing					
Circuit Type/Configuration	-	Single Stage	Single Stage	Single Stage	Single Stage
Primary Crushing Circuit$_{99}$)	mm	1,050	1,050	1,050	1,050
Crushing Circuit Product Size (P_{100})	mm	290	300	300	300
Crushing Circuit Product Size (P_{80})	mm	98	96	96	(SPS) 96
Milling					
Circuit Type 1 (Existing Circuit)	-	SABC	SABC	SABC	SABC
Feed Size (F_{80})	mm	90–127	90–127	90–127	90–127
Product Size (P_{80})	µm	88	75	75	75
Overflow Slurry Solids Content	wt % solids	31	15–35	15–35	15–35
Flotation					
Annual Tonnage Treated – Nominal	Mtpa		5	10	10
Annual Tonnage Treated – Design	Mtpa		6	12	12
Mass Pull to Concentrate	%	-	45	45	45

Table 17-3 shows the process design criteria for the back-end, which includes the POX circuit and downstream circuits that will be affected by the process plant expansion.

Table 17-3 Back-End Process Design Criteria

Description	Unit	Existing	Phase 1	Phase 2	Phase 3
Pressure Oxidation (POX)					
POX Feed		Base	POX-Dilution (6.4%S-2)	FTR (6.4%S-2)	FTR (7.4%S-2)
Sulfide Sulfur Capacity (nominal)	tph	76	86.52	109.00	126.00
Number of Autoclaves		4	4	4	4
Feed % Solids	%	50	50	50	50
Nominal time	min	Varies by ore type	48	58	54
Oxygen Plant					
POX Oxidation Target	%	97.0	97.0	97.0	97.0
Total Existing Plant Oxygen	tpd	4,152	4,152	4,152	4,152
Recommended Additional Oxygen Plant Capacity	tpd	2,000–3,000			
Hot Curing					
Retention Time	hrs	12	6	~12	~12
Operating Temperature	°C	105	106	106	106
CCCD Washing					
Number of Wash Stages		3	3	3	3
Wash Efficiency	%	99.3–99.4	99	99	99
Lime Boil					
Retention Time	hrs	2	>2	> 2	> 2
Operating Slurry Temperature	°C	98	98	99	99
Lime Addition	kg $Ca(OH)_2$/t	46.25	46.25	46.25	46.25
Lime Boil Slurry Cooling					
Number of Tower Units		5	5	5	5
Inlet Temperature	°C	90	90	90	90
Outlet Temperature	°C	40	40	40	40
Neutralisation					
CCD Overflow to Quench Feed Rate (New Feed)	m^3/h	6,000	6,580	7,010	7,203
Solution Temperature Range	°C	70–85	85	92–100	92–100
Precipitation Circuit Feed pH		1.3 to 1.5	1.3 to 1.5	1.3 to 1.5	1.3 to 1.5
Neutralising Agent		Limestone	Limestone	Limestone	Limestone
Iron Precipitation, Residence Time	min	60	60	60	60
Number of Trains		1	2	2	2
HDS Neutralisation Stage 2					
Neutralisation Stage Feed Rate	m^3/h	7,233	8,314	8,758	9,035
Neutralisation Stage Feed Temperature	°C	71	80	80	81

Discharge Slurry pH		6.2	5.5	5.5	5.5
Stage 2 Neutralising Agent		Lime slurry	Lime slurry	Lime slurry	Lime slurry
Discharge Slurry pH		8.5	8.5	8.5	8.5
Thickener Underflow Density	wt % solids	50	31	31	31
Neutralisation Stage Effluent Solution Cooling					
Number of Cooling Tower Units		8	14	14	14
Inlet Temperature	°C	65	79	76	76
FLOAT TAILS CIL					
Leach Solids Feed % m/m	%	-	35	35	35
Leach Feed Grade (Nominal) Au	g/t Au	-	1.5	1.0	0.9
Leach Feed Grade (Nominal) Ag	g/t Ag	-	5.6	3.9	3.6
Leach Dissolution (Au)	% Au	-	35	35	35
Cyanide Detoxification Process			INCO	INCO	INCO
Number of Tanks		-	2.0	2.0	2.0
Thickening 2					
Flash Recycle Thickening					
Recycle Solids Tonnage (Design)	tph	-	-	1,528	1,528

17.3 Power, Water, and Process Reagents Requirements

Power

Power is supplied to the plant by a 230 kV incoming line to the substation intake transformers and reduced to 34,500 VAC for plant distribution. The operational steady-state energy demand (including expansion loads) was calculated as 210 MW, with the new SAG mill being the only load of critical relevance to the energy demand. The new SAG mill is a 23 MW gearless motor drive.

Historical and LOM power consumption is shown in Table 17-4.

Table 17-4 Power Consumption in GWh

Area	2022	2023	2024 – LOM
Primary Crusher	3.2	13	17.7
Power – SAG Mill	48.6	116.2	136.4
Ball Mill & Classification	89.9	81.4	84.6
Neutralization	81.6	114.8	125.8
Grinding Common and Thickening	30.6	60.3	70.2
Pressure Oxidation	69.9	92.4	100.0
Oxygen Plant	534.1	612.5	784.3
CIL	49.2	68.3	74.7
Carbon Elution/Regeneration	13.4	16.6	16.8
Tailings	21.1	34.2	74.7
Water Treatment	61.7	80	84.4
Mill Flotation	0	40.9	55.3
Limestone – Ball mill	43.1	78.5	100.0
Limestone – Lime milling/slaking	14.7	14.7	14.7
Total	**1,061.1**	**1,423.8**	**1,739.4**

Water

Process Water

The source of process water is the POX feed thickener and the flotation tailings thickener overflows. Process water is used in milling and thickeners as top-up and is supplied by dedicated operating and standby process water pumps. Process water is also used as service water for flushing, hosing and screen spraying applications.

Spray water is used on the milling discharge vibrating screens, trommel screens, trash screens and FTCIL tails screen.

Spillage in the process water distribution area is collected in the area sump and pumped back into the process water tank using the process water spillage pump.

The averaged reclaim water pumped from TSF is 3,340m^3/h, 20% is reused in process and 80% is treated in the effluent treatment plant (ETP) before being discharged into the Margajita river.

Raw Water

Raw water is supplied from the existing raw water distribution system into an additional new raw water tank for the process plant expansion. Raw water is used for the Mine's reagent make-up, firefighting system, potable water supply and gland seal water. It is distributed using new dedicated operating and standby raw water pumps.

The raw water in the new potable water supply tank is treated to produce potable water which is delivered to a potable water hydrosphere that maintains the pressure for the immediate supply of safety showers and drinking water in the plant and office buildings.

Spillage in the raw water distribution area is collected in the area sump and pumped back into the aforementioned new raw water tank using a dedicated new raw water spillage pump.

Gland Service Water

Gland seal water is supplied to all the new slurry pumps in the milling, flotation, thickening, POX, neutralization, and cyanide destruction areas. New gland water pumps distribute gland water to necessary slurry pumps from the new gland water tank.

Provision is made to use tailings return water for gland service in the event of drought conditions and raw water is not available. A process water line is taken off from the main tailings return water line and fed into the gland service water line upstream of the inline filters.

The annual average for the main water streams is shown in Table 17-5.

Table 17-5 Main Water Streams in the Plant

Water	Value (m^3/h)
Raw water from Hatillo	2,870
TSF reclaim water	2,723
Reclaim water to Process Plant	604
ETP discharge to Margajita	2,608
Existing Gland Water requirement	223
New Expansion Average Gland Water Requirement	41
Potable Water	15

Reagent Requirements

Flocculant

POX Feed and Flash Recycle Thickening

Existing flocculant make-up and distribution systems are provided for POX feed and flash recycle thickening. The flocculant solution is made up to 0.25% strength and is stored in a separate dosing tank from which the flocculant is pumped to the thickener in-line mixer for further dilution.

Flotation Tails Thickening

A dedicated new flocculant plant feeds diluted flocculant solution to the flotation tails thickener.

Lime

The lime slurry for the expansion plant is taken from the existing lime ring-main feeding lime boil. It is discharged into the new lime storage tank. Lime dosing pumps pump the lime slurry through a ring-main that feeds the comminution and flotation.

The lime slurry required for the FTCIL and cyanide destruction circuits is taken directly from the existing ring-main feeding ETP/CIL.

Limestone and Lime Slaking

Limestone slurry is required in the iron precipitation and neutralisation circuit. To handle the additional limestone requirements, a fine grind mill (Vertimill) is installed downstream of the existing milling plant. Limestone slurry is supplied to the iron precipitation and neutralisation areas via a new ring-main. An additional Vertimill is considered a future installation, in parallel with the existing lime slaker.

Flotation Reagents

Activator – Copper Sulfate

Dosing pumps are used to pump copper sulfate solution to header tanks. Each flotation train has a dedicated header tank from where the reagent is distributed to the various cells in the flotation train.

Collector – PAX

Dosing pumps are used to pump PAX solution to header tanks. Each flotation train has a dedicated header tank from where the reagent is distributed to the various cells in the flotation train.

Frother – MIBC

The dosing pumps pump the frother, methyl isobutyl carbinol MIBC from the dosing tank to the flotation circuit.

Depressant – Guar Gum

Guar gum dosing is controlled using a running/standby set of variable-speed pumps to the flotation circuit.

A summary of the key reagent consumption is shown in Table 17-6.

Table 17-6 Reagent Consumption

Lime	Unit	Existing	Expansion
Lime Boil& Mills Consumption (100% CaO)	kg CaO/ t Ore feed	27	34
CN Destruction & ETP Consumption (100% CaO)	kg CaO/ t Ore feed	6	8
HDS Consumption (100% CaO)	kg CaO/ t Ore feed	14	18
Flotation Tails CIL Consumption (100% CaO)	kg CaO/ t Ore feed	-	3
Total Addition (as 100% CaO) – nominal	kg CaO/ t Ore feed	47	62.5
Total Addition (as 100% CaO) – design	kg CaO/ t Ore feed	75	75
Limestone	**Unit**	**Existing**	**Expansion**
Lime Production Consumption as 100% CaCO3	kg $CaCO_3$/ t Ore feed	72	107
Iron Precipitation Consumption as 100% CaCO3	kg $CaCO_3$/ t Ore feed	233	266
HDS Consumption as 100% CaCO3	kg $CaCO_3$/ t Ore feed	5	23
ETP Consumption as 100% CaCO3	kg $CaCO_3$/ t Ore feed	11	11
Total Addition (as 100% CaCO3) – nominal	kg $CaCO_3$/ t Ore feed	320	408
Total Addition (as 100% CaCO3) – design	kg $CaCO_3$/ t Ore feed	321	489
Flocculant	**Unit**	**Existing**	**Expansion**
100% Floc Consumption POX Feed	g/t POX feed	40	40
100% Floc Consumption Flotation Tails	g/t feed	-	20
100% Floc Consumption Flash Recycle Thickener	g/t R Conc	-	20
Flotation	**Unit**	**Existing**	**Expansion**
Activator – Copper sulfate (CuSO4)	g/t	-	100
Collector – PAX	g/t	-	135
Depressant – Guar Gum	g/t	-	100 – 200
Frother – MIBC	g/t	-	115
Oxygen Plant	**Unit**	**Existing**	**Expansion**
Oxygen Consumption for POX Circuit (design)	tpd	4152	7,000
CIL & Cyanide Detoxification	**Unit**	**Existing**	**Expansion**
Cyanide	kg/t feed	0.5	0.5
Prilled sulfur for sulfur dioxide (SO2)	kg/t feed	0.45	0.45
Grinding	**Unit**	**Existing**	**Expansion**
SAG Mill Media consumption	kg/t feed	0.4 - 0.7	0.4 - 0.7
Ball Mill Media consumption	kg/t feed	0.6 - 0.8	0.6 - 0.8
New SAG Mill Media consumption	kg/t feed	-	1.1 - 1.4

Work force

The work force in the process area is distributed between process operations and maintenance fixed plant according to Table 17-7.

Table 17-7 Process Work Force circa 31 December 2022

Employer	Process Operations	Maintenance fixed plant	Total
Pueblo Viejo	507	542	1,049
Contractors	94	223	317
Total	**601**	**765**	**1,366**

17.4 Tailings and Water Balance

The detoxified slurry from the CIL tail together with sludge from the HDS circuit and neutralised solids from the ETP are all pumped to the existing tailings storage facility using a multi-stage pump train. The first stage pumps are fitted with variable speed drives, while the second stage pumps are fixed speed.

Return water from the TSF is pumped to the raw water tank at the process plant using three vertical spindle barge-mounted pumps.

Tailings Storage Facility

The current TSF is created by constructing an engineered embankment structure across the El Llagal valley, approximately 3.5 km south of the plant site. The current facility is expected to be filled to its design limit in 2027, after which tailings will be placed in the new Naranjo TSF. The details of this are described in Section 18.14.

Effluent Treatment Plant (ETP)

The process includes an ETP to treat the combined flows of tailings effluent and the ARD generated in the Margajita drainage basin from previous mining activities. The ARD collects in storage facilities located at Dam 1 and Dam 3 and is then pumped with barge pumps to the ETP and process plants.

The ETP comprises two stages of neutralization:

- Limestone is used in the first stage to raise the pH to approximately 6.2, and lime is used in the second stage to raise the pH to 8.5.
- The treated acidic liquor is then fed to a clarifier to remove the sludge in the underflow and produce a clear overflow for discharge to the environment.

A high percentage of the sludge is recycled to the head of the circuit, where it is mixed with the incoming solution to provide the nuclei for crystal formation, resulting in the production of high-density, chemically stable sludge for disposal. The tailings effluent, which is near neutral in pH, is fed directly to the lime reactors.

The discharge from the lime reactors flows by gravity to a clarifier, where it is mixed with a flocculant. The clarifier underflow is connected to two sets of variable speed pumps, and the sludge recycle pumps and the sludge discharge pumps. The chemically stable sludge produced in the plant is pumped to the tailings pond for permanent storage. See Table 17-8 for main ETP clarifier parameters.

Table 17-8 Effluent treatment clarifier

Parameter	Unit	Value
Clarifier slurry feed	m^3/h	6,574
Clarifier unit capacity	m/h	2.75
Clarifier design diameter	m	50
Clarifier underflow density (design)	wt %	40
Clarifier underflow density (operation)	wt %	35
Overflow turbidity (TSS)	mg/L	50
Total sludge recycle ratio		1:1

Water Balance

A new TSF is required because of the extension of mining to 2041 with stockpile drawdown to 2044. The designed increase in processing capacity from 8.6 Mtpa to approximately 14 Mtpa will modify the process flow sheet and the properties/geochemistry of the tailings will change. See Figure 17-5 for the water balance of the current operation.

The current regime of water consumption and discharge as agreed with the authorities will not change with the Expansion project; those being:

- Raw water abstraction from Hatillo Reservoir not to exceed at 3,200 m^3/h.
- Treated water discharge to Margajita River a minimum of 1,655 m^3/h.

