

# **MINE DEVELOPMENT ASSOCIATES**

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## **MINE ENGINEERING SERVICES**

### **Technical Report Relief Canyon Gold Project Pershing County, Nevada, U.S.A.**



*Prepared for*

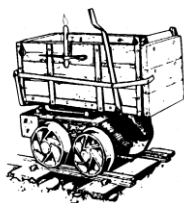
**Firstgold Corporation**

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## **MINE DEVELOPMENT ASSOCIATES**

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### **MINE ENGINEERING SERVICES**

#### **1.0 EXECUTIVE SUMMARY**

Mine Development Associates (“MDA”) has prepared this technical report on the Relief Canyon gold project, located in Pershing County, Nevada, at the request of Firstgold Corporation, formerly called Newgold, Inc. (“Firstgold”). The report is written in compliance with disclosure and reporting requirements set forth in the Canadian Securities Administrators’ National Instrument 43-101, Companion Policy 43-101CP, and Form 43-101F1.

The purpose of this report is to provide a technical summary of the Relief Canyon project for Firstgold, including the first NI 43-101-compliant mineral resource estimate. This report was written in compliance with disclosure and reporting requirements set forth in the Canadian Securities Administrators’ National Instrument 43-101, Companion Policy 43-101CP, and Form 43-101F1 (“NI 43-101”).

As of the date of this report, Firstgold’s interests in the Relief Canyon property are subject to bankruptcy proceedings.

#### **1.1 Introduction**

The Relief Canyon property, purchased by Firstgold in 1995, is located at the southern end of the Humboldt Range in northwestern Nevada, about 16 miles in a direct line east-northeast of Lovelock in Pershing County and about 110 miles northeast of Reno, Nevada. The property consists of 120 unpatented millsite claims and 19 unpatented lode mining claims, for a total of approximately 949 acres. The lode claims are in two contiguous blocks that cover the western part of Section 16 and the northeastern part of Section 20 in Township 27 North, Range 34 East, Mount Diablo Base and Meridian. The millsite claims lie in Section 18, Township 27 North, Range 34 East, west of, but not contiguous with, the lode claims.

The Relief Canyon property, including the mineral resources discussed herein, appear to be to a 4% net smelter return royalty held by Royal Gold, Inc.

#### **1.2 Geology and Mineralization**

The Relief Canyon property is located on the western flank of the southern Humboldt Range, one of the generally north-trending fault-bounded ranges of the Basin and Range physiographic province. The oldest rocks exposed in the range are mafic and silicic volcanic rocks of the arc-related Lower Triassic Koipato Group, which are overlain by marine carbonate platform rocks of the Middle to Late Triassic Star Peak Group. The Cane Spring Formation lies at the top of the Star Peak Group and underlies the gold mineralization modeled by MDA at Relief Canyon. Overlying the Star Peak Group



is a fluvial-deltaic system called the Auld Lang Syne Group, of which the basal Grass Valley Formation overlies the gold mineralization at Relief Canyon.

During Middle Jurassic to Middle Cretaceous time, southeast directed folding and thrusting, as well as metamorphism to at least greenschist facies, affected the Mesozoic carbonate and deltaic sedimentary rocks of the Relief Canyon area. Granitic and diabasic intrusions of possibly Late Cretaceous or Tertiary age followed. Isolated remnants of Miocene basaltic and rhyolitic volcanic rocks in the southern Humboldt Range attest to Tertiary volcanism.

Cenozoic northeast and north-northwest-trending normal faults are present on the property. These include the northeast-trending Black Ridge range-front fault that forms the western boundary of the exposed mineralization. The northeast side of the North pit is bounded by a northwest-trending diabase dike that has intruded one of the north-northwest-trending faults. Less well understood is the 'Relief fault', which was originally described as a northwest-striking thrust fault between the Cane Spring and Grass Valley formations that was thought to be the principal structural control of the mineralization. Some authors have questioned whether evidence for this fault has been obscured by later hydrothermal activity, others have posited that the structure that may be a detachment fault caused by extension, and some suggest there may be no fault at all.

The gold mineralization modeled by MDA at Relief Canyon occurs within a stratabound breccia horizon that lies between the Cane Spring and Grass Valley formations and has been variously attributed to sedimentary, structural, or solution origins. Semi-coherent bodies of jasperoid occur within the breccia and appear to be related to higher-grade mineralization. Significant amounts of gold also occur in mixed breccias of Cane Spring and Grass Valley rocks that may have silicified and/or clay-rich matrices. Limestone breccia is common in the lower portion of the breccia horizon; it is usually associated with argillic alteration and is typically lower grade.

The gold occurs primarily as disseminated native gold or electrum associated with silica, calcite, fluorite, and clay minerals. Silver, arsenic, antimony, and mercury are also associated with the gold. The breccia mineralization is predominantly oxidized or partially oxidized to the depths of the existing drill data, although pods of unoxidized breccia are not uncommon.

### **1.3 Exploration and Mining History**

Relief Canyon lies in the Relief-Antelope Springs mining district, which had antimony, silver, and mercury production and fluorite prospecting dating back to the late 1800s. The property was staked in 1978 for high-purity limestone by Falconi Cement Inc., who drilled one core hole to test the quality of the limestone. Gold was not identified in the area until 1979, when a regional precious metals prospecting program by the Duval Corporation ("Duval") generated anomalies in the area. Drilling by Duval in 1981 and 1982 confirmed the presence of a low-grade zone of gold.

Lacana Mining Inc. ("Lacana") purchased the property from Duval in 1982. After drilling 204 reverse circulation ("RC") holes and undertaking pilot-scale heap-leach test work, Lacana opened the Relief Canyon open-pit gold mine in September 1984, only to close it in October 1985 due to poor gold recoveries. Various sources report that Lacana produced about 14,000 ounces of gold from the property from 1984 to 1985. Southern Pacific Land Company owned property adjacent to the deposit,





participated with Lacana in the pilot-scale metallurgical program, and drilled 147 RC holes on their property to test for continuation of the mineralization.

In 1986, Pegasus purchased the property from Lacana and re-opened the mine in October 1987. Mining ceased in 1989 after having extracted material from three open pits. Production by Pegasus from the Relief Canyon mine is variously reported to be approximately 117,000 ounces.

J. D. Welsh and Associates of Reno, Nevada (“Welsh”) purchased the property from Pegasus in September 1993 and reportedly produced several thousand ounces of gold by continuing to rinse the existing heaps.

Firstgold purchased the Relief Canyon property from Welsh in January 1995. In the first year, Firstgold rebuilt the adsorption-desorption recovery (“ADR”) process plant originally constructed by Pegasus and processed pregnant pond solution until July 1995.

Through April 1997, Firstgold drilled 73 RC holes to examine the areas north, west, and southwest of the old pits for continuation of mineralization. The property was apparently then idle until 2003. In 2006, a ground magnetic survey was conducted. Subsequent exploration by Firstgold focused on the potential for mineralization between the existing pits and to the north and northwest. A total of 105 RC holes and four core holes were completed at Relief Canyon by Firstgold in 2007 and 2008.

Firstgold recently re-evaluated the Lacana and Pegasus heaps and attempted to reprocess some of the heap material in late 2008 and early 2009 with little apparent success.

## **1.4 Drilling and Sampling**

Falconi Cement Inc., Duval Corp., Lacana Mining Inc., and Pegasus Gold Corp. all drilled at the Relief Canyon property prior to Firstgold. Southern Pacific Land Co. (later Santa Fe Pacific Corp.) drill tested the western extension of the Relief Canyon deposit off of the Firstgold property. Firstgold undertook two drilling programs following their acquisition of the property in 1995.

Table 1.1 summarizes the drilling in the current project drill-hole database. The first known drill hole on the property, a single core hole drilled by Falconi in 1978 during its investigation of limestone potential, is not included in the database. While the Santa Fe holes were drilled outside of the limits of the Firstgold property, they are included in the database and used in the mineral resource estimation.

Lacana and Santa Fe reported different experiences with sampling of the mineralized breccia. Nearly all of the Lacana samples in the breccia were collected by dry drilling methods, as the breccia was intersected above the water table, and they made an effort to mitigate and quantify any effects of contamination. To the west, Santa Fe encountered heavy formational water flows in the breccia, and their early sampling procedures allowed fine, clay-sized material to overflow the sampling bucket. Santa Fe revised its sampling procedures to improve collection of the fines, and comparison of the two types of sampling procedures by Santa Fe showed average increases of 8% to 19% in the gold values for intervals for which the fines were caught. Drill logs suggest that most holes by other operators drilled the breccia dry when it was intersected above the water table.



**Table 1.1 Relief Canyon Mineral Resource Database Summary**

Company	Period	Hole Numbers	Core		RC		Total	
			No.	Feet	No.	Feet	No.	Feet
Duval	1981-1982	DVR1 - 45 <sup>1</sup> (excludes 27, 39-41)	-	-	41	13,663	41	13,663
Lacana	1982-1983	LRC1 - LRC203 (includes two re-drilled holes <sup>2</sup> )	-	-	205	50,453	205	50,453
Santa Fe	1983-1984?	SPRC1 - 148 <sup>3</sup> (excludes 80, 114-119, 129) (includes six "A" holes)	-	-	146	47,433	146	47,433
Pegasus	1987-1988	PRC87-02, 03, 06 - 15 <sup>4</sup> (excludes 04, 05)  PRC88-1 through 5	-	-	17	5,100	17	5,100
Firstgold	1996-1997	9601-9640 (excludes 07, 14, 16, 22-24, 39)  9702-9743 (excludes 18, 41)	-	-	73	50,420	73	50,420
Firstgold	2007-2008	RCM07-01 - 75 <sup>5</sup> RCM08-01 - 19 RC - D1 NT07-01, NT08-01 - 10 NT08-D01, 03, 04	4	4,578	105	39,113	109	43,691
<b>TOTAL</b>			<b>4</b>	<b>4,578</b>	<b>587</b>	<b>206,182</b>	<b>591</b>	<b>210,760</b>

<sup>1</sup>DVR42 - 45 may have been drilled by conventional rotary

<sup>2</sup>In cases of original and re-drilled hole sets, assay data available for re-drilled holes only

<sup>3</sup>Assay data unavailable for 13 holes

<sup>4</sup>Assay data unavailable for PRC87-03

<sup>5</sup>Assay data unavailable for RCM07-24

The drill data strongly suggest that down-hole contamination of gold values occurred in some portion of the RC sample database. This issue was mitigated to a large extent in the resource modeling by the exclusion of suspect intervals, but since it is impossible to recognize possible contamination in mineralized intervals within the breccia horizon, some uncertainty persists in the reported resources, primarily below the water table.

## 1.5 Metallurgical Testing

Relief Canyon is a predominantly oxidized to partially oxidized gold deposit that metallurgical testing and actual mining experience indicate is amenable to cyanide heap-leach processing. Lacana undertook extensive metallurgical studies of various types of mineralization in 1983 and 1984 that culminated in pilot-scale heap-leach testing. Lacana ultimately chose to process by heap leaching run-of-mine material, which reportedly yielded gold recoveries of 45 to 50%. Pegasus conducted additional test work and decided to heap leach crushed and agglomerated material, which resulted in average gold recoveries in the range of 65% to 70%.



Firstgold reports that they engaged Kappes, Cassiday and Associates in 2009 to perform column-leach testing on samples from Relief Canyon; no final report discussing the results has been issued.

## 1.6 Mineral Resource Estimation

The gold resources at Relief Canyon were modeled and estimated by evaluating the drill data statistically, utilizing sectional lithologic interpretations provided by Firstgold to interpret mineral domains on cross sections, rectifying the mineral domain interpretations on long sections, analyzing the modeled mineralization statistically to establish estimation parameters, and estimating gold grades by inverse-distance methods into a block model with 20 x 20 x 20 foot blocks. All modeling of the diluted resources was performed using Gemcom Surpac® software.

The Relief Canyon gold resources are presented in Table 1.2.

**Table 1.2 Relief Canyon Mineral Resources**

Relief Canyon Indicated Resources			
Cutoff (oz Au/ton)	Tons	oz Au/ton	oz Au
<b>0.005</b>	<b>6,533,000</b>	<b>0.017</b>	<b>113,000</b>
0.008	5,329,000	0.020	106,000
0.010	4,655,000	0.022	100,000
0.015	3,065,000	0.026	81,000
0.020	1,756,000	0.034	59,000
0.025	1,189,000	0.04	47,000
0.050	200,000	0.071	14,000
0.100	15,000	0.127	2,000

Relief Canyon Inferred Resources			
Cutoff (oz Au/ton)	Tons	oz Au/ton	oz Au
<b>0.005</b>	<b>2,719,000</b>	<b>0.015</b>	<b>42,000</b>
0.008	1,988,000	0.019	38,000
0.010	1,616,000	0.021	35,000
0.015	949,000	0.028	27,000
0.020	566,000	0.036	20,000
0.025	414,000	0.041	17,000
0.050	84,000	0.066	5,500
0.100	6,000	0.109	700

A cutoff of 0.005 oz Au/ton is used to tabulate the gold resources. This cutoff was chosen to capture mineralization potentially available to open-pit extraction and heap-leach processing. The block-diluted resources are tabulated at additional cutoffs in order to provide grade-distribution information, as well as to account for economic conditions other than those envisioned by the 0.005 oz Au/ton cutoff.

No Measured resources are assigned due to: (1) the lack of core holes that could allow for verification of the RC data; (2) the lack of QA/QC data that could be used for verification purposes; (3) remaining uncertainties in resources lying below the water table related to the possible presence of down-hole



contamination; (4) the limited amount of density data; and (5) uncertainties with respect to the location of some drill holes.

The resource database includes a significant number of holes drilled beyond the limits of the Firstgold property that were used in the resource modeling. Only resources lying within the Firstgold claim block are reported in Table 1.2, which represent approximately 60% of the total resources estimated.

## **1.7 Summary and Conclusions**

MDA has reviewed the project data and the Relief Canyon drill-hole database and has visited the project site. MDA believes that the data presented by Firstgold are generally an accurate and reasonable representation of the Relief Canyon gold project and adequately support the mineral resources reported herein.

The North Target area, which extends northward from the northern extents of the mineral resources but is not included in the reported resources, is defined by drill-hole intercepts of significant grades and widths. Drilling at the North Target area consists primarily of vertical RC holes, and the geology of the mineralization is not understood. While there are uncertainties as to what portion of the gold intersections are representative of *in situ* mineralization due to possible down-hole contamination, the North Target mineralization clearly warrants additional exploration work.

On-site facilities at Relief Canyon include a 750 tons-per-hour two-stage crushing circuit, a permitted 72-acre heap-leach pad that is one-quarter constructed, one radial stacker, a 3,000 gallons-per-minute processing plant, and mine office and warehouse facilities. Additional office facilities, as well as an assaying laboratory, are located in Lovelock.

## **1.8 Recommendations**

A confirmatory core drilling within the mineral resources is recommended in order to: (1) provide data that may help to verify the geologic, hydrologic, oxidation, and grade models developed from the existing RC data; (2) obtain representative samples for metallurgical testing and bulk-density determinations; and (3) test areas below the resources that returned significant values in the RC holes.

An additional exploration core-drilling program is warranted to test the North Target area. This program should utilize angled core holes to: (1) define the true extents, grade, and geometry of the mineralization; and (2) gain an understanding of the critical geologic controls of the mineralization.

A scoping-level economic study should be completed on the existing resource base to provide an initial indication of the potential viability of the project.



## **2.0 INTRODUCTION**

Mine Development Associates (“MDA”) has prepared this technical report on the Relief Canyon gold project, located in Pershing County, Nevada, at the request of Firstgold Corporation (“Firstgold”). Firstgold was incorporated under the laws of Nevada in 1993 under its former name of Newgold, Inc., and on November 15, 2006 the company’s name was changed to Firstgold Corporation. Firstgold has been listed on the Toronto Stock Exchange since May 14, 2008 (Firstgold, 2008b); it is also listed on the Over-the-Counter Bulletin Board trading service. For the purposes of this report, Firstgold Corporation and Newgold, Inc. are referred to interchangeably as “Firstgold”.

This report is written in compliance with disclosure and reporting requirements set forth in the Canadian Securities Administrators’ National Instrument 43-101, Companion Policy 43-101CP, and Form 43-101F1 (“NI 43-101”).

As of the Effective Date of this report, Firstgold’s interests in the Relief Canyon property are subject to bankruptcy proceedings that are further discussed in Section 4.3.3.

### **2.1 Project Scope and Terms of Reference**

The purpose of this report is to provide a technical summary of the Relief Canyon project, including the first 43-101-compliant mineral resource estimate of the Relief Canyon project. The mineral resources were estimated and classified under the supervision of Michael M. Gustin, Senior Geologist for MDA, who is a qualified person under NI 43-101; no mineral reserves are estimated. There is no affiliation between Mr. Gustin and Firstgold except that of an independent consultant/client relationship. The mineral resources reported herein for the Relief Canyon project are estimated to the standards and requirements stipulated in NI 43-101. Other resource estimates presented in Section 6.2 are reported for historic purposes only and do not necessarily meet the reporting requirements of NI 43-101.

The scope of this study included a review of pertinent technical reports and data provided to MDA by Firstgold relative to the general setting, geology, project history, exploration activities and results, methodology, quality assurance, interpretations, drilling programs, and metallurgy. MDA has relied on the data and information provided by Firstgold for the completion of this report, including the supporting data for the estimation of the mineral resources. In compiling the background information for this report, MDA relied on the 2007 NI 43-101 technical report prepared by John Mears, a 1996 review of the project by Watts, Griffis and McOuat Ltd. (Fernet *et al.*, 1996), and on other references as cited in Section 22.0. Based on the extensive work on the property by previous operators, including mining by two well-known companies, MDA presumes that there is a considerable body of information that has been developed over the years, although only those references cited in Section 22.0 were available for review by MDA.

Firstgold’s work at Relief Canyon has focused on exploration designed to identify and further define resources lying within the property, as well as the potential for reprocessing the heaps remaining from gold mining operations. This report does not discuss Firstgold’s work related to the reprocessing potential, with the exception of a brief summary in Section 19.0. Unless otherwise specifically noted,



all references to Firstgold's drilling, sampling, assaying, and metallurgical programs do not pertain to their reprocessing program.

The author conducted a site visit on November 4, 2008, which included inspections of the on-site processing facilities, examination of existing open pits and related rock exposures, and review of various maps, reports, etc. stored in Firstgold's office in Lovelock, Nevada.

MDA has made such independent investigations as deemed necessary in the professional judgment of the author to be able to reasonably present the conclusions discussed herein, and MDA believes that the data provided by Firstgold are generally an accurate and reasonable representation of the Relief Canyon gold project.

The effective date of this updated technical report is May 1, 2010 unless otherwise stated.

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

In this report, measurements are generally reported in Imperial units. Where information was originally reported in metric units, MDA has made conversions according to the formulas shown below; discrepancies may result in slight variations from the original data in some cases.

### **Linear Measure**

1 centimeter	= 0.3937 inch	
1 meter	= 3.2808 feet	= 1.0936 yard
1 kilometer	= 0.6214 mile	

### **Area Measure**

1 hectare	= 2.471 acres	= 0.0039 square mile
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### **Capacity Measure (liquid)**

1 liter	= 0.2642 US gallons
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### **Weight**

1 tonne	= 1.1023 short tons	= 2,205 pounds
1 kilogram	= 2.205 pounds	



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

**Acronyms and abbreviations that appear in report:**

AA	atomic absorption spectrometry
ADR	adsorption-desorption recovery
Ag	silver
Au	gold
BLM	United States Department of the Interior, Bureau of Land Management
°C	degrees centigrade
core	diamond core-drilling method
°F	degrees Fahrenheit
Firstgold	Firstgold Corporation
hr	hour
ICP	inductively coupled plasma analytical method
lb(s)	pound/pounds
NSR	net smelter return
opt	ounces per ton
oz Au/ton	ounces of gold per short ton
ppm	parts per million
QA/QC	quality assurance and quality control
RC	reverse-circulation drilling method
RQD	rock-quality designation



### **3.0 RELIANCE ON OTHER EXPERTS**

The author is not an expert in legal matters, such as the assessment of the legal validity of mining claims, private lands, mineral rights, and property agreements. The author did not conduct any investigations of the environmental or social-economic issues associated with the Relief Canyon project, and the author is not an expert with respect to these issues.

The author has relied on Firstgold to provide full information concerning the legal status of Firstgold Corporation, as well as current legal title, material terms of all agreements, existence of applicable royalty obligations, and material environmental and permitting information that pertain to the Relief Canyon property. Sections 4.2, 4.3.1, 4.3.2., and 4.4 in their entirety are based on information provided by Firstgold, including two title opinions (Thompson, 2007, 2008), and the author offers no professional opinions with respect to the provided information. The information summarized in Section 4.3.3 was provided by Daniel Reiss of Levene, Neale, Bender, Rankin & Brill L.L.P., legal advisors to Firstgold's secured creditors.





## 4.0 PROPERTY DESCRIPTION AND LOCATION

The author is not an expert in land, legal, environmental, and permitting matters. The information presented in this Section 4 is based entirely on information provided to MDA by Firstgold, including 2007 and 2008 title opinions (Thompson, 2007 and 2008).

MDA presents this information in this Section to fulfill reporting requirements of NI 43-101, but expresses no opinion regarding the legal or environmental status of the Relief Canyon property or any of the agreements and encumbrances related to the property, other than to state that the title opinion dated August 1, 2008 reflects the title condition at that time, and there may have been significant changes in the areas of title condition, claim ownership (including liens), and claim conflicts in the twenty-two months between the completion of the title opinion and the date of this report.

As of the date of this report, Firstgold's interests in the Relief Canyon property are subject to bankruptcy proceedings (see Section 4.3.3).

### 4.1 Location

The Relief Canyon property is located in Pershing County at the southwestern flank of the Humboldt Range in

The center of the Relief Canyon property is located at approximately 40° 12' 15" North latitude and 118° 10' 13" West longitude. The property area is included on the Lovelock 1:250,000 and Buffalo Mountain 15' topographic maps. A geologic map of the Buffalo Mountain quadrangle was published in 1969 (Wallace *et al.*, 1969).

### 4.2 Land Area

The Relief Canyon property consists of 139 claims, including 120 unpatented millsite claims and 19 unpatented lode mining claims (Thompson, 2008; the title opinion references an additional five unpatented claims that overlie other Firstgold unpatented claims and are therefore superfluous), for a total of about 949 acres (Figure 4.2). The property is located on public land administered by the U.S. Bureau of Land Management ("BLM").

The lode claims form two blocks, one in the western portion of Section 16 and the other in the northeastern part of Section 20 in Township 27 North, Range 34 East, Mount Diablo Base and Meridian ("MDB&M"). Thompson (2008) reports that *"Except for the problem affecting the R5, 6, and 8 discussed ... below, the claims have been located in accordance with state and federal mining law, and the title condition is presently good...The owner of record is Newgold, Inc..."*.

The conflict with Firstgold unpatented lode claims R5, R6, and R8 in Section 16 described in the paragraph above regards seniority of these claims with respect to PF 133, 140, and 141 lode claims located in January 1999 by Newmont Mining Corp. ("Newmont"). Thompson (2008) summarizes his findings as follows:



*“The [Firstgold] R5, 6, and 8 claims appear to conflict with the senior PF claims owned by Newmont Mining, however, the Newmont claims were partially staked over the senior set of original R claims, therefore, the Newmont claims were likely invalid in the areas of overlap and the R claims should be valid. The PF 133, 140, and 141 lode claims were located in January 1999 by Newmont Mining Corp. over the original [Firstgold] R5, 6 and 8 lode claims (located on January 13, 1982). The R6 and 8 claims were abandoned in 1998 and the R5 claim appears to have been valid through September 1, 2004. Subsequent R claims were located and dropped as detailed on Exhibit C attached hereto, with the final set of R claims having been located in 2005. Assuming that a court would infer an abandonment of the other R claims as discussed in Exhibit C, and assuming that the original R claims were valid in 1999, then the present R5 claim is valid, but the R6 and 8 claims appear to be invalid.”*

The total of 19 unpatented lode claims held by Firstgold reported herein reflects the assumptions of Thompson stated above, which, if true, suggest that lode claim R5 is valid and R6 and R8 are invalid. A portion of the mineralization modeled by MDA lies within claims R6 and R8, while R5 lies outside of the modeling. In this report, MDA assumes that R5 is valid and R6 and R8 are invalid due to the title uncertainties. The mineral resources reported in Section 17.0 are therefore exclusive of claims R6 and R8,. No modeled mineralization lies within R-5, while mineralization modeled within R-6 and R-8 would represent only a small percentage of the total resources reported herein.

The millsite claims are located in Section 18, Township 27 North, Range 34 East, MDB&M and are not contiguous with the lode claims. Four heap-leach pads, two solution ponds, and a cement block processing circuit lie within the millsite claims (Mears, 2007).

According to Fernette *et al.* (1996), “...approximately 500 of the 640 acres of the Millsite Claims are over-staked on Lode Claims held by Newmont and Victoria Resources.” Mears (2007) reports that “approximately 300 acres of the Millsite Claims are on top of Lode Claims held by Newmont Gold Corp.”

Thompson (2008) notes that “The junior [Firstgold] RC (located in 2005) and RM (located in 2006) millsite claims owned by Newgold, Inc. are located over the senior PF lode mining claims (located in 1999 and owned by Newmont Mining Corp.). Since the RC and RM claims are millsites and the PF claims are lode claims, technically the claims may co-exist. However, in order to be valid a millsite claim must be located on non-mineral land. If Newmont has established a mineral discovery on the PF claims, the millsites may be invalid.” Similarly, Thompson (2008) notes that lode claims owned by Victoria Resources US Inc. (“Victoria Resources”) overstaked some of the Firstgold millsite claims, which would mean that the affected millsite claims may be invalid if Victoria Resources has established a mineral discovery. None of the millsite claims owned by Firstgold lie proximal to the mineral resources reported herein.

Odd-numbered sections in the area of the Firstgold property (Figure 4.2) are privately owned, primarily by Nevada Land and Resource Company, LLC (Firstgold, 2006). As described in Section 6.1, Firstgold once subleased some of this private land when it first acquired the project.