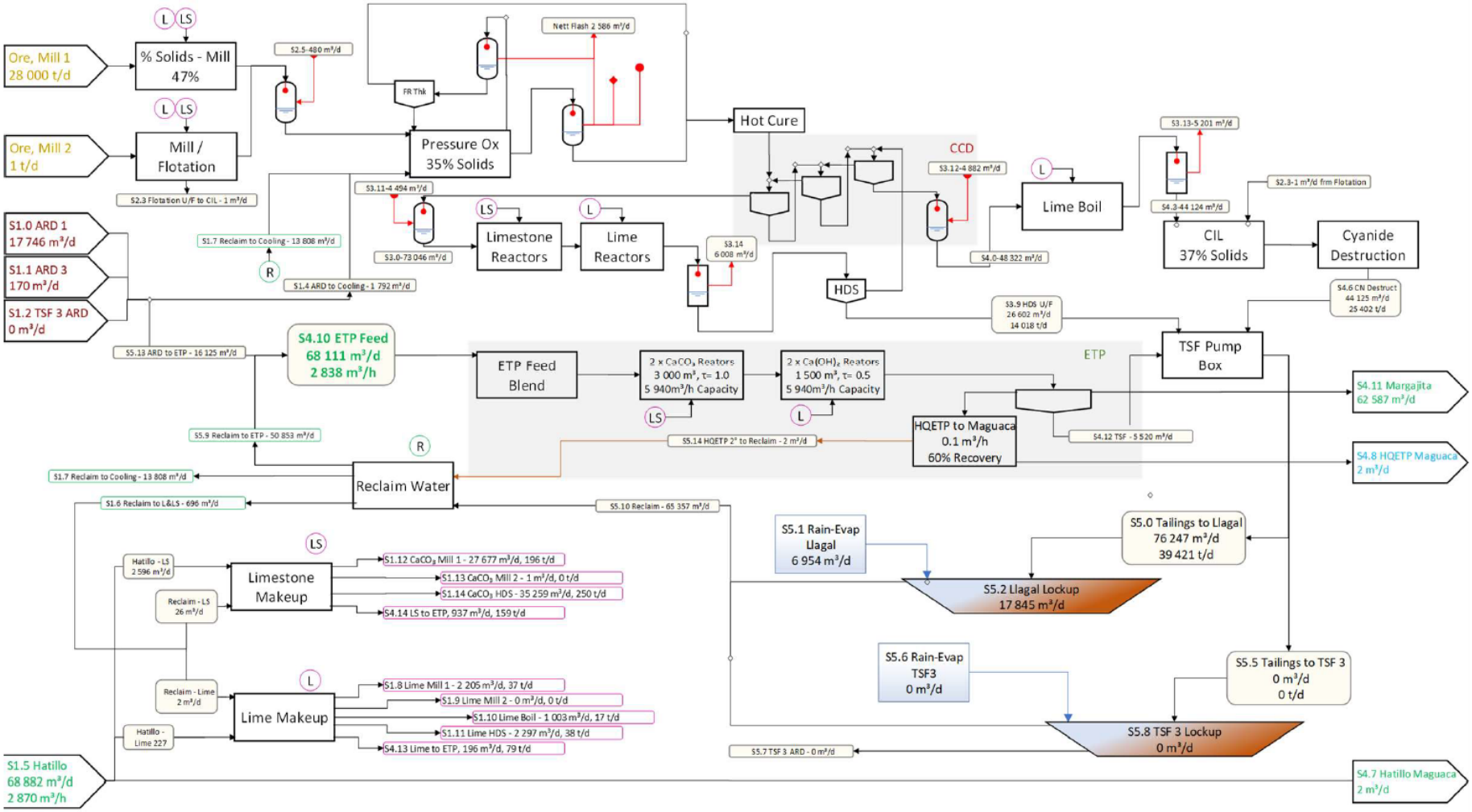
17.5 Deleterious Elements

Heavy Elements – Arsenic, Copper, Zinc and Mercury

All ore streams apart from float tails are processed through a neutralisation step within the POX circuit of the main plant. Any deleterious elements are largely eradicated before any tailings are pumped to the TSF. Operational experience and test work have proven that these deleterious elements can be precipitated and meet the requisite standards for discharge.

All POX gas emissions are scrubbed and monitored for the presence of deleterious elements, in particular mercury, to ensure compliance with discharge thresholds.

Any water released from the TSF reports back to the plant, where any excess water requiring discharge to the environment is first processed though a standalone ETP (effectively a precipitation plant). PV is compelled to adhere to a minimum rate of discharge at all times of 1,655 m^3/h.



Source: Viljoen, 2022

Figure 17-5 Water Balance of the Current Operation

18 Project Infrastructure

The Pueblo Viejo operation is a mature project that has been operating since 2010. It has well developed infrastructure supporting the current operations and plans for additional infrastructure to support the Project growth.

An overview of the site plant and key infrastructure is shown in Figure 18-1.

The QP's responsible for the Infrastructure Section believe that the current infrastructure and planned infrastructure PFS's support the estimation of Mineral Resources and Mineral Reserves.

18.1 Site Access

The main access by road from Santo Domingo is a surfaced, four-lane, divided highway (Autopista Duarte, Highway #1) in generally good condition that reaches to within about 22 km of the Mine site. Access from this main road to site is via a two-lane, paved road.

18.2 Mine Roads

Gravel surfaced internal access roads provide access within the Mine to the site facilities. A network of haul roads is built to supplement existing roads so that mine trucks can haul ore, mine overburden, and limestone from the various quarries.

18.3 General Infrastructure

Additional site infrastructure includes accommodation, offices, a truck shop, a medical clinic, administrative and other buildings, water supply, and old tailings impoundments with some water treatment facilities.

The process plant site is protected by double and single fence systems. Within the plant site area, the freshwater system, potable water system, fire water system, sanitary sewage system, storm drains, and fuel lines are buried underground. Process piping is typically left above ground on pipe racks or in pipe corridors.

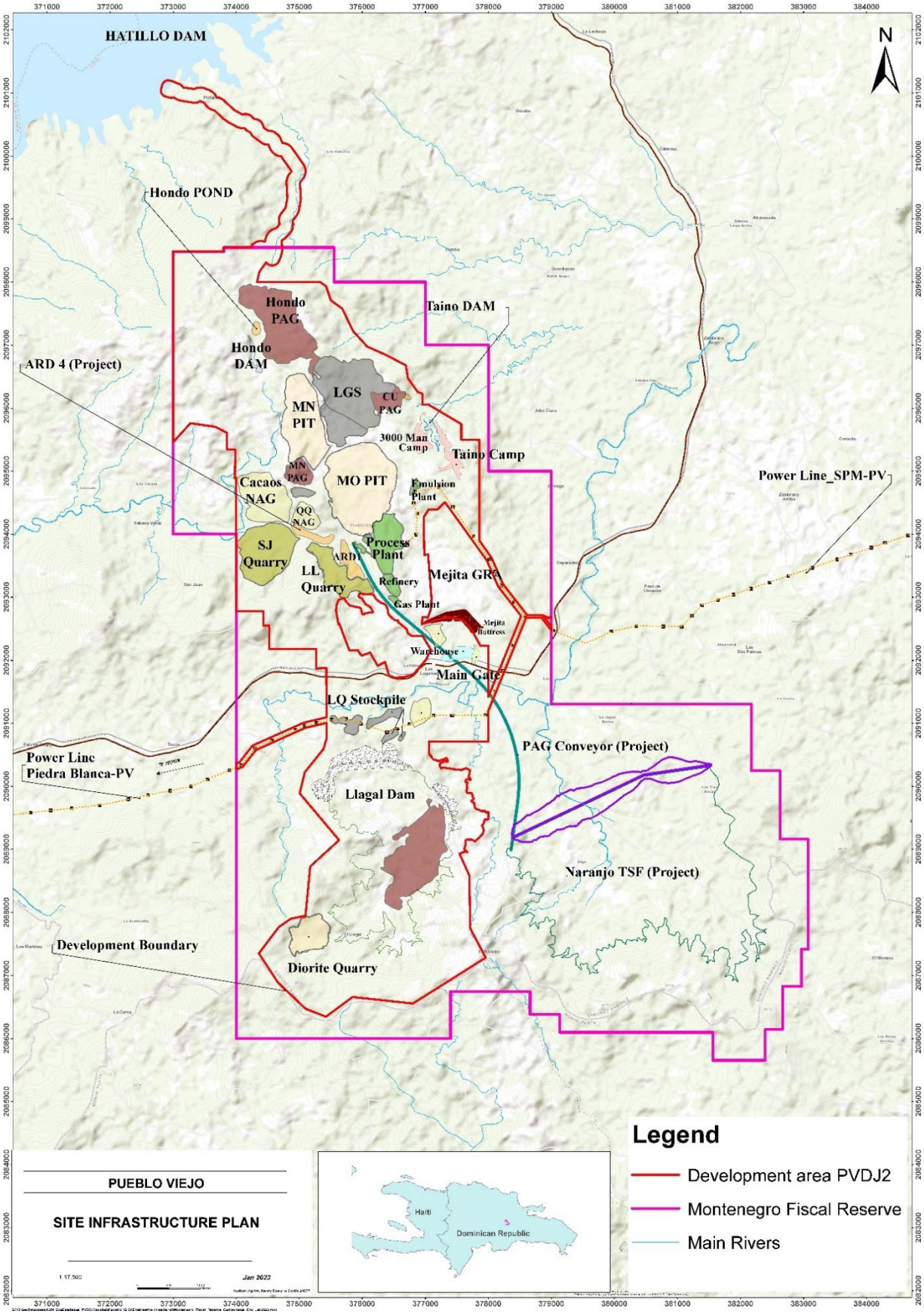


Figure 18-1 Major Site Infrastructure Plan

18.4 Supply Chain

Materials and other consumables are predominately sourced from within the Dominican Republic where possible, with a preference given to appropriate local suppliers. There are several seaports and international airports located within relatively short distances from the project location. As noted previously, site is accessible by well maintained paved roads.

The Dominican governmental agency responsible for customs and importation has a presence at the Mine to facilitate the supply of imported materials.

18.5 Power Supply

Pueblo Viejo is supplied with electric power from two sources via two independent 230 kV transmission circuits. The operational power requirements are less than the combined capacity of the power sources.

The primary source of electric power for the Mine is the Quisqueya 1 power plant, which is located near the city of San Pedro de Macoris. A single 114 km long 230 kV circuit directly connects the 215 MW Quisqueya 1 power plant to the Pueblo Viejo Mine Substation. A second 138 km long 230 kV circuit connects the Quisqueya 1 power plant with Bonao III Substation, which is then connected to the Pueblo Viejo Mine Substation via another 27 km long 230 kV circuit. The Pueblo Viejo Mine Substation is connected to the mine.

The secondary source of electric power for the mine is the Dominican Republic's national power grid, referred to as the "Systema Electrico Nacional Interconectado" (SENI). Pueblo Viejo is interconnected to the SENI via the 250 and 350 MVA rated Piedra Blanca Substation step-up transformers. The SENI interconnection can provide the full electric power requirements of the mine.

The Mine peak load to date is 150 MW and the average load at full production is approximately 140 MW; the Quisqueya 1 power plant's capacity exceeds the Mine's load. Excess power from the Quisqueya 1 power plant is transmitted to Bonao III Substation and sold to various SENI customers at the grid marginal price. Selling excess power to the grid provides additional revenue and allows the power plant to operate at closer to its peak efficiency. Presently, the Quisqueya 1 power plant operates at a full capacity to meet the electrical needs of PV and to sell the surplus to grid. It is expected that the Mine average load at full production including the Expansion Project exceeds the Quisqueya 1 power plant's capacity in around 2026. Additional power will come from the grid or from a solar plant that is currently in the planning stage.

In 2020, Quisqueya 1 power plant was converted from heavy fuel oil (HFO) to liquefied natural gas (LNG), to reduce the carbon footprint and decrease dependence on oil. The power plant uses HFO as back up fuel in the event of a failure in the supply of natural gas.

Power is distributed through the site from the Mine main substation via a single 230 kV bus system. In addition, four main transformers provide power for all site loads, with two being dedicated to the oxygen plants.

In case of interruption, the plant will operate on emergency feed. This is provided by 15 MW of diesel generation that connects to the main substation for distribution to critical areas such as lighting, communication, as well as computer and process equipment.

18.6 Communication and IT Facilities

A redundant fibre communication backbone system of approximately 40 km links and manages the data transmission of the distributed control system (DCS), third party PLCs, motor controls, fire detection system, Vo-IP telephone system, and computers around the mine site.

18.7 Workforce

The permanent employee numbers at PV as of 31 December 2022 is summarised in Table 18-1.

The Contractor employees as of 31 December 2022 are summarised in Table 18-2.

Table 18-1 PV Direct Employees circa 31 December 2022

Classification	Department	Employees
Capital	Capital Projects	36
	Energy	12
	Tailing Constructions	43
G&A	Communications	4
	Community Engagement and Development	27
	Environmental	48
	Finance	26
	Government Affairs	2
	Human Resources	73
	Legal	6
	Safety	37
	Security	106
	Site Management	6
	Supply Chain	115
	Technology Innovation and Systems	15
Mining	Exploration	11
	Mineral Resources Management	77
	Mining	560
Processing	Fixed Plant Maintenance	542
	Processing	507
Mobile Maintenance	Mobile Equipment Maintenance	396
Expansion	Expansion Projects	181
Programs		186
LATAM		4
BOHIO		12
Grand Total		**3,032**

Table 18-2 PV Contractor Employees circa 31 December 2022

Department	Employees
Expansion Projects	4400
Tailing Constructions	458
Human Resources	265
Mining Operations	313
Mineral Resources Management	160
Mine Maintenance	159
Fixed Plant Maintenance	223
Capital Projects	131
Process Operations	94
Environmental	99
Security	57
Safety And Health	10
Technology Innovation And Systems	6
Supply Chain	11
Communications	1
Total	**6387**

18.8 Fuel

Two permanent fuelling stations feed the fleet of Mine vehicles. A permanent diesel storage tank supplies the lime kilns. There are numerous other diesel storage facilities onsite with a total capacity of 1.2 ML.

18.9 Water Supply

Water is supplied to the process plant from two sources. The Hatillo Reservoir supplies freshwater requirements. Reclaim water from the TSF is a key secondary water supply for the plant.

Three vertical turbine barge-mounted pumps at Hatillo Reservoir and three vertical turbine in-line booster pumps pump fresh water directly to the fresh water pond at a maximum rate of 3,200 m^3/h. The pipeline total length is approximately 10.5 km and utilizes 24 in and 30 in diameter HDPE, and 24 in carbon steel for the high pressure inclined section after the booster pumps. The fresh water pond has 12 hrs of storage at normal consumption rates and is positioned at an elevation which is 60 m above the plant to achieve a reliable gravity discharge.

The reclaim water from El Llagal TSF has six barge pumps capable of pumping close to a maximum of 6,000 m3/h through two parallel pipelines made up of both 30 in carbon steel and 32 in high density polyethylene (HDPE). Under normal conditions, three to five pumps operate simultaneously. Reclaim water is pumped directly to both the ETP and the Expansion Process Water Tank.

The pipeline between Hatillo and the freshwater pond includes points where fresh water is drawn off for two additional purposes. The first is to feed the plant's fire water tank and potable water treatment system and storage tank (Cumba tanks). The second is to provide make-up water to the new Taino Dam. The Taino Dam will provide three days of water supply to the process plant in the event of a long-term outage of the Hatillo pumping system. When called upon for service, three barge pumps can be activated to pump fresh water to the Fresh Water Pond. Taino Dam will replace the Hondo Reservoir that will be converted to an acid run-off collection pond for the expanded Hondo PAG waste dump.

The plant site is located on a ridge between two drainage catchments. Where possible, runoff from the process plant is directed to the Margajita drainage area to separate it from the storm water runoff from the old facilities. Otherwise, a collection pond captures the runoff before it is returned to the process plant to serve as make-up water.

18.10 Waste Management

Domestic waste water from the various sites is collected through an underground gravity sewer system. Separate, underground, gravity systems serve the construction and operations camps. The clean effluent is discharged to the process plant gutters which are directed to ARD1. Non-hazardous domestic solid waste is sent by truck to a central handling facility.

The sewage treatment configuration is based on two 280 m^3/d plants, one at the construction camp, and one at the process plant site. Water from the permanent camp is pumped to the construction camp facility. Both plants utilize the same three-part modular arrangement concept: primary settlement tank, biological treatment unit with biological rotating contactor, and final settling tank.

18.11 Fire Protection

Fire protection throughout the Mine is provided by a variety of measures, including fire walls, hose stations, automatic sprinkler systems, and fire hydrants. A fresh water/fire water tank supplies fire water to the site. The fire water is distributed to the protected areas through an underground water pipe network.

18.12 Dust Control

Water sprays, fogging systems, and scrubbers are used as required on the site as dust control measures depending on specific needs.

Dust control on roads and within the Mine areas is performed by spraying with water trucks.

18.13 Landfill

Non-hazardous material is stored in an area south of the Mejita TSF for removal at a later date. Landfills for historical hazardous waste, which are the responsibility of the Dominican Republic government, are proposed to be located east of the Mejita TSF.

18.14 Tailings Facilities

Tailings from the process plant will continue to be deposited in the existing El Llagal Tailings Storage Facility (LTSF) until the end of life of that facility in 2027. The LTSF is located 3.5 km south of the process plant, in a tributary of the Rio Maguaca.

From approximately mid-2027 until the end of mineral processing in 2044, tailings from the expanded process plant will be deposited into the proposed new Naranjo TSF. In addition, from 2025 until 2041, PAG waste rock from the mine will also be deposited into the Naranjo TSF. The Naranjo TSF is proposed to be located 5.5 km southeast of the process plant and 1.0 km east of the LTSF, in the upper Arroyo Vuelta catchment, a tributary of the Rio Maguaca. See Figure 18-2.

The Naranjo TSF will safely store both tailings and PAG waste rock.

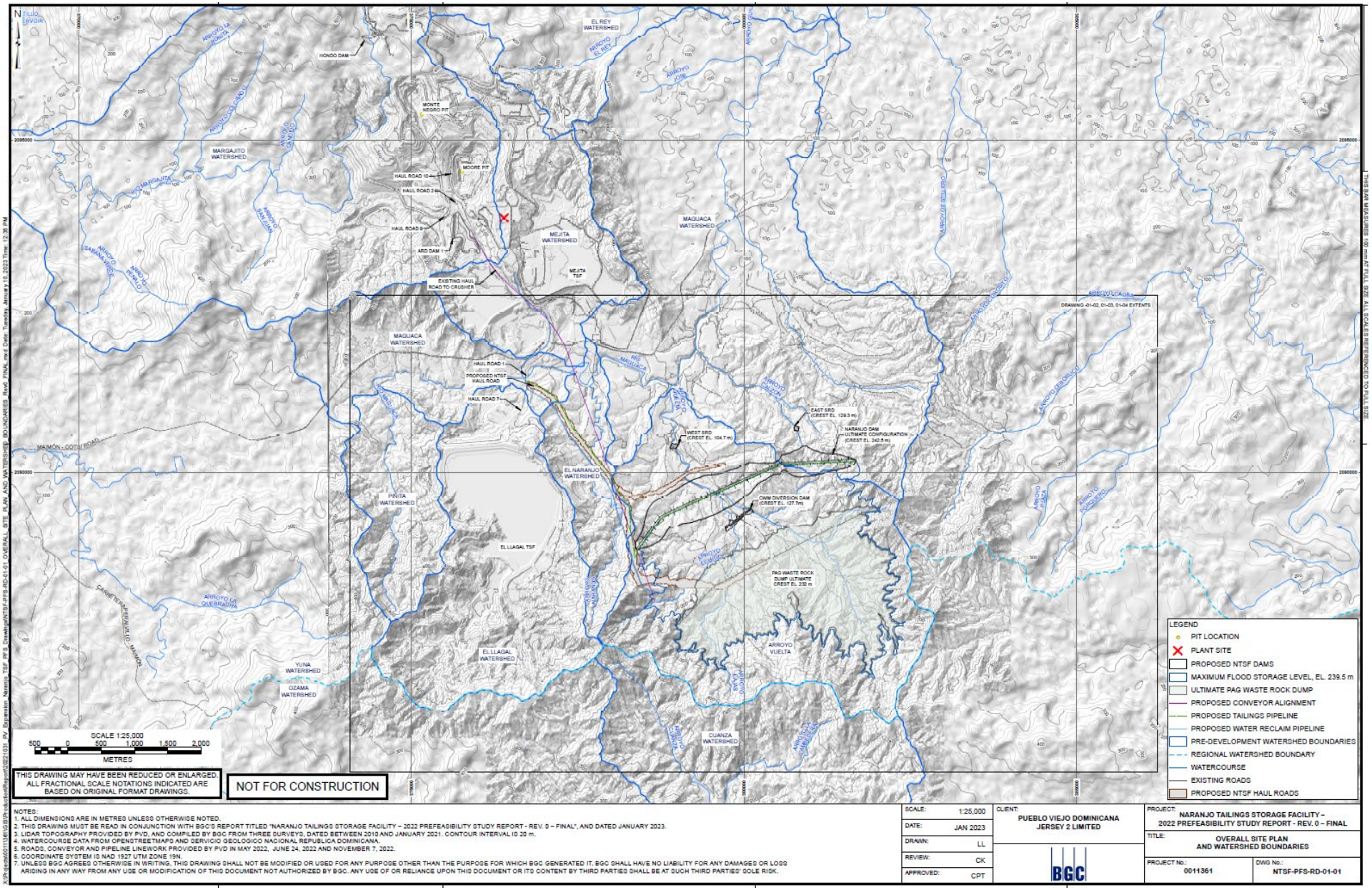
The tailings are delivered in a single combined stream consisting of four solids components:

- High pressure oxidation CIL tailings.
- Flotation CIL tailings.
- HDS precipitates (from the neutralization circuit and ARD treatment).
- ETP sludge.

The combined tailings stream is delivered to the TSFs by pipelines, for sub-aqueous deposition from the upstream crest of the TSF embankment into the impoundment.

The majority of waste rock from the mine is potentially acid generating and will be delivered to a PAG waste dump located inside the Naranjo TSF impoundment by a crusher, conveyor, and stacking system. The PAG material will be covered by tailings at closure to minimize the impact of ARD generation.

The Naranjo TSF will be one of the largest earth core rockfill dams in the world, with a maximum height of approximately 150 m, crest length of 3.8 km and catchment area of 14.4 km^2.



Source: BGC, 2023

Figure 18-2 Naranjo TSF Site Plan

Engineering Studies

A PFS has been finalized for the Naranjo TSF. It includes a comprehensive site investigation program of geological surface mapping, geotechnical boreholes, geophysics survey, test pits and groundwater monitoring wells.

The next phase of design (Feasibility Study) will be carried out beginning in early 2023, and will continue into 2024, and will include ongoing site investigation.

The final phase of design (Detailed Engineering) will be carried out from the second half of 2023 into 2024.

Storage Requirement

The overall requirement for the Naranjo TSF base case design is for storage of 500 Mm^3 of mine waste products (tailings and PAG waste rock), as detailed in Table 18-3.

Table 18-3 Storage Volume Design Basis

Component	Quantity (Mt)	Density (t/m3)	Storage Volume (Mm3)
Combined Tailings	344.7	1.24	278
PAG Waste Rock	452.7	2.1	215
Estimated Total Waste Storage Volume Required	-	-	493
Storage Volume adopted for PFS Design	-	-	500

A potential upside design case has also been prepared for the PFS engineering report, with a total waste storage volume of 645 Mm^3. The upside case allows the additional storage volume in the Naranjo TSF for future Mineral Reserves and associated PAG waste rock.

The Naranjo TSF Starter Dam will be formed by two sections of dam embankments (west and east), sized to provide storage of:

- Three years of PAG waste rock mining
- 1.5 years of tailings
- An operating pond with 5M m^3 capacity
- Flood storage for a volume of 8M m^3
- Freeboard of 3 m

Following completion of the starter dams and commencement of tailings deposition, staged construction will facilitate annual raising of the dam crest and emergency spillway to provide

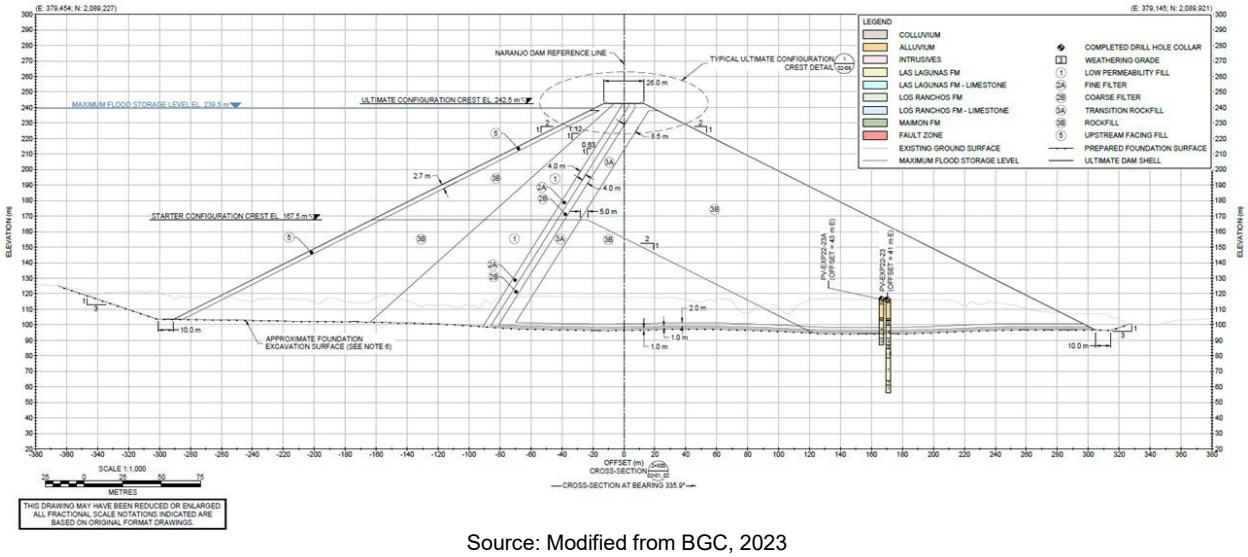
adequate storage capacity for continued tailings and PAG waste rock deposition into the impoundment.

Design

The Naranjo TSF embankment will be an earth core rockfill dam, designed as a tailings and water retention dam and similar in configuration to the existing LTSF embankment which has operated safely at PV for the past ten years.

The Naranjo TSF valley will be located within the same geologic setting and shares similar topographic characteristics as the adjacent LTSF valley (see Figure 18-2).

The Naranjo TSF impoundment is formed by the construction of an inclined core, zoned earth and rockfill embankment adopting the downstream raise construction method, with little reliance on the tailings material as a structural element. The embankment zones include rockfill, transition rockfill, filter and low-permeability fill (LPF) zones. The rockfill and transition rockfill will be limestone or diorite sourced from on-site quarries. The filter will be either imported river sand or produced on site by crushing and screening quarried rock. The LPF will be saprolite material excavated from borrow areas within or near to the TSF impoundment. A cross-section of the design is shown in Figure 18-3.



Source: Modified from BGC, 2023

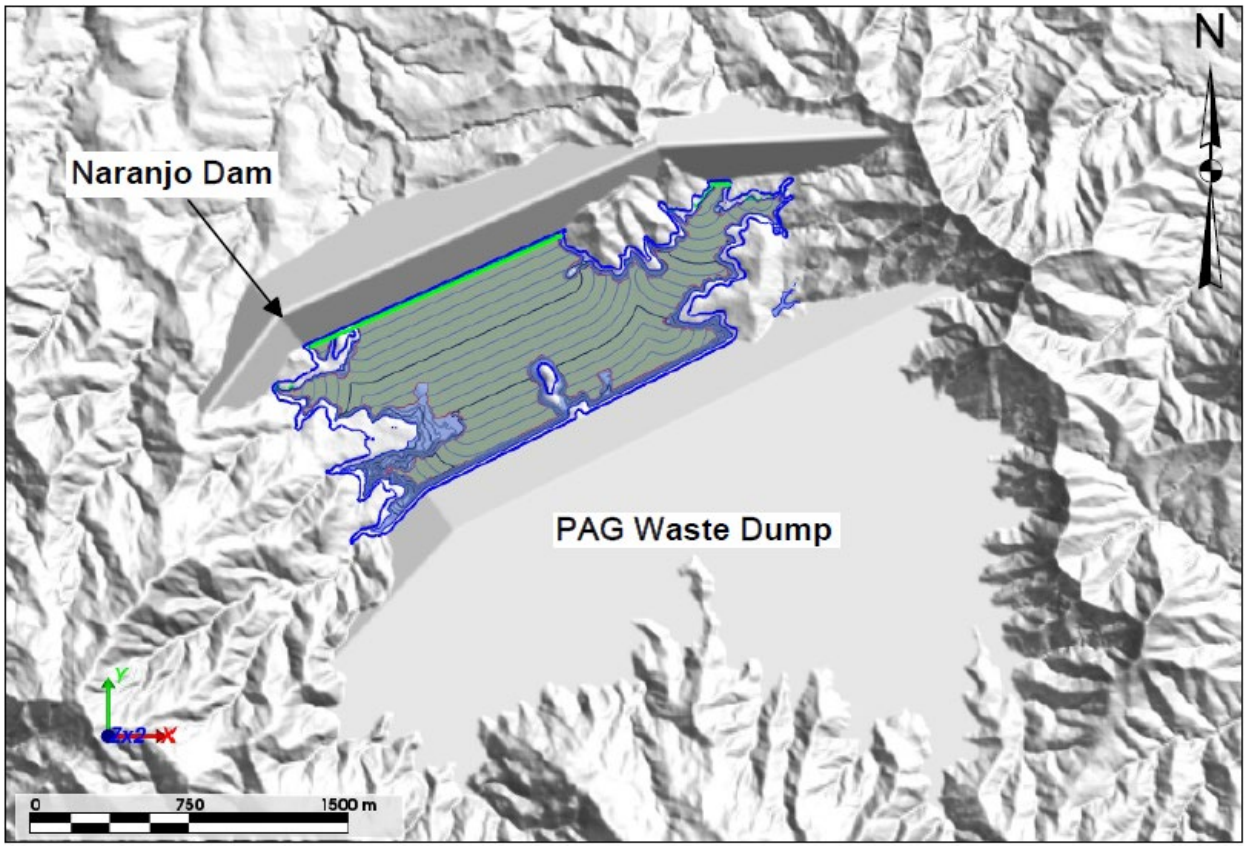
Figure 18-3 Example Naranjo TSF Dam Cross-section

The Naranjo TSF dam will be designed for “Extreme” consequence classification which is consistent with Barrick’s Tailings Management Standard (TMS, March 7, 2022) and the Global Industry Standard on Tailings Management (GISTM, August 2020). The dam design meets or exceeds design criteria associated with the “Extreme” consequence classification and in accordance GISTM and Canadian Dam Association (CDA) Dam Safety Guidelines and technical bulletins (CDA, 2007, 2013 and 2019).