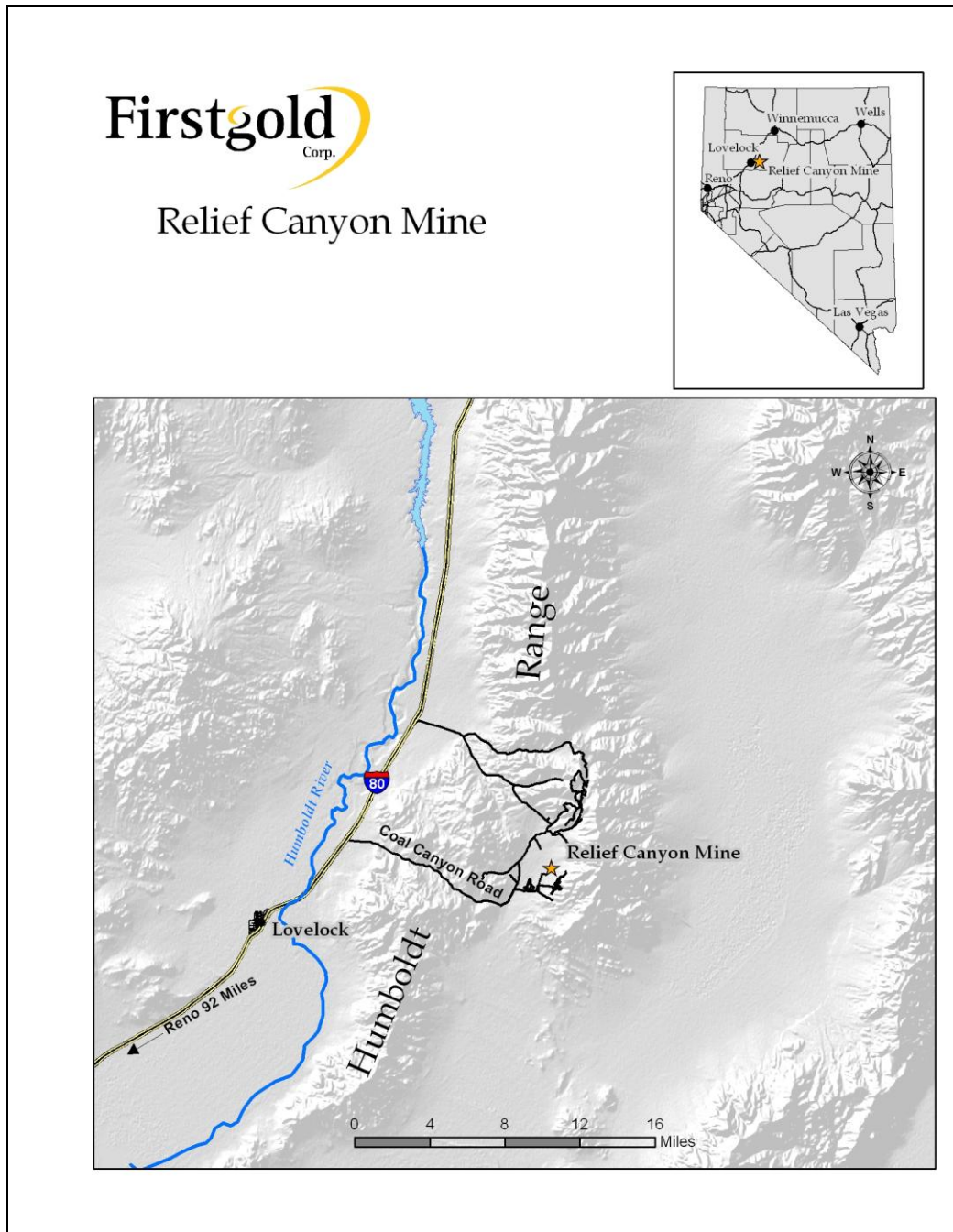
The annual claim maintenance fees payable to the BLM for the 139 Firstgold claims total \$19,460 (\$140 per claim). Firstgold reports that \$1,484.50 in filing fees for the Affidavit and Notice of Intent



to Hold Mining Claim(s) and Sites(s) are payable annually to Pershing County. Firstgold has provided documentation of payment of these fees in 2009.

Appendix A lists the 139 claims comprising the Relief Canyon property.

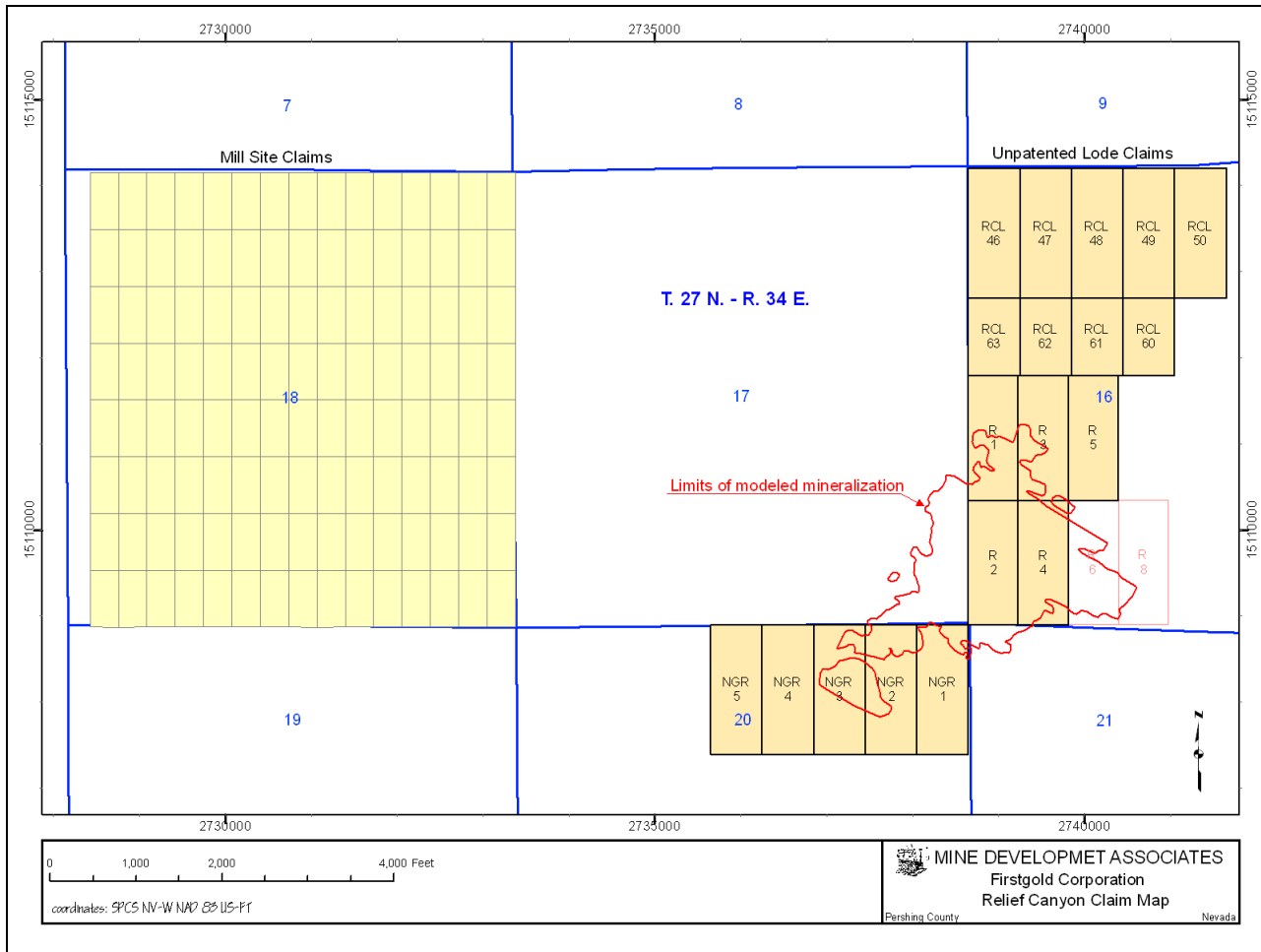
**Figure 4.1 Location of the Relief Canyon Project**





**Figure 4.2 Property Map of the Relief Canyon Project**

Note: resources lying outside of Firstgold claims are not reported in Section 17.0



### 4.3 Agreements and Encumbrances

Firstgold purchased the Relief Canyon property from J. D. Welsh and Associates of Reno, Nevada ("Welsh") in January 1995 for US\$500,000 (Fernet *et al.*, 1996; Wojcik, 1996; U. S. Securities and Exchange Commission, 1997; <http://www.secinfo.com/dQq6n.8q.htm>).

Firstgold obtained a right-of-way easement for a road across Section 17 from Nevada Land and Resource Company, LLC that grants access between Firstgold's millsite and lode claims (Thompson, 2008).



#### 4.3.1 Royalties

MDA has reviewed several royalty agreements provided by Firstgold and the 2008 title opinion (Thompson, 2008), which discusses royalties applicable to Relief Canyon. The following discussion summarizes the materials reviewed by MDA.

Thompson (2008) discusses a net smelter returns (“NSR”) royalty agreement between Newgold and Repadre International Corporation (“Repadre”) effective June 19, 1997. Thompson’s discussion references a June 13, 1997 letter agreement between the two parties. The magnitude of the royalty is not disclosed. Thompson also discusses a royalty payable to Repadre by Newgold that is identified by a notice dated June 1999; the amount of this NSR royalty is also not disclosed. The title opinion implies that these two royalties are actually one and the same, and this royalty interest covers the original set of lode claims that were staked at Relief Canyon in 1982. These original claims are no longer valid, although the title report states that, “*A court would almost certainly impose a constructive trust declaring that the royalty applies to the current set of claims*” (Thompson, 2008).

A copy of a royalty agreement between Newgold and Repadre provided to MDA references a June 13, 1997 letter agreement, which is likely the same as mentioned by Thompson (2008). The royalty agreement reviewed by MDA grants Repadre a 1% NSR.

MDA reviewed a copy of an agreement dated October 3, 1996 in which Repadre agreed to purchase from Newgold a 1.5% NSR royalty on all minerals “*mined or otherwise recovered*” from the Relief Canyon property for \$500,000. The agreement included a Repadre option to increase the royalty to 3% NSR. According to documents supplied to MDA, Repadre exercised the option and thereby increased the royalty to 3% NSR on October 27, 1998. Firstgold represents that Royal Gold, Inc. has since purchased the Repadre royalty interest.

Mears (2007) reported that Battle Mountain Gold Exploration Corp. holds a 4% NSR royalty on any production (heaps, reprocessing, and new mining). Battle Mountain Gold Exploration Corp. is a subsidiary of Royal Gold Inc.

From the information provided above, it appears that Royal Gold, Inc. holds a 4% NSR royalty interest at Relief Canyon.

#### 4.3.2 Other Encumbrances

A security agreement dated May 1, 2008 stipulates the conveyance of US \$1,100,000 to Firstgold and covers Firstgold’s interest in the project lode claims, 57 of the millsite claims, and fixtures and all personal property of Firstgold located at Relief Canyon (Thompson, 2008). Thompson states that the BLM serial numbers listed in the security agreement appear to be incorrect.

Thompson (2008) notes that a number of liens and encumbrances were filed against Newgold prior to the security agreement discussed above that “*appear to have been released or rendered unenforceable because the statute of limitations has run...*”



### **4.3.3 Bankruptcy Proceedings**

As of the Effective Date of this report, Firstgold remains in a bankruptcy proceeding being overseen by a federal bankruptcy court. Firstgold and the secured lenders have reached an agreement and the bankruptcy court has approved the terms of the “Stipulation” by a court order entered on April 27, 2010.

Under terms of the Stipulation, the parties agreed to accept an asset manager to take control over Firstgold’s mining assets. The asset manager’s role is to ensure the property assets remain intact, the project remains in compliance with applicable permits, and necessary bills are maintained current to minimize impacts to the project. The asset manager has all authority to make decisions and expend funds as needed to secure and maintain asset values. The secured lenders have full authority to liquidate project assets in accordance with their pre-bankruptcy loan agreements and there is no dispute by Firstgold that the secured lenders have the right to seize and sell the assets that constitute their collateral. The secured lenders have the option to sell some or all of its collateral using the bankruptcy court if preferred by a buyer in light of some advantages that this may have for a buyer.

By agreeing to an asset manager, the secured lenders have stepped in financially to ‘protect’ their asset value. Therefore, the purchase and development of the mineral resources reported herein by another company and/or party would be free from court issues and any further bankruptcy court proceeding that Firstgold may be subject to in the future, unless the purchaser wishes to invoke the bankruptcy process, as mentioned above.

### **4.4 Environmental Permits and Potential Liabilities**

The author is not an expert on environmental issues and presents this information with no opinion. The author cannot verify that the information provided below constitutes all of the permits required for future work on the property, including the possible development of the mineral resource discussed in this report.

The following information on environmental permits is derived from copies of permits and correspondences with regulatory agencies provided to MDA by Firstgold, as well as information on Firstgold’s website in January 2009 ([http://www.firstgoldcorp.com/our\\_story.asp](http://www.firstgoldcorp.com/our_story.asp)); other sources used are cited. The author cannot be certain as to the completeness of the information summarized, nor of which of the permits are presently active.

Without considering Firstgold’s recent attempts at reprocessing the existing heaps, mining of the open pits at Relief Canyon property ceased in August 1989, crushing of the ore ended in September 1989, cyanide was last added to the heaps in July 1990, addition of fresh water to the cyanide solutions was terminated in September 1990, rinsing of the heaps with fresh water was initiated in October 1991, and rinsing was completed in late 1993 (U.S. Dept. of Interior, BLM, 2007b). Existing disturbances on the property include three open pits and several waste-rock dumps (Figure 4.3), a process building and process ponds, a topsoil stockpile, access roads, and heap-leach pads (Firstgold, 2006, 2009).

Firstgold acquired the property in 1995 and submitted a revised Plan of Operations (“POO”) that was approved by the BLM in 1997. The POO covers mining and processing of approximately 3.2 million



tons of material from the existing pits, 100,000 tons of existing stockpiled material adjacent to the heaps, and 200,000 tons of material stockpiled on the #4 waste-rock dump, as well as the mining of about 6.4 million tons of waste rock. The POO states that all mining will be conducted above the standing water table, and no pit lakes will be formed. It should be noted that the property included private lands adjacent to the Firstgold lode claims at the time the permit was approved. Firstgold placed the property in closure later in 1997 before initiating operations, and from 1998 until late 2004 the property remained in a care-and-maintenance state (Firstgold, 2006).

The BLM revoked the POO on April 2, 2004 due to a failure to perform required reclamation and to submit an adequate financial guarantee for the reclamation liability at the mine site. The BLM and the Nevada Department of Environmental Protection's ("NDEP") Bureau of Mining Regulation and Reclamation then entered into an Action of Compliance ("AOC") with Firstgold in May 2005.

The POO was reinstated, and the AOC requirements satisfied, on April 5, 2007 after the compliance issues, including bonding of the reclamation liabilities and approval of a final closure plan at the mine site, were resolved. A heap-leach-pad drilling program was also approved as part of the reinstated POO.

An Environmental Assessment was prepared by the BLM in 2007 for Firstgold in support of a proposed amendment to the POO (U.S. Dept. of Interior, BLM, 2007b). The proposed amendment included construction of drill sites, limited road construction, overland travel, and the drilling of 63 exploration holes; MDA has not reviewed this proposed amendment.

On June 14, 2007, the BLM approved the adequacy of reclamation of 4.2 acres of disturbance associated with exploration drilling by Firstgold. An amendment to the POO to allow for additional exploration drilling was approved on May 2, 2008.

A further amendment to the POO was approved by the BLM on August 7, 2008. The amendment covers off-loading of seven million tons of material from the existing pads 1, 2, 3, and 4; re-crushing and agglomerating the off-loaded material and placing it onto a new double lined pad; and the construction of additional solution-processing facilities. As part of the permitting process, Firstgold received a Reclamation Permit from NDEP in August 2008 (U.S. Dept. of Interior, BLM, 2008) after increasing its reclamation bond with the BLM (Firstgold, 2008f). The NDEP permit is valid for the life of the project unless it is modified, suspended, or revoked.

Firstgold also received Water Pollution Control and Air Quality permits to allow construction and operation of the adsorption-desorption recovery ("ADR") process plant and crushing facility (Firstgold, 2008e). Firstgold provided MDA with a copy of the Class II Air Quality Operating Permit approved by NDEP on July 1, 2008, with an expiration date of July 1, 2013. Firstgold also provided MDA with a copy of the Notice of Decision from NDEP approving issuance of the Water Pollution Control Permit dated May 23, 2008, with the modified permit becoming effective June 7, 2008 and remaining effective until June 7, 2013 unless modified, suspended, or revoked.





Figure 4.3 Aerial Photograph of the Relief Canyon Project

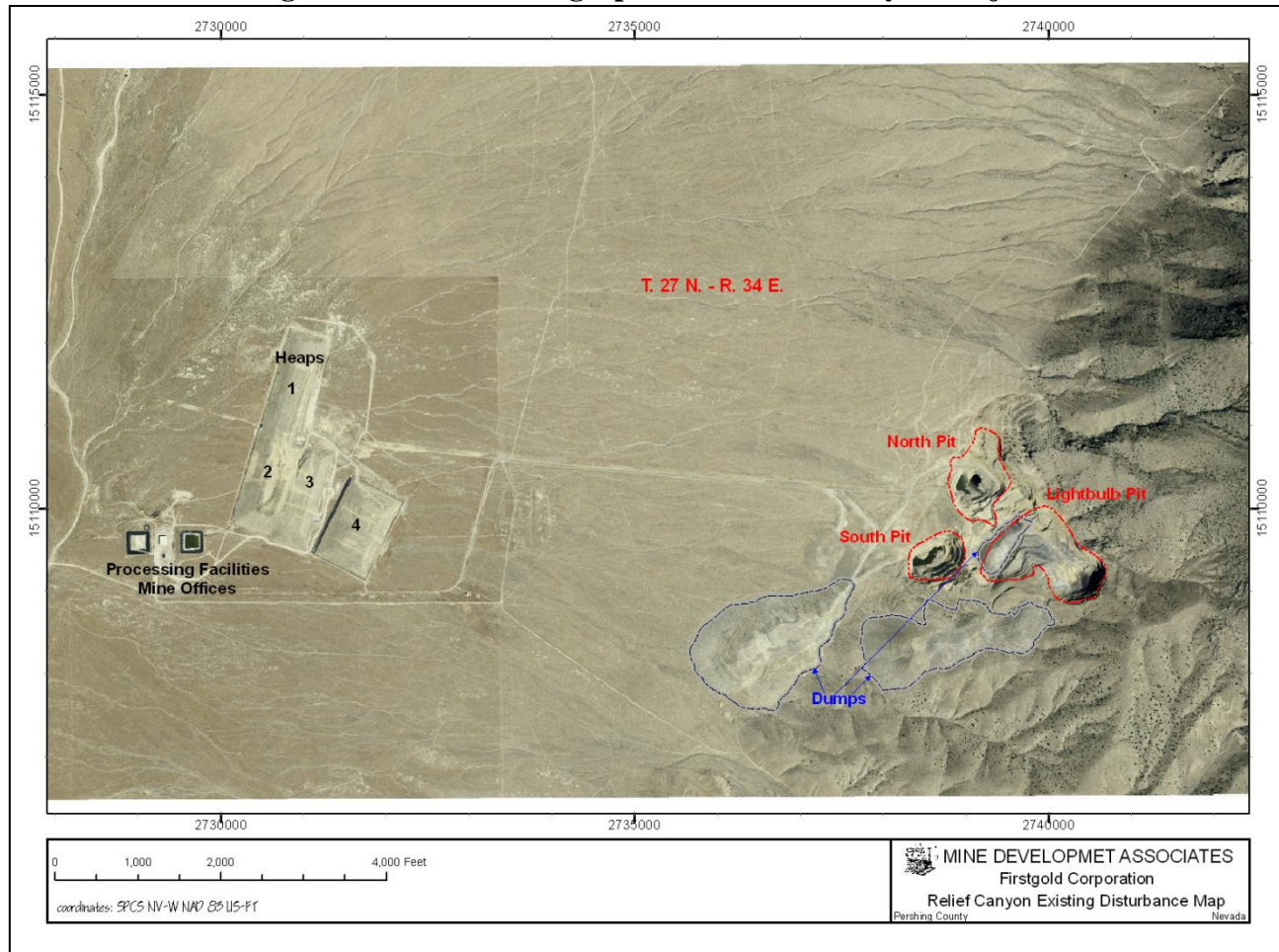


Table 4.1 lists the permits issued for the Relief Canyon project for which copies were provided to MDA by Firstgold. Table 4.2 lists additional permits, licenses, and authorizations that were required for the Relief Canyon mine according to the 1997 POO; MDA has no information on the status of the items listed in Table 4.2.

Firstgold initiated construction of the existing facilities at Relief Canyon and operated for a short period of time in late 2008 and early 2009, presumably under permits approved by the appropriate State and/or Federal agencies.





**Table 4.1 Permits Issued for the Relief Canyon Project as Provided to MDA by Firstgold**

Type of Permit	Issuing Agency	Date of Issue	Expiration Date
Relief Canyon project Plan of Operations / Reclamation Plan and Reclamation Bond Cost Estimate and Amendments to Plan of Operations Permit No. NVN-64634 for (1) drilling outside the pit, (2) reprocessing heaps	U.S. Bureau of Land Management	POO Reinstated April 5, 2007. (1) May 2, 2008 (2) Aug. 7, 2009	Dependent on Firstgold actions
Reclamation Permit #0264 for Relief Canyon Mine	NDEP-Bureau of Mining Regulation and Reclamation	June 12, 2007; amended permit approved August 5, 2008	Valid for life of project
Class II Air Quality Operating Permit	NDEP-Bureau of Air Pollution Control	July 1, 2008	July 1, 2013
Water Pollution Control Permit NEV2007105(new)	NDEP-Bureau of Mining Regulation and Reclamation	June 7, 2008	June 7, 2013
Stormwater General Permit NVR300000	NDEP	November 7, 2007	None listed
Class III Landfill Permit waiver F444	NDEP	January 8, 2007	January 8, 2012
Industrial Artificial Pond Permit S29657	Nevada Division of Wildlife	November 20, 2007	November 30, 2012
Right-of-way Grant N-83323 for a radio repeater communication site	BLM	October 11, 2007	None listed

**Table 4.2 Additional Permits, Licenses and Authorizations Required for Relief Canyon Mine**  
 (Modified from Newgold, Inc., 1997)

Permit	Agency
Permit to Appropriate	Nevada Division of Water Resources
Nevada Hazardous Materials Storage Permit	Nevada State Fire Marshall
Explosives License	U.S. Bureau of Alcohol, Tobacco and Firearms
EPA ID Number	U.S. Environmental Protection Agency

Note: MDA has no information concerning the current status of the permits listed.

The following summary of the current state of permits at Relief Canyon was provided to MDA by Firstgold representatives. Amendments to the existing authorizations that allowed re-leaching of spent-heap material will have to be amended through both the State of Nevada and the Bureau of Land Management to permit any development of the mineral resources reported herein. As of the Effective Date of this report, the secured lenders are maintaining the property on a care-and-maintenance basis to ensure permits remain active for future use. The project is fully bonded for the current authorized operations, and the cash bond is held by the Bureau of Land Management. The bond amount is approximately \$3,000,000.



## 5.0 ACCESS; CLIMATE; LOCAL RESOURCES; INFRASTRUCTURE; AND PHYSIOGRAPHY

### 5.1 Access

Access to the Relief Canyon property is via Interstate 80 northeast of Lovelock. From exit 112 located 7 miles northeast of Lovelock, access is by way of Coal Canyon Road about 10 miles southeast, turning north at Packard Flat onto a gravel road for about 2 miles to the property. Coal Canyon Road is a paved, county-maintained road.

### 5.2 Climate

The climate at Relief Canyon is typical of the high desert. Summers are warm with cool nights; winters are cool to cold with occasional moderate snowfall. Precipitation is low and comes primarily in winter, although there are infrequent rains in the summer. The yearly precipitation is about 6 inches in the valleys and up to 20 inches in the mountains in Pershing County (Johnson, 1977). Mining can be conducted year-round on the property.

### 5.3 Local Resources and Infrastructure

The city of Lovelock lies about 19 miles by road west-southwest of the property and had an estimated population of 2,458 in 2008, according to the website of the Nevada State Demographer ([http://www.nsbdc.org/what/data\\_statistics/demographer/pubs/pop\\_increase/](http://www.nsbdc.org/what/data_statistics/demographer/pubs/pop_increase/)). The city of Reno, Nevada, lies about 90 miles southwest of Lovelock on Interstate 80 and is a metropolitan area with a population of over 300,000.

The following description of infrastructure at Relief Canyon is taken from Mears (2007):

*“Electricity is hooked up on the property. Water is from two wells located east of the process plant. Phone lines are also in place. The former Pegasus Process building is present on the Relief Canyon Gold Project site and is being updated to support exploration. Necessary supplies, equipment and services to carry out full sequence exploration and mining development projects are available in Winnemucca, Reno, and Elko, Nevada. A trained mining-industrial workforce is available in Lovelock and other nearby communities. The overall subdued topography that characterizes much of the Relief Canyon Gold Project’s past Process Facilities area provides ample ground for the sitting of new mine facilities, tailings, waste dumps and heap leach facilities.”*

As previously described, there are currently three open pits (North, South, and Light Bulb pits; Figure 4.3), several waste-rock dumps, a process building and process ponds, a topsoil stockpile, access roads, and heap-leach pads on and adjacent to the property.

### 5.4 Physiography

The Relief Canyon property is located on the southwestern flank of the Humboldt Range, one of the generally north-trending fault-bounded ranges of the Basin and Range physiographic province. Within



the project area, the topography is flat to hilly (Figure 5.1). Elevations range between 4,600 feet along the valley side of the project on the west to 5,500 feet in the range on the eastern portion of the project (Mears, 2007).

Vegetation is sparse, consisting of grasses and shrubs of the high desert with a few trees in the higher elevations of the range.

According to Mears (2007), the Packard Flat aquifer is generally found at a depth of 150 feet to 500 feet; RC drilling encountered groundwater at those depths. As of 2007, the pits contained only meteoric water as reported by Dyer Engineering Consultants. Mears also states that “*Documentation in Cameron Park, California has been found that shows that water rights were included in the sale from J.D. Welsh to A Scott Dockter (Firstgold).*” At the time of Mears’ report, Firstgold’s attorney was in the process of recording the water rights under Firstgold’s name with the State of Nevada. Based on a letter to Firstgold from the Nevada Division of Water Resources dated November 25, 2008, it appears that process was completed and that a permit was issued. Firstgold’s website (Firstgold website [http://www.firstgoldcorp.com/our\\_story.asp](http://www.firstgoldcorp.com/our_story.asp), January 2, 2009) says that water for mining and processing is provided by two wells located on the property near the mine and processing facilities. Water rights to the northern of the two wells are owned by others, whereas Firstgold owns the water rights to the southern well. A third production well used by prior operators was plugged and abandoned in 1993 (Firstgold, 2009).

According to Wojcik (1996), water is also available from a spring located four miles north of the property that can be developed, if needed.

**Figure 5.1 Photograph Showing Physiography of Relief Canyon Area**  
(Lacana/Pegasus Heaps in middle ground)





## 6.0 HISTORY

### 6.1 History of Exploration

The project history has been compiled from the following references: Johnson (1977), Fiannaca (1982), Fiannaca and McKee (1983), Easdon (1983b), Fiannaca and Easdon (1984), Wittkopp *et al.* (1984), Atiyeh (1986), Parratt *et al.* (1987), Pegasus Gold Inc. (1987, 1988, 1990), Wallace (1989), Cuffney *et al.* (1991), Abbott *et al.* (1991), Wojcik (1996), Fernet *et al.* (1996) (Firstgold, 2006), Mears (2007). In some cases, references differ as to details of the history, but MDA has assembled what it believes to be an accurate description of events.

The Relief-Antelope Springs mining district, in which the property is situated, had historical production of silver, antimony, and mercury, but there is no evidence that it had produced gold prior to development of the Relief Canyon deposit in the 1980s.

Exploration began in the district in the early 1860s with discovery of antimony and silver in the same decade and mercury discovered in 1907. Historic production of silver, antimony, and mercury totaled about \$3,000,000. There were a number of fluorite prospects in the immediate vicinity of the Relief Canyon deposit, where mining took place in the 1940s, although none have had reported production (Papke, 1979). The site of the current Relief Canyon deposit was originally known as the Bohannon or Emerald Spar fluorite prospect.

In 1978, the property was staked for high-purity limestone by Falconi Cement Inc. ("Falconi"), who drilled one core hole measuring 745 feet to test the quality of the limestone that passed through mineralized breccia into Cane Spring Formation limestone. That hole is not included in the current database.

As part of a regional, precious metals prospecting program with an emphasis on the Humboldt Range, Duval Corporation ("Duval") explored the area in 1979 with mapping and stream-sediment sampling and detected 0.45ppm gold in a single stream sediment sample from the site. Duval then contacted Falconi, logged and assayed their single core hole, and ran a series of soil and rock-chip sample lines over Falconi's property. Assays of the core showed the presence of gold. Duval negotiated a joint-venture agreement with Falconi in 1979 and staked an additional 2,300 acres. Duval initiated a detailed mapping and sampling program, which identified a gold anomaly that was 2,000 feet by 1,500 feet in area, ranging between 0.01 and 0.06 oz Au/ton in grade. Duval proceeded to drill reverse circulation ("RC") percussion holes during 1981-1982 that confirmed the presence of a low-grade but potentially mineable zone that was 2,400 feet by 1,800 feet in size. Fiannaca and McKee (1983) and Fiannaca and Easdon (1984) reported that Duval drilled 40 RC holes, although the database shows 41; Mears (2007) reported that Duval drilled 44 holes. MDA cannot account for these discrepancies.

Lacana Mining Inc. ("Lacana"; Lacana Gold Inc. was the U. S. subsidiary, and this name is also referenced in the literature) first optioned and then purchased the property from Duval in 1982, including the remaining 10% interest held by Falconi. At the start of its investigation, Lacana undertook various sampling programs to verify Duval's assays and to understand the metallurgy of the mineralization. These are described in Section 14.1 and Section 16.1 of this report respectively. In addition, Lacana commissioned aerial photography in order to prepare a topographic map of the main



drilling area. Lacana took 48 high-wall samples from several trenches to evaluate variations among assays of the drill intervals along a vertical plane adjacent to the holes. The samples were taken on a 5-foot continuous chip basis on vertical lines spaced 10 feet apart horizontally. The end points of each sample interval were horizontally parallel to the end points of each 5-foot drill interval. Lacana's initial efforts also included mapping, sampling, drilling, and bench-scale metallurgical testing.

Lacana conducted detailed geological mapping of the property and then drilled 48 RC holes in order to provide details on the "inferred geological reserves."

In September 1983, Lacana undertook pilot-scale heap-leach test work, mining and cyanide heap leaching two 5,000-ton blocks of mineralization. Bo-Ter Construction Company was contracted to mine the deposit and construct the leaching facility, crushing plant, and recovery circuit according to final design engineering by Mine and Mill Engineering. Additional RC drilling on 25-foot centers was conducted at each of four potential mining sites, and 140 blast holes were drilled on the two selected sites. The leach tests indicated that a net gold recovery approximating 70% could be achieved by standard cyanide heap leaching of run-of-mine material with 80% for agglomerated material.

Based on encouraging preliminary results midway through the pilot test, Lacana undertook a second drilling phase to sample the main zone of mineralization on 100-foot centers. A total of 99 RC holes were drilled in this phase. A third phase of drilling was undertaken to better define the pit perimeter and to condemn potential sites for waste dumps; this phase consisted of 57 RC holes. The three phases of exploration drilling reported here total 204 holes, but the database shows 205 holes. MDA cannot account for the discrepancy.

Southern Pacific Land Company ("SPLC"), who was an adjacent property owner, had participated with Lacana in the pilot-scale metallurgical program and according to Fiannaca and Easdon (1984) drilled 147 RC holes proximal to Lacana's deposit on their own property to test for continuation of mineralization; this drilling apparently took place in 1983 and possibly into 1984. The database includes 146 holes. Southern Pacific Land Company later merged with Santa Fe Industries, subsequently Santa Fe Pacific Corp., whose natural resource interests were spun off as Santa Fe Pacific Gold Corp. Santa Fe Pacific Gold Corp. later merged with Newmont Mining Corp., and Santa Fe Pacific Corp.'s property interests were sold to Nevada Land and Resource Company. For simplicity, SPLC and its later iterations are referred to as "Santa Fe" in this report.

At some point during their tenure on the property, Lacana commissioned an IP survey by Phoenix Geophysics, Inc. Results from a single line were provided to MDA.

Cooksley Geophysics Inc. conducted a reflection seismic exploration program in the alluvium of Packard Flat near Relief Canyon in 1984 (Cooksley and McMahon, 1984). The program was designed to define stratigraphy and structure covered by the alluvium. Three lines were run – two trending northwest and one trending east. The alluvium ranged from less than 50 feet to over 300 feet in thickness. All three lines encountered well-stratified sections thought to represent Mesozoic units.

Lacana began mining the open-pit Relief Canyon mine in August 1984 but closed it in October 1985 due to poor leach recoveries. Based on metallurgical testing, Lacana had expected gold recovery from run-of-mine material to be about 65%, but actual gold recoveries were only 48% (Wojcik, 1996).





According to Fernet *et al.* (1996, citing the 1986-1988 Canadian Mines Handbook), Lacana produced 13,826 ounces of gold in 1984-1985. However, the Nevada Bureau of Mines and Geology (1987; 2008) reported that 1984 production from Relief Canyon was 24,500 ounces of gold from one million tons per year (this may be mined ounces, as opposed to recovered ounces, which is consistent with the material estimated to have been mined in Table 6.4, but would suggest a recovery of 56%); they did not report any production for 1985.

In March 1986, Pegasus Gold Corporation (“Pegasus”) entered into an option agreement with Lacana to evaluate the property. Work began immediately on an evaluation of the mineable material (estimates described in Section 6.2). The project database includes 17 Pegasus holes totaling 5,100 feet that are stated to have been drilled in 1987 and 1988. Pegasus purchased the property in July 1986 and re-opened the mine in November 1986, using crushing and agglomeration and a conveyor/stacker to handle the problem with clays. They also installed an ADR cement block process plant. Mining ceased in 1989 with four heap-leach pads completed; Pegasus continued leaching operations until August 1990. Figure 6.1 shows one of the Relief Canyon pits as of fall 2008.

**Figure 6.1 Photograph of One of the Relief Canyon Pits as of 2008**





Table 6.1 shows production by Pegasus from Relief Canyon as reported by Pegasus to the Nevada Division of Minerals (NV Div. Minerals column), Pegasus' annual reports, and Fernette *et al.* (1996, citing Pegasus' 1990 annual report and the Canadian Mines Handbook for 1989-1991). Wojcik (1996) reported that Pegasus recovered some 117,600 ounces of gold from 5.18 million tons of ore. According to Mears (2007), Pegasus processed about two million tons per year averaging 0.03 oz Au/ton. Pegasus reported that its 1989 gold production came from 1,600,000 tons of ore with a cutoff grade of 0.010 and that the gold and silver grades for that year were 0.028 oz Au/ton and 0.100 oz Ag/ton respectively (Pegasus Gold Inc., 1989).

Various reports suggest that Pegasus achieved recoveries of 65% to 70% at Relief Canyon. The Pegasus 1989 annual report states that Pegasus recovery from their heap leaching of crushed and agglomerated ore in 1987 exceeded 65%. Fernette *et al.* (1996) state that, "no data is available from the Pegasus operation so actual gold recoveries are not known. According to the 1990 Pegasus Annual Report, during 1987 and 1988, the mine produced 83,600 ounces of gold from 4 million tons of ore with an average grade of 0.03 ounces of gold per ton. This would indicate that 70% of the gold in the ore was recovered."

**Table 6.1 Production at Relief Canyon by Pegasus from 1987 through 1990**

(Data from Pegasus Gold Inc. annual reports (1987, 1989, 1990) and data provided by the Nevada Commission on Mineral Resources, Division of Minerals based on figures provided by Pegasus)

Year	Gold (ounces)			Silver (ounces)	Tons Mined <sup>2</sup>
	NV Div. Minerals	Pegasus Annual Repts.	Fernette <i>et al.</i> (1996)	NV Division of Minerals	
1986		1,800			
1987	41,177	41,600	41,600	31,868	4.9 million
1988	40,827	40,000	42,000	42,570	9.5 million
1989	29,906	29,900	29,900	29,828	9.6 million
1990	4,064	4,100	4,100	6,414	0
Total	115,974	117,400	117,600	110,680	24.0 million

<sup>1</sup> Table does not include 1984 through 1985 production by Lacana; see text.

<sup>2</sup> Tonnages reported here by the NV Division of Minerals appear to be total of ore and waste.

Based on the information presented herein, a total of about 131,000 ounces of gold were produced by Lacana and Pegasus at Relief Canyon from 1984 through 1990; Wojcik (1996) and Fernette *et al.*, 1996 both reported that production from the Relief Canyon mine in this period totaled about 131,000 ounces of gold.

Welsh purchased the property from Pegasus in September 1993 and reportedly produced several thousand ounces of gold by continuing to rinse the heaps.

Firstgold purchased the property from Welsh in January 1995 for \$500,000. This acquisition originally included the unpatented claims, which were purchased from Welsh, and fee land that Welsh was leasing from Santa Fe Pacific Gold Corporation, for which Newgold acquired an Assignment of Minerals Sublease. Nevada Land and Resource Company was the owner of the fee land, which was leased by Santa Fe Pacific Gold Corporation and subleased by Newgold (Newgold Inc., 1997). Following initial exploratory drilling, Firstgold placed the property in closure in 1997, and from 1998 until late 2004, the property was maintained on a care and maintenance basis. The fee land sublease was dropped at some time the period of 1997 to 2004 (likely in 1997). Firstgold began preparations to



resume exploration and development of the project in 2003 and reactivated the project in 2005. Further information on Firstgold's activities on the property is provided in Section 10.0.

## 6.2 Historic Mineral Inventory Estimates

All estimates described in this section were prepared prior to establishment of NI 43-101 reporting requirements. There are insufficient details available on the procedures used in these estimates to permit the author to determine if the estimates meet NI 43-101 standards. The classification terminology are presented as described in the original references, but it is not known if they conform to the meanings ascribed to the measured, indicated and inferred mineral resource classifications or proven and probably reserve classifications by the Canadian Institute of Mining, Metallurgy and Petroleum (the CIM Definition Standards). Accordingly, these estimates should not be relied upon, and are presented herein merely as an item of historical interest with respect to the exploration targets at Relief Canyon, and should not be construed as being representative of actual mineral resources or mineral reserves (under NI 43-101) present at the Relief Canyon project. Current NI 43-101 mineral resources are discussed in Section 17.0 of this report.

Duval's initial drilling of the Relief Canyon deposit in 1981-1982 identified "inferred geological reserves" ranging from six million tons at a grade of 0.06 oz Au/ton and a waste-to-ore stripping ratio of 3.0:1.0 to 10 million tons at a grade of 0.04 oz Au/ton and a 1.5:1.0 stripping ratio (Fiannaca and Easdon, 1984).

Following their bench-scale metallurgical test program in 1983, Lacana recalculated "inferred geological reserves" based on Duval's drilling, categorizing the reserves into three cases. The total "inferred contained gold" was about 460,000 ounces (Fiannaca and Easdon, 1984). Table 6.2 compares Lacana's results to those of Duval.

**Table 6.2 Preliminary Calculations of "Inferred Geological Reserves" by Duval and Lacana**  
(From Fiannaca and Easdon, 1984)

Company	Case	Tonnage (million tons)	Grade (oz Au/ton)	Stripping Ratio
Duval	1	6	0.06	3.0:1.0
Duval	2	10	0.04	1.5:1.0
Lacana	1	2.1	0.04	2.1:1.0
Lacana	2	5.0	0.060	2.0:1.0
Lacana	3	10.4	0.044	1.2:1.0
		9.8*	0.042*	

\* Recalculated following later drilling and heap-leach testing.

Subsequently, after two phases of RC drilling and pilot heap-leach testing, Lacana recalculated their "geological reserves" (Fiannaca and Easdon, 1984). They found that their third case of "inferred geological reserves" had decreased from 10.4 million tons at a grade of 0.044 oz Au/ton to 9.8 million tons at a grade of 0.042 oz Au/ton (Table 6.2).

As part of their final feasibility study in 1984, Lacana once again calculated the "mining reserves" and also constructed the pit plan by two methods. The first calculation was done entirely by hand. For confirmation, Pincock, Allen, and Holt ("PAH") of Tucson was commissioned to recalculate the





“mining reserves” by Kriging and to derive the pit and bench plans by the floating cone method. These reserves are shown in Table 6.3 and are based on a recovery factor of 70%, bench height of 15 feet, and pit slope of 50° (Fiannaca and Easdon, 1984). Santa Fe had drilled out a smaller volume of deeper mineralization on their own property that could perhaps be mined in the future, but these potential future reserves are not included in Table 6.3.

**Table 6.3 Comparison of “Mineable Reserves” Calculations  
by Lacana and Pincock, Allen, and Holt**  
(From Fiannaca and Easdon, 1984)

Company	Au Price \$ US/oz	Cut-off oz Au/ton	Mineable “Ore” (million tons)	Diluted Grade oz Au/ton	Waste: “Ore”
Lacana	400	0.02	7.250	0.036	2.8:1.0
Lacana	400	0.015 *	9.185	0.032	2.0:1.0
Lacana	400	0.010 *	11.403	0.028	1.4:1.0
PAH	400	0.02	7.793	0.035	1.49:1.0
PAH	400	0.010 *	10.972	0.029	0.77:1.0
PAH	500	0.02	9.175	0.034	1.87:1.0
PAH	500	0.010 *	14.391	0.027	0.94:1.0

\* Internal to the pit based on the 0.02 cut-off

In 1986 while evaluating the Relief Canyon property under an option agreement with Lacana, Pegasus estimated the “mineable ore reserves” (Atiyeh, 1986). Pegasus used a statistical software package developed by Geostat Systems of Golden, CO that used the kriging method of grade interpolation. Drill-hole spacing was about 100 feet. “Total mineable reserves” were estimated to be 5,042,000 tons at an average grade of 0.030 oz Au/ton with a 0.015 oz Au/ton cutoff and a stripping ratio of 1.18:1. Compared to prior estimates of “reserves” by Lacana, Pegasus’ estimate was lower due to elimination of deeper carbonaceous material, some limestone “ore”, and a few outlying areas where Pegasus felt there were insufficient data. Pegasus’ estimate used costs of \$1.11/ton for mining and \$3.60/ton for processing, a gold recovery of 70%, a density of 14.1 cubic feet/ton, and a gold price of \$400/oz (Atiyeh, 1986). Table 6.4 shows “ore reserve” estimates from Lacana and Pegasus for 1985 mine-to-date, 1986 mine plan, and the ultimate pit. Table 6.5 shows the final “mineable ore reserve” estimates made by Pegasus in 1986.

**Table 6.4 Comparison of 1985 and 1986 “Ore Reserve” Estimates of Lacana and Pegasus**  
(Modified from Atiyeh, 1986)

Project Stage	Company	Ore (tons)	Grade (oz Au/ton)	Total Ounces Au	Total Tons	Strip Ratio
1985 mine-to-date	Lacana	739,000	0.036	26,604	3,074,000	3.16:1
	Pegasus	652,000	0.036	23,472	2,310,000	2.54:1
1986 mine plan	Lacana	857,000	0.045	38,565	2,040,000	1.38:1
	Pegasus	1,372,000	0.033	45,276	2,789,000	1.03:1
Ultimate pit	Lacana	7,570,000	0.032	242,240	26,344,000	2.48:1
	Pegasus	8,775,000	0.028	245,700	27,804,000	2.17:1



**Table 6.5 Relief Canyon “Total Mineable Reserves” Calculated by Pegasus in 1986**  
(Atiyeh, 1986)

Cutoff (oz Au/ton)	Ore (tons)	Grade (oz Au/ton)	Waste (tons)	Total Tons	Strip Ratio
<b>Floating Cone Runs at \$400/oz Au</b>					
0.015	6,738,000	0.030	3,734,000	10,472,000	0.55:1
0.020	5,805,000	0.032	4,667,000	10,472,000	0.80:1
<b>Hand-Design Pit</b>					
0.015	5,042,000	0.030	5,923,000	10,965,000	1.18:1

As of December 1, 1986, “reserves” at Relief Canyon were said to be 5.3 million tons grading 0.03 oz Au/ton (Engineering and Mining Journal, June 1987, cited in Abbott et al., 1991).

Following acquisition of drill-hole data from the prior owner, Firstgold created a block model and estimated the tonnage and grade of the Relief Canyon deposit with Watts, Griffis and McOuat Limited (“WGM”) reviewing Firstgold’s methodology (Fernette *et al.*, 1996; Wojcik, 1996). A “resource and reserve” summary, believed to reflect this block model, was prepared by Kim Drossulis, Firstgold’s mining engineer, and was based on 400 vertical RC drill holes with 22,188 assay intervals containing gold, silver, and rock codes (Drossulis, undated but presumed to be 1996). WGM reported that Firstgold’s grade modeling approach was, in effect, a geologically constrained polygonal model. Using the inverse distance squared interpolation method and assigning a tonnage factor of 15 cubic feet/ton to all blocks in the model, Drossulis estimated a “geological resource” of 23,984,400 tons containing 0.017 oz Au/ton using a 0.004 oz Au/ton cutoff and digitizing the geopolygons in plan with 15-foot benches and section with 85-foot centers. Fernette *et al.* (1996) commented that “*The use of a single density value for all rock types and the lack of coding for alluvium and waste dumps could lead to overestimation of waste tonnage. Alternatively, the density of the Cane Spring limestone is probably greater than 15 cubic ft. per ton which would understate the tonnage of mineralized limestone and limestone waste blocks.*” WGM concluded, “*Although the sample density on which the model is based is quite high, the criteria used to develop the grade and rock models, as noted above, are such that the estimated tonnage and grade for the Relief Canyon deposit meets the criteria for an ‘Indicated Mineral Resource’*”

WGM used computerized floating cone methodology combined with the grade and rock model developed by Firstgold as described above to define the potential economic pit boundaries and make preliminary estimates of the minable portion of the Relief Canyon “indicated mineral resource” (Fernette *et al.*, 1996). Two floating-cone resource estimates at different cutoff grades were developed from the Newgold deposit model by WGM. “*The estimates range from 5.6 million tons at 0.022 oz Au/ton to 8.2 million tons at 0.020 oz Au/ton, with the contained ounces of gold ranging from 121,000 to 163,000*” (Fernette *et al.*, 1996).

A “mining reserve” for North pit, South pit, and Light Bulb pit was derived by Drossulis using costs adjusted by WGM (Drossulis, undated but presumed to be 1996). Using a \$400/oz gold price and a cutoff of 0.003 oz Au/ton, Drossulis estimated a surface mining reserve of 5,408,000 tons grading 0.009 oz Au/ton; at a cutoff of 0.015 oz Au/ton, the estimated reserve was 4,920,000 tons at a grade of 0.034 oz Au/ton. The reserve estimate used a density of 18 cubic feet/ton and costs of \$0.83/ton for mining of ore and waste, \$4.35/ton for milling, and \$0.60 for G&A. Newgold used a 0.1 oz Au/ton cap on assay values (WGM, 1996).



In 1997, Independent Mining Consultants, Inc. of Tucson, Arizona (“IMC”) was commissioned to review the resource model developed by Firstgold’s personnel (IMC, 1997). The IMC estimate was based on a total of 474 drill holes, including those from Falconi, Duval, Lacana, Santa Fe, Pegasus and the first 73 holes drilled by Firstgold. All of these holes except the one drilled by Falconi were RC. Table 6.6 shows the estimates of “model contained resources” (mineral inventory or geologic resource) from IMC, and Table 6.7 compares the “model-contained resource” at cutoffs of 0.003 and 0.019 oz Au/ton from IMC’s work with that at the same cutoffs calculated earlier by Firstgold. According to Firstgold’s website (Firstgold website [http://www.firstgoldcorp.com/our\\_story.asp](http://www.firstgoldcorp.com/our_story.asp), January 2, 2009), the IMC estimates were based on areas considered proximal to the North, South, and Light Bulb pits, and Firstgold controls about 75% of the surface area considered in these estimates. IMC identified the following differences between their revised block model and the one developed by Firstgold:

- IMC used a 22° dip for the search ellipse operator instead of a flat search;
- IMC used ordinary kriging instead of the inverse-distance-squared method;
- The location of Hole 88-3 was corrected in the IMC study;
- The atomic absorption assays of the Pegasus holes from 1988 increased using a factor of 1.25 to approximate fire assays, as opposed to the 1.53 factor used by Firstgold; and
- Firstgold’s RC holes through the end of 1996 were included in IMC’s study.

**Table 6.6 1997 Estimate of Relief Canyon “Model-Contained Resources” by IMC**

<b>Cut-off (oz Au/ton)</b>	<b>Tons (000's)</b>	<b>Grade (oz Au/ton)</b>	<b>Contained Au ounces</b>
0.003	76,782	0.012	921,384
0.010	30,483	0.022	670,626
0.015	18,642	0.028	521,976
0.019	12,939	0.033	426,987
0.030	5,629	0.046	258,934
0.040	2,702	0.060	162,120
0.050	1,592	0.072	114,624

**Table 6.7 Comparison of Firstgold 1996 and IMC 1997 Historical Estimates**

(Modified from IMC, 1997)

	Cutoff Grade = 0.003 oz Au/ton			Cutoff Grade = 0.019 oz Au/ton		
	Tons (000's)	Grade (oz Au/ton)	Contained Au ounces	Tons (000's)	Grade (oz Au/ton)	Contained Au ounces
Firstgold 1996 Model	69,345	0.013	901,485	12,866	0.036	463,176
IMC 1997 Model	76,782	0.012	921,384	12,939	0.033	426,987
Variance	7,437	-0.001	19,899	73	-3	-36,189
% Variance	10.7%	-7.7%	2.2%	0.6%	-8.3%	-7.8%

IMC (1997) estimated the “approximate potential minable resources” for the Relief Canyon deposit using a floating cone on the IMC model, a gold price of \$390 per ounce, and a 50° slope angle (Table 6.8).



**Table 6.8 Potential “Minal Resources” for the Relief Canyon Deposit**

(Modified from IMC, 1997)

<b>Cut-Off (oz Au/ton)</b>	<b>Tons (000s)</b>	<b>Grade (oz Au/ton)</b>	<b>Contained Au ounces</b>
0.050	486	0.065	31,590
0.040	958	0.055	52,690
0.030	1,792	0.045	80,640
0.019	3,697	0.034	125,698
0.015	5,061	0.029	146,769
0.010	7,708	0.023	177,284
0.003	10,870	0.018	195,660
<b>The total material inside the floating cone geometry is 18,925,000 tons</b>			



## **7.0 GEOLOGIC SETTING**

### **7.1 Regional Geology**

The Relief Canyon property is located in northwestern Nevada at the southern end of the Humboldt Range within the Basin and Range physiographic province. Johnson (1977) summarized the geology of Pershing County, from which the following discussion is taken.

During Paleozoic time, western Nevada was the site of deep-water sedimentation and local marine volcanism, while to the east of Pershing County predominantly carbonate rocks were deposited on the continental shelf. East-directed compression transported rocks of the western assemblage to the east on the Roberts Mountains thrust during the Late Devonian to Early Mississippian Antler Orogeny. A second compressional episode during the Early Triassic Sonoma Orogeny produced more east-directed transport on the Golconda thrust. The Golconda thrust lies to the west of the Roberts Mountains thrust.

The sedimentary environment changed in the Early Triassic with deposition of a thick non-marine sequence of rhyolitic and andesitic volcanic rocks over much of what is now Pershing County. Subsequent uplift and erosion were followed by a long period of sedimentation that began in the late Early Triassic and deposited lithologically variable marine and non-marine sedimentary sequences at first, followed by more uniform carbonate deposits, including the Cane Spring Formation (formerly called the Natchez Pass Formation) of the Relief Canyon area. From Middle Triassic to Early Jurassic time, there were uplift and deposition of near-shore deltaic deposits of mudstone, shale, and sandstone that include the Grass Valley Formation of the Relief Canyon area.

A third episode of pre-Cenozoic deformation occurred during the Jurassic and Cretaceous during the Nevadan Orogeny, during which time there were low-grade regional metamorphism, variably directed folding and thrust faulting, and extensive intrusion of granodiorite in the region.

Several episodes of plutonism are recorded in this region, ranging in age from Early Triassic to Tertiary. Early Triassic leucogranites and rhyolite porphyries were associated with contemporaneous volcanism. During the Middle Jurassic, gabbro was widely intruded as sills in the south-central part of the county, south and southwest of the Relief Canyon area. Late Cretaceous granitic stocks are present in the Humboldt Range along with numerous diabase dikes associated with these stocks. Other Cretaceous and Tertiary granodiorite plutons are exposed in the region.

During the Cenozoic, basaltic, andesitic, and rhyolitic flows, breccias, and tuffs with intercalated lacustrine deposits, fanglomerate, and fluvial sand and gravel were deposited across the county. Quaternary alluvial deposits fill the structural basins between ranges in Pershing County and are also exposed on the flanks of the ranges.

The structural regime changed dramatically to extensional events in the Cenozoic. High-angle normal faulting and tilting of Tertiary units exemplify this period of regional extension that resulted in the present physiography of the Basin and Range Province.



## 7.2 Local Geology

The following information is taken from Fiannaca and McKee (1983), Fiannaca and Easdon (1984), Wallace (1989), and Mears (2007) with additional details as cited. It should be noted that various historic references differ in nomenclature for one of the major units at Relief Canyon. What was formerly called the Natchez Pass Formation has since been separated into the Augusta Mountain Formation and the lower part of the overlying Cane Spring Formation, with the Cane Spring Formation hosting or forming the footwall for much of the gold mineralization at Relief Canyon. In this report, the Cane Spring Formation will be used in place of Natchez Pass Formation of previous authors.