The Dominican Republic and Haiti form the island of Hispaniola which is part of a tectonic unit called the Hispaniola-Puerto Rico microplate bounded by two active subduction zones and the PV site is considered to be in a high seismic region. The 1/10,000-year annual exceedance probability seismic event has been used for Naranjo TSF dam design, with an estimated peak ground acceleration of 0.92 g.

The Naranjo TSF is designed with adequate flood storage capacity for reasonably anticipated flood events to minimize the risk of any discharge of contact water to the environment. An emergency spillway is included in the design, which will only be called into service if the design flood storage is exceeded and controlled discharge through the spillway is required for dam safety. The emergency spillway is designed to safely pass the Inflow Design Flood (IDF) while providing sufficient freeboard below the dam crest. In addition, a suitable pumping system will be installed so that pond water which will accumulate in the impoundment during operations can be pumped out of the impoundment.

For the Naranjo TSF base case, the PAG waste dump will be located at the south end of the impoundment (away from the embankment, see Figure 18-4). However, options for locating the PAG Dump further to the north close to (or against) the upstream shell of the Naranjo TSF embankment are also being evaluated.



Source: Modified from BGC, 2023

Figure 18-4 Naranjo TSF PAG Rock Proposed Placement Location

The tailings pipelines have secondary containment where they cross rivers to minimize environmental damage in the unlikely event of a rupture at these locations.

The Naranjo TSF has a net positive water balance and over time will accumulate water in the reclaim pond. Accumulated process water will be sent to the Reclaim Water Tank at the process plant via a system of barge-mounted pumps and pipelines, for re-use in the process plant or treatment at the ETP prior to discharge into the Rio Margajita or Rio Maguaca. Water discharged into rivers will meet Dominican Republic government standards for discharge water quality.

Construction Water Management (CWM) structures, including diversion dams and channels, are required upstream of the Naranjo TSF starter dam embankments to divert surface water flows around the work area during initial construction. The “High” consequence classification and associated design criteria are currently adopted for the CWM diversion dam, in accordance with CDA Dam Safety Guidelines and technical bulletins.

Seepage from the TSFs is collected in Seepage Recovery Dams (SRDs), located a short distance downstream of the main TSF embankments. A pumping and piping system returns collected seepage back into the reclaim pond inside the TSF impoundment. The “High” consequence classification and associated design criteria are currently adopted for the SRDs, in accordance with CDA Dam Safety Guidelines and technical bulletins.

Construction

Construction of early works associated with the Naranjo TSF are expected to commence in the second half of 2023 following completion of the FS level design. Early works will include access and construction roads, haul roads, borrow and stockpile areas, and platforms for contractor and owner facilities.

Construction of the Naranjo TSF Starter Dam is expected to commence in 2024 following approval of the INDRHI permit. The Starter Dam works are expected to be completed in mid-2027.

Operation

Placement of PAG waste rock into the Naranjo TSF impoundment will commence in 2025, following installation of the PAG transport system and infrastructure to manage contact runoff water, and continue until 2041.

Tailings deposition into the Naranjo TSF will commence in approximately mid-2027 and continue until 2044.

During operations, it is planned that an emergency spillway will be constructed with each staged construction phase. The location of the emergency spillway will alternate between the left and right abutments for each dam crest raise to facilitate the construction of the emergency spillway for the subsequent dam crest raise.

Closure

Towards the end of the life of the facility, PAG waste rock placement will cease, and tailings will be allowed to cover the PAG dump surface to a minimum cover depth of 10 m of tailings. This tailings cover is to limit the ingress of oxygen into the PAG waste rock and minimise the impact of ARD generation. The tailings surface will be shaped to provide positive drainage to the closure spillway, located at the west side of the Naranjo TSF valley. In addition, a minimum 1.0 m thick NAG cover (including 0.3 m of growth medium) will be placed over the exposed tailings. Permanent pond covering of the facility will be minimized.

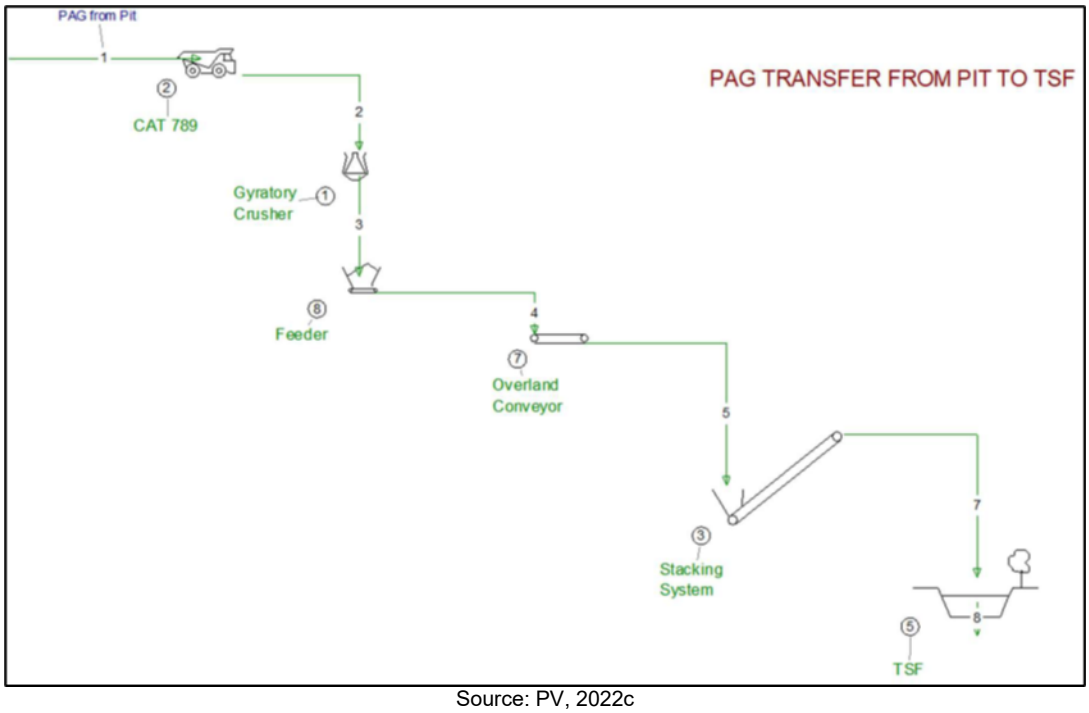
The reclaim pumping system and ETP will remain in operation until the water quality in the reclaim pond becomes suitable for direct discharge to the Arroyo Naranjo. The permanent spillway will then function as a flow-through structure to passively manage the closure water pond and discharge continually and directly to the environment.

18.15 PAG Transport Infrastructure

A PFS level engineering study has been completed evaluating the proposed PAG rock transport to and deposition into the Naranjo TSF (SENET, 2022). The PAG waste rock transfer solution consists of a crushing station located at Los Quemados, an overland conveyor approximately 6km long, and a waste spreader (stacker) system. Figure 18-5 shows a simplified depiction of the material flow from pit to Naranjo TSF placement. PAG material is loaded onto mine trucks and delivered to a crushing plant which crushes the material to -300mm. A discharge conveyor lines the crushing station to the overland conveyor that discharges the material onto a retractable downhill conveyor to access the TSF impoundment. The retractable conveyor will transfer material to a shiftable conveyor equipped with a mobile track-mounted tripper car, which in turn is connected to a spreader with a receiving and discharge boom. Material is deposited in a regular radial shape to form the PAG waste dump.

The PAG transfer operation can be divided into three physical and sequential segments:

- Pit to Crusher; performed with the mining fleet.
- Crusher, Overland Conveyor and Stacking System.
- Stacking System to Deposition in TSF.



Source: PV, 2022c

Figure 18-5 PAG Transport Infrastructure

The annual throughput, design factor system operating hours, and other important parameters are shown in Table 18-4.

Table 18-4 PAG Handling System Design Factors

Description	Unit	Value
Operating schedule		
Annual throughput (maximum design capacity)	Mtpa	31.0
Annual operating hours	hrs	6,176
Design factor		25%
Design throughput	tph	6,275
PAG dump		
PAG waste dump volume	Mm^3	276.0
PAG dump density	t/m^3	2.1

18.16 Security

Access to the Mine is strictly controlled. The site is protected by a double layered fence around key infrastructure with 24 hrs a day security patrols around all site facilities and support from the Dominican Republic Military for security of the site explosive stores.

19 Market Studies and Contracts

19.1 Markets

The principal commodity produced at Pueblo Viejo is gold and silver doré, which is freely traded at prices that are widely known, so that prospects for sale of any production are virtually assured. Prices are normally quoted in US dollars per troy ounce.

These intermediary products are sent to refineries for further processing to convert them into refined gold and silver metal.

PV uses Barrick corporate guidance for the metal price assumptions which the QP regards as reasonable based on publicly available long term forecast consensus data.

19.2 Contracts

Pueblo Viejo is a large modern operation, and Barrick and Newmont are major international firms with policies and procedures for the letting of contracts. The contracts for smelting and refining are considered routine contracts for a large producer and the terms of such contracts are within industry norms.

There are numerous contracts at the mine including project development contracts to provide services to augment Barrick's efforts.

There are no contracts related to Pueblo Viejo which, in and of themselves, are material to Barrick.

20 Environmental Studies, Permitting, and Social or Community Impact

Rosario operated the Mine prior to June 1999. Previous development included the mining of two main pits (Monte Negro and Moore) and several smaller pits, construction of a plant site, and construction of two tailings impoundments (Las Lagunas and Mejita). Waste rock dumps and low-grade ore stockpiles from these operations are located throughout the pit areas. When the Rosario ceased operations, proper closure and reclamation was not undertaken. The result was a legacy of polluted soil and water and contaminated infrastructure.

The major legacy environmental issue at the Mine following Rosario's operations was ARD. It developed from exposure of sulfides occurring in the existing pit walls, waste rock dumps, and stockpiles to air, water, and bacteria. Untreated and uncontrolled ARD contaminated local streams and rivers and has led to the deterioration of water quality and aquatic resources both on the Mine site and offsite.

In addition to ARD and associated degradation of the water quality in the streams, large amounts of hazardous waste materials were present at the Mine site, including rusting machinery, hydrocarbon contaminated soils, mercury contaminated materials, asbestos, and tailings that had escaped into neighbouring watersheds.

Under the SLA, environmental remediation within the Mine site and its area of influence is the responsibility of PV, while the Dominican Government is responsible for historic impacts outside the Mine development area and for the hazardous substances located at the Rosario plant site. However, an agreement was reached in 2009 that PV would donate up to US$37.5M, or half of the government's total estimated cost of US$75M, for its clean-up responsibilities. PV will also finance the remaining amount, allowing the government to repay the debt with revenues generated by the Mine. In December 2010, PV agreed to contribute the remaining US$37.5M on behalf of the government towards these clean-up activities. The clean-up work is in progress and has two main components: the construction of a buttress wall; and a cover over the tailing's ponds. The first stage of the wall was completed and the second is expected to begin in 2023. The final disposal of the historical hazardous waste is in the planning process with the Dominican Republic Government.

PV built a water treatment plant larger than would otherwise be required for the mining operations. This made it possible for the plant to capture and process water in both PV and the government's areas of responsibility.

The hazardous materials and contaminated infrastructure located at the Rosario plant site were removed from the area and significant improvements in the water quality of the streams were accomplished through the efforts and management of ARD by PV.

20.1 Environmental Studies

Pueblo Viejo engaged several consultants to carry out an Environmental and Social Impact Assessment (ESIA) for the construction of the new Naranjo TSF, for the co-disposal of tailings and waste rock, as part of the extension of the LOM and to continue with the mining operations. The ESIA included the following:

- Study of several alternatives for the location of the Naranjo TSF.
- Study of the physical environment.
- Study of the biological environment.
- Study of the socioeconomic, cultural, and archaeological environment.
- Public Participation Activities, where the project was presented to stakeholders.
- Identification, characterization, and valorization of Impacts.
- Formulation of environmental, social and security management programs for the project.

Additionally, a risk assessment was carried out using the formal risk analysis (FRA), which is one of the corporate tools applied by PV for hazard analysis, risks, and implementation of controls.

The most significant hazards evaluated in the study include thunderstorms, mobilization of heavy and light mobile equipment, lifting work, construction work, assembly of structures and manipulation of energized tools and environmental risks related to biodiversity, water, air, noise, and archaeology.

PV's Environmental Management System (SGA) is aligned with the ISO 14001 environmental management standard. Through the SGA, PV manages its environmental and social aspects, as well as its legal obligations and other requirements, including those established in the following management plans:

- Water Management Plan.
- Air Management Plan.
- Rock Management Plan.
- Tailings Management Plan.
- Waste Management Plan.
- Material Management Plan.
- Biodiversity Management Plan.
- Archeology Management Plan.
- Social Adjustment Plan.

20.2 Project Permitting

PV has acquired all the permits necessary for the current operations. There are certain permits related to the Naranjo TSF and other changes that are in the process of approval.

PV completed a Feasibility Study on the original Project in September 2005 and presented an Environmental Impact Assessment (EIA) to the Dominican state in November of the same year. The Ministry of Environment approved the EIA in December 2006 and granted Environmental Licence 101-06. Requirements of the Environmental Licence included submission of the detailed design of tailings dams, installation of monitoring stations, and submission for review of the waste management plan and incineration plant.

Additional environmental reports were subsequently submitted in 2008, 2020 and 2022 to address an increase in the planned processing rate, the process plant expansion and the Naranjo TSF. The last amendment to the environmental license was issued on 13 August 2020, which authorized the plant expansion to a processing rate of approximately 14 Mtpa.

An ESIA was prepared for the Naranjo TSF based on concept level engineering details. It was submitted to the Ministry of Environment at the end of October 2022. A decision on the ESIA is expected from the Dominican Republic Government during the first half of 2023.

The Naranjo TSF is pending review and approval by the authorities. The ESIA submission is expected to be amended in Q1 2023 to incorporate the latest PFS level engineering details of the Naranjo TSF. ESIA approval will allow commencement of early works construction activities not directly associated with the in-stream dam embankments.

The location of the Naranjo TSF was one of the preferred options by the Ministry of Energy and Mines and the Ministry of Environment based on review conducted by such institutions. Once the feasibility study for the Naranjo TSF is completed, it will be presented to the Dominican government. PV also needs to submit the detailed engineering of the new Naranjo TSF to the relevant authority for review and approval.

The main in-stream dam construction activities require a separate permit from INDRHI, which is the hydraulic resources unit of the Ministry of Environment. An application is expected to be submitted to the INDRHI in Q3 2023, following completion of the Feasibility Study engineering report. INDRHI approval is expected in Q1 2024. INDRHI approval will allow commencement of the main in-stream dam construction activities (requiring surface water diversion or storage).

The principal agencies from which permits, licences, and agreements are required for mine operation in the Dominican Republic include:

- Minister of Energy and Mines (Ministerio de Energía y Minas).