The Relief Canyon property lies on the western flank of the southern Humboldt Range on the eastern side of Packard Wash. The Humboldt Range itself is the product of Cenozoic high-angle normal faulting and is one of the typical, generally north-trending fault-bounded ranges of the Basin and Range Province. According to Mears (2007), rocks within the range form a broad anticline with Cretaceous intrusions locally exposed in the central core. The oldest rocks exposed in the Humboldt Range are mafic and silicic volcanic rocks of the arc-related Lower Triassic Koipato Group, with silicic volcanic rocks predominating. The Limerick Canyon Greenstone, Rochester Rhyolite, and Weaver Rhyolite make up the Koipato Group in the southern Humboldt Range. Boron and fluorine-enriched leucogranite and rhyolite porphyry intrusions cut the upper part of the Koipato Group and are thought to be genetically related to the volcanic units. At the Rochester silver district, located about 5 miles north of Relief Canyon, low-grade disseminated and vein-controlled precious-metals mineralization has been mined from the Koipato Group. The Koipato Group is overlain by the Star Peak Group, which represents a marine carbonate platform developed over the volcanic rocks in the Middle Triassic. The Prida, Augusta Mountain, and Cane Spring formations make up the Star Peak Group. In Late Triassic and Early Jurassic time, a fluvial-deltaic system deposited predominantly fine-grained sediments of the Auld Lang Syne Group, which is composed of the basal Grass Valley Formation and the overlying Osobb, Dun Glenn, Winnemucca, Raspberry, O'Neill, Singas, Adorno, and Mullinix formations. There are varying descriptions in the literature of the nature of the contact between the Cane Spring and Grass Valley formations. At the Relief Canyon mine, the contact is poorly exposed in outcrop and is modified by solution-related brecciation in the mine; where exposed in the mine and outside the deposit, the contact appears to be conformable (Wallace, 1989). However, Wittkopp *et al.* (1984) and Parratt *et al.* (1987) suggest that the contact at Relief Canyon is a thrust fault that they call the Relief fault.

Within the Humboldt Range between Middle Jurassic and Middle Cretaceous time, coeval basinal sedimentary rocks were folded and thrust southeastward over the older platform and deltaic rocks, and all the units were deformed and metamorphosed to at least greenschist facies. This was followed by Late Cretaceous emplacement of granitic intrusions.

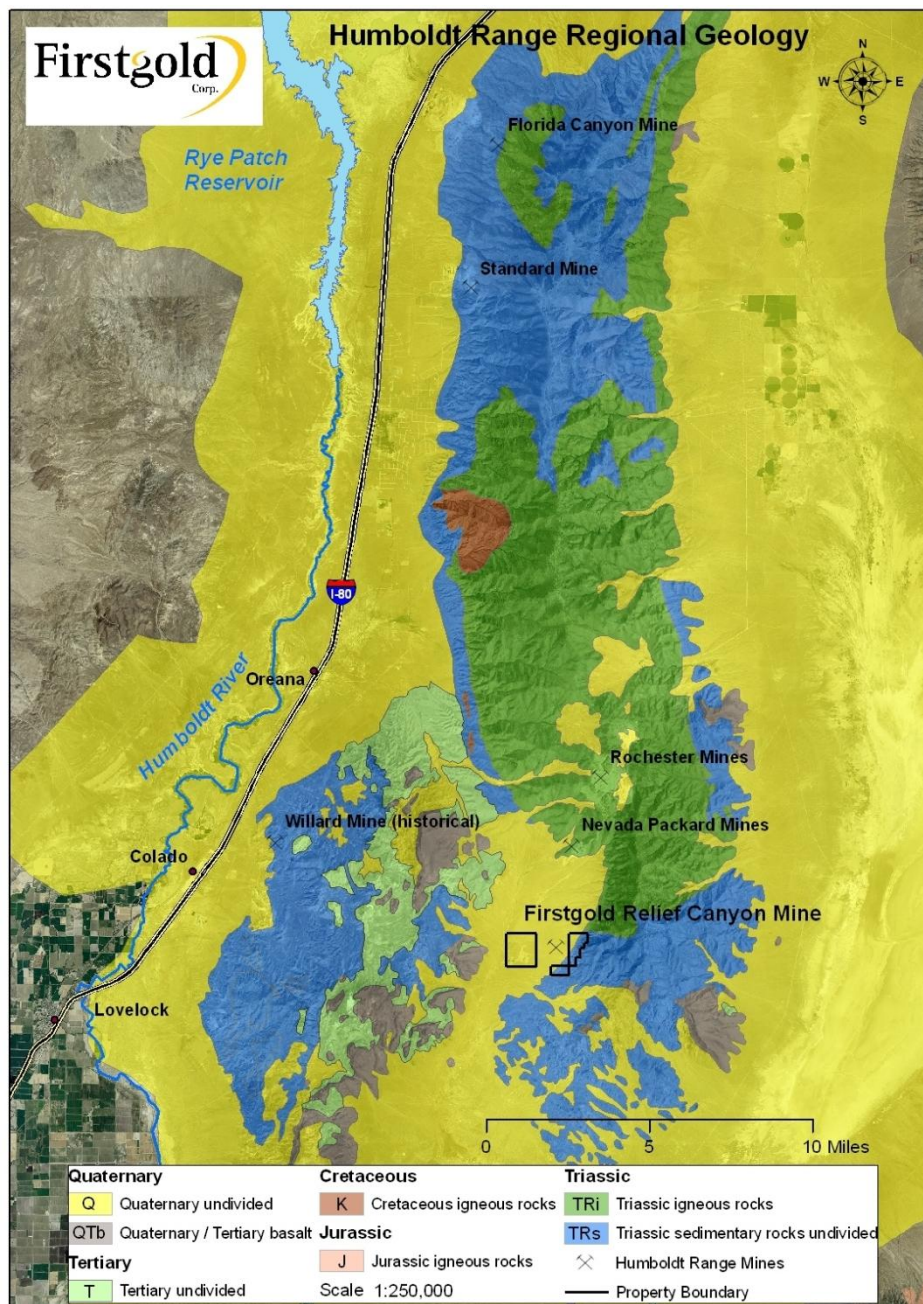
There are two intersecting structural zones in the region that are Late Mesozoic to Tertiary in age. Possibly the older is a major northwest-trending, right-lateral strike-slip system that forms a topographically pronounced linear fault belt at least 5 miles wide cutting the southernmost portion of the Humboldt Range and the northernmost portion of the West Humboldt Range. Probably younger is a northeast-trending, left-lateral shear that cuts most of northern Nevada and forms the western margin of the West Humboldt Range; a parallel structure called the Black Ridge fault defines the western edge of the southern Humboldt Range.



Tertiary volcanic rocks were deposited but largely eroded during Miocene and younger uplift of the range. There are isolated remnants of Miocene basaltic and rhyolitic volcanic rocks in the southern part of the Humboldt Range. There are also diabase or gabbro dikes of probable Tertiary age that generally strike northwest intruding zones of structural weakness.

Figure 7.1 shows the regional geology of the Humboldt Range and vicinity.

**Figure 7.1 Regional Geologic Setting of the Relief Canyon Project**





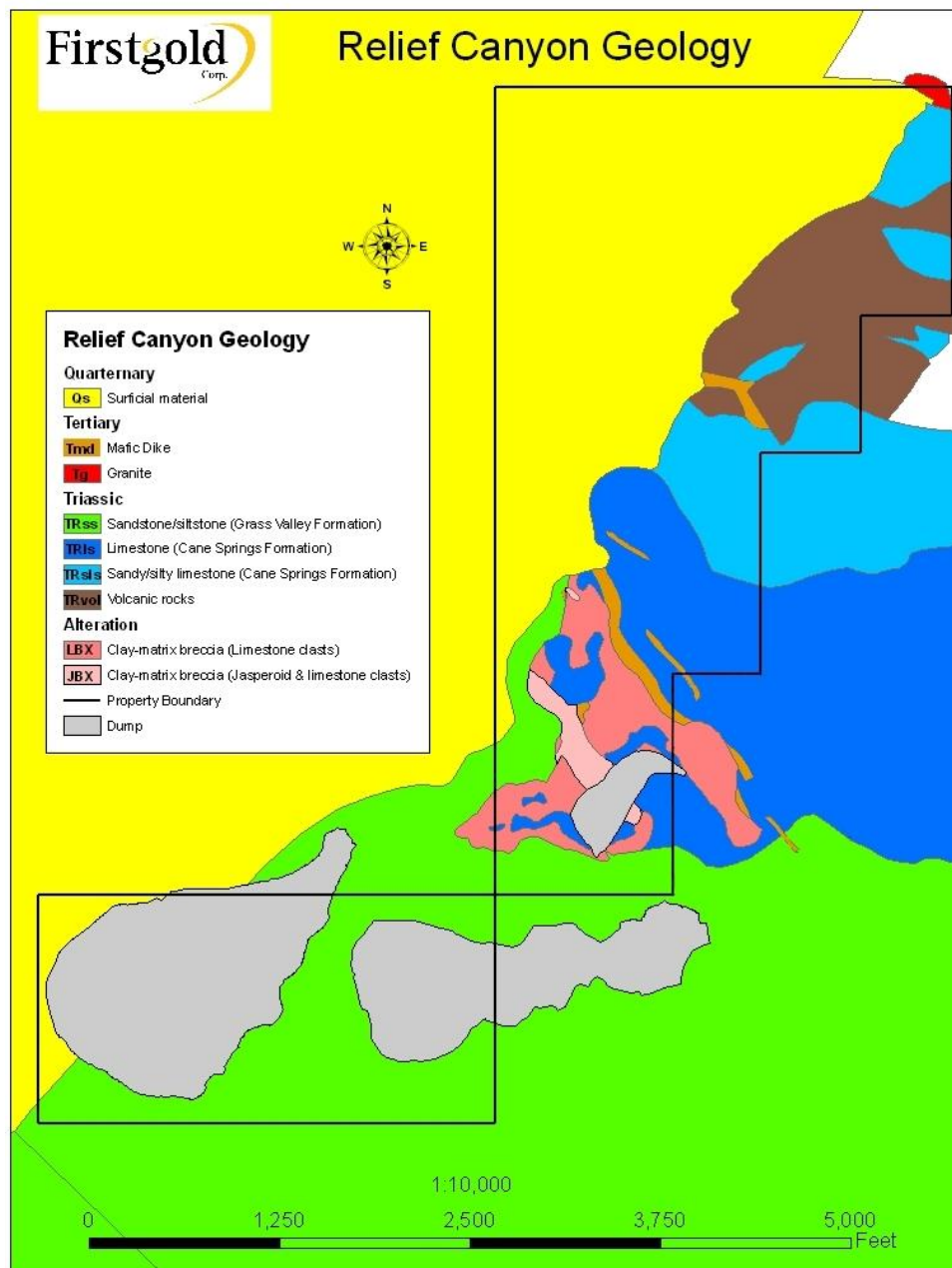


### 7.3 Project Geology

The following information on the geology of the Relief Canyon project is taken from Fiannaca and McKee (1983), Wittkopp *et al.* (1984), Atiyeh (1986), Parratt *et al.* (1987), Wallace (1989), Abbott *et al.* (1991), Cuffney *et al.* (1991), Fernet *et al.* (1996), IMC (1997), and Mears (2007).

Figure 7.2 shows the geology of the eastern portion of the Relief Canyon project area. The western portion of the project covered by the millsite claims is underlain by Quaternary sedimentary units.

**Figure 7.2 Geology of the Relief Canyon Project**







### 7.3.1 Lithology

There are three main rock units at Relief Canyon. A stratabound horizon of breccia containing limestone and jasperoid fragments and blocks lies immediately below the Grass Valley Formation and above the Cane Spring Formation. This breccia is the main host for mineralization. The breccia occurs throughout the mine area and ranges in thickness from about 30 to 250 feet (Figure 7.3). The breccia has been interpreted to be structural in origin, occupying a thrust fault (Wittkopp *et al.*, 1984; Parratt *et al.*, 1987), a sedimentary breccia, representing a Triassic subaqueous debris flow (Fiannaca and Easdon, 1984), and most recently a limestone solution breccia by Wallace (1989). Coherent bodies of jasperoid occur in the upper portions of the breccia horizon, comprising 20 to 25% of the unit by volume. The upper portion of the breccia horizon is typically higher grade than the lower portion.

The Late Triassic Grass Valley Formation, which overlies the breccia horizon, forms low hills to the south of the Relief Canyon mine and consists of an essentially barren fluvial-deltaic assemblage consisting of shale, siltstone, and sandstone that are weakly metamorphosed. Beneath the breccia horizon at the mine and exposed in high relief to the northeast is dolomitic limestone of the Middle to Late Triassic Cane Spring Formation, which is part of the platform assemblage and is locally mineralized. The sedimentary rocks dip moderately to the southwest. Diabase dikes that are probably post-Late Cretaceous in age intrude northwest-trending faults on the eastern margin of the deposit. High-angle northwest-trending faults cut the sedimentary rocks.

**Figure 7.3 Tan-Colored Breccia Lying Beneath Gray-Colored Grass Valley Formation**





The Cane Spring Formation is a massive, light gray to bluish black, dolomitic limestone that is locally carbonaceous as well as locally silty and sandy; its lower portion is thinly bedded, and its upper portion is thickly bedded. Within the project area, the limestone beds are up to 12 feet thick. There are also minor beds of shale and siltstone that are up to 3 feet in thickness. The formation is over 985 feet thick. There are traces of syngenetic pyrite within the Cane Spring Formation below the zone of oxidation. Local dolomitization created patches of coarse-grained dolomite. Because of extensive development of solution breccia, the limestone exposures at the mine are only small islands of coherent rock. Although northwest and northeast-trending isoclinal folds are common in the formation regionally, at the mine they are not evident.

The Grass Valley Formation is composed of shale, siltstone, argillite, and quartzite and is over 655 feet thick. Where oxidized, the units are olive gray in color; below the zone of oxidation, the units tend to be black. A few beds are calcareous, and a number of shale sections are dolomitic. The clastic sediments are often slightly to highly carbonaceous. Wallace (1989) reports that the Grass Valley Formation depositionally overlies the Cane Spring Formation, although Wittkopp *et al.* (1984) and Parratt *et al.* (1987) interpret the contact as a thrust in the project area. The formation is complexly folded and faulted at the mine and exhibits well-developed slaty cleavage oblique to bedding.

Various types of breccia characterize the contact of the Cane Spring Formation with the overlying Grass Valley Formation, and these breccias are the primary control on the gold mineral resources described in this report. Drilling indicates that the breccia zone is generally 100 feet to 230 feet thick, although it can range from less than 30 feet to over 300 feet thick. Cane Spring limestones immediately beneath the Grass Valley Formation were partially reduced to unconsolidated, poorly sorted rubble of subrounded limestone fragments in a matrix of silt and clay. In other places, clastic rocks of the Grass Valley collapsed as much as 130 feet into large, pipe-like cavities forming a chaotic jumble of small fragments of Grass Valley rocks. Irregular solution cavities that permeate unbrecciated limestone are filled with clay to silt-sized clastic sediments, but can also include subrounded pebbles of Grass Valley siltstone and shale; these sediments show horizontal graded bedding and other fluvial textures. The presence of horizontal bedding within the cavities while the surrounding limestone dips to the south indicates that the sediments in the cavities were deposited after tilting of the limestone (Wallace, 1989). Jasperoid fragments are present in some breccia zones and less commonly in the bedded cavity-filling silts. According to Wallace (1989), metamorphic fabrics in some of the breccia clasts show that brecciation post-dated Mesozoic metamorphism, which refutes the theory that the breccia zone is a Triassic subaqueous debris flow formed during Triassic shelf-slope sedimentation. Wallace does not discount the possibility of thrust faulting along the Grass Valley-Cane Spring contact, but believes textures in the breccia indicate contemporaneous formation of the breccia and fluvial sediments, which suggests the breccia is a solution breccia. According to Fiannaca and Easdon (1984), the main breccia unit is absent to the east of the project area, where the Grass Valley Formation rests upon the Cane Spring Formation in what appears to be a normal sedimentary contact. Figure 17.1 and Figure 17.2 are cross sections that show the relationships of the breccia horizon with gold mineralization and surrounding rock units.

According to Wallace (1989), locally there are large areas within the breccia zone that have carbon-rich matrix resembling, and probably derived from, material in carbonaceous stylolite zones in unbrecciated limestone. There are also small solution cavities in carbonaceous limestones that contain stratified and graded sediments with abundant silt-sized grains of carbon, shale, and limestone.



In addition to the three main rock types described above, dikes of quartz monzonite and diabase were encountered in a number of drill holes. Both appear to pre-date gold mineralization (Wittkopp *et al.*, 1984). In a number of intervals, the quartz monzonite dikes exhibit propylitic or argillic alteration, but there is no known gold mineralization in these dikes. The diabase dikes are almost always propylitically altered and are a bright orange color at the mine. The age of either type of dike is not known, but the quartz monzonite ones may be Jurassic or Cretaceous in age; the diabase dikes may be the same age as the quartz monzonite dikes (Wittkopp *et al.*, 1984; Parratt *et al.*, 1987).

A significant portion of the Relief Canyon deposit is overlain by Quaternary alluvium.

### 7.3.2 Structure

There are different interpretations of the structure at Relief Canyon, especially with respect to the presence or absence of a major thrust fault at the mine and the nature of the mineralized breccia.

Both the Grass Valley and Cane Spring formations strike to the northwest. According to Wittkopp *et al.* (1984) and Parratt *et al.* (1987), the main structural feature within the property is the Relief fault, believed to be a northwester-striking thrust fault. The fault forms a northeast-striking antiformal shape that plunges to the southwest. A small fold perpendicular to the plunge of the antiform forms a dome over the southern portion of the gold deposit.

Although he does not rule out the presence of thrust faulting at Relief Canyon, Wallace (1989) believes that evidence for it has been obscured by later hydrothermal activity. He notes that regional Mesozoic metamorphism to lower greenschist facies affects the units at Relief Canyon. While the Cane Spring Formation exhibits northwest and northeast-trending isoclinal folding less than 0.6 mile northeast of the mine, limestone beds at the mine dip relatively uniformly to the south-southwest. However, the Grass Valley Formation is complexly folded and faulted both at the mine and in surface exposures to the south. Slaty cleavage is well defined in the Grass Valley Formation and in shaly interbeds of the Cane Spring Formation, but is poorly developed in Cane Spring limestones.

Firstgold's website (Firstgold website [http://www.firstgoldcorp.com/our\\_story.asp](http://www.firstgoldcorp.com/our_story.asp), January 2, 2009) offered an alternative explanation of the structure, whereby the fault may be a low-angle detachment fault formed in an extensional environment.

There are a number of Cenozoic northeast and north-northwest-trending normal faults on the property, including the northeast-trending Black Ridge range-front fault along which at least 1,500 feet of offset down-dropped the rocks beneath Packard Flat valley. Diabase dikes and tabular jasperoid bodies are found within the north-northwest-trending faults, including a northwest-trending diabase dike that bounds the north side of the Relief North pit. West-northwest-trending joints in Cane Spring limestones appear to have facilitated formation of what Wallace (1989) interprets as the solution breccia at the mine.

The various theories concerning the origin of the breccia at Relief Canyon are discussed further in Section 8.0.



## 8.0 DEPOSIT TYPE

Somewhat differing interpretations of the type of deposit exhibited at Relief Canyon have been offered in the literature. All agree that the gold mineralization occurs primarily within a breccia horizon, with and without jasperoidal silicification, and that this horizon occurs at the contact of the Cane Spring Formation limestones and the overlying Grass Valley Formation. What differ are the inferred origin of the breccias and the nature of the gold mineralization.

Fiannaca and McKee (1983) and Fiannaca and Easdon (1984) of Lacana interpreted the Relief Canyon mineralization as representing disseminated epithermal gold metallization within a polymictic submarine debris-flow breccia. Minor movement along the northwest-trending fault now occupied by diorite intrusions may have occurred in response to rapid loading of deltaic sediments on poorly lithified micrites. This movement may have induced sub-horizontal shear failure of the calcareous oozes, resulting in slumping and detachment of both the Cane Spring and Grass Valley formations. Deltaic sedimentation then continued. Hydrothermal fluids trapped beneath basal shales of the Grass Valley Formation migrated laterally under low hydrostatic pressures, favoring the silty and sandy zones of the debris flow. Larger limestone clasts are mineralized along their margins and in small fracture networks within the clasts.

Santa Fe staff also believed the gold mineralization to be of the disseminated epithermal type, but invoked fault breccias developed along a thrust-faulted contact as the primary mineralizing control (Wittkopp *et al.*, 1984; Parratt *et al.*, 1987). The typical trace elements of epithermal gold deposits – arsenic, antimony, and mercury, with fluorine as fluorite present as well – are associated with the Relief Canyon mineralization, although regression analysis failed to show a direct correlation of these associated elements with gold content. In contrast to gold deposits at Carlin in northeastern Nevada, where the host rocks are often a specific stratigraphic unit or units, the gold at Relief Canyon is interpreted by these workers to be contained within a structurally prepared horizon. “*Weak gold mineralization often occurs above the thrust in the Grass Valley Formation, however, most of the ore grade mineralization is present below the thrust in the brecciated Natchez Pass Formation [Cane Spring Formation of this report] or where the two formations are mixed as a result of movement along the thrust*” (Parratt *et al.*, 1987). These authors cite the Pinson and Dee gold deposits in northeastern Nevada as similar types of structurally controlled disseminated gold deposits. Wittkopp *et al.* (1984) and Parratt *et al.* (1987) did note, however, that mineralization in a rubbly mixed breccia may represent slumping of the mixed breccia rubble into elongate cavities or chimneys formed by karsting of the limestone along joints and fractures, such as has also been observed at the Bootstrap gold mine in Elko County.

While not discounting the possibility of a thrust-faulted contact, Wallace (1989) proposed that the host breccia was the product of low-temperature dissolution and associated brecciation. Ground water may have dissolved much of the limestone directly beneath Grass Valley shales, progressively creating irregular cavities and resulting collapse breccias. Episodic hydrothermal pulses deposited gold, silica, and fluorine into earlier-formed jasperoids and unconsolidated cave-fill sediments, forming the Relief Canyon mineralization, with continued solution-related brecciation further disrupting the gold deposit. Wallace proposed that the gold mineralization at Relief Canyon is a variant of sedimentary rock-hosted mineralization, similar in part to some Mississippi Valley-type base-metal deposits.



All interpretations agree that the mineralization was introduced by hydrothermal fluids, possibly mixed with groundwater, and that the deposit formed at relatively shallow depths. According to Wallace (1989), fluid inclusion data indicate that the late-stage gold and fluorine-bearing hydrothermal fluids were extremely dilute and had temperatures near 200°C.

The staurolite breccia horizon is clearly the critical geologic control on mineralization in the area of the existing open pits, and MDA therefore honored the breccia in the resource modeling.



## 9.0 MINERALIZATION

The following information on the nature of the mineralization at Relief Canyon has been taken from Wittkopp *et al.* (1984), Parratt *et al.* (1987), Wallace (1989), Fiannaca and McKee (1983), Fiannaca and Easdon (1984), Mears (2007), and IMC (1997).

Gold mineralization at Relief Canyon occurs in thicknesses of up to 100 feet within and proximal to the breccia horizon lying between the pelitic rocks of the Grass Valley Formation and the underlying Cane Spring platform carbonate rocks. Gold mineralization often extends a short distance (usually less than 10 feet) above the contact into the Grass Valley Formation within a clay zone. The highest gold grades typically occur below the Grass Valley Formation at the breccia contact, decreasing toward the base of the breccia.

Several types of mineralization have been identified that occur within breccias of various types. A tan to red-brown jasperoid breccia that contains clay stringers and is often vuggy frequently occurs in the upper portion of the breccia; purple and green fluorite crystals are found in drill cuttings from the jasperoid breccia. The jasperoid breccia often grades downward into silicified limestone and limestone breccia, which contain lower-grade gold values than the jasperoid breccia. Gold appears to be associated with argillic alteration in the limestone breccias.

Significant amounts of gold also occur in a mixed breccia consisting of Grass Valley rocks, fresh limestone, clay, and jasperoid breccia. In contrast to the hard, silicified jasperoid breccia, this mixed breccia is a loose rubble of the constituent rock types. Higher gold grades in the mixed breccia are usually associated with highest proportions of clay and jasperoid breccia. The mixed breccia often is found within fresh limestone and is interpreted to have formed by slumping of the mixed breccia rubble into cavities or chimneys formed by karsting of the limestone along joints and fractures.

Most of the mineralization occurs on the crest of a broad, northeast-trending, southwest-plunging antiform. The crests of smaller folds that are superimposed on the antiform were also important loci of mineralization. The antiform has a steeper dip on its eastern limb; most mine development has been on the more accessible western limb of the fold (Firstgold website [http://www.firstgoldcorp.com/our\\_story.asp](http://www.firstgoldcorp.com/our_story.asp), January 2, 2009).

Figure 9.1, Figure 9.2, and Figure 9.3 show some of the breccia types seen at Relief Canyon.





**Figure 9.1 Close-Up of Limestone Breccia with Silicified Matrix**



**Figure 9.2 Drill Core of Mixed Breccia with Clay-Rich Matrix**







**Figure 9.3 Drill Core of Limestone Breccias With and Without Clay Matrix**



The deposit is dominated by fine-grained silica, calcite, fluorite, and clays, with small amounts of pyrite. Trace amounts of galena, cinnabar, arsenic sulfides, and native silver occur with the gold. Tourmaline and sphalerite were reported in logs from holes north of the mine area near hole DH-9723 (Mears, 2007). Gold is disseminated principally in jasperoids and the silicified clay matrix of the breccia. In addition, carbon-rich clay matrix can also host significant gold. Gold occurs principally as native gold or electrum and is typically fine grained, usually less than 20 microns. Fiannaca and McKee (1983) state there is no evidence that gold is associated with pyrite or encapsulated by silica.

Alteration associated with gold includes silicification, sericitization, and argillization. Wittkopp et al. (1984) state that the highest gold grades are often associated with argillic alteration rather than silicification.

Silver (0.009 to 1.17 oz/ton), arsenic (17 to 2,620 ppm), antimony (1 to 430 ppm), mercury (1.8 to 18 ppm), and fluorine (190 ppm to 11%) are associated with the gold mineralization. Lithium is slightly anomalous in the jasperoids and non-carbonaceous clays. Arsenic and gold values are positively correlated in the jasperoids, but not in the clays. Arsenic, mercury, and antimony are more closely associated with clay alteration.