- Ministry of Environment and Natural Resources – MIMARENA (Ministerio de Medio Ambiente y Recursos Naturales).
- Dominican Institute of Hydraulic Resources – INDRHI (Instituto Dominicano de Recursos Hidráulicos).
- Various Municipalities (Cotuí, for example).
- Ministry of Public Works and Communications – MOPC (Ministerio de Obras Públicas y Comunicaciones).
- National Institute of Potable Water and Sewage – INAPA (Instituto Nacional de Aguas Potables y Alcantarillados).
- General Mining Agency – DGM (Dirección General de Minería).
- Ministry of Industry and Commerce – MIC (Ministerio de Industria y Comercio).
- Ministry of Defense (Ministerio de Defensa).
- Ministry of Public Health and Social Assistance – MISPAS (Ministerio de Salud Pública y Asistencia Social).
- National Energy Commission – CNE (Comisión Nacional de Energía).
- Dominican Telecommunications Institute – INDOTEL (Instituto Dominicano de las Telecomunicaciones).
- Ministry of Housing and Buildings (Ministerio de la Vivienda y Edificaciones).

The processes to obtain and renew permits are well understood by PV and similar permits have been granted to the operations in the past. PV expects to be granted all permits and approvals necessary and see no impediment to such. For permits that require renewal, PV expects to obtain them in the normal course of business.

The QP understands the extent of all environmental liabilities to which the property is subject to have been appropriately met.

20.3 Water and Waste Management

Water Management

PV is located close to four main watersheds (see Figure 20-1):

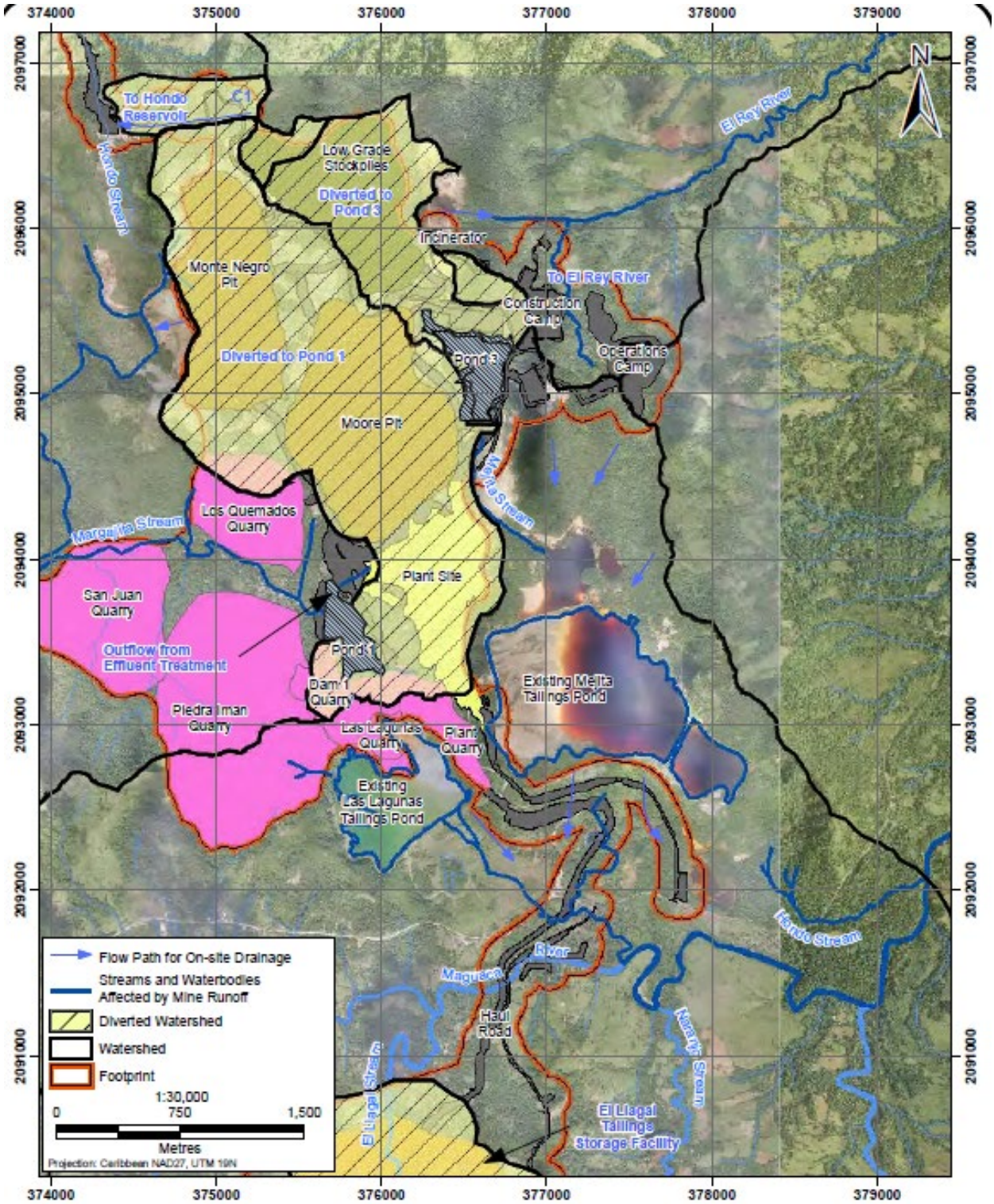
- Margajita River.
- Maguaca River.

- El Rey River.
- Guardianón River.

The natural state of the hydrology of these basins has been altered due to historical mining activity. The main facilities currently involved in water management include:

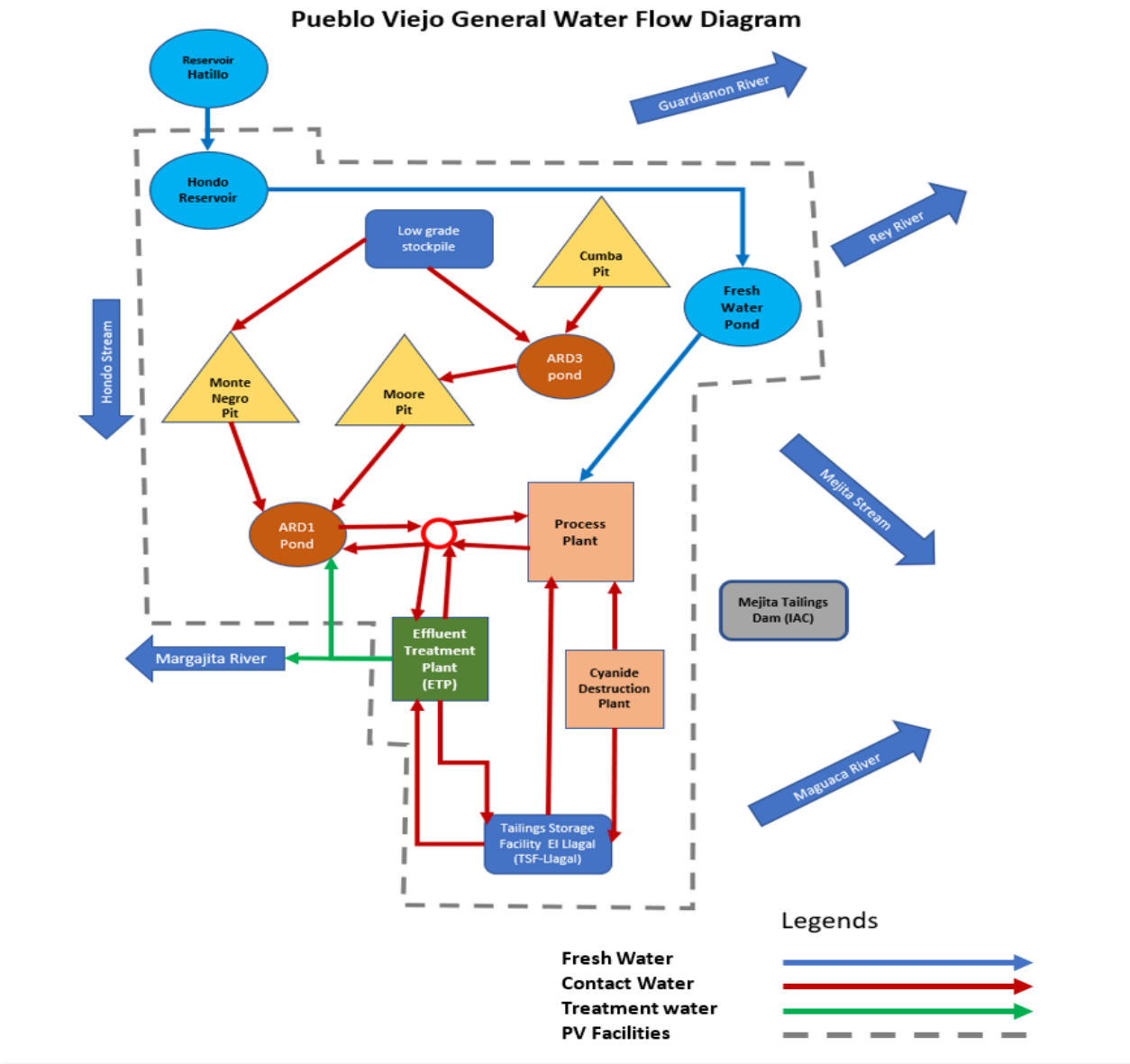
- Hatillo Reservoir: It is the largest body of water in the region and the primary source of fresh water for the operation.
- Hondo Reservoir: Provides storage of fresh water pumped from the Hatillo Reservoir, and runoff from the catchment area for use in the mine.
- Fresh Water Storage Pool: Receives pumped water from the Hondo Reservoir to regulate the fresh water supply.
- Emergency Containment Pools: Provides temporary storage in the event of an emergency and allows temporary storage of wastewater.
- Monte Negro, Moore and Cumba Pits: They temporarily store contact runoff water.
- ARD Storage Dams: Collecting and storing runoff from various areas of the Mine. All water collected in ARD1 pond is treated in the ETP for reuse in the process plant. ARD3 pond is currently not storing acid water as it was mostly backfilled to assist with pit stability; the area is now used as a ROM pad with a reduced collection capacity.
    - ARD1 collects water from the process plant area, domestic wastewater already treated from treatment plants located in the process area and the area of the 3000 Man Camp, the Moore pit, the Monte Negro pit and Cumba Pit.
    - The ARD3 collects runoff from medium/low-grade ore stockpiles, the emulsion plant, and leachates that could be generated from the Solid Waste Area – Landfill / Cumba dump, water from the Truck Shop, the heavy and light equipment laundry rooms, and the process lab area. This facility currently operates as a temporary pool with minimal storage; all acid water is immediately pumped into Moore pit, then to ARD1.
- Process Plant: This facility uses water to process the ore, and for cooling water, washing water and sealing water. Fresh water, reclaim water and ARD runoff can be used in the process plant.
- ETP: Mine water is treated at the ETP before discharge into the Margajita River. The ETP consists of an HDS treatment plant and neutralization. The ETP sludge is pumped to the El Llagal TSF.
- El Llagal TSF: It is designed to store waste rock, tailings, ETP sludge and water from PV.

Figure 20-2 provides a diagram of the current Pueblo Viejo general water flow.



Source: Rescan, 2008.

Figure 20-1 Pueblo Viejo Watershed Diagram



Source: Knight Piesold, 2020

Figure 20-2 Pueblo Viejo Water Flow Diagram

The following guidelines are used to develop and implement the water management systems for the mine:

- Dominican Republic Water Quality Standards.
- International Finance Corporation (IFC) Water Quality Guidelines.
- International Cyanide Management Code.
- Barrick Water Conservation Standard.
- Barrick Tailings Management Standard.

Mine development is designed to treat most of the surface water that has been impacted by historical mining activity, control water quality during mine operations, and post closure so that the water released to the receiving environment will meet water quality standards established by the Dominican Republic government. The process treated water is discharged to the Arroyo Margajita. The point for water quality monitoring is the outfall of the ETP. A secondary point located at the confluence of the Arroyo Margajita and the Hatillo Reservoir serves as a reference point for a better understanding of water quality interaction of discharged water and the reservoir.

Contact water from the mining areas is captured at ARD1, located in the headwaters of Arroyo Margajita. The water level within ARD1 is always maintained at the lowest possible level to provide sufficient storage. ARD1 is designed with a geomembrane liner to limit seepage. It is also constructed with spillways designed to pass the probable maximum flood resulting from the 24-hour Probable Maximum Precipitation. The ARD3 was backfilled to assist with pit stability and the area is now used as a ROM pad. To offset the loss of capacity resulting from the backfilling of ARD3, and additionally to enable maintenance of ARD1, a new ARD Dam (ARD4) to collect contact water is in the study and design engineering stage of development.

Limestone and lime requirements for the water treatment plant were estimated based on the results of pH at the HDS plant. The pH discharge criterion used for the test was 8.5 to 9.0, which meets the Dominican Republic Standards for Mining Effluents and Receiving Water Quality applicable to mining effluents discharged to surface water (pH 6.0 to 9.0).

Surface and ground water monitoring is routinely conducted, with sample intervals, depending on what is being monitored, that can be daily, weekly, monthly, quarterly, or annual. Samples are sent to ALS Dominicana S.A.S. LAB for analysis, located in Santo Domingo, the laboratory is accredited under Norm INTE-ISO 17025. Parameters tested include physical and chemical: Organic, inorganic, dissolved metals, total metals, hydrocarbon.

A groundwater impacts model has been prepared by Piteau Associates Engineering Ltd (Piteau 2022 and Piteau 2023) for the Naranjo TSF as part of the PFS design, which concluded that impacts to groundwater (above Government regulatory limits for groundwater quality) will be limited to a short distance downstream of the Naranjo TSF. A significant portion of seepage under the Naranjo TSF dam embankment either reports directly to the embankment blanket drain or surfaces in the Arroyo Vuelta a short distance downstream of the embankment, for collection and pump-back by the SRD system to the Naranjo TSF reclaim water pond. Modelling demonstrates that contaminant loading from seepage into the Maguaca River will be very low and the base flow water quality in the Maguaca River will remain within regulatory limits at the selected compliance point.

Cyanide Treatment

Cyanide in the tailings stream is routed to the cyanide-detoxification process to destroy most of the cyanide. The effluent from the process is blended with mill neutralization sludge prior to pumping to the TSF. Further degradation of cyanide in TSF is expected to occur at a level that meets discharge criteria which are:

- Total cyanide (limit 1 ppm),
- Weak acid dissociable (WAD) Cyanide (0.5 ppm); and
- Free cyanide (0.1 ppm) according to the NA-CDAS-2012 Metallic Mining standard.

The treatment process in the detoxification plant can be adjusted if necessary to reduce levels of cyanide.

Low Grade Stockpile

Approximately 94 Mt of low-grade ore has already been stockpiled for processing. PV is assuming that all stockpiles (excluding limestone and NAG) will be potentially acid generating and has implemented procedures to collect and treat all runoff water.

Waste Management

Waste management at PV includes a set of actions aimed at minimizing the volume and risk of waste, and then enacting appropriate disposal methods (according to their characteristics), to preserve human health and the environment. The set of actions includes, but is not limited to, the following activities:

- Waste classification (Hazardous Waste versus Non-Hazardous Waste),
- Waste segregation,
- Internal collection and transport,
- Temporary storage,
- Treatment,
- External transport, and
- Final disposition (depending on the classification).

Additionally, Pueblo Viejo has authorized areas for waste management, including, but not limited to:

- Waste Transfer Station Area (Cumba),

- Solid Waste Area – Landfill,
- Construction and Demolition Waste Facility,
- Used Oil and Refrigerant Storage Facilities.
- Domestic and Industrial Wastewater Treatment Plants,
- Mejita Environmental Management Zone.
- Support Areas, and
- Social and Community Requirements.

20.4 Social and Community Requirements

Local Context

Since the beginning of the Pueblo Viejo project, the Community Engagement and Development team (CED) has been working with more than 183,000 people from 31 communities in the direct area of influence of the Mine and 26 in the indirect area of influence. These communities belong to nine municipalities of the Monseñor Nouel, Sánchez Ramírez, Monte Plata and San Pedro de Macorís provinces, where the different components of Pueblo Viejo are located (including the Mine's current operations, the Expansion Project, power plant, transmission line and electrical substation).

Social Management System

PV has implemented a Social Management System, which includes the following Social Management Plans: Engagement and Disclosure; Land Acquisition and Involuntary Resettlement; Community Development (emphasizing education, capacity building, production, income generation and diversification, microenterprises, community water and preventive health); Local Content (local employment and development of local suppliers); Community Safety; Support for Environmental Management; and Monitoring and Evaluation.

The objective of the Engagement and Disclosure plan is to maintain effective communication between the company, local authorities, and the broader community within a framework of trust, transparency and mutual respect. This plan, together with the creation of strategic alliances, the empowerment of communities and gender equality, is the foundation for the other management plans.

Activities in the plan include formal and informal meetings with stakeholders; frequent visits to communities; community involvement in identifying emerging issues and potential risks; visits to the information offices (one outside the mine to allow free access for the community, another in Cotuí,

the head municipality of the Sánchez Ramírez province, and another in the Quisqueya I power plant); participatory community mapping, as well as the design and implementation of the Grievance Mechanism.

The Grievance Mechanism is the process known and accepted by stakeholders to submit and for PV to address concerns, complaints, or grievances concerning PV's social and environmental performance. The concepts of complaints and grievances are the same used by international organizations and agreed upon with the communities during the disclosure processes carried out by the CED team from 2007 within the framework of the Engagement and Disclosure Plan aimed at building relationships based on trust and transparency to support a stable operating environment, timely permitting/approvals, and the development of key partnerships by ensuring that communities are regularly informed about developments that may impact them, have timely opportunities to raise concerns, and have a voice in the decisions that affect them. The activities of this Plan include formal and informal meetings; focus groups; establishment of information offices; and participatory community mapping. All meetings seek a mutual company-community engagement based on trust. The Grievance Mechanism is also part of the Engagement and Disclosure Plan.

Resettlement

The Expansion Project requires the construction and operation of a new tailings and waste rock co-disposal facility (Naranjo TSF), which includes the construction of a conveyor. For this, the resettlement of seven communities (two for the conveyor belt and five for the tailings dam – one of them without permanent residents) is required. Land acquisition and involuntary resettlement, and livelihood restoration plans are in place and comply with national law and guided by international standards, especially the Performance Standard 5 (Land Acquisition and Involuntary Resettlement 2018) from World Bank and International Finance Corporation (IFC).

The resettlement process of El Llagal tailings dam was conducted by the Dominican government but PV participated in the planning process, funded the preparation of the Resettlement Action Plan (RAP) and assisted in the implementation of the RAP. The process consisted of resettling three communities, with 369 households and 1,338 people. 55 households (177 persons) were displaced both physically and economically (permanent residents); 314 households (1,162 persons) were displaced only economically (non-residents). This process was successfully completed in 2009. The new community is called El Nuevo Llagal and is in the municipality of Maimón. The resettlement process was followed up and monitored for five years, after which the CED team works with this community, as it is still within PV's direct area of influence.

Preliminary studies of the Naranjo TSF have identified that approximately 3,500 ha are required for the Naranjo TSF project, with the number of households affected to be determined through the assessment that is currently taking place. In addition, an area of 1,056 ha to the south of the tailings dam has also been identified as required for the Naranjo TSF project for the construction of perimeter roads as well as an environmental buffer zone.

The RAP helps to facilitate informed participation and broad disclosure of management and compensation measures to the individuals, family groups and communities that the project will impact.

The strategic steps for the resettlement process are outlined in the graphic shown in Figure 20-3.

Source: INSUCO, 2021

Figure 20-3 PV Resettlement Process Strategic Steps

PV also contracted the services of an expert consultant to prepare the Livelihood Restoration Plan (LRP) for the communities to be resettled. This plan includes:

- Preparing family life plans.
- Aligning LRP with national initiatives.
- Strengthening territorial management and leadership.
- Accompaniment in the identification, design and implementation of economic activities; and
- Design and implementation of a monitoring, follow-up and evaluation system.

Community Development

The Community Development Plan includes the participation of all stakeholders implementing initiatives. The plan promotes the sustainable development of the communities near the Project and supports investment programs that are prioritized through a participatory process. The areas of

investment are aligned with the 2030 Sustainable Development Goals (SDG). Since 2008, PV has invested more than US$50M in different development programs.

According to the latest evaluations, there has been a 41.1% increase in access to water in nearby communities, a 4% increase in access to sanitation, a 17.2% increase in the number of people employed in some economic activity, a 35% increase in the completion of secondary and tertiary education and 97% increase in access to technical and university education.

One of the most important Community Development programs is the AgroEmprende project which will also support the Project's Livelihood Restoration Program for HAP. This program started in 2011 with a reforestation, production, and diversification program from Piedra Blanca to Los Haitises National Park. It will now focus on establishing a high production and income diversification project that acts as a model in business, agribusiness, administration, marketing, and capacity building for both the communities around the mine and those we have resettled, supporting the Livelihood Restoration Program, and aligned with the Local Content strategy, through:

- Promote productive systems, conservations measures and access to local, regional, and international markets to improve the quality of life of the communities around the mine; resettled and host communities.
- Support the Livelihood Restoration Plan for resettled communities.
- Increase returns for the resettled communities through the installation of a Farmers' Hub
- Diversify the income of farmers by increasing productivity through economic and family activities.
- Promote associativity among producers.
- Deliver self-sustaining businesses which no longer rely on Barrick involvement or funding.

Local Content

The Local Content Plan (local employment and development of local suppliers) expands employment opportunities for local community through skilled, semi-skilled and unskilled roles. The plan identities positions, training, and development required. Finally, it also includes training and development of local companies to increase the supply of local content purchased by PV.

The Human Resources department, with the support of CED, implements specific learning programs to:

- Provide on-the-job training to local workers.
- Increase employment opportunities for the communities impacted by the Project.

- Guarantee good technical training in collaboration with technical-vocational education institutions and universities.
- Maximize the transfer of skills and technical knowledge of expatriate workers during the construction and operation phase to provide long-term benefits and employment opportunities to local communities.
- Maintain a dynamic succession planning system that identifies and develops high potentials.

CED, with the involvement of the Supply Chain department, also implements the community business incubation and acceleration program to provide access to local businesses near PV, through:

- Initiatives to strengthen local suppliers and create new suppliers.
- The inclusion of local suppliers for goods and services.
- Compliance with clauses to contractors who demand a percentage of local purchases of goods and services.

Community Health and Safety

The Community Safety Plan is aimed at strengthening the capacity of communities and emergency response agencies to prevent health and safety risks during the construction of the Expansion Project and operations. It is designed to reduce the potential impacts (security, health, access to basic services, among others) of a disorderly influx in nearby communities or invasions of acquired land associated with the Naranjo TSF, and efficiently manage the influx with the support of local governments and residents of the communities near the new Naranjo TSF. For these purposes, CED, Safety and Security have prepared a Land Influx and Protection Management Plan to guarantee the safety of both PV and the communities near it.

Monitoring and Evaluation

CED implements a social monitoring program designed to:

- Improve the ability to manage information,
- Follow-up, and close processes related to PV's social management,
- Guarantee the safeguarding of evidence (physical and electronic) of all the activities contained in the Social Management Plans for reporting purposes and as well as internal and external audits,
- Ensure the annual measurement of the KPIs of each Social Management Plan, and

- Guarantee compliance and progress of the proposed activities, as well as the impact that the different actions have had concerning the development of the communities.

The CED team also continues to evaluate the outcomes generated from the implementation of PV's sustainable programs described above.

20.5 Mine Closure Requirements

The update of the Mine Closure Plan was prepared by Piteau in September 2021, submitted to the Government in December 2021 and is under review. The design of the closure plan considers several interrelated components. These include legal and other obligations, closure objectives, environmental and social considerations, technical design criteria, closure assumptions, health and safety hazards, and relinquishment conditions. The plan was prepared in accordance with the following Barrick environmental standards or guidelines:

- Barrick Mine Closure Guidelines.
- Barrick Mine Closure Cost Estimate Guideline.
- Barrick Social Closure Guidance.
- Barrick Biodiversity Standard.
- Barrick Water Conservation Standard, and
- Global Industry Standard on Tailings Management.

The overarching closure vision for Pueblo Viejo is to maximize value to PV Business Plan by implementation of measures for management risks which are cost-effective, fit for purpose and suitably protective of human welfare, the environment and future beneficial land use. To achieve this closure vision, specific technical and economic objectives were defined including physical and chemical landform stability, protection of human health and the environment, performance uncertainty and risk residual mitigation, legal compliance, Capex optimization, minimization of post closure liabilities or maintenance expenditure (including water treatment), alignment with stakeholder expectations for post-closure land use and facilitation of property relinquishment. Quantitative design criteria relating to landform stability and legal compliance objectives were established based on a combination of national statutory guidelines, residual risk thresholds specified in Barrick's Closure Standard and industry best-practise.

Strategies for closure of all components of the Pueblo Viejo site have been incorporated into closure plan. As a general the final closure goal by facility is described below:

- Pits: backfill and pit lake will form, supernatant will be treated during post closure.
- Quarries: backfill and area will be revegetated.

- Dumps: management into the pit or use as cover rock, footprint will be rehabilitated and revegetated.
- TSF El Llagal: restore surface drainage. Water treatment for 10 years, NAG rock cover and topsoil for revegetation and rehabilitation of surface drainage network.
- Process Plant: Demolition at closure, rehabilitation of the footprint. Ancillary infrastructure: Most ancillary infrastructure, including reagent storage areas, the truck shop, maintenance areas, office and staff accommodation, non-essential internal roads and water supply systems, are assumed to be removed, with footprint areas appropriately rehabilitated. Some accommodation and office space may, however, be retained to support post-closure monitoring and maintenance activities.

The overall, long term post-closure land use objective for the site is to return it to a self-sustaining condition suitable to support pre-mining land use activities, such as small-scale agriculture, hunting, and artisanal forestry.

PV plans to progressively reclaim the Mine site as sections of the site become available and continue to optimise the closure plan to minimise post closure liabilities.

Closure liabilities for the LOM are estimated to be US$342M with US$173.8M already included in the provisions for environmental rehabilitation (PER), and $168.7M future liabilities not yet included in the PER. These provisions are allocated in line with Barrick's accounting policy.

Bond

The Environmental Licence requires a compliance bond that corresponds to 10% of the amount of the updated Environmental Adjustment and Management Plan (PMAA) defined for the operational phase. At the end of the operational phase, PV will provide the corresponding bond at 10% of the total amount of the PMAA for the closure and post-closure phases.

To cover closing costs PV has US$123M in an escrow account and US$110M in an insurance bond for a total of US$233M. PV will increase the value in escrow and bonds on an as need basis when the value of liabilities increase.

21 Capital and Operating Costs

Pueblo Viejo is an operational project with an extensive historical basis enabling accurate estimation of future capital and operating costs.

All costs presented are in USD.

21.1 Capital Costs

Capital costs for the project are summarized in Table 21-1.

Table 21-1 Mining Capital Expenditure Summary

Capital Expenditure	LOM Value (US$M)
General & Administration	6.2
Capitalized Drilling	12.1
Mine Capitalized Stripping	528.4
Open Pit Sustaining	611.5
Expansion	1,259.4
Processing Sustaining	1,361.8
Total	**3,779.4**

Capitalized drilling is drilling required for ore definition, development, and geotechnical purposes.

Open Pit Sustaining capital is capital required for the continuation of the mining operations and includes items such as replacement and additional equipment, capitalised mobile maintenance components, new and upgraded mining infrastructure, geotechnical risk management equipment, light vehicles, and others.

Processing Sustaining Capital is for the transition of Naranjo TSF to the operational phase, TSF dam raises above the starter dam limit (for Llagal and Naranjo TSF), post expansion works, power plant major repairs, major equipment rebuilds, and others.

General & Administration capital is for IT and communication equipment upgrades, warehouse improvements, G&A building improvements, and others.

Mine Capitalized Waste Stripping is calculated as per Barrick corporate accounting guidelines.

Expansion capital is the estimate of the capital required to complete the process plant expansion to the approximate 14 Mtpa maximum capacity scheduled, the Hondo PAG waste dump, Naranjo TSF land acquisition, Naranjo TSF starter dam construction and commissioning, and construction and

commissioning of the PAG waste transport system. The Expansion Capital is summarized in Table 21-2.

Table 21-2 Expansion Project Capital Expenditure Summary

Expansion Capital Item	LOM Total (US$M)
Mine PAG Transport System	255.2
Hondo PAG Dump (Phase 2 & 3)	13.8
Process Plant	135.3
Naranjo TSF	850.3
Tailings Pipeline	4.8
Total	**1,259.4**

It is noted that the capital estimates for the project are based on historical values (adjusted as necessary) or are supported by a minimum of PFS level studies. The QP believes that the costs are appropriate for supporting estimation of Mineral Resource and Mineral Reserves.

21.2 Operating Costs

The operating costs for the LOM were developed considering the planned mine physicals, equipment hours, labor projections, consumables forecasts, and other expected incurred costs.

A summary of the operating costs for the LOM Mineral Reserves is shown in Table 21-3.

Table 21-3 LOM Average Unit Operating Costs Summary

Operating Costs	LOM US$/t ore processed
Mining – OP	9.93
Processing	37.18
General & Administration	4.06
Other Operating Costs / Credits	-0.27
Total Direct Operating Costs	50.90
Freight & Refining Costs	0.17
Royalty	2.83
Total Operating Costs (without by-product credits)	**53.89**

The QP has validated that the recent historical actual costs reconcile well against the projected forecast costs and believe the costs assumptions used for the LOM are appropriate.

22 Economic Analysis

This section is not required as Barrick, the operator of Pueblo Viejo for both exploration and mining, is a producing issuer, the property is currently in production, and the proposed expansion of current annual gold production at Pueblo Viejo is not material.

The QP has reviewed an economic analysis of the Pueblo Viejo Mine using the Mineral Reserve estimates presented in this Report; results confirm that the outcome is a positive cash flow that supports the statement of Mineral Reserves.

23 Adjacent Properties

There are no adjacent properties which are considered by the QP to be material to Pueblo Viejo.

There are two additional mining operations in the general vicinity of the Pueblo Viejo Mine:

- Falcondo Nickel Project, operated by Americano Nickel, located approximately 18 km from the Pueblo Viejo Mine (currently under limited operation), and
- Cerro de Maimon Copper-Gold Project, operated by Perilya, also located approximately 9 km away.

Neither project impacts materially on the Pueblo Viejo Mine.

24 Other Relevant Data and Information

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

25 Interpretation and Conclusions

25.1 Geology and Mineral Resources

QA/QC

Pueblo Viejo has documented standard operating procedures (SOP) for the drilling, logging, and sampling processes, which meet industry standards. The geological and mineralization modelling are based on visibly identifiable geological contacts, tested, and proven structural controls, and data supported geochemical signatures, which support a geologically robust interpretation and model.

Pueblo Viejo has a QA/QC program in place to ensure the accuracy and precision of the assay results from the analytical laboratory. Checks conducted on the quality control database indicated that the results are of acceptable precision and accuracy for use in Mineral Resource estimation.