Fiannaca and Easdon (1984) and Wittkopp *et al.* (1984) report that the breccia zone is well oxidized (see Section 17.2.6 for MDA's comments regarding oxidation of the mineralized zones). These workers also note the presence of two types of iron oxide grains in the jasperoid breccia – coarse,





euohedral to subhedral iron oxides and much finer framboidal iron oxides. An occasional chip of unoxidized jasperoid breccia containing pyrite suggests that the euohedral to subhedral iron oxide grains are an oxidation product of cubic to subhedral pyrite, whereas the framboidal iron oxide grains are derived by oxidation of framboidal pyrite. There appears to be a direct correlation between the amount of framboidal iron oxide and gold content (Wittkopp *et al.*, 1984).

Although the absolute age of the gold mineralization is not known, Wallace (1989) suggested late Tertiary or younger age in order to explain the occurrence of gold in horizontal cave-fill sediments that are younger than the tilting of the surrounding limestones.

Mears (2007) reported that there are four target areas on the property:

1. The Exposed Benches target
2. The Tourmaline 9723 target near Firstgold drill hole DH-9723, north of the pit areas
3. The North-Forty target along the range front, and
4. The Southwest target.

The Exposed Benches target includes the area between the North and South pits but below the current pit level, a jasperoid on the southeast side of the North pit that continues to the southeast, and the area to the immediate northwest of the North pit.

The Tourmaline 9723 target, which lies within what is presently referred to as the North Target area, is based on drill hole DH-9723, which was drilled in 1997 to twin hole PRC-88-4. The best-mineralized interval assayed 0.293 oz Au/ton at a depth of 365 to 370 feet in silty limestone at the bottom of a silicified zone. Mears (2007) reports that concerns were raised about contamination in hole DH-9723, but that contamination was determined to be insignificant. Firstgold's hole NT08-02 was located about 250 feet east of DH-9723 and encountered 15 feet of material averaging 0.932 oz Au/ton from 865 to 880 feet in a locally intensely sheared felsic intrusion with strong quartz-sulfide veining and silicification.

The North-Forty target is on the northwest margin of the Relief Canyon pit along the range-front fault, jasperoid mineralization and local zones of intense silicic alteration, sericitic alteration, and quartz veins containing tourmaline are seen in the hills. Mears (2007) suggests the range-front and parallel faults in the valley form this target.

The Southwest target lies beneath the waste dump and low-grade stockpile along the eastern side of Section 20. The target occurs at the contact between limestone and shale, down plunge along the antiform. Elevated gold grades in the same stratigraphic position as mineralization in the pit were found by prior drilling (Mears, 2007).

A discussion of mineralization outside of the mineral resources is presented in Section 17.4.



## 10.0 EXPLORATION

The following description of exploration by Firstgold at Relief Canyon is taken from Mears (2007), Fernette *et al.* (1996), Wojcik (1996), and Firstgold (2007d, 2007e, 2008a, 2008c), with additional information as cited.

Firstgold acquired the Relief Canyon property in January 1995, rebuilt the ADR processing plant, and processed pregnant pond solution until July 1995. In addition, they acquired a drill-hole and assay data set with 400 drill holes and over 22,000 assays, and also acquired much of Lacana's metallurgical test data. Firstgold's staff entered the assay and geologic data into a database, compiled geologic cross sections, and generated grade and rock models of the deposit using computer block modeling. Every 20<sup>th</sup> drill hole was checked to verify the accuracy of the database, and no significant errors were found (Fernette *et al.*, 1996).

Through April 1997, Firstgold drilled 73 RC holes totaling 43,220 feet, including 23 holes drilled on Santa Fe's ground that Firstgold was leasing at the time. The holes drilled on Santa Fe's ground – both those drilled by Santa Fe and those drilled by Firstgold – are included in the current database and were used for the resource estimation in this report. The focus of Firstgold's initial drilling was just north of the North pit, west of the pits, and southwest of the pits. A ground magnetic study was conducted in 1999, but no reports or data from the magnetic study are available.

The property was apparently then idle until 2003, when preparation for exploration and development resumed. Through early 2007, Firstgold carried out the following activities:

1. Available data were assembled and, where possible, digitized;
2. The land status was researched, and Firstgold staked additional claims;
3. Surface and trench samples were taken on the existing heap leach piles and sent for analysis, including heap-leach column analysis, by an outside testing lab;
4. Aerial photography was flown to produce a topographic map of the property and surrounding area; and
5. The firm of Dyer and Associates was hired to bring the property into complete government compliance, to design new leach pads for re-processing of the existing heaps, and to expand capacity for processing.

In 2006, Zonge Geosciences, Inc. conducted a ground magnetic survey on the project. The following is Mears' (2007) description of the survey:

*"From October 20<sup>th</sup> to October 25<sup>th</sup> 2006 Zonge Geosciences, Inc. performed a GPS-based ground magnetic survey on the Relief Canyon Gold Project. Ground Magnetic/GPS data were acquired on 29 lines oriented east-west and spaced approximately 90 meters apart, for a total of 40 line kilometers of data acquisition. Total magnetic field data were acquired with GEM Systems GSM-19 Overhauser-effect magnetometers. The GSM-19 magnetometer has a resolution of 0.01 nT and an accuracy of 0.2 nT over the operating range. Positioning was made with a Trimble PRO-XRS GPS receiver. The GPS data were differentially corrected in real-time using OMNISTAR corrections. This system provides sub-meter accuracy under standard operating conditions."*



White (2008) reported on the interpretation of the ground magnetic data, noting that the data can be used to map near-surface mafic dikes or sills and possibly deeper, more felsic intrusions.

Firstgold resumed exploration drilling at Relief Canyon in 2007, initially focusing on the potential of the area between existing pits and then expanding to the north and northwest. A total of 92 RC holes were completed by May 2008 within and adjacent to the resources discussed in Section 17.0, with an additional 13 RC holes drilled in the North Target area. Firstgold also completed four core holes in 2008, one within the resource area and three in the north target area; one additional hole was abandoned before completion and it is not included in the MDA database.

Firstgold attempted to reprocess existing heaps in late 2008 and early 2009, apparently with little success.



## 11.0 DRILLING

### 11.1 Summary

The mineral resources discussed in this report were estimated using the data provided by reverse-circulation and core drilling completed by Duval, Lacana, Santa Fe, Pegasus, and Firstgold.

The Relief Canyon drilling has outlined a zone of gold mineralization within the jasperoidal breccia horizon lying immediately below the Grass Valley Formation. While gold in other geologic settings has also been intersected, this mineralization is not presently understood and therefore could not be included in the mineral resource estimation, but remains as an exploration target that warrants additional work.

Table 11.1 is a summary of the drilling included in the project database that was used to estimate the mineral resources. The database does not include the hole drilled by Falconi in 1978, and it is likely missing some holes drilled by the some of the companies listed in Table 11.1 as well; as noted in Section 6.0 and discussed further below, there are a number of discrepancies in the total numbers of holes drilled by the various companies in reports reviewed by MDA.

**Table 11.1 Relief Canyon Mineral Resource Database Summary**

Company	Period	Hole Numbers	Core		RC		Total	
			No.	Feet	No.	Feet	No.	Feet
Duval	1981-1982	DVR1 - 45 <sup>1</sup> (excludes 27, 39-41)			41	13,663	41	13,663
Lacana	1982-1983	LRC1 - LRC203 (includes two re-drilled holes <sup>2</sup> )			205	50,453	205	50,453
Santa Fe	1983-1984?	SPRC1 – 148 <sup>3</sup> (excludes 80, 114-119, 129) (includes six "A" holes)			146	47,433	146	47,433
Pegasus	1987-1988	PRC87-02, 03, 06 - 15 <sup>4</sup> (excludes 04, 05)  PRC88-1 through 5			17	5,100	17	5,100
Firstgold	1996-1997	9601-9640 (excludes 07, 14, 16, 22-24, 39)  9702-9743 (excludes 18, 41)			73	50,420	73	50,420
Firstgold	2007-2008	RCM07-01 - 75 <sup>5</sup> RCM08-01 – 19 RC - D1 NT07-01, NT08-01 – 10 NT08-D01, 03, 04	4	4,578	105	39,113	109	43,691
<b>TOTAL</b>			<b>4</b>	<b>4,578</b>	<b>587</b>	<b>206,182</b>	<b>591</b>	<b>210,760</b>

<sup>1</sup>DVR42 - 45 may have been drilled by conventional rotary

<sup>2</sup>In cases of original and re-drilled hole sets, assay data available for re-drilled holes only

<sup>3</sup>Assay data unavailable for 13 holes

<sup>4</sup>Assay data unavailable for PRC87-03

<sup>5</sup>Assay data unavailable for RCM07-24



The project database includes a significant number of holes drilled outside the limits of Firstgold's property holdings at Relief Canyon, including all holes drilled by Santa Fe and some of the Duval, Lacana, Pegasus, and Firstgold holes (Figure 11.1). Regardless of location with respect to the property boundary, all holes were used to complete the resource estimation.

Of the 591 holes in the project database, 479 penetrate the mineral domains modeled by MDA. One of these holes, which is the only core hole within the modeled mineral domains (RC\_D1), has only in-house assay data from the Relief Canyon mine laboratory. While there is no evidence that the in-house assay data are flawed, the laboratory was not clearly independent of Firstgold at the time of the assaying and MDA therefore chose not to use the data in the grade interpolations for the resource modeling.

The breccia horizon that hosts the Relief Canyon mineralization modeled by MDA forms a broad antiform. Much of the crest of the antiform is subhorizontal to shallowly plunging, while the limbs generally dip at angles less than 30°. While only 31 of the 591 holes in the database were drilled at an angle, the vertical holes are generally well oriented with respect to the breccia-hosted mineralization.

## **11.2 Historic Drilling**

### **11.2.1 Falconi**

While exploring the property for high-purity limestone, Falconi drilled a single core hole to a depth of 745 feet (Fiannaca and Easdon, 1984). MDA has no further information on this drilling, and no information from this hole is included in the database.

### **11.2.2 Duval**

According to Fiannaca and Easdon (1984), Duval Corporation drilled 40 RC holes on the property in 1981-1982 for a total of 13,148 feet. Fiannaca and McKee (1983) had previously reported that Duval drilled 38 RC holes in 1981-1982. Mears (2007) reported that Duval drilled 44 holes totaling 15,080 feet. However, the database used by MDA shows 41 holes totaling 13,663 feet. The author cannot account for these discrepancies. MDA has no information on the drill contractor or type of equipment used for Duval's drilling.

### **11.2.3 Lacana**

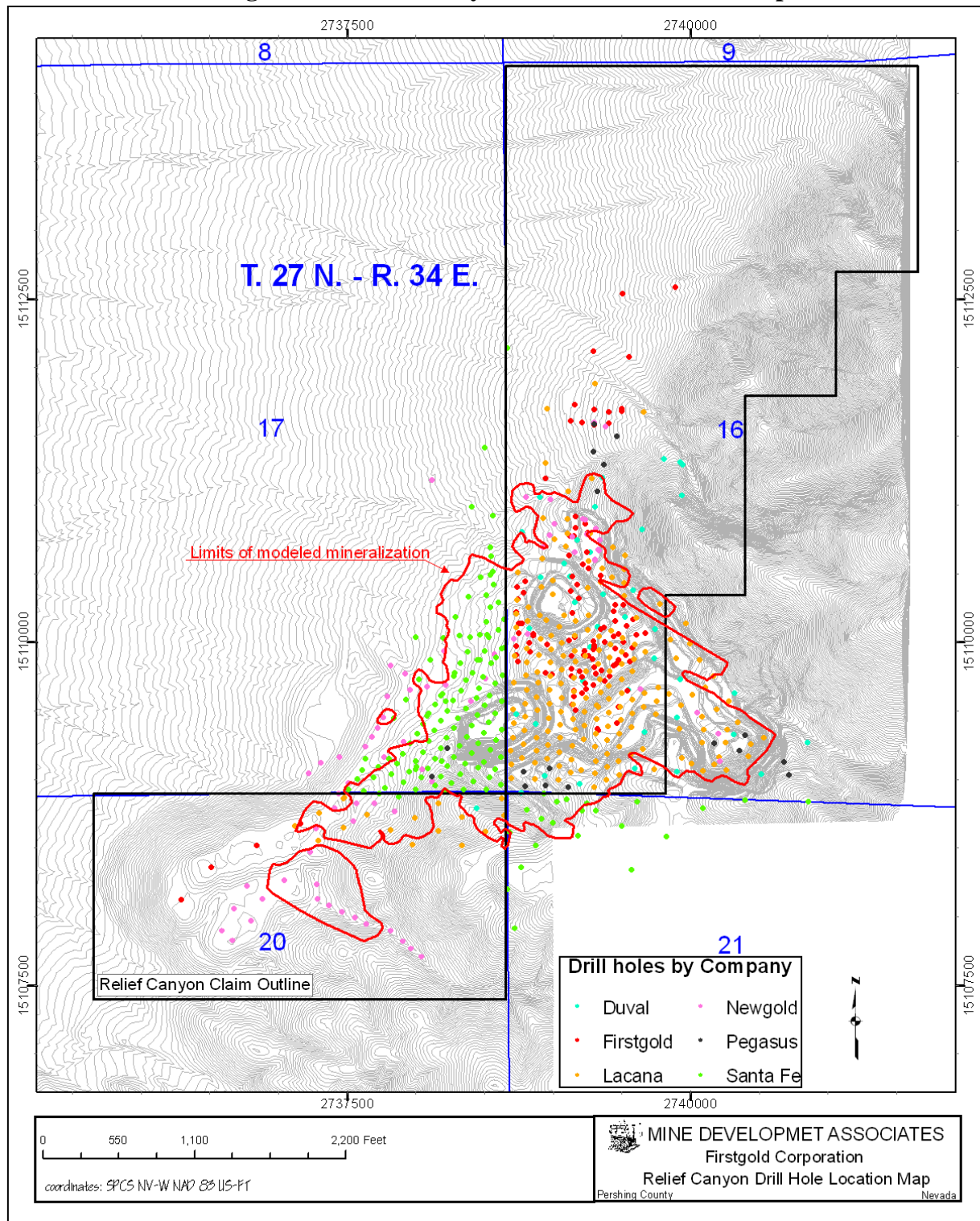
Upon exercising its option and acquiring Relief Canyon, Lacana drilled 48 RC percussion holes totaling 12,610 feet in a first phase of drilling to provide details on the deposit as defined by Duval. The following information on Lacana's drilling is taken from Fiannaca and Easdon (1984) and Fiannaca and McKee (1983).

Lacana's holes were drilled on 200-foot centers such that the holes fell at the apices of a series of contiguous equilateral triangles. This pattern was chosen to eliminate directional bias in the grid and to permit construction of cross sections from three directions. Eklund Drilling Company of Elko, Nevada, was the drill contractor for these 48 holes. Data in the drill-hole database indicates that



Eklund used a TH-60 rig for these holes, although for the last few holes the database indicates that LL Enterprises Eklund was the contractor using a TD-105 or TD-100 rig.

**Figure 11.1 Relief Canyon Drill-Hole Location Map**





Nearly all of the samples collected in the breccia unit were dry. Apparently some wet conditions were encountered in other units.

Results of this drilling led to Lacana's constructing a pilot heap-leaching facility, during which each of four potential mining sites were drilled by RC methods on 25-foot centers. After two sites were selected for the pilot test, 140 blastholes were drilled on 4 to 6-foot centers. MDA has no details on this drilling except that all blasthole cuttings were fire assayed for head-grade control. The blastholes are not included in the database used by MDA.

While the pilot test was underway, Lacana began a second phase of RC drilling to sample the main zone of mineralization on 100-foot centers. A total of 99 RC holes were drilled during this phase for a total of 24,038 feet. A third phase of drilling was then undertaken to better define the pit perimeter and to condemn waste dump sites; this phase consisted of 57 RC holes totaling 13,715 feet. The total of the three phases of drilling is 204 holes, although the drill-hole database used by MDA shows 205 Lacana holes with a total of 50,453 feet of drilling; MDA cannot account for the discrepancy, although it may involve counting of holes that were started and then re-drilled.

MDA has few details concerning the drilling contractors, rigs, or drilling conditions for the second and third phase of Lacana's drilling. Where a drill contractor is shown in the database, it is listed as Eklund using a TH-60 or TH-100 rig.

#### **11.2.4 Santa Fe**

Santa Fe owned property adjacent to Lacana's property and drilled 147 RC holes to test for continuation of mineralization onto their property, according to Fiannaca and Easdon (1984). A total of 146 of these holes are included in the drill-hole database with a total of 47,433 feet drilled; MDA cannot account for the difference. MDA has no information on the drilling contractor or type of rig used for Santa Fe's drilling.

#### **11.2.5 Pegasus**

According to Mears (2007), Pegasus drilled 11 RC holes totaling 3,545 feet on the property, but the drill-hole database used by MDA contains 17 holes totaling 5,100 feet; MDA cannot account for the difference. According to the database, these holes were drilled in 1987 and 1988. The five holes shown as drilled in 1988 appear from the database either to have been drilled by Eklund Drilling or with equipment leased from Eklund. MDA has no further information on drilling equipment or procedures.

### **11.3 Firstgold**

The only drilling described in this section has been for exploration and identification of remaining and potential new resources. Firstgold also investigated the potential for reprocessing heaps remaining from previous mining, including drilling of the heaps, but this program is not discussed in this section. Information on Firstgold's reprocessing program is provided in Section 19.0.



From acquisition of the property in 1995 through April 1997, Firstgold drilled 73 RC drill holes that were 6.5 inches in diameter (Mears, 2007). Based on the database used by MDA, this drilling totaled 50,420 feet; however, according to Mears (2007), the 73 holes totaled 43,220 feet. MDA cannot account for the differences in total length drilled between the database and that reported by Mears (2007). The focus of this drilling was just north of the North pit, west of the pits, and southwest of the pits (Mears, 2007). MDA has no details on the drilling contractor or type of rig used except for an entry in the database for the first hole drilled in 1996 that indicates Five-O was the drilling contractor.

In 2007, Firstgold again began exploration drilling at Relief Canyon, initially focused on the area of the existing pits from prior mining operations (Firstgold, 2007e). Their drilling included shallow twin holes and infill drilling to confirm grade and continuity of the gold mineralization (Firstgold, 2007d). Later drilling tested deeper targets within the pit and outside it to the northwest in the pediment area, between the North and South pits, and in the North Target (Firstgold, 2008a, 2008c, 2008d). In 2007 and 2008, Firstgold drilled four core holes totaling 4,578 feet and 105 RC holes totaling 39,113 feet, based on the database used for the resource estimate.

The information that follows has been provided by Firstgold.

Firstgold drilled these holes using their own crew and equipment. RC holes RCM07-1 through RCM07-72 were drilled with an MPD 1000 rig using a 5 1/8-inch diameter hammer bit, with the exception of holes RCM07-24, RCM07-29, RCM07-31, and RCM07-38, which used a 4 3/4-inch rock bit. Holes RCM07-73 through RCM07-75 and holes RCM08-1 through RCM08-16 were drilled with an IR TH-75E rig; most used a 5 3/4-inch hammer bit, except for holes RCM08-15 and RCM08-16, which used 5 3/8-inch rock bits and hole RCM07-73, which used a 5 3/4-inch hammer and 5 1/2-inch and 5 1/4-inch rock bits. Holes RCM08-18 and RCM08-19 were drilled with a Schram 685 rig using a 6-inch hammer bit. Additional holes were numbered NT07-1 and NT08-1 through NT08-10. All except NT07-01, NT08-01, and NT08-03 were drilled with a Schram 685, while the remaining holes were drilled with an IR TH-75E rig. The bits were either rock or hammer and ranged from 5 3/8-inch to 6-inch in diameter.

Water was encountered at depths of between 120 and 460 feet in 33 of the RC holes.

For its core drilling, Firstgold drilled one core hole between the pits (RC-D1) and four core holes in the North target (NT08-D1 through NT08-D4), of which one was abandoned. The core holes were drilled with a UDR 200DLS rig using HQ bits.

#### **11.4 Drill-Hole Collar and Down-Hole Surveys**

Uncertainties with respect to collar elevations and x-y positions in several holes remain, although these are not likely to be material to the resource modeling discussed in Section 17.0.

No down-hole survey data are available for any of the drill holes in the database, so all holes are assumed to have constant dip angles. This assumption is likely to introduce increasing error with increasing depth of the drill holes, although the shallow nature of most of the modeled mineralization and the prevalence of vertical holes (only 31 of the 591 holes in the database were drilled at an angle) likely minimizes any impacts in the resource modeling.





## **12.0 SAMPLING METHOD AND APPROACH**

The Relief Canyon database includes assay data from RC and several core drill holes, although only RC sample data are used in the grade interpolations completed as part of the resource estimation. While it is likely that RC down-hole contamination presents a sample integrity issue in some holes, especially in intervals drilled below the water table, MDA believes techniques employed during the resource modeling have limited the problem, as discussed below, and any potential remaining issues are appropriately reflected in the resource classification.

The preponderance of samples for all drill programs of all operators were taken at 5-foot intervals, which is customary for RC drilling, which is significantly less than the thickness of the bulk-tonnage style of mineralization at Relief Canyon. Each drill sample interval is therefore a fraction of the true thickness of the mineralized zones.

MDA has no information on the sampling methods used by Duval or Pegasus during their drilling at Relief Canyon, other than some data regarding wet or dry sampling.

### **12.1 Falconi**

Fiannaca and Easdon (1984) state that although the single Falconi core hole was drilled through mineralized breccia into the Cane Spring Formation limestone, the core was not assayed for gold.

### **12.2 Duval**

Drill logs indicate that the Duval RC holes drilled in 1981 were drilled dry until encountering the water table.

### **12.3 Lacana**

The following information on Lacana's sampling procedures for their initial 48 RC holes is taken from Fiannaca and Easdon (1984).

Lacana took the following measures to mitigate and quantify any effects of down-hole contamination in their RC drilling program:

- Lacana personnel were used for sample collection;
- Holes were air-cleaned at the bottom of each five-foot interval;
- Water and/or stabilizers were injected to minimize caving as needed;
- The sample-collection cyclone and splitter were continuously cleaned; and
- When drilling below the water table, contamination samples were collected while the drill continued to circulate for three-minute intervals.

Nearly all of the samples that Lacana collected in the mineralized breccia unit were dry. Each five-foot interval in the breccia was collected and assayed. When drilling in dry conditions, each sample was collected in a cylindrical cyclone device equipped with a 10 foot-high baffled stack to minimize the loss of fines. The dry samples were dumped into a 42-inch Jones-type splitter, and both splits were



remixed and re-split twice to insure homogeneity of the final split. During drilling of the 48 holes of the phase-one program, three identical, equal-volume samples of each drill interval were collected by designing inserts for the splitter pans which contained exactly 1/3 the volume of each pan. All samples of the first split were sent to the primary assay lab; every fifth sample of the second split was sent to a secondary assay lab for check; and all the samples of the third split were stored for future metallurgical testing.

All samples were collected in pre-labeled polyethylene sample bags and marked with identification tags placed into each bag. Sample weights commonly varied between 10 pounds and 15 pounds, and the drill-sample recovery was stated to be “*generally excellent*”.

When drilling in wet conditions, each sample was discharged through the opened cyclone onto either a single-deck or a triple-deck Jones splitter, and the water-rock mixture was collected in 40-gallon plastic cans. The mixture was allowed to settle, and CaCl was added to rapidly enhance flocculation of the slimes. Clarified water was removed by siphon, with care taken to prevent remixing of the sample slurry. The sample was removed from the plastic can and was shipped to the laboratory either in pre-labeled, double-lined polyethylene bags or in plastic metallurgical sample buckets. At the laboratory, the wet samples of a given interval were mixed and thoroughly dried together in drying sheds. The laboratory handled the final mixing and splitting of the dried sample.

During the drilling of Lacana’s second phase, in which 99 RC holes were drilled, the same sampling procedures were followed, except that only two sample splits were collected instead of three; the metallurgical sample split was omitted. MDA has no specific details about the sampling in Lacana’s third phase of 57 RC holes.

## 12.4 Santa Fe

Santa Fe drilled the portion of the Relief Canyon deposit under their control in Sections 17 and 21 (Figure 11.1), which consists primarily of the northwest-dipping limb of the antiformal mineralized breccia horizon. Most Santa Fe holes were therefore drilled deeper than the Lacana holes and encountered considerably more groundwater, which caused sampling problems. Drill logs indicate that Santa Fe drilled their holes dry until the water table was intersected.

According to Wittkopp *et al.* (1984) and Parratt *et al.* (1987), early sampling procedures allowed fine, clay-sized material to overflow the sample bucket when heavy water flows were encountered at the upper contact of the mineralized breccia unit, which resulted in sufficient loss of sample to raise concerns. Assays of grab samples of the overflow indicated gold values up to five times those returned from assaying of the primary samples from the bucket. Two previously drilled holes were offset about 16 feet and re-drilled. During re-drilling, material from the cyclone was passed over a riffle splitter, taking a 50-50 split. On one split, the bucket was allowed to overflow, losing the fines. On the second split, the entire five-foot sample, including the water, was recovered in several buckets. Flocculent was added to each bucket and the water decanted over a 24-hour period. Assay comparisons of the two types of sampling procedures showed average increases of 8% to 19% in the gold values for intervals for which the fines were caught.



While not stated explicitly, it appears that Santa Fe did not allow overflow of the sample buckets following this exercise.

Assuming the results from the re-drilling exercise are generally applicable to the early Santa Fe holes, and perhaps some holes by other operators as well, some portion of the drill-hole database may have grades that understate the true grades drilled.

## **12.5 Pegasus**

Drill logs indicate that the five holes drilled by Pegasus in 1988 were drilled dry until either drilling conditions required the injection of water or formational water was intersected.

## **12.6 Firstgold**

With very few exceptions, all Firstgold RC samples were collected at five-foot intervals. Review of drill-hole logs indicates that all 1996 and 1997 RC holes were drilled dry until the water table was encountered, while at least some, and perhaps all, of the later RC Firstgold holes were drilled similarly.

The following description of Firstgold's sampling methods during the 1996 and 1997 RC drill program are taken from Ball (1997). Each five-foot sample to be sent for laboratory analysis was collected by the drill crew, while chips for logging and petrologic samples (samples of the cuttings that are sufficiently representative of the rock to be adequate for petrologic studies) were usually collected by Firstgold geologists. The primary samples were collected in 10 x 17-inch olefin sample bags, labeled by the geologists with the hole number and footage interval, after passing through a rotary wet splitter. The split sample was either directly captured into the sample bag or into a five-gallon bucket. The splitter was regulated to contain just enough sample to fill the sample bags.

Chip samples for geological reference were collected from each five-foot interval from a different sample discharge of the splitter than the primary samples for analysis and stored in plastic chip trays for later examination and lithologic logging.