Mineral Resources

Geological models and subsequent Mineral Resource estimates continue to evolve with each successive model update, incorporating additional knowledge and data from the operations of the open pit. Significant infill and conversion drilling, combined with grade control drill programs and pit mapping have been completed to increase the confidence in the resulting Mineral Resources and Mineral Reserves.

In the QP's opinion, the Pueblo Viejo Mineral Resources outlier capping, domaining, and estimation approach are appropriate, and reflect industry best practice, and therefore considers the Mineral Resources at Pueblo Viejo to be appropriately estimated and classified.

The QP is not aware of any environmental, permitting, legal, title, taxation socioeconomic, marketing, political, metallurgical, fiscal, or other relevant factors, that could materially affect the Mineral Resource estimate.

25.2 Mining and Mineral Reserves

Pueblo Viejo is a mature mining operation with an extensive operating history. Mine development of the current operations by Barrick began in August 2010.

The Mine consists of two main open pits (Moore and Monte Negro) plus a smaller satellite pit (Cumba) and is mined by conventional truck and shovel methods.

The remaining pit only Mineral Reserves are estimated at 196.1 Mt of ore with a strip ratio 2.6:1. Total Mineral Reserves (pit plus stockpiles) are estimated to be 291.6 Mt at a strip ratio of 1.8:1.

The remaining pit life, based on the Mineral Reserves estimate, is projected to be 19 years, until 2041, with the processing of low-grade ore stockpiles and limestone mining continuing until 2044. To maximize project economics, higher grade ore is processed in the early years, while lower grade ore is stockpiled for later processing. Stockpiled ore is mined with a reclamation sequence to maximize ore delivery and revenue. Life of Mine (LOM) planned total material movement, including limestone, will range from approximately 59 Mtpa to 98 Mtpa.

The QP responsible for the Mineral Reserves has directly supervised the estimation process, has performed an independent verification of the estimated tonnes and grade, and in their opinion, the process has been carried out to industry standards and uses appropriate modifying factors for the conversion of Mineral Resources to Mineral Reserves.

The QP is not aware of any environmental, legal, title, socioeconomic, marketing, mining, metallurgical, infrastructure, permitting, fiscal, or other relevant factors that could materially affect the Mineral Reserve estimate. As noted in Section 4, while the permitting process for the Expansion Project is not finalised, Barrick sees no impediment to obtaining all required permits in the normal course of business.

25.3 Mineral Processing

Significant testwork has already been undertaken on the various refractory ore types, including the major stockpile inventory. Based on testwork completed, the overall recoveries depicted for the Project are deemed realistic. The QP is satisfied that Pueblo Viejo can maintain production, gold recovery, and reagent consumptions as forecasted.

The QP considers the modelled recoveries for all ore sources and the processing plant and engineering unit costs to be acceptable.

25.4 Infrastructure

The Pueblo Viejo operation is a mature project that has been operating since 2010. It has well developed infrastructure supporting the current operations and plans for additional infrastructure to support the Project growth.

The most significant infrastructure projects planned for PV's growth include the Naranjo TSF and a crushing conveying, stacking system for PAG transport. Both infrastructure projects are supported by a minimum of PFS level studies and are being further developed to more detailed levels of study.

The QP's responsible for the Infrastructure Section believe that the current infrastructure and planned infrastructure PFS's support the estimation of Mineral Resources and Mineral Reserves.

25.5 Environment, Permitting, and Social Aspects

PV has acquired all the permits necessary for the current operations. There are certain permits related to the Naranjo TSF and other changes that are in the process of approval. One of which is an ESIA for the construction of the new Naranjo TSF which PV has submitted and expects a decision during the first half of 2023. Another key permit is from INDRHI, which is the hydraulic resources unit of the Ministry of Environment, expected to be granted in Q3 2023. Both of these permits will allow the commencement of construction of the Naranjo TSF.

The key environmental concerns are addressed in the EISA and PV have numerous management plans to manage these risks.

Community engagement and development (CED) is managed by a dedicated team supporting PV's Social Management System, which includes the following Social Management Plans: Engagement and Disclosure; Land Acquisition and Involuntary Resettlement; Community Development (emphasizing education, capacity building, production, income generation and diversification, microenterprises, community water and preventive health); Local Content (local employment and development of local suppliers); Community Safety; Support for Environmental Management; and Monitoring and Evaluation.

The Expansion Project requires the construction and operation of the proposed Naranjo TSF and includes the construction of a conveyor. For this, the resettlement of seven communities is required. Land acquisition and involuntary resettlement, and livelihood restoration plans are in place and comply with national law and guided by international standards. This is being managed by the PV CED team.

25.6 Risks

Risk Analysis Definitions

The following definitions have been employed by the QP's in assigning risk factors to the various aspects and components of the Project:

- **Low** – Risks that are considered to be average or typical for a deposit of this nature and could have a relatively insignificant impact on the economics. These generally can be mitigated by normal management processes combined with minor cost adjustments or schedule allowances.
- **Minor** – Risks that have a measurable impact on the quality of the estimate but not sufficient to have a significant impact on the economics. These generally can be mitigated by normal management processes combined with minor cost adjustments or schedule allowances.

- **Moderate** – Risks that are considered to be average or typical for a deposit of this nature but could have a more significant impact on the economics. These risks are generally recognisable and, through good planning and technical practices, can be minimised so that the impact on the deposit or its economics is manageable.
- **Major** – Risks that have a definite, significant, and measurable impact on the economics. This may include basic errors or substandard quality in the basis of estimate studies or project definition. These risks can be mitigated through further study and expenditure that may be significant. Included in this category may be environmental/social non-compliance, particularly regarding Equator Principles and IFC Performance Standards.
- **High** – Risks that are largely uncontrollable, unpredictable, unusual, or are considered not to be typical for a deposit of a particular type. Good technical practices and quality planning are no guarantee of successful exploitation. These risks can have a major impact on the economics of the deposit including significant disruption of schedule, significant cost increases, and degradation of physical performance. These risks cannot likely be mitigated through further study or expenditure.

In addition to assigning risk factors, the QP's provided opinion on the probability of the risk occurring during the LOM. The following definitions have been employed by the QP's in assigning probability of the risk occurring:

- **Rare** – The risk is very unlikely to occur during the Project life.
- **Unlikely** – The risk is more likely not to occur than occur during the Project life.
- **Possible** – There is an increased probability that the risk will occur during the Project life.
- **Likely** – The risk is likely to occur during the Project life.
- **Almost Certain** – The risk is expected to occur during the Project life.

Risk Analysis Table

Table 25-1 details the PV Risk Analysis as determined by the QP's.

Table 25-1 PV Risk Analysis

Issue	Likelihood	Consequence Rating	Risk Rating	Mitigation
Geology and Mineral Resources - Confidence in Mineral Resource Models	Unlikely	Minor	Low	Additional scheduled infill drilling maintaining two years of full grade control coverage ahead of mining. Resource model updated on a regular basis using production reconciliation results.
Mining and Mineral Reserves - Open Pit Slope Stability	Unlikely	Moderate	Minor	Continued 24hr in-pit monitoring with Radar, geotechnical drilling well ahead in advance, instrumentation, and continued updating of geotechnical and hydrology models.
Processing - Salts build-up in the process water – leading to carbon fouling in the CIL and elution circuits	Possible	Moderate	Medium	A full salt and water balance has been completed and tracked in the plant to ensure that correct water dilution into the critical streams of elution is managed with minimum impact on carbon fouling and gold recovery.
Processing - Reagent consumptions and recoveries hence operating costs and economics may be affected by potential uncharacteristic behaviors given the possible blends	Possible	Minor	Low	Process operating costs and recoveries have been estimated based on specialist studies on the variable ore types however it has been recommended that ongoing testwork ensue, in particular with blends incorporating stockpile material, on account of the large component of the feed it represents, itself requiring standalone locale-based domaining, to further understand and optimize the process recoveries and costs.
Environmental -Tailings failure	Rare	High	Medium	Engineering design and construction of TSF to international standards, proper water management at the TSF; emergency spillway; buttressing if required.
Environmental - Hydrocarbon or ARD spillage	Possible	Moderate	Medium	Water and hydrocarbon monitoring and management processes employed on site.
Environmental - Commercial and Reputational Issues due to GHG Emissions	Possible	Moderate	Moderate	Continue transition to renewable energy sources. Continue identifying opportunities through the climate committee
Social - Community unrest	Possible	Moderate	Moderate	Dedicated community engagement by company social and sustainability department. Accessible Grievance Mechanism. Community development project.
Country & Political - Security - Governmental	Possible	Major	Moderate	Dedicated government liaison team. Engagement with local authorities. Government participation/ownership.
Permitting delays	Possible	High	Moderate	Dedicated government liaison team/constant engagement with government authorities
Expansion Project construction delays	Possible	Minor	Low	Several months buffer capacity available in Llagal TSF.

- Naranjo TSF - PAG Transport System				Construction schedule can be accelerated with increased equipment and personnel numbers. Extra design capacity for PAG in Hondo dump.
Processing & Infrastructure -Delay or unable to exploit limestone resources located outside of fiscal reserve boundary, impacting the availability of process and TSF construction limestone	Possible	Minor	Minor	Sufficient limestone resources are available within the fiscal reserve boundary, but at a higher strip ratio and cost. Drilling, testing and modeling of diorite resources continue as a potentially cheaper, alternative source of TSF construction material
Mining & Infrastructure -PAG transport and stacking system does not operate at design capacity	Unlikely	Moderate	Minor	Additional mobile fleet to supplement transport and deposition of PAG using conventional truck haulage. Increased operating and sustaining capital costs
Capital and Operating Costs	Possible	Moderate	Low	Continue to track actual costs and LOM forecast costs, including considerations for inflation and foreign exchange.
Fiscal Stability	Possible	Moderate	Moderate	Regularly communicate with government and other key stakeholders regarding taxes paid by PV and the direct and indirect impact of those tax payments. Re-enforce the importance of PV's tax, customs and stability provisions during all government engagements. Continue to work closely with the tax authorities and engage with Congress

26 Recommendations

The QP's have made the following recommendations.

26.1 Geology and Mineral Resources

- Continue to improve geology and estimation models with learnings acquired through continued mining development.
- Continue to investigate and improve, geochemical signature modeling, as a geological reconciliation of visual alteration logging, to remove the 1.0g/t grade shell currently used to removal bimodal distributions.
- Review grade capping strategy and metal at risk, as current approach is potentially aggressive (removing too much metal).
- Incorporate additional data density variability samples into sample workflow and update current density estimation procedures.
- Continue to collect additional Sulfide Sulfur, Total and Organic Carbon assay data to drive continuous improvement in models.

26.2 Mining and Mineral Reserves

- Continue pit slope geotechnical investigations, analyses, dewatering and depressurisation activities to improve pit wall stability and the possibility of steepening the final pit slope angle.
- Investigate options to minimise costs of the PAG waste transportation requirements.
- Continue efforts to process higher grade ore earlier in the LOM schedule through either mining or stockpile rehandle optimisations.
- Maintain efforts to improve the mining fleet productivities and utilisations to decrease operating costs and/or mining capital.
- Develop process recovery and operating cost relationships for the combined direct POX and flotation-POX streams, instead of assuming only conservative flotation-POX parameters for mine planning activities.

26.3 Mineral Processing

- Continue with laboratory assessment of blend behaviors with differing regimes of reagents so as to ensure validity of the recovery and operating cost predictions, as well as pre-empt potential anomalies.
- Monitor the TSF reclaim water including in-plant recovered process water to ensure no buildup of chemicals detrimental to the process. Whilst the water balance has been designed to prevent such an occurrence, prudence suggests confirmation by observation hence mitigation where necessary.
- There are opportunities for further optimizing the water management via fast-tracking the replacement of fresh water to reclaim water, where several projects have already been identified. Plans, however, need to be implemented, being mindful of the larger picture or site-wide balance. Subsequent consideration will incorporate the needs of ecological flows, process requirements, precipitation and evaporation variations and finally, governmental regulation.
- Process Control – The addition of control and instrumentation mechanisms with a view to optimize operability of processing circuits is not new, indeed Pueblo Viejo possesses a plethora of said paraphernalia, as well as implementing dedicated optimization software to its milling circuits. The opportunity and intention remains to roll this initiative out to encompass the autoclave operation as well, potentially using artificial intelligence to combine and optimize the operation of several successive circuits.

26.4 Infrastructure

- Continue the study work for the Naranjo TSF and the PAG transport system.
- Continue to investigate lower costs sources of TSF construction and limestone material.

26.5 Environment, Permitting, and Social and Community

- Continue the permitting and land acquisition process required for the Naranjo TSF construction and operation.
- Continued stakeholder engagement and public education of the Expansion Project.
- Continue identifying and implementing initiatives of renewable energies to support Barrick global commitment on Climate Change (GHG reduction of 30% by 2030 while maintaining a steady production profile, and Net Zero by 2050).

27 References

AMEC, 2005; Placer Dome Inc. Technical Report and Qualified Persons Review. Pueblo Viejo Project, Dominican Republic. Prepared by AMEC (October 2005).

Barrick, 2007; Barrick Gold Corporation, Pueblo Viejo Dominicana Corporation Pueblo Viejo Project Feasibility Study Update, Volume 1, December 2007.

BGC, 2023; Naranjo Tailings Storage Facility – 2022 Prefeasibility Study Report – Rev.1 [Report], BGC Engineering Inc, Vancouver Canada, January 2023.

Escuder-Viruete et al. 2007; Escuder-Viruete, J., Díaz de Neira, A., Hernaiz Huerta, P.P., García-Senz, J., Monthel, J., Joubert, M., Lopera, E., Ullrich, T., Friedman, R., Weis, D., Pérez-Estaun, A., 2007, Implicaciones tectonomagmáticas y edad de las toleítas de arco-isla, boninitas y rocas ácidas relacionadas de la formación Los Ranchos, Cordillera Oriental, República Dominicana: Boletín Geológico y Minero, 118, 195-220.

Hedenquist & Lowenstern, 1994; The role of magmas in the formation of hydrothermal ore deposits, JW Hedenquist, JB Lowenstern - Nature, 1994.

INSUCO, 2021; Resettlement Action Plan (RAP), INSUCO INTL., Berkshire UK, 2021.

Knight Piesold, 2020; Pueblo Viejo Water Management Plan, Knight Piesold Consulting 2020

McPhie, 2020; Facies analysis of the Pueblo Viejo volcanic succession, Dominican Republic. J. McPhie, April 2020

Muntean et al., 1990; Evolution of the Monte Negro Acid Sulfate Au-Ag Deposit, Pueblo Viejo, J. Muntean and others. Economic Geology Vol. 85, 1990, pp. 1738-1758

Nelson et al. 2020; Nelson, C., Polanco, J., Macassi, A., Dominguez, H., Proenza, J., Torró, L., Rhys, D., Iturralde-Vinent, M., 2020, The Hatillo Limestone, Pueblo Viejo district, Dominican Republic: Marginal reef or impermeable cap?: Boletín de la Sociedad Geológica Mexicana, 72 (3)

Piteau, 2022; Groundwater Impact Assessment for Development of TSF3, Piteau Associates Engineering Ltd., Vancouver Canada, July 2022.

Piteau, 2023; Groundwater Flow Model Development in Support of the Naranjo TSF Prefeasibility Study, Piteau Associates Engineering Ltd., Vancouver Canada, January 2023.

PV, 2020; Feasibility Study Report, Pueblo Viejo Expansion Project (PVEP), Barrick Gold Corporation, 2020

PV, 2021; Pueblo Viejo Mine Closure Plan prepared by Piteau Associates International Ltd, 2021.

PV, 2022a; 2021-22 Geotechnical Drilling Summary and Rock Mass Model Review, Internal Report, Barrick Pueblo Viejo, 2022.

PV, 2022b; Groundwater Model Hu Coefficient – Update February 2022, Internal Report, Barrick Pueblo Viejo, 2022.

PV, 2022c; PAG Waste Transfer to TSF – Document For EIA Purposes, Pueblo Viejo, 2022

Rescan, 2008;.Pueblo Viejo Sulfide Project Processing Expansion Evaluation Report, Rescan Environmental Services Ltd., Vancouver Canada, 2008

RPA 2016; Technical Report on the Pueblo Viejo Mine, Sanchez Ramirez Province, Dominican Republic; Roscoe Postle Associates Inc., 2016

RPA 2018; Technical Report on the Pueblo Viejo Mine, Sanchez Ramirez Province, Dominican Republic; Roscoe Postle Associates Inc., 2018

RRG, 2021; Rock Mass Model 2021 Pueblo Viejo Mine, Report No BGC-178-REP-01, Red Rock Geotechnical, Perth, Australia, 2021.

RRG, 2022; Slope Stability Analysis & Design Pueblo Viejo Mine, Report No: BGC-224-REP-01, Red Rock Geotechnical, Perth, Australia, 2022.

SENET 2022; Pueblo Viejo (PV) PAG Handling Project Pre-feasibility Study (PFS) Report, Senet (Pty.) Ltd., Lethabong, South Africa, June 2022

SRK, 2022a; Factual Report on Barrick Pueblo Viejo 2021 Geotechnical Drilling, Revision 3, SRK Consultants, Denver USA, 31 October 2022.

SRK, 2022b; Numerical Groundwater Model for Pore Pressure Predictions, Dominican Republic, Draft, SRK Consultants, Denver USA, 29 August 2022.

Stone & Webster 1992; Sulphide Gold Feasibility Study, Private Report for Rosario Dominicana, S.A. Stone & Webster International Projects Corporation, October 1992.

Viljoen, 2022; Pueblo Viejo Gold Mine - Expansion project. Water Management system, A. Viljoen, 2022

28 Date and Signature Page

This report titled "Technical Report on the Pueblo Viejo Mine, Dominican Republic" with an effective date of 31 December 2022 and dated March 17, 2023 was prepared and signed by the following authors:

(Signed) *Mike Saarelainen*

Dated at Miami, USA

17th March 2023

Mike Saarelainen, B.Eng., FAusIMM
Chief Mining Engineer, LATAM & Australia Pacific
Barrick Gold Corporation

(Signed) *Chad Yuhasz*

Dated at Mexico City, Mexico

17th March 2023

Chad Yuhasz, P.Geo.
Head of Mineral Resource Management, LATAM & Australia Pacific
Barrick Gold Corporation

(Signed) *Richard Quarmby*

Dated at Butte, USA

17th March 2023

Richard Quarmby, B.Sc.(Chem Eng), PrEng., CEng., MSAIChE., MIMMM
Group Metallurgist, Projects
Barrick Gold Corporation

(Signed) *Neil Bar*

Dated at Almaty, Kazakhstan

17th March 2023

Neil Bar B.Eng., M.Eng.Sc., M.Eng., RPEQ
Principal Geotechnical Engineer
Gecko Geotechnics LLC.

(Signed) *Bill Burton*

Dated at Vancouver, Canada

17th March 2023

Bill Burton, M.Eng., P.Eng. (BC)
Principal Geotechnical Engineer
BGC Engineering Inc.

29 Certificate of Qualified Persons

29.1 Mike Saarelainen

I, Mike Saarelainen, B.E. Mining (Hons), as an author of this report titled “Technical Report on the Pueblo Viejo Mine, Dominican Republic” (the Technical Report) with an effective date of 31 December 2022 and dated 17 March 2023 prepared for Barrick Gold Corporation, do herby certify that:

1. I am currently employed as Chief Mining Engineer, Latin America and Asia Pacific, with Barrick Gold Corporation, of 161 Bay Street, Toronto, ON, M5J 2S1, Canada.
2. I graduated with a Bachelor of Engineering (Mining) degree from the University of Queensland, Queensland, Australia, in 1991.
3. I am a member of the Australasian Institute of Mining and Metallurgy (FAusIMM, #110008). I have worked as a mining engineer for a total of 28 years in various site based and corporate roles. My relevant experience for the purposes of the Technical Report includes:
    - Leading and undertaking mine planning activities for gold and copper projects in Tanzania, Alaska, Dominican Republic, Chile, Argentina, Pakistan, Papua New Guinea and Zambia. This includes the estimation of gold mineral reserves for operating sites and development projects. I was employed at the Pueblo Viejo operation for four years from 2015 to 2019, most recently as mining lead for an expansion project considering an increase in plant throughput, new tailings storage facility and alternatives to conventional truck haulage of waste rock.
4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfil the requirements to be a "qualified person" for the purposes of NI 43-101.
5. I visited the Pueblo Viejo Gold Mine Complex most recently on 28 November to 02 December 2022.
6. I am responsible for Sections 15, 16.1 to 16.2, 16.4 to 16.7, 18.1 to 18.13, 18-15 to 18-16, and 21. I share responsibility for Section 1 to 3, and 25 to 27.
7. I am not independent of the Issuer applying the test set out in Section 1.5 of NI 43-101, as I have been a full-time employee of Barrick Gold Corporation since 2006.
8. I have had prior involvement with the property that is the subject of the Technical Report, as Chief Mining Engineer, Latin America Asia Pacific, as mining lead for the PV Expansion project.
9. I have read NI 43-101, and the sections of the Technical Report for which I am responsible have been prepared in compliance with NI 43-101 and Form 43-101F1.

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

Dated this 17th day of March 2023

(Signed) *Mike Saarelainen*

Mike Saarelainen, B.Eng., FAusIMM

29.2 Chad Yuhasz

I, Chad Yuhasz, P.Geo. as an author of this report titled “Technical Report on the Pueblo Viejo Mine, Dominican Republic” (the Technical Report) with an effective date of 31 December 2022 and dated 17 March 2023 prepared for Barrick Gold Corporation, do herby certify that:

11. I am Mineral Resource Manager, Latin America and Asia Pacific, with Barrick Gold Corporation, of 161 Bay Street, Toronto, ON, M5J 2S1, Canada.
12. I graduated with a Bachelor of Science degree in Geology from University of Regina, Regina, Saskatchewan, Canada, in 2003.
13. I am a member of the Association of Professional Engineers and Geoscientists of the Province of British Columbia, Canada (#31779). I have worked in the mining industry for more than 20 years in roles including operations, project studies, evaluations, management and consulting. My relevant experience for the purposes of the Technical Report includes:
    - I have been involved in various mining projects for gold, lead, zinc, and copper metals in Australia, Argentina, Canada, Chile, China, Dominican Republic, Mexico, the United States and Peru during various stages of project review / development, evaluations, resource estimation and operation.
14. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfil the requirements to be a "qualified person" for the purposes of NI 43-101.
15. I visited the Pueblo Viejo Gold Mine Complex most recently on 15-22 November 2022.
16. I am responsible for Sections 4 to 12, 14, 22-24 and share responsibility for Section 1 to 3, and 25 to 27.
17. I am not independent of the Issuer applying the test set out in Section 1.5 of NI 43-101, as I have been a full-time employee of Barrick Gold Corporation since 2016.
18. I have had prior involvement with the property that is the subject of the Technical Report, as Mineral Resource Manager, Latin America Asia Pacific.
19. I have read NI 43-101, and the sections of the Technical Report for which I am responsible have been prepared in compliance with NI 43-101 and Form 43-101F1.
20. At the effective date of the Technical Report, to the best of my knowledge, information, and belief the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 17th day of March 2023

(Signed) ***Chad Yuhasz***

Chad W Yuhasz, P.Geo, EGBC (Engineers and Geoscientests of British Columbia)

29.3 Richard Quarmby

I, Richard Quarmby, BSc (Chem Eng), MBA, MIoMMM, CEng, MSAIChE, PrEng as an author of this report titled “Technical Report on the Pueblo Viejo Mine, Dominican Republic” (the Technical Report) with an effective date of 31 December 2022 and dated 17 March 2023 prepared for Barrick Gold Corporation, do herby certify that:

1. I am Group Metallurgist, Projects, with Barrick Gold Corporation, of 161 Bay Street, Toronto, ON, M5J 2S1, Canada.
2. I graduated with a BSc chemical engineering degree from the University of the Witwatersrand in 1985 and earned a Master of Business Administration degree in 2005.
3. I am a Professional Engineer (Pr Eng) with the Engineering Council of SA (no. 910237); a Chartered Engineer with the Engineering Council UK (C Eng) (no. 580441); Member of the South African Institution of Chemical Engineers (SAIChE) (no. 1361); Member of the Institute of Materials Minerals and Mining (IoMMM) in the UK (no. 454225); and a Member of the Institute of Chemical Engineers (IChemE) (no. 99963338). My relevant experience for the purpose of the Technical Report is:
   - Senior Manager involved in the Process Development across all operations within the Barrick Africa & Middle East Region since 2015, then from 2019 expanding to other regions of Latin America and Asia Pacific, plus selected North American operations. Experience includes evaluation of mine projects incorporating delivery of preliminary economic assessments, pre-feasibility, and feasibility studies. Practical experience includes development via process design, project management as well as operational management of mine operations. Similar positions held previously in process and business development largely within Africa.
4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfil the requirements to be a "qualified person" for the purposes of NI 43-101.
5. I was seconded to the property for a period of three years as the Lead for the Process Expansion Feasibility Study and last visited the site in May of 2022.
6. I am responsible for Sections 13 and 17 and share responsibility for Section 1 to 3, and 25 to 27.
7. I am not independent of the Issuer applying the test set out in Section 1.5 of NI 43-101, as I have been a full-time employee of Barrick Gold Corporation since 1 September 2015.
8. I have had prior involvement with the property that is the subject of the Technical Report, as Lead for the Process Expansion Feasibility Study.
9. I have read NI 43-101, and the sections of the Technical Report for which I am responsible have been prepared in compliance with NI 43-101 and Form 43-101F1.

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

Dated this 17th day of March 2023

(Signed) ***Richard Quarmby***

Richard Quarmby, BSc (Chem Eng), MBA, MIoMMM, CEng, MSAIChE, PrEng

29.4 Neil Bar

I, Neil Bar, BEng, MEngSc, MEng, RPEQ. as an author of this report titled “Technical Report on the Pueblo Viejo Mine, Dominican Republic” (the Technical Report) with an effective date of 31 December 2022 and dated 17 March 2023 prepared for Barrick Gold Corporation, do herby certify that:

1. I am Principal Geotechnical Engineer, with Gecko Geotechnics LLC, of the First Floor, First St. Vincent Bank Ltd Building, James Street, Kingstown, Saint Vincent and the Grenadines.
2. I am a graduate of the University of Queensland, Australia in 2008 with a Bachelor of Engineering (Major in Civil Engineering); the University of New South Wales, Australia in 2012 with a Master of Engineering Science (Major in Geotechnical Engineering and Engineering Geology); and Technische Universität Graz (Graz University of Technology), Austria in 2020 with a Master of Engineering (Major in NATM - Tunnel Engineering).
3. I am registered as a Registered Professional Engineer of Queensland (RPEQ 15184) in the area of Geotechnical (mining) with the Board of Professional Engineers of Queensland, Australia. I have worked as a geotechnical engineering continuously for 15 years since my graduation from university. My relevant experience for the purpose of the Technical Report is:
   - Leading Geotechnical Engineering and Hydrogeology division for Barrick Pueblo Viejo between 2020 and 2022 including the mine geotechnical and hydrogeological study inputs into the mine plan. Previously, held positions in the development and operational management of mine operations and have completed technical studies in geotechnical engineering for mines across Australia, Africa, Asia and South America.
4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfil the requirements to be a "qualified person" for the purposes of NI 43-101.
5. I visited the Pueblo Viejo Mine most recently on 25 February to 30 June 2022.
6. I am responsible for Sections 16.3 and share responsibility for Section 1 to 3, 16.2, and 25 to 27.
7. I am not independent of the Issuer applying the test set out in Section 1.5 of NI 43-101, as I have been a full-time employee of Pueblo Viejo between October 2020 and June 2022.
8. I have had prior involvement with the property that is the subject of the Technical Report, as Head of Geotechnical Engineering and Hydrogeology for the Pueblo Viejo Mine.
9. I have read NI 43-101, and the sections of the Technical Report for which I am responsible have been prepared in compliance with NI 43-101 and Form 43-101F1.
10. At the effective date of the Technical Report, to the best of my knowledge, information, and belief the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 17th day of March 2023

(Signed) *Neil Bar*

Neil Bar, BEng, MEngSc, MEng, RPEQ

29.5 Bill Burton

I, Bill Burton, M.Eng., P.Eng., as a contributing author to the report entitled “Technical Report on the Pueblo Viejo Mine, Dominican Republic” (the Technical Report), with an effective date of 31 December 2022 and dated 17 March 2023, and which was prepared for Barrick Gold Corporation, do hereby certify that:

21. I am a Principal Geotechnical/Geological Engineer, with BGC Engineering Inc. (BGC). BGC is a British Columbia, Canada corporation. BGC’s address is Suite 500 – 980 Howe Street, Vancouver, British Columbia V6Z 0C8.
22. I am a graduate of the University of Alberta, Canada in 1998, with a Master of Engineering Degree in Geotechnical Engineering. I earned my Bachelor of Applied Science degree in geological engineering from the University of British Columbia, Canada in 1994.
23. I am registered as a professional engineer with the Association of Professional Engineers and Geoscientists of British Columbia, Canada. I have worked as a Geotechnical/Geological Engineer continuously for 29 years since my graduation from university. My relevant experience for the purpose of the Technical Report is:
    - Leading and reviewing geotechnical site investigation, design, and construction quality monitoring for tailings and water dams for the Pueblo Viejo project for BGC Engineering since 2001. Practical experience in the design of tailings storage facilities and geotechnical aspects of mine infrastructure ranging from preliminary economic assessments to prefeasibility, feasibility studies to construction and operation at sites in North America and South America since 1994.
24. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfil the requirements to be a "qualified person" for the purposes of NI 43-101.
25. I visited the Pueblo Viejo Mine most recently on 6-9 February 2023.
26. I am responsible for Section 18.14 (Tailings Facilities) of the Technical Report, and I share responsibility for Sections 1 to 3, and 25 to 27, with respect to the aspects of those Sections concerning the Pueblo Viejo Mine tailings storage facilities.
27. I am independent of the Technical Report Issuer, applying the test set out in Section 1.5 of NI 43-101.
28. I have had prior involvement with the property that is the subject of the Technical Report, as a Geotechnical/Geological Engineer employed by BGC. My prior involvement with that property includes geotechnical site investigation and geotechnical design and construction monitoring of the existing tailings storage facility and certain related infrastructure.
29. I have read NI 43-101, and the section of the Technical Report for which I am responsible. I prepared the section of the Technical Report for which I am responsible in compliance with NI 43-101 and Form 43-101F1.

30. At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the section of the Technical Report for which I am contains all currently available scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 17th day of March 2023

(Signed & stamped) ***Bill Burton***

Bill Burton, M.Eng., P.Eng.