An undated Firstgold protocol reviewed by MDA described the proposed sampling procedures for RC and core sampling of Firstgold projects for 2007 and beyond. MDA cannot verify to what extent this protocol was followed for the drilling at Relief Canyon. According to the Firstgold protocol, RC samples were to be collected with a rotating wet pie splitter attached to the drill rig. Samples were to be collected in five-gallon buckets, with the pie splitter to be rinsed with water after each five-gallon sample was collected. A flocculent was to be added to the finished sample, and the entire sample was to be agitated. The water was to be decanted and the sample poured into an 11-inch by 17-inch cloth sample bag; the entire sample was to be placed in the bag. Samples were either to be air dried or dried in a drying oven at Firstgold's prep lab facility. Once dried, the samples were to be crushed using a jaw crusher, and a 1,000-gram (2.2 pounds) split, made with a riffle splitter, was to be placed in a paper envelope for transport to Chemex. Rejects were to be stored at Firstgold's warehouse.

According to Firstgold's protocol, core samples were to be a maximum length of 5 feet unless conditions dictated an extension to no greater than 10 feet. Unless dictated otherwise by the situation, the smallest core sample length was to be 2.5 feet. Changes in the minimum or maximum lengths might be warranted because of alteration, poor recovery, or changes in lithology. Core samples were



to be cut in half using a diamond-blade rock saw. The Firstgold prep lab would then crush the samples using a jaw crusher and take a 1,000 gram (2.2 pounds) sample split using a riffle splitter that would be put into paper sample envelopes. Samples would either be delivered to the lab by Chemex staff or by Firstgold employees.

## 12.7 Reverse-Circulation Sample Contamination

Due to the nature of RC drilling, the possibility of contamination of drill cuttings from intervals higher in the hole is a concern, especially when groundwater is encountered or fluids are added during drilling. A number of holes at Relief Canyon intersected groundwater. Wittkopp *et al.* (1984) report that “*most [Santa Fe] drill holes hit a heavy flow of water at the point where they hit the [mineralized] breccia units.*” In addition, based on comments recorded in drill logs, MDA was able document that a significant number of holes in the database encountered water while drilling.

Down-hole contamination can sometimes be detected by careful inspection of the RC drill results in the context of the geology, by comparison with adjacent core holes, and by examining down-hole grade patterns. Such evidence of contamination exists at Relief Canyon, whereby cyclic down-hole patterns in the gold assays that correlate with drill-rod changes can be observed, as well as anomalous spreading of gold values beyond the limits of the mineralized breccia in areas below the water table.

A number of the Relief Canyon holes clearly exhibit cyclic down-hole patterns in the gold assays. These are detected by examining the gold results of each set of four samples derived by the drilling of the same 20-foot drill rod. In a classic case, the first sample of the drill rod will have the highest grade, while the following three samples will gradually decrease in grade. This classic ‘decay’ pattern in grade is caused by the accumulation of mineralized material (present at some level higher in the hole) at the bottom of the hole as the drilling pauses and a new drill rod is added to the drill string. When drilling resumes, the first sample has the greatest amount of contamination, and the successive samples are gradually ‘cleaner’ as the accumulated contamination is removed and the continuing contamination experienced during the drilling is overwhelmed by the material being drilled. This decay pattern is usually possible to detect only while drilling barren or very weakly mineralized rock. Even in cases where this cyclic gold contamination is of such low grade as to have minimal impact on resource estimation, its presence suggests that similar, and possibly more serious, contamination is occurring higher in the hole within mineralization, where the contamination is impossible to recognize.

The geologic context can also be used to detect contamination. There are a number of cases where a mineralized drill intercept in the breccia horizon below the water table is followed by lower-grade mineralization in the Cane Spring Formation limestone, when nearby holes show no such tail of mineralization in the limestone.

In addition to this evidence of down-hole contamination, MDA found references to down-hole contamination in 32 logs from holes drilled by Firstgold in 1996, 1997, and 1998. All of these recorded observations lie below the water table. While Lacana collected contamination samples (see Section 12.3) during their drilling programs, the results were not available to MDA.

In recognition of the strong evidence of down-hole contamination in at least some holes, the mineral-domain modeling used in the resource estimation described in Section 17.0 has excluded almost all



mineralized samples that lie below both the water table and the lower contact of the mineralized breccia horizon. Mineralization at the base of the breccia horizon was also excluded in the few cases where the logs noted contamination in these intervals. There is no doubt that these procedures have resulted in the exclusion of some mineralization that is 'real', and there is also little doubt that some mineralized samples included in the resource estimation, especially below the water table, have been affected by contamination. MDA feels, however, that the procedures used in the resource modeling have minimized the effects of potentially contaminated intervals.



### **13.0 SAMPLE PREPARATION, ANALYSIS, AND SECURITY**

MDA has no information on sample preparation, analysis, or security used by Santa Fe during their drilling programs at Relief Canyon, and very limited information is available regarding Duval and Pegasus.

MDA believes the sample preparation, security, and analytical procedures used by Firstgold and prior operators followed industry-standard procedures and the resulting analytical data are sufficient for use in the resource estimation.

#### **13.1 Duval**

The only information MDA has on Duval's analyses is that pulps were assayed by ½-assay-ton fire assays (Fiannaca, 1982; Fiannaca and Easdon, 1984).

#### **13.2 Lacana**

The following information is taken from Fiannaca and Easdon (1984).

Samples from the 48 RC holes drilled by Lacana in their first phase of drilling and the 99 RC holes drilled in their second phase underwent sample preparation at the assay lab and then were analyzed by one-assay-ton fire assay. Sample preparation consisted of crushing the entire sample to 85% -10 mesh. A 7-12 ounce split was taken and pulverized to 80% -200mesh. The pulverized samples were rolled 30 times before selecting a 1.03 ounce split for fusion. The pulverizer was routinely cleaned with compressed air, and every fourth sample pulverized was barren silica sand. MDA has no information on sample preparation during Lacana's third phase of drilling.

The only information available to MDA on the laboratories used by Lacana for analysis is in the drill-hole database. For many holes, no laboratory is listed. Those from the first phase of drilling that do show that Monitor Geochemical Laboratory, Inc. ("Monitor") of Elko, Nevada was the lab used. For the second phase of drilling, some holes list Shasta Analytical Geochemistry Laboratory ("Shasta"); others list both Shasta and Monitor; and later holes list Shasta and Hunter Mining Laboratory, Inc. ("Hunter"). For the third phase of drilling, Shasta, Legend Metallurgical Laboratory Inc. ("Legend"), or both are listed.

#### **13.3 Pegasus**

As part of a review of Newgold's resource model, IMC found that the drill samples for the five holes drilled by Pegasus in 1998 were analyzed by cyanide-leach methods, which would normally understate the gold contents yielded from fire assaying (IMC, 1997). Only one of these holes penetrates the mineral domains modeled by MDA, so the effect on the resource estimation is minimal.

MDA has not further information regarding the sample preparation, analysis, and security procedures implemented during the Pegasus drilling programs.



### 13.4 Firstgold

For its 1995-1997 drilling, the Firstgold RC samples were ordered sequentially on the ground at the drill site while each hole was being drilled. Personnel from the laboratory picked up the samples two to three days after the hole was drilled. Pick-up days, times, and laboratory personnel were recorded by Firstgold geologists (Ball, 1997). According to Mears (2007), Firstgold ran 32-element ICP (inductively coupled plasma) analyses on several of the RC drill holes from their 1995-1997 drilling program; four standards identified as “standard C2” were apparently included and reported in the results.

For their drilling program from 1995 through 1997, Firstgold used ALS Chemex Laboratories (“Chemex”) and American Assay Laboratories (“American Assay”) for analysis. Both are currently ISO-rated laboratories (Mears, 2007). According to Mears, for samples submitted to Chemex, *“Chemex picked up the lab bag samples at each drill site pad and transported them directly to its sample preparation facility in Sparks, Nevada, using chain-of-custody identification and tracking procedures. Chemex prepared the samples for assay and geochemical analysis. If the samples were wet, they were dried in low temperature ovens. Then, depending on the type of analysis requested, the samples were split, sieved, crushed, and pulverized. Finally, Chemex shipped the pulps to its laboratory in Vancouver, British Columbia for final chemical analysis, maintaining custody of the samples the entire time.”* For samples submitted to American Assay, the same procedures were used except that the final analysis was performed in Sparks, Nevada (Mears, 2007).

Mears (2007) reported that for Firstgold’s 1995 to 1997 programs, samples were protected from contamination or disturbance from third parties by storage away from other activity at the drill site. Only drillers or lab pick-up personnel handled the sample bags. Exploration personnel were present seven days a week, and at night the access gate was locked.

According to Mears (2007), for its subsequent drilling Firstgold used protocols for handling, bagging, transportation, security, preparation and analysis as defined in an internal memorandum by B. Ball in 1997. MDA has reviewed that report as well as a copy of an undated Firstgold protocol for sampling and QA/QC that was developed for their 2007 and subsequent drilling. MDA cannot verify that the procedures in the undated protocol were followed in practice.

According to the Firstgold protocols, the following QA/QC program was developed:

1. Duplicate samples of RC chips were collected after initial assay results were received. Duplicates for core were taken from coarse rejects. Duplicates were to be submitted at a rate of one for every 40 samples submitted, with a second duplicate to be sent to a second laboratory at a rate of one for every 80 samples.
2. Commercial standards of medium and low-grade oxide gold from Rocklabs of New Zealand were to be inserted into the sample stream prior to assaying at the rate of one standard for every 20 samples. Any standard that differed from the expected results by +/- 10% was to be reported to the assay lab, which was to run their own checks on the particular batch of samples containing the anomalous results. If the lab reported problems with the batch, they would perform re-runs at their cost on all of the samples contained within that batch.



3. One blank composed of cuttings with known assays of less than 0.005ppm will be submitted for every 100 samples.
4. Internal QA/QC procedures from Chemex and American Assay will also be used.

For its 2007 and 2008 drilling, Firstgold continued to use Chemex and American Assay for its sample preparation and assaying (Mears, 2007), with Chemex as the lead lab (Firstgold, 2007d, 2007e). All assays for their 2007 drilling were fire assays with an atomic absorption (“AA”) finish on either a 30 gram or 50-gram charge (Firstgold, 2007d). Pulps and coarse rejects were returned to Firstgold from American Assay on a quarterly basis and were stored at Relief Canyon (Mears, 2007). Firstgold reports that in the pit areas, samples from RC hole RCM08-19 and core hole RC-D1 were assayed by Firstgold’s in-house laboratory, but most of the intervals were then assayed by Chemex to check the values. All of the assaying of the North Target holes was done in Firstgold’s in-house laboratory, but these holes lie outside of the mineral resource modeling. No assay data from the Firstgold in-house laboratory were used in grade interpolation related to the resource estimation.

The sampling and QA/QC protocols for Firstgold stipulated that no samples would be collected or handled by officers or directors of the company or any associate of the issuer prior to the reporting of final analytical results. Samples were to be picked up on site by Chemex personnel and delivered to the Chemex prep lab in Winnemucca or Elko, Nevada. Following preparation, the pulps were trucked to Reno by Chemex staff for assaying or shipment to their Vancouver assay lab.

Mears (2007) reports that most of the stored RC chip cuttings from the various drilling programs at Relief Canyon were destroyed or lost.

### **13.5 Comments**

While documentation of sample preparation, analysis, and security for the various companies that operated at Relief Canyon prior to Firstgold is incomplete, all of the companies were reputable, well-known mining/exploration companies that likely followed the accepted industry standards.

All of the laboratories discussed above are (or were, since some are no longer in business) well-known commercial analytical laboratories that used industry-standard sample preparation and analytical techniques. Only the 2007-2008 drill samples of Firstgold were assayed in a laboratory with present-day certification (Chemex, ISO 9001:2000; American Assay, ISO/IEC 17025); all other assaying was completed prior to the institution of formal certifications.





## 14.0 DATA VERIFICATION

MDA conducted an audit of the Relief Canyon project database and compiled and analyzed available quality control/quality assurance (“QA/QC”) data collected by Lacana and Firstgold; no QA/QC data collected by Duval, Pegasus, or Santa Fe are available. In addition to a review of the database auditing and available QA/QC data, a comparison of the drill data by company is also discussed, as is a sample-pair analysis of closely spaced drill intervals from adjacent holes.

### 14.1 Database Audit

The project database includes information derived from 591 drill holes. Using various digital survey files provided by Firstgold, MDA validated the collar locations of 540 holes, found discrepancies of two feet or less in 23 holes, and found significant discrepancies in the collar coordinates of 16 holes, only some of which could be resolved (11 of the 16 holes provide data to the resource estimation). After fixing the collar locations to the extent possible, MDA still noted several holes lying significantly above or below the ground surface, which indicate errors in the x, y, and/or z coordinates, or whose mineralized intervals seemed out of place in context with surrounding holes. These database uncertainties, in conjunction with other factors, led to the lack of resources classified as Measured resources. No records of down-hole survey data were found that could be used to validate the database.

The pre-2007 assay database was audited using original or photocopied assay certificates and typed or handwritten assays on drill logs. A total of 3,997 sample intervals out of 31,579 (~13%) were audited. A total of 62 audited sample intervals had substantive errors ( $\geq 0.007$  oz Au/ton), 40 had marginally significant errors ( $\geq 0.003$  to  $0.006$  oz Au/ton), and 106 had insignificant errors. All errors found were corrected.

The audit revealed problems in conversions of gold values from ppb to oz/ton and *vice versa*, as well as assigned values for less-than-detection limit and trace assays, all of which MDA corrected to the extent possible. A minor amount of original and check assay data were added to the project database by MDA.

There are 6,914 sample intervals from the Firstgold 2007 and 2008 drill holes with assays from independent laboratories in the database. Using original digital copies of the assay certificates received directly from the analytical laboratories, MDA was able to check 6,890 of the intervals. A total of eight errors were found and corrected, two of which were substantive.

While MDA believes the corrected MDA database is adequate for the resource estimation at Relief Canyon, remaining uncertainties contribute to the lack of Measured resources. The entire database should be checked against available data, with care being taken to document all sources of the audit, corrections made, and any issues that remain.

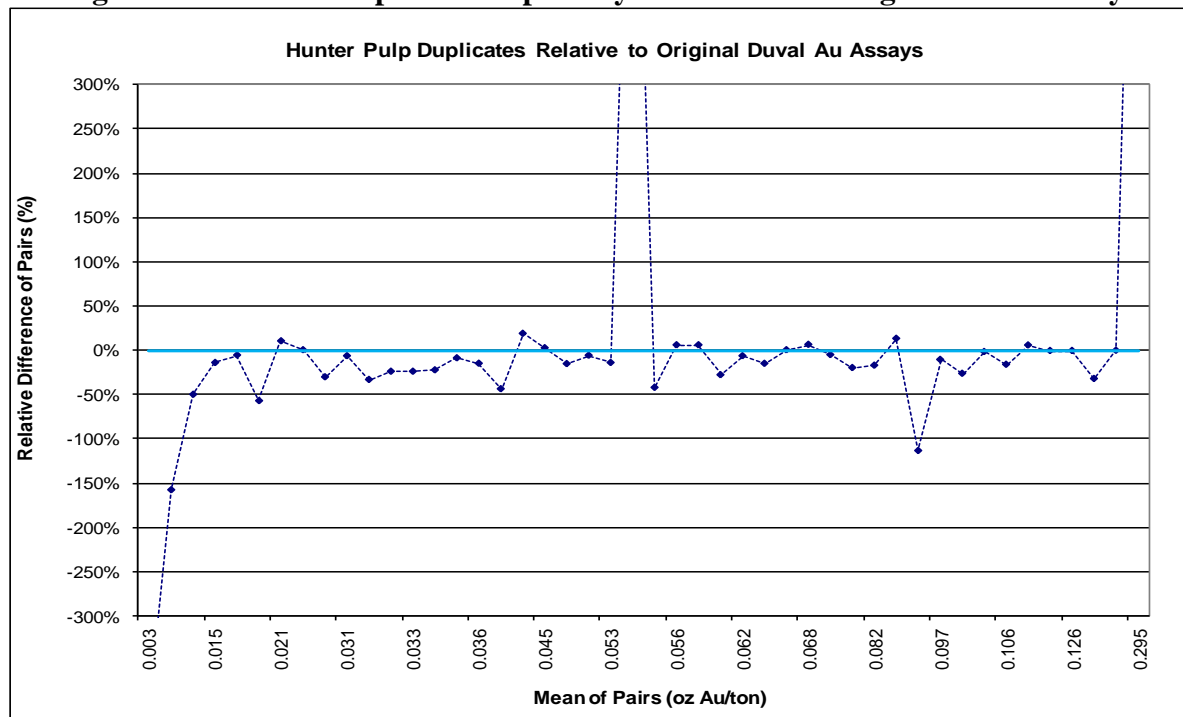


## 14.2 Lacana QA/QC Data

The following information is derived from Fiannaca (1982) and Fiannaca and Easdon (1984). Upon optioning the Relief Canyon property from Duval, Lacana undertook a program in 1982 to verify the Duval assay database. Lacana submitted 46 coarse-reject splits from original Duval drill samples to Hunter, who prepared duplicate pulps from the rejects and analyzed the new pulps by one-assay-ton fire assays; the Duval drill samples were originally analyzed by fire assaying of ½-assay-ton charges.

MDA compiled the Lacana check-assay data from tables and a copy of an original Monitor assay certificate provided by Fiannaca (1982). The Hunter duplicate-pulp analyses are compared to the original Duval assays in Figure 14.1, which is a graph showing the relative difference, plotted on the y-axis, between each original assay and the pulp-duplicate assay. The x-axis plots the means of the paired data, with each pair consisting of an original assay and the pulp-duplicate assay.

**Figure 14.1 Hunter Duplicate-Pulp Analyses Relative to Original Duval Assays**



Although the mean of the Lacana duplicate pulps (0.068 oz Au/ton) is 9% higher than the mean of the original Duval analyses (0.062 oz Au/ton), the graph shows that the duplicate-pulp assays are actually systematically lower than the Duval assays (the difference in the mean lowers to -8% if the highest-grade pair is removed).

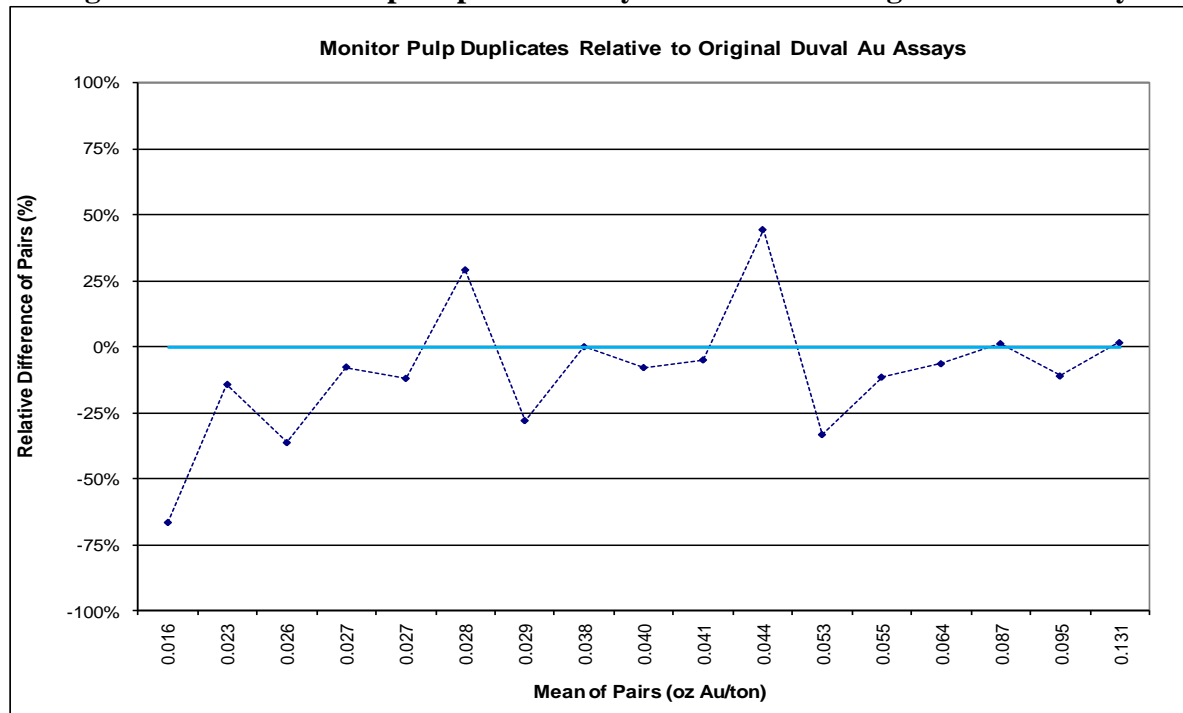
As an additional check, Lacana submitted “*selected sample intervals of the pulps which Hunter had earlier analyzed*” to Monitor. While this explanation does not clarify the type of sample Monitor analyzed, handwritten notes on the original Monitor assay certificate suggest that Monitor prepared a new pulp from the coarse rejects. These samples were selected as a subset of 76 Duval sample



intervals analyzed by cyanide leach by Hunter. Monitor analyzed these samples by both one-assay-ton fire assay and hot cyanide extraction-AA finish. MDA compiled the one-assay-ton fire-assay check data and compared it to the original 1/2-assay-ton fire assays of Duval (Figure 14.2).

The mean of the Monitor analyses of the Duval pulp duplicates (0.047 oz Au/ton) is 5% lower than the original Duval results, which is supported by the low bias evident in the relative difference graph.

**Figure 14.2 Monitor Pulp-Duplicate Analyses Relative to Original Duval Assays**



Lacana collected field duplicate samples at the rig during the drilling of their three-phase, 203-hole drilling program. These field duplicates consisted of secondary splits of the drill cuttings when the drilling was dry; no field duplicates were collected when the drilling was wet. While MDA does not have the field-duplicate data, Fiannaca and Easdon (1984) report that comparisons of the field duplicates to the primary assay samples for each of the three drill phases yield differences in the means of -1.4% to +7.3% for all 1,463 field-duplicate/primary sample pairs and -3.8% to +10.4% for sample pairs with primary assays >0.010 oz Au/ton (608 pairs); it is not clear if the stated percentages are based on the field duplicates relative to the primary samples or *vice versa*.

Lacana also inserted one standard for every nine primary samples, at least for the first phase of drilling (Fiannaca and Easdon, 1984); MDA does not have the results of the standard analyses.



### **14.3 Firstgold QA/QC Data**

Other than check assaying of the petrological samples (see Section 0) from hole DH-9723 by a third-party, MDA has no QA/QC data from the Firstgold 1996-1997 drilling programs. The petrological samples were washed of fines, represent only a small, hand-selected portion of the sample interval, and therefore are not useful for the purposes of a QA/QC analysis.

Firstgold instituted a formal QA/QC program in 2007, described in an undated and anonymous QA/QC protocol document, that included the insertion of analytical standards and blanks into the primary sample stream, as well as the analysis of field-duplicate samples that were submitted after the primary sample assays were received. MDA compiled and analyzed the resultant QA/QC data provided by Firstgold.

#### **14.3.1 Analytical Standards**

Standards are used to evaluate the analytical accuracy and precision of the assay laboratory during the time the primary drill samples were analyzed.

MDA was provided with 287 standard results from the 2007 and 2008 drilling programs. Samples from 18 of the 109 holes drilled do not have accompanying standard analyses; 13 of the 18 holes without standards contribute samples to the resource estimation. The insertion ratio implied by the number of standards and the total gold analyses for these holes in the database is one standard for every 17 drill samples. The drill samples and associated standards were analyzed by Chemex.

MDA does not have any documentation of the 13 standards used by Firstgold, nor was the name (the standards are simply numbered 1 through 13) or source of the standards provided, although the QA/QC protocol document states that standards were to be acquired from Rocklabs of New Zealand. The expected values were provided by Firstgold without standard deviation data.

The standard results are summarized in Table 14.1 (samples with insufficient material for analysis and two results that were likely to actually be from blank samples were excluded). The means of the standard analyses are quite close to the expected values for most of the standards, although they tend to be lower than the expected values of the standards in 2007. A low bias in the Chemex analyses might be present in both 2007 and 2008, however, as evidenced by the higher number of analyses below the expected value than above. A more comprehensive review of the data would require full documentation of the standards.



**Table 14.1 Summary of Results of Firstgold Analytical Standards**

Drill Hole Series	Standard	Expected Value	No. of Analyses	Mean	Percent Diff.	Min.	Max.	No. Below Exp. Value	No. Above Exp. Value
2007 holes	1	0.012	26	0.012	0.0%	0.011	0.013	7	2
2007 holes	2	0.030	28	0.029	-3.3%	0.025	0.033	18	6
2007 holes	3	0.054	27	0.052	-3.7%	0.046	0.058	19	5
2007 holes	4	0.012	14	0.011	-8.3%	0.009	0.013	5	3
2007 holes	5	0.030	17	0.029	-3.3%	0.024	0.032	9	5
2007 holes	6	0.054	12	0.051	-5.6%	0.045	0.056	10	1
2008 holes + NT07-01	7	0.012	24	0.011	-8.3%	0.009	0.013	11	4
2008 holes + NT07-01	8	0.030	26	0.030	0.0%	0.027	0.032	7	8
2008 holes	9	0.053	10	0.054	1.9%	0.049	0.062	7	3
2008 holes + NT07-01	10	0.012	29	0.012	0.0%	0.009	0.013	13	3
2008 holes + NT07-01	11	0.030	21	0.030	0.0%	0.027	0.032	8	5
2008 holes + NT07-01	12	0.053	13	0.052	-1.9%	0.049	0.055	8	3
2008 holes	13	0.012	6	0.012	0.0%	0.011	0.013	1	1

### 14.3.2 Check Assays

MDA has nine American Assay check assays of original Chemex pulps, with one check each of nine holes within the sequence RCM07-01 to 19. The American Assay and Chemex means are identical (0.032 oz Au/ton).

### 14.3.3 Preparation Blanks

The Firstgold QA/QC protocol document states that blank material was to be prepared from approximately 100 kilograms (220 pounds) of drill cuttings with assay results of less than 0.005 g Au/t (0.0001 oz Au/ton). The samples were to be thoroughly mixed and split into 1 kilogram (2.2 pounds) packets for insertion into the sample stream.

Preparation blanks are used to test for cross contamination between drill samples in the analytical laboratory, which is most common during sample-preparation stages. In order for the blanks to accomplish this, they must be sufficiently coarse to require the same crushing stages as the drill samples. It is also important for blanks to be placed in the sample stream immediately after mineralized samples (which would be the source of most cross-contamination issues). Blank results that are greater than five times the detection limit are typically considered failures that require further investigation and possible re-assay of associated drill samples.

MDA has the results of 24 blanks inserted into the sample stream of 18 holes drilled in 2008; the gold values from the previous sample are not known. Twelve of the blanks have values less than the detection limit (<0.0001 oz Au/ton), 10 lie between 0.0001 and 0.0004, and two have anomalously high results (0.0062 and 0.013 oz Au/ton).

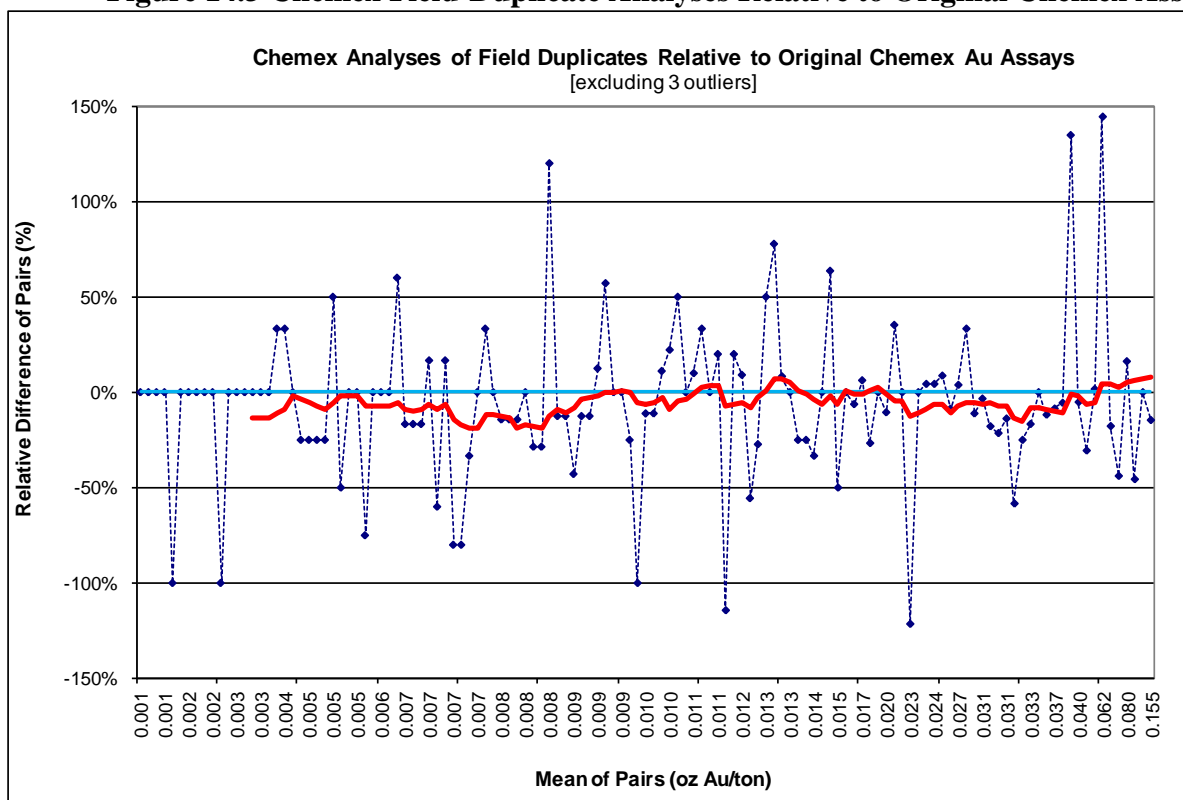


#### 14.3.4 Field Duplicates

The Firstgold RC field duplicates are secondary splits of the drill cuttings collected at the rig at the same time as the primary samples. Field duplicates are mainly used to assess inherent geologic variability and sampling variance.

MDA was provided with 131 field-duplicate analyses by Chemex that can be compared to the original Chemex analyses. The field duplicates are from 66 RC holes, including RCM07-01 through 75, RCM08-01 through 19, and NT07-01. The number of duplicates relative to the associated primary assays implies an analytical rate of one field duplicate for every 32 primary samples. The field-duplicate analyses are compared to the primary assays in Figure 14.3, with three outlier pairs excluded.

**Figure 14.3 Chemex Field-Duplicate Analyses Relative to Original Chemex Assays**



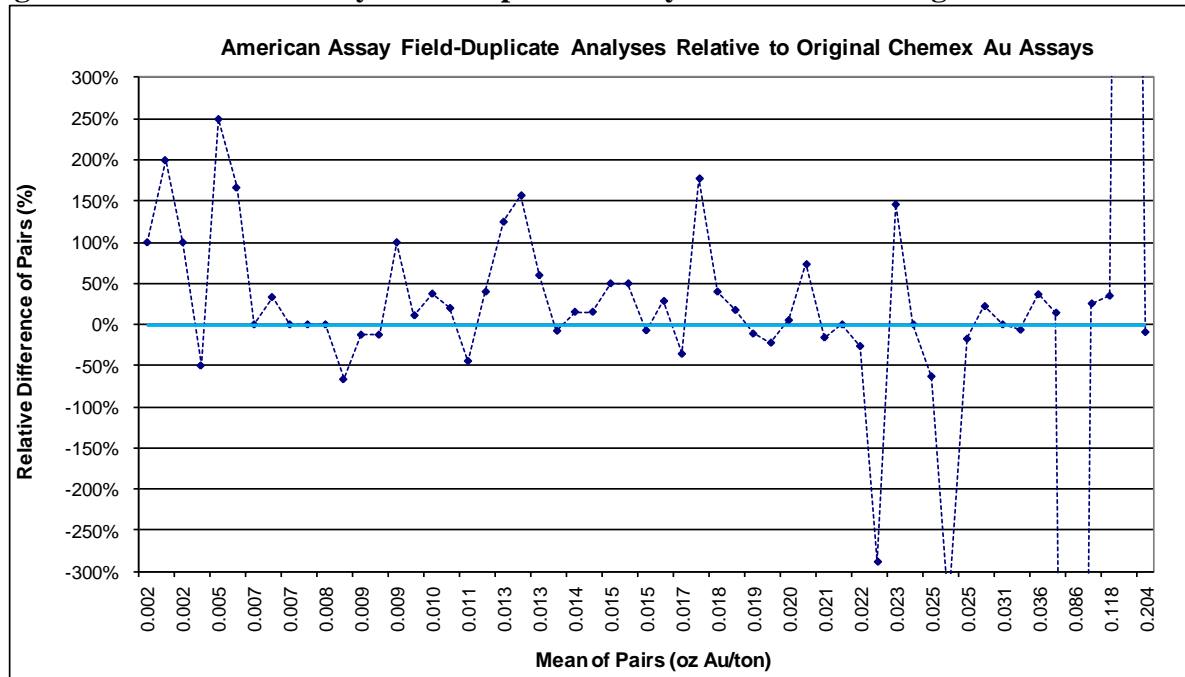
A very slight low bias in the field-duplicate analyses relative to the original assays may be evident in the graph, but the means of the two sets of data are identical (0.017 oz Au/ton). Additional data are needed to prove the existence of a low bias. The absolute value of the relative differences between the sample pairs averages 25%.

There are an additional 57 field-duplicate samples analyzed by American Assay that can be compared to the original samples, which were assayed by Chemex, although the differing laboratories lead to additional factors when analyzing the data statistically. These RC field duplicates are from 27 RC holes, including NT08-03 and 26 holes in the sequence of RCM07-20 through 75, with an implied



analytical rate of 1 duplicate for every 33 primary samples. The field-duplicate results are compared to the original Chemex assays in Figure 14.4.

**Figure 14.4 American Assay Field-Duplicate Analyses Relative to Original Chemex Assays**



The relative difference plot shows that the field duplicates tend to be higher grade than the original samples, and the mean of the duplicates (0.027 oz Au/ton) is higher than the original samples (0.024 oz Au/ton). The variability indicated by the relative differences in the paired data exceeds that seen in Figure 14.3. More data are required before definitive conclusions can be reached, however.

#### 14.4 Discussion of QA/QC Results

Based on their duplicate-pulp check assaying of original Duval results, Lacana concluded that their one-assay-ton fire assays were uniformly slightly lower than the original 1/2-assay-ton fire assays of Duval. While the two sets of Lacana duplicate-pulp data are indeed systematically lower-grade than the original Duval assays, the discrepancy could also be due to heterogeneities in the coarsely crushed samples, which could lead to sub-samples of the coarse material having varying gold contents. Another possibility is there were problems in the sub-sampling itself that caused the bias.

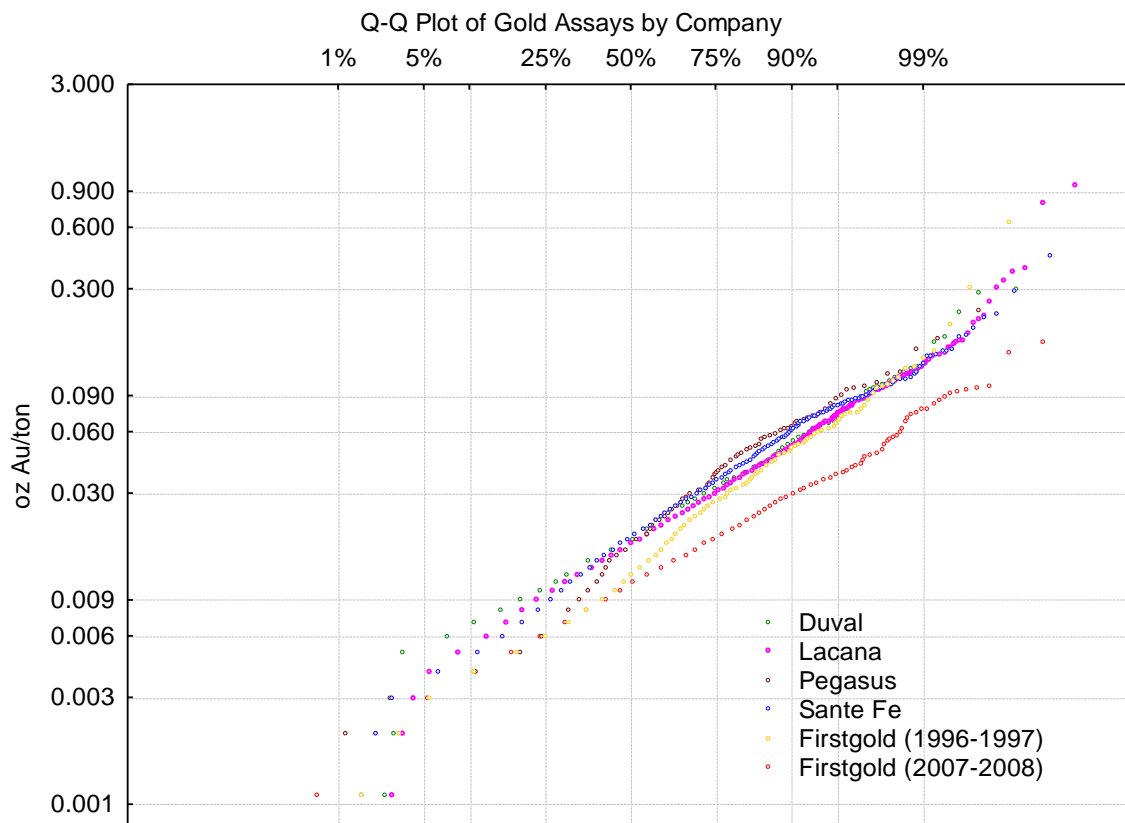
The Chemex analyses of the Firstgold RC field duplicates show no significant issues with respect to sample bias caused by splitting at the drill rig or in the variability of the data. The remaining Firstgold QA/QC data are either insufficiently documented or do not have enough data to allow for meaningful conclusions.



## 14.5 Comparison of Drill Programs

As Firstgold's 2007 and 2008 drilling programs are the best documented, used up-to-date reverse-circulation drilling equipment, and implemented the most QA/QC protocols, statistical comparisons were completed that compared the results from these programs to those of other companies, including the older Firstgold drilling. Figure 14.5 is a quantile-quantile plot that compares the assay populations of the various operators at Relief Canyon. The graph shows the 2007-2008 Firstgold drill data to be significantly lower grade than the assay data from other operators; the Firstgold 1996-1997 gold assay population is also lower grade, although less so.

Figure 14.5 Q-Q Plot of Gold Assays by Company



There are problems with these comparisons, however, due to spatial biases. The Firstgold holes are drilled on post-mining topography, so that many holes are collared in the footwall of significant mineralization and therefore drilled proportionally less mineralized material; this is especially true of the 2007-2008 Firstgold holes.

Comparisons involving other companies have problems as well. Land constraints prohibit meaningful comparisons involving Santa Fe holes (Figure 11.1), and Pegasus has too few holes for meaningful comparisons.





The most meaningful comparisons can be made using Lacana and Duval holes. These two populations are seen to be reasonably close on Figure 14.5, and their mean and median gold values compare well (0.025 and 0.017 oz Au/ton for Lacana vs. 0.026 and 0.018 oz Au/ton for Duval, respectively).

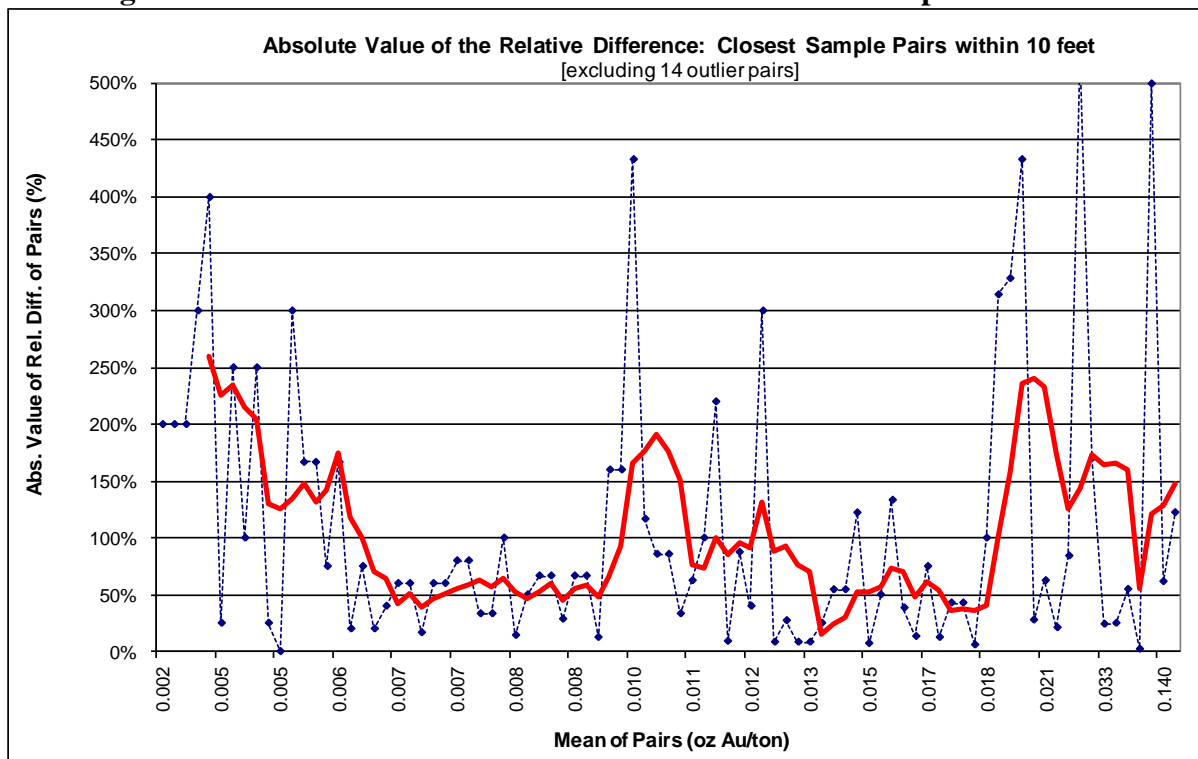
## 14.6 Paired-Sample Analysis

In order to remove spatial biases from comparisons of drill data, pairs of samples from within the mineral domains modeled by MDA that consist of samples from different holes and lying no more than 10 feet apart were compared. Since any sample pair may be comprised of samples from the same company or same drill program, statistical comparisons of the mean and median are not particularly meaningful. The data can provide information with respect to the variability of closely spaced gold values from different holes, however.

Figure 14.6 shows a graph that plots the absolute values of the relative differences between the gold values in the 87 sample pairs meeting the criteria (14 additional sample pairs with extreme relative differences were excluded for clarity); the red line is a moving average that provides a visual guide to the trend of the relative differences.

The plot shows a ‘background’ variance of about 50% in the gold values of samples in each pair, with this background value being exceeded in a significant number of cases. These data provide evidence of substantial variability in gold values in closely spaced drill samples at Relief Canyon.

**Figure 14.6 Absolute Value of the Relative Difference of Sample Pairs Within 10 feet**





## **15.0 ADJACENT PROPERTIES**

The Relief Canyon gold deposit extends onto ground controlled by Newmont, presently leased to Victoria Resources, to the west, south, and southeast of the Firstgold property. MDA is not aware of work completed on this adjacent ground beyond what is presented in this report.



## 16.0 MINERAL PROCESSING AND METALLURGICAL TESTING

The following information on metallurgical testing and mineral processing at Relief Canyon is summarized from reports that were provided to MDA by Firstgold. The author is not an expert with respect to metallurgy and mineral processing. MDA presents these data to fulfill reporting requirements of NI 43-101 and to document the work completed to date.

The information in this section is used in this report for the sole purpose of assisting in the determination of cutoff grade(s) for use in the reporting of mineral resources at Relief Canyon. For the purposes for which the data are being used in this report, MDA believes that the materials used in the historic testing adequately represent the mineralization within the Relief Canyon deposit.

Relief Canyon is a predominantly oxidized to partially oxidized gold deposit that metallurgical testing and actual mining experience indicate is amenable to cyanide heap-leach processing. The project benefits from having a history of production, including the approximate average gold recoveries achieved. The average recovery realized during Lacana's run-of-mine heap-leach operation was reportedly 45% (Pegasus Gold Inc., 1989) to 48% (Wojcik, 1996, citing Canadian Mines Handbook, 1986), while the average recovery of the Pegasus operation, which consisted of leaching crushed and agglomerated material, was 65% in 1987 (Pegasus Gold Inc., 1989) and 70% for 1987-1988 (Wojcik, 1996).

Table 16.1 summarizes historical metallurgical testing data from Relief Canyon that was reviewed by WGM (Fernet *et al.*, 1996). In cases where MDA was provided appropriate documentation, the test work is described in more detail below. MDA did not have access to the report by Macy (1994) that apparently describes results of testing on the existing heap material that were conducted by Welsh. MDA also did not have a copy of the report by Mine and Mill Engineering Inc. (1983).

**Table 16.1 Summary of Historical Metallurgical Data from Relief Canyon Reviewed by WGM**  
(Adapted from Fernet *et al.*, 1996)

Process	Size ( inches)	Au Extraction	NaCn (lb/ton)	Cement (lb/ton)	Source
Agglomeration	-3/4	80%	1.0	7	Fiannaca & Easdon (1984)
Run-of-Mine	-	70%	ND	-	Fiannaca & Easdon (1984)
Agglomeration	-1/4	80%	0.21	10	Dawson Labs (1983)
Agglomeration	-1/2	78-87%	0.5-0.95	10	Kappes Cassiday (1983)
Agglomeration	-3/4	65-70%	ND	ND	Mine & Mill Eng. (1983)
Run-of-Mine	-	48%	ND	ND	Lacana (1984-1985)
Agglomeration	"3/4"	65-80%	ND	ND	Pegasus (1986-1990)
Agglomeration	-3/4 min	48-70%	0.21-1.0	7-10	Summary/Agglomeration
Run-of-Mine	-	48-65%	ND	-	Summary/Run-of-Mine
Existing Heaps	-	8.3%	1.56	-	Macy (1994)

ND = not determined



The following summary of metallurgical work completed by operators prior to Firstgold is taken from Fiannaca and Easdon (1984), Fiannaca (1982), Fiannaca and McKee (1983), and Shoemaker (1983), with additional information from original laboratory reports as cited. Shoemaker reviewed and summarized 13 metallurgical reports of testing performed in 1982 and 1983 for Lacana; MDA has reviewed copies of eight of these reports. Of the five metallurgical reports reviewed by Shoemaker but not available to MDA, four are 1982 and 1983 reports by Kappes, Cassidy and Associates (“KCA”) that describe bottle roll and column-leach testing for Lacana; some information on this testing can be gleaned from other reports, and at least some of these reports apparently were reviewed by WGM as shown on Table 16.1. The fifth report not provided to MDA was written by Mine and Mill Engineering Inc., but this work relates to barrel and agitation leach tests performed by Dawson Metallurgical Laboratories, Inc. (“Dawson”) that were described by Salisbury (1983a); this appears to be one of the studies reviewed by WGM as shown on Table 16.1.

In addition to these metallurgical programs, Firstgold engaged KCA to perform column-leach testing on samples from Relief Canyon in 2009, but finalized results are not available.

## **16.1 Lacana**

### **16.2 1982 to 1983 Test Work**

Lacana undertook bench-scale metallurgical testing at Relief Canyon in the fall of 1982 with the goals of corroborating data they had obtained from Duval and further evaluating the metallurgy of the Relief Canyon mineralization within their two-month initial option agreement. In October 1982, Lacana gathered three sets of samples that were subsequently sent for metallurgical testing.

The first sample set was created from composite samples of splits of coarse rejects from Duval drill-hole samples, based on a classification scheme that defined five mineral types developed by Lacana. Four of these were strongly oxidized, with one characterized by low clay and moderate jasperoid (~9% of the cuttings), one having moderate clay but low silica (~11% of the cuttings), one high in jasperoid (~19% of the cuttings), and one low in both silica and clay (~51% of the cuttings). The fifth type was weakly oxidized and moderately carbonaceous (~10% of the cuttings). These composites are sometimes referred to as the 9%, 10%, 11%, 19%, and 51% samples, referring to their relative percentage of the cuttings.

A second sample set consisted of four splits of coarse rejects from four of Duval’s holes: hole 37 from 40 to 45 feet, hole 10 from 45 to 50 feet, hole 12 from 5 to 10 feet, and hole 15 from 185 to 190 feet.

The third sample set came from a bulldozer trenching program that collected bulk samples of the three most abundant mineralization types at Relief Canyon, as described above, plus one sample of relatively high-grade material according to Duval data. Nine trenches were cut adjacent to, or over, Duval holes whose logs indicated near-surface zones of acceptable grades of the various mineralization types. Approximately 2.5 tons of potentially ore-grade material was collected. The purpose of this trenching program was to examine the relationship between Duval’s average grade of drill intervals to Duval’s “inferred reserve” block estimates based on the average assay of the



trench highwall samples. Equal proportions of sample material were taken from the various trenches of each mineral type from depths of at least 10 feet; six 50-gallon drums and 12 five-gallon bucket samples were collected. Samples 1A and 1B came from the oxidized, low-silica, low-clay mineralization (Type E or 51% mineralization). Samples 2A and 2B came from oxidized jasperoidal material (Type D or 19%). Sample 3A came from oxidized, moderate-clay, low-silica (Type C or 11%). Sample 4H was from the relatively high-grade mineralization as indicated by Duval logs. The geology of the trenches was mapped, and the trench highwalls were sampled at intervals corresponding with Duval's drill sample intervals. The samples were taken as five foot-long by six inch-wide channel samples on vertical lines spaced 10 feet apart, and each sample was analyzed by one-assay-ton fire assay and rapid hot-cyanide digestion followed by atomic absorption analysis ("NaCN-AA").

The drill cuttings from the first two sample sets were subjected to either NaCN-AA or bottle roll or agitation leach tests. The bulk samples from the trenching program were analyzed by KCA, Dawson, and Hunter. The testing included cyanide bottle roll, column leach, barrel leach, assay screen analysis, agglomeration, crushing, and gravity concentration. As a check on the Dawson and KCA results, 23 samples representative of the bulk-sample material were sent to Hunter for comparative one-assay-ton fire assay and hot cyanide extractable-AA finish analyses.

Fiannaca and Easdon (1984) summarize the 1982 cyanide leach results for the drill cuttings from the first two sample sets as follows:

- *"Cyanide leachability varied directly with degree of oxidation and indirectly with carbon content, and*
- *The three most prevalent ore types indicated favorable cyanide leachabilities ranging between 60-90% of the head assays."*

Agglomeration was thought to potentially enhance percolation. Results from the cyanide leach tests run on the bulk trench samples led to the following conclusions (Fiannaca and Easdon, 1984):

- *"The three most prevalent ore types indicated excellent recoveries;*
- *Leachability of both coarse and fine crushes was similar;*
- *The project could be considered a candidate for heap leaching;*
- *Pilot leach tests of large ore samples should be conducted in the field as soon as possible; and*
- *[Lacana] could proceed immediately to [its] first phase of drilling."*

The remainder of this subsection describes the 1982 to 1983 test work completed on Lacana's sample sets.

Kappes, Cassiday and Associates. Four of the bulk samples from the bulldozer trenching program were sent to KCA for analysis. The samples consisted of two 5-gallon buckets of Samples 1 A and B,



two 5-gallon buckets of Samples 2 A and B, two 5-gallon buckets of Sample 3A, and one 3-gallon bucket plus six bagged samples of Sample 4H as described above (Fiannaca, 1982). As reported by Shoemaker (1983), KCA performed four 24-hour bottle-roll tests on composites of pulverized samples. The four extractions were said to be in the mid to high 80% range, with calculated head analyses of the samples varying from 0.042 to 0.069 oz Au/ton (Shoemaker, 1983).

According to Figure 2 of Shoemaker's (1983) report, KCA also performed two column-leach tests on samples from Relief Canyon, but his report does not describe the samples and MDA was not able to obtain the KCA reports. One test involved column leaching of two samples of as-received 3-inch material. According to Shoemaker (1983) and the single figure from the KCA report that MDA was provided, one sample leached for 61 days had a calculated head of 0.040 oz Au/ton with 0.031 oz Au/ton recovered, for a gold extraction of 77%. The second sample, leached for 36 days, had a calculated head of 0.034 oz Au/ton with 0.027 oz Au/ton recovered for a gold extraction of 79%. The second column-leach test involved column leaching of four samples agglomerated with a combination of  $\text{Ca}(\text{OH})_2$  and Portland cement and ranging in size from 3/8 to 5/8 inch. Extraction from all four samples is shown in Table 16.2.

**Table 16.2 Results from Column Leach Test on Lacana Agglomerated Bulk Samples**  
(Shoemaker, 1983; Figure from a KCA 1983 report)

KCA Test Number	Ore size ( inches)	Gold Recovered	Calculated Head	Extraction %
		oz Au/t	oz Au/t	
2921	1/2	0.039	0.048	81%
2976	3/8	0.034	0.039	87%
2962	1/2	0.018	0.023	78%
3044	5/8	0.034	0.043	79%

Dawson Metallurgical Laboratories, Inc. Five composite samples of minus 6-inch size underwent bottle-roll cyanide agitation leaching for 48 hours (Salisbury, 1982a; Dawson, 1982; Fiannaca, 1982; Shoemaker, 1983) (Table 16.3). Fiannaca's (1982) report and handwritten notes on copies of Salisbury's (1982a) report indicate the five samples were composites of coarse rejects from Duval drill cuttings representing the five mineral types described above. The samples used for bottle-roll testing weighed approximately 4 pounds each (Salisbury, 1982a). Residues from two of the samples were screened at 35 mesh prior to assaying. Calculated head grades ranged from 0.032 to 0.057 oz Au/ton. The weakly oxidized, moderately carbonaceous sample had a gold extraction of 42.3% and 83.6% silver. Gold extraction of the remaining four strongly oxidized samples ranged from 62.2% (42.1% Ag), to 79.4% (32.2% Ag) (Salisbury, 1982a). Shoemaker (1983) noted that these extractions were much more erratic than those in other Dawson tests and, with the exception of one test, recoveries were high for coarse material leached for only 48 hours. Based on this work, Shoemaker (1983) suggested that a run-of-mine heap leach should be considered.



**Table 16.3 Results of Cyanide Agitation Tests on Various Types of Mineralization**  
(Modified from Salisbury, 1982a)

Sample	Residue (oz/ton)		Calc. Head (oz/ton)		Recovery (%)		Reagents (lb/ton)	
	Au	Ag	Au	Ag	Au	Ag	Ca(OH) <sub>2</sub>	NaCN
Ox: low clay, moderate jasperoid	0.010	0.09	0.049	0.13	79.4	32.2	0.9	0.8
Carbonaceous	0.030	0.08	0.052	0.49	42.3	83.6	1.8	3.8
Ox: moderate clay, low jasp.	0.012	0.10	0.032	0.17	62.2	42.1	0.9	2.3
High jasperoid	0.019	0.18	0.057	0.22	67.0	16.1	0.9	3.4
Ox: low clay, low jasp.	0.013	0.09	0.044	0.14	71.2	33.2	0.9	2.7

Four un-composited splits of coarse rejects from Duval drill holes were tested for gravity concentration (panning) with fire assay (Dawson, 1982; Salisbury, 1982a; Fiannaca, 1982). About one half of each sample was hand panned and examined under a binocular microscope, but the concentrates showed no free gold in spite of assaying from 0.1 to 1.9 oz Au/ton (Salisbury, 1982a). The gold recoveries in the gravity tests were low; Brogoitti (1983a) concluded that this process had no application for Relief Canyon mineralization.

Lacana also sent to Dawson four as-received bulk samples from their bulldozer trenching program described above. Three of the bulk samples (Samples 1 A and B, 2A and B, and 4H) consisted of two 55-gallon drums of material, and the fourth (Sample 3A) consisted of one 55-gallon drum (Fiannaca, 1982). Head values of 0.048, 0.041, and 0.021 oz Au/ton were obtained on the three oxidized bulk samples by assay screen analyses (Salisbury, 1982a). Each sample weighed approximately 77 pounds. The samples were agitated for 30 minutes in a cement mixer at about 40% solids, and the resulting slurry was wet screened into several fractions for assay. The one sample with moderate clay content had the minus 200-mesh material removed by decanting from minus 35 mesh in order to evaluate the values in slimes (Dawson, 1982). The purpose of the assay screen analysis was to determine whether sizing could be used to upgrade potential mineral. According to Brogiotti, (1983a), the gold values were more or less distributed uniformly throughout the size fractions for two of the samples, suggesting that sizing will not effectively upgrade Relief Canyon mineralization.

As a check on Dawson's work, 23 samples representative of the material Lacana had shipped to Dawson from the trenches were sent to Hunter for comparative one-assay-ton fire assay and NaCN-AA analyses (Fiannaca, 1982). The intent was to examine the relationship between Duval's point estimates based on average assay of drill intervals to Duval's inferred reserve block estimate based on average assay of highwall samples. Fiannaca and Easdon (1984) show the comparison in their Figures 10A and 10B.

Salisbury (1982b) reported on the results of 48-hour agitation cyanide leaches on samples 1, 2, and 4 supplied by Lacana that were crushed to minus ¾ inch. These samples were from the 1982 bulldozer trenching program described above. Sample 1 was oxidized, low-silica, low-clay material, sample 2 was oxidized jasperoidal material, and sample 4 was "(supposedly) relatively high grade" material



(Fiannaca, 1982). The products were assayed by Union Assay Office (“Union”) of Salt Lake City, UT, and by Assay Lab, Inc. (“Assay”) of West Jordan, UT (Salisbury, 1982b). About 7 pounds of mineral were taken from each of samples 1 A and B, 2 A and B, and 4H, crushed to minus  $\frac{3}{4}$  inch, and agitated 48 hours at 50% solids with the equivalent of 10 lbs NaCN/ton of mineralized material (Salisbury, 1982b). The resulting slurry was filtered and washed prior to screening the residue into several fractions for assaying. According to notes on the copy of a Salisbury memo (1982b), the results of sample 1 were in error, and Dawson repeated the analyses (Salisbury, 1983a; Duncan, 1982).

Table 16.4 shows the results of this testing on the three samples, using the corrected values for sample 1. Shoemaker (1983) noted that the extractions for these samples were lower than for samples of  $\frac{5}{8}$ ,  $\frac{1}{2}$ , and  $\frac{3}{8}$ -inch sizes that are described below. Assay screen analysis of sample 4H was also conducted in this study. As with the assay screen analyses on the three other samples described above, the results demonstrated that no “throw-away” product is obtained by crushing and screening (Salisbury, 1982b). Upon completion of this study, Lacana requested that Monitor Lab in Elko, NV, be the primary lab, and that Dawson would continue to use Assay, provided their results agreed fairly well with Monitor’s (Easdon, 1983a).

**Table 16.4 Results of Agitation Leaching on Minus  $\frac{3}{4}$  Inch Material**

(Salisbury, 1983a for sample 1 A&B; Salisbury, 1982b for remaining data)

Sample	Residue oz Au/ton		Calculated Head oz Au/ton		Recovery (%)	
	Assay Lab	Union Assay	Assay Lab	Union Assay	Assay Lab	Union Assay
1 A&B *	0.015		0.044		65.8	
2A	0.028		0.064		56.7	
2 A&B repeat	0.015	0.020	0.044	0.046	65.8	56.8
4H	0.016	0.020	0.053	0.052	69.6	62.4

\* Duncan (1982) did not identify the lab used for the residue value, but based on the original value he cited, it is assumed to have been Assay. Salisbury’s (1982b) calculated head value from Assay is reported here. Duncan’s (1982) recovery value is reported here, with the assumption that it also represents information from Assay.

The same material from sample 1 A and B that was re-analyzed in the study just described was subjected to a barrel leach, with the material crushed to minus  $\frac{3}{4}$ -inch and agglomerated with the equivalent of 10 pounds/ton Portland cement (Salisbury, 1983a). Sample 1 A and B was from the 1982 bulldozer trenching program and was oxidized, low-silica, low-clay material (Fiannaca, 1982). About 650 pounds of sample were crushed and agglomerated at 5.5% moisture. The pellets were loaded into a barrel and leached for 15 days with a solution containing the equivalent of 2 pounds NaCN/ton (Salisbury, 1983a). After washing, the residue was screened into several fractions and assayed by both Assay and Union laboratories. Table 16.5 shows the results of this analysis.

**Table 16.5 Results of Barrel Leach on Agglomerated Minus  $\frac{3}{4}$  Inch Agglomerated Material**

(Salisbury, 1983a)

Sample	Residue oz Au/ton		Calculated Head oz Au/ton		Recovery (%)	
	Assay Lab	Union Assay	Assay Lab	Union Assay	Assay Lab	Union Assay
1 A&B	0.021	0.019	0.055	0.059	61.8	67.8

Finally, the second half of mine-run sample 1 A and B was tumbled in a cement mixer at 40% solids for 30 minutes, followed by screening at 35 mesh (Salisbury, 1983a). The minus 35-mesh fraction was





cyanided by agitation with a solution containing the equivalent of 3 pounds NaCN/ton at a pH of 11.0; samples taken at 24 and 48 hours showed that leaching was complete in 24 hours. The plus 35-mesh portion was barrel leached for 18 days with a solution containing the equivalent of 2 pounds NaCN/ton; the residue was washed, screened into several fractions, and assayed. Table 16.6 gives the results of this testing.

**Table 16.6 Results of Combination Barrel and Agitation Leach on Minus  $\frac{3}{4}$  Inch Material**  
(Salisbury, 1983a)

Sample	Residue oz Au/ton		Calculated Head oz Au/ton		Recovery (%)	
	Assay Lab	Union Assay	Assay Lab	Union Assay	Assay Lab	Union Assay
1 A&B	0.017	0.014	0.054	0.051	69.1	72.6

In March 1983, Dawson conducted a column leach test on an 80 pound sample crushed to minus  $\frac{1}{4}$  inch and agglomerated with the equivalent of 10 pounds/ton of Portland cement (Salisbury, 1983b). The sample came from a barrel of mine run containing about 19% jasperoid. The sample was leached for 14 days with a solution containing the equivalent of 2 pounds/ton NaCN. A moisture sample of the finished product contained 8.4% water. All products with the exception of the last two solution samples were assayed by both Union and Assay, with the results in “*excellent agreement*” (Salisbury, 1983b). Based on Assay’s results, extraction was 80.0%, with the assay head being 0.059 oz Au/ton, the calculated head 0.055 oz Au/ton, and the residue 0.011 oz Au/ton (Salisbury, 1983b).

Three cyanide agitation leaches lasting 48 hours were conducted on samples crushed to  $\frac{3}{8}$ ,  $\frac{1}{2}$ , and  $\frac{5}{8}$  inch (Salisbury, 1983c; Shoemaker, 1983c). It is not apparent from Salisbury (1983c) exactly what these samples represent, except that they appear to be from a barrel of material supplied by Lacana, probably a bulk sample from the bulldozer trenching. The products were assayed by both Union and Assay (Salisbury, 1983c). About 110 pounds of minus  $\frac{5}{8}$ -inch mineralized material was coned and quartered to about 33 pounds, followed by splitting out of three 7-pound portions (Salisbury, 1983c). One portion was leached at minus  $\frac{5}{8}$  inch for 48 hours with the equivalent of 10 pounds NaCN/ton. The second portion was crushed to minus  $\frac{1}{2}$  inch, and the third portion was crushed to minus  $\frac{3}{8}$  inch. Both were also leached for 48 hours with the equivalent of 10 pounds NaCN/ton. After leaching, the slurries were filtered, followed by washing the residues prior to screening into several fractions for assay. Table 16.7 shows the results of this agitation leach testing.

**Table 16.7 Results of Agitation Leaching of Material of Various Sizes**  
(Salisbury, 1983c)

Size	Residue oz Au/ton		Calculated Head oz Au/ton		Recovery (%)	
	Assay Lab	Union Assay	Assay Lab	Union Assay	Assay Lab	Union Assay
- $\frac{3}{4}$ in.	0.014	0.010	0.040	0.049	64.9	79.7
- $\frac{1}{2}$ in.	0.014	0.010	0.042	0.046	67.7	78.3
- $\frac{3}{8}$ in.	0.012	0.010	0.041	0.046	70.9	78.3

Brogioitti (1983b) discussed the lack of correlation of assays, although his correspondence does not make clear which assays are problematic. He noted that the degree of accuracy often depends on the amount of sample used for assaying. Variations in equipment can also sometimes cause different



results. However, he felt that in spite of assay problems, recoveries in the 65-80% range could be expected at Relief Canyon on a heap-leaching operation, when the mineralized material is crushed to minus  $\frac{3}{4}$  inch and agglomerated.

Based on review of Dawson's results reported in Salisbury (1982a), Easdon (1982) commented that Ag recoveries are sufficiently high that a carbon circuit may be precluded in a conventional heap leach and instead zinc precipitation may be required. He further indicated that the results of the cyanide agitation bottle tests on the four main material types reported above may be the maximum recoveries in a heap leach, i.e., 65% to 70%. He also concluded that based on the assay screen analysis of the low-silica, low-clay mineral (type 1) where about 50% of the contained gold is in the minus 35-mesh fraction, it is possible that 20-25% by weight of the deposit may contain significant gold in the fine fractions, which would warrant de-sliming and subsequent vat leaching of the slimes.

Shoemaker's (1983) review of the Dawson work indicated that there were variations in recoveries when calculated from assays made by two different laboratories. He further noted that "...recoveries calculated from agitation cyanidation of coarse ore samples for relatively short times would not be representative as they would tend to be on the low side." He also reported that "Column leaches were not carried out for extended periods of time and at the ends of the tests, gold was still being produced. Results of gravity concentration, screen assays and separate cyanidation of + and - fractions of - $\frac{3}{4}$ " ore samples revealed no problems with coarse free gold". Reagent usages were as would be expected during testing and did not indicate potential problems with acidity or cyanicides (Shoemaker, 1983).

Based on reports from KCA and Dawson concerning their 1982 testing, Brogoitti (1983a) reported that agglomeration would be required for any heap leaching of bulk material, because both labs experienced column plugging on material that was not agglomerated. He further reported that based on telephone conversation with Dawson, they had completed a barrel-leach test on an agglomerated sample crushed to minus  $\frac{3}{4}$  inch. The sample was agglomerated with 10 pounds of cement, and overall extraction for this test was 61.8% (Brogoitti, 1983a) (Table 16.5 above). Brogoitti (1983a) described a second test in which the sample was screened to 35 mesh, followed by washing and column leaching of the +35-mesh portion and agitation leaching of the -35-mesh portion. The combined extraction was 65.7; about 30% of the test material was clay. He concluded that a nominal 62-65% recovery should be expected on material crushed to minus  $\frac{3}{4}$  inch, with possible improvement with the use of agglomeration for heap leaching.

### 16.2.1 Lacana Pilot Heap-Leach Test Work

In fall 1983, following an initial phase of drilling and bench-scale metallurgical testing, Lacana undertook pilot-scale heap-leach test work at Relief Canyon (Easdon, 1983b; Fiannaca and Easdon, 1984). Two 5,000-ton samples were studied, one crushed and agglomerated and the other processed as run-of-mine material. In addition to the pilot heap, Lacana installed a 20 by 4-foot column to test optimum stacking height for the run-of-mine material. From October 5 through November 2, the estimated total gold recovery for the run-of-mine heap was 155.85 oz for a projected recovery of 70.5%, assuming leaching of 4,700 tons of material grading 0.047 oz Au/ton (Easdon, 1983b). Solution-flow rate and gold recovery of the 20 by 4-foot column were nearly identical to those of the run-of-mine heap. Recovery for the agglomerated material exceeded 80% (Fiannaca and Easdon, 1984). The agglomerated material appeared to have been substantially diluted in mining by the



addition of overburden waste (Fiannaca and Easdon, 1984). Reagent consumption of both heaps was very low, and percolation was excellent.

Lacana used Hunter, Shasta, Pinson Mining Co., and Legend as assayers for this program. Hunter conducted cyanide digestion and fire assaying for gold and silver. Shasta performed fire assaying for gold and silver on five-assay-ton samples. Legend analyzed for gold and silver with atomic absorption and conducted one-assay-ton fire assays for gold and silver.

In a 1985 memo, Lacana staff described a classification system for the Relief Canyon mineralized material (Fiannaca, 1985), which was classified as follows:

- Clay
- Homogeneous breccia (clay, limestone, no jasperoid)
- Limestone
- Weakly silicified breccia (also called weak jasperoid)
- Moderately silicified breccia (also called moderate jasperoid)
- Strongly silicified breccia (also called strong jasperoid), and
- Carbonaceous breccia.

According to Fiannaca (1985), the clay, homogeneous breccia, and weak jasperoids will probably require agglomeration. He also commented that the “*carbonaceous ores are probably preg robbing.*”

### 16.2.2 Estimated Lacana Heap-Leach Recovery

Lacana began mining the open-pit Relief Canyon mine in August 1984, but closed it in October 1985 due to poor leach recoveries. Mears (2007) reported that Lacana was not able to achieve the heap-leach gold recovery rates in full operation that they had expected following the pilot study. In actual operation, a recovery of 48% was experienced (Fernette *et al.*, 1996, citing Canadian Mines Handbook, 1986). Pegasus (1989) reported that Lacana’s maximum recovery from leaching run-of-mine material was 45%. These recoveries are significantly lower than the 65% recovery that Mears (2007) reported was realized by Lacana’s pilot run-of-mine heap.

### 16.3 Pegasus Jasperoid Study

A metallurgical study of jasperoids from the north and mid-section pits of the Relief Canyon mine was undertaken in 1987, but MDA only has information on the results from part of that study (Rice and Geyer, 1987). MDA has no results for the column testing of one 1,500 pound sample of “normal jasperoids.”

Four 50-pound samples were selected from “normal jasperoids” for size fraction and assay analysis to understand in what sizes the gold is best liberated. Six sizes were analyzed. Three of the samples had extractions of 81%, 68%, and 70% based on “*a pure AA:Fire ratio*” with an average of 73%. The plus 2-inch fraction had extractions of 89%, 59%, and 51% respectively, averaging 66%. The fourth sample had a 42% extraction, with 67% extraction for the +2-inch fraction and 17% for the -1 to +1/2-inch fraction. Rice and Geyer (1987) suggested that the poor extraction from the fourth sample “*might indicate a serious silica encapsulation problem in this fraction which appears to be rare.*”



Fernette *et al.* (1996) provided the following summary from work by Pegasus at Relief Canyon:

*“Pegasus conducted additional test work and concluded that the high clay ore could be successfully leached if it was crushed and agglomerated prior to being placed on heaps by conveyor and stacker (Pegasus Gold, 1990).”*

### 16.3.1 Pegasus Heap-Leach Recovery

Various reports suggest that Pegasus achieved recoveries of 65% to 70% at Relief Canyon. The Pegasus 1989 annual report states that Pegasus recovery from their heap leaching of crushed and agglomerated ore in 1987 exceeded 65%. Fernette *et al.* (1996) state that, “no data is available from the Pegasus operation so actual gold recoveries are not known. According to the 1990 Pegasus Annual Report, during 1987 and 1988, the mine produced 83,600 ounces of gold from 4 million tons of ore with an average grade of 0.03 ounces of gold per ton. This would indicate that 70% of the gold in the ore was recovered.”



## 17.0 MINERAL RESOURCE ESTIMATES

### 17.1 Introduction

Mineral Resource estimation described in this section for the Relief Canyon project follows the guidelines of Canadian National Instrument 43-101 ("NI 43-101"). The modeling and estimate of the mineral resources, which were completed in July 2009, were done under the supervision of Michael M. Gustin, a qualified person with respect to mineral resource estimation under NI 43-101. Mr. Gustin is independent of Firstgold by the definitions and criteria set forth in NI 43-101; there is no affiliation between Mr. Gustin and Firstgold except that of an independent consultant/client relationship. There are no Mineral Reserves estimated for the Relief Canyon project as part of this report.

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

The mineral resources presented in this report for the Relief Canyon project conform to the definitions adopted by the Canadian Institute of Mining, Metallurgy and Petroleum in December 2000 and modified in 2005, and meet the criteria of those definitions, where:

*A Mineral Resource is a concentration or occurrence of natural, solid, inorganic or fossilized organic material in or on the Earth's crust in such form and quantity and of such a grade or quality that it has reasonable prospects for economic extraction. The location, quantity, grade, geological characteristics and continuity of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge.*

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

*An 'Inferred Mineral Resource' is that part of a Mineral Resource for which quantity and grade or quality can be estimated on the basis of geological evidence and limited sampling and reasonably assumed, but not verified, geological and grade continuity. The estimate is based on limited information and sampling gathered through appropriate techniques for locations such as outcrops, trenches, pits, workings and drill holes.*

Due to the uncertainty that may be attached to Inferred Mineral Resources, it cannot be assumed that all or any part of an Inferred Mineral Resource will be upgraded to an Indicated or Measured Mineral Resource as a result of continued exploration.



*An 'Indicated Mineral Resource' is that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics, can be estimated with a level of confidence sufficient to allow the appropriate application of technical and economic parameters, to support mine planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that are spaced closely enough for geological and grade continuity to be reasonably assumed.*

*A 'Measured Mineral Resource' is that part of a Mineral Resource for which quantity, grade or quality, densities, shape, and physical characteristics are so well established that they can be estimated with confidence sufficient to allow the appropriate application of technical and economic parameters, to support production planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that are spaced closely enough to confirm both geological and grade continuity.*

## **17.2 Resource Modeling**

### **17.2.1 Data**

A model was created for estimating the gold resources at Relief Canyon from data generated by Duval, Lacana, Pegasus, and Firstgold, including RC and limited core drill data. Project digital topography is provided by Firstgold. These data were incorporated into a digital database using State Plane coordinates, Nevada West zone, NAD83 datum, expressed in US Survey feet, and all subsequent modeling of the Relief Canyon resource was performed using Gemcom Surpac<sup>®</sup> mining software.

It is important to note that the project database includes a significant amount of data from holes drilled beyond the limits of the Firstgold property. Since the Relief Canyon gold deposit can be best modeled by using all available data, irrespective of land constraints, all available data were used in the resource estimation, although only resources controlled by Firstgold are reported herein.

### **17.2.2 Deposit Geology Pertinent to Resource Modeling**

The modeled Relief Canyon gold mineralization lies primarily within an envelope of breccia that lies immediately below the Grass Valley Formation. Within the project area, the contact between the Grass Valley Formation and underlying Cane Spring Formation, as well as the mineralized breccia horizon lying between the two units, forms a broad, northeast-trending antiform that plunges about 10° to the southwest. The thickest portions of the breccia, as well as the associated mineralization, lie primarily along the broad crest of the antiform, and the breccia and accompanying mineralization thins and pinches out down dip on the northwest limb and is very thin to nonexistent on the southeast limb. Locally, the breccia-hosted mineralization extends a short distance (usually less than 10 feet) into the overlying Grass Valley Formation.



### 17.2.3 Modeling of Geology and Water Table

Firstgold provided MDA with a set of cross sections that define the limits of alluvium, Grass Valley Formation, Cane Spring Formation, the breccia lying immediately below the Grass Valley Formation, jasperoids/jasperoid-rich breccias within the breccia unit, and mine dumps that partially fill mined-out areas, as well as several faults. The Firstgold sections were created using geologic logs of Firstgold drill holes in combination with interpretations of logging codes and historic cross sections from older holes. MDA digitized all units on the cross sections and created computer-generated three-dimensional solids of the alluvium and Cane Spring Formation polygons, as well as three-dimensional surfaces of the faults.

Approximately half of the holes in the project database note “dry” and “wet” intervals in the RC drilling, which MDA used to approximately model the groundwater surface. The modeling was hindered by insufficient data in many areas and inconsistencies in the logging of adjacent holes, but MDA believes that a reasonably accurate depiction of the water table was created.

### 17.2.4 Density

There are very limited rock density data available to MDA. Atiyeh (1986) reports that Pegasus used tonnage factors of 15.25 ft<sup>3</sup>/ton for mineralized and unmineralized breccia and 12.39 ft<sup>3</sup>/ton for unmineralized Grass Valley Formation in a 1986 estimation. Firstgold has used tonnage factors of 15 (Fernet et al., 1996) and 18 (Drossulis, undated) in internal estimations in the past.

The only documented density measurements known to MDA are reported by Hopkins (1985), who summarized tests completed by Lacana’s Engineering Department of the Relief Canyon mine. A blast-hole air-track rig was used to drill 50 four-inch diameter holes to depths of 5.5 to 14 feet. Cuttings from each hole were “meticulously” collected to prevent loss, the wet and dry weights of the cuttings were determined, the hole depth was measured, and the hole was immediately filled by weighed amounts of screened flux sand of known density (to determine hole volume). Using these data, the density of the material was determined for each of 48 holes (two holes were discarded from the study; Table 17.1).

**Table 17.1 Lacana Density Study**

Rock Type	Tonnage Factor (ft <sup>3</sup> /ton)	Specific Gravity	No. of Holes
Breccia	15.19	2.11	40
Limestone	12.99	2.47	5
Shale	14.29	2.24	3

Mears (2007) summarizes an additional density study by Pegasus in 1987; MDA does not have further documentation of this study, and Mears states that little is known of the methods used in the density determinations. The weighted average (using “percent tonnage”) of the Pegasus breccia tonnage factors is 14.3 (Table 17.2).



**Table 17.2 Pegasus Density Study**  
(Walker et al., 1987 as reported in Mears, 2007)

Item	Grass Valley Formation	Dike	Limestone	High-Clay Limestone Breccia	Limestone Breccia	Siliceous Breccia
Tonnage Factor (ft <sup>3</sup> /ton)	13.25	11.30	12.27	14.60	13.70	14.93
Specific Gravity	2.42	2.83	2.61	2.19	2.34	2.15
Percent Tonnage	15	9	8	31	25	12
Number of Samples	23	14	12	59	42	24
oz Au/ton	0.011	0.013	0.011	0.017	0.011	0.012

The tonnage factors MDA chose to use in the resource model are shown in Table 17.3.

**Table 17.3 Tonnage Factors Applied to Resource Model**

Unit	Tonnage Factor (ft <sup>3</sup> /ton)	Specific Gravity
Mine Dump	20	1.60
Alluvium	18	1.78
Grass Valley Formation	14	2.29
Mineralization (Breccia)	15	2.14
Cane Spring Formation	13	2.46

### 17.2.5 Gold Modeling

The mineral resources at Relief Canyon were modeled and estimated by evaluating the drill data statistically, utilizing the geologic interpretations provided by Firstgold to interpret mineral domains on cross sections spaced at 86-foot intervals, rectifying the mineral domain interpretations on long sections spaced at 20-foot intervals, analyzing the modeled mineralization geostatistically to establish estimation parameters, and estimating grades into a three-dimensional block model. All modeling of the Relief Canyon resources was performed using Gemcom Surpac<sup>®</sup> mining software.

**Mineral Domains.** MDA modeled the Relief Canyon gold mineralization by interpreting mineral-domain polygons on northeast-looking cross sections that span the extents of the deposit. A mineral domain is a natural grade population of a metal that occurs within a specific geologic setting. In order to define the mineral domains at Relief Canyon, the natural populations were first identified on quantile graphs that plot the gold-grade distributions of the drill-hole assays. This analysis led to the identification of low (~0.004 to ~0.010 oz Au/ton), medium (~0.010 to 0.030 oz Au/ton), and high-grade (>~0.030 oz Au/ton) gold populations, assigned to domains 100, 200, and 300, respectively. Ideally, each of these populations can be correlated with specific geologic characteristics that are captured in the project database to aid in the definition of the mineral domains.





The three mineral domains modeled by MDA occur almost exclusively within the breccia lying below the Grass Valley Formation; mineralization lying below the breccia was only rarely included due to the lack of geologic understanding and uncertainties related to possible down-hole contamination (see Section 12.7).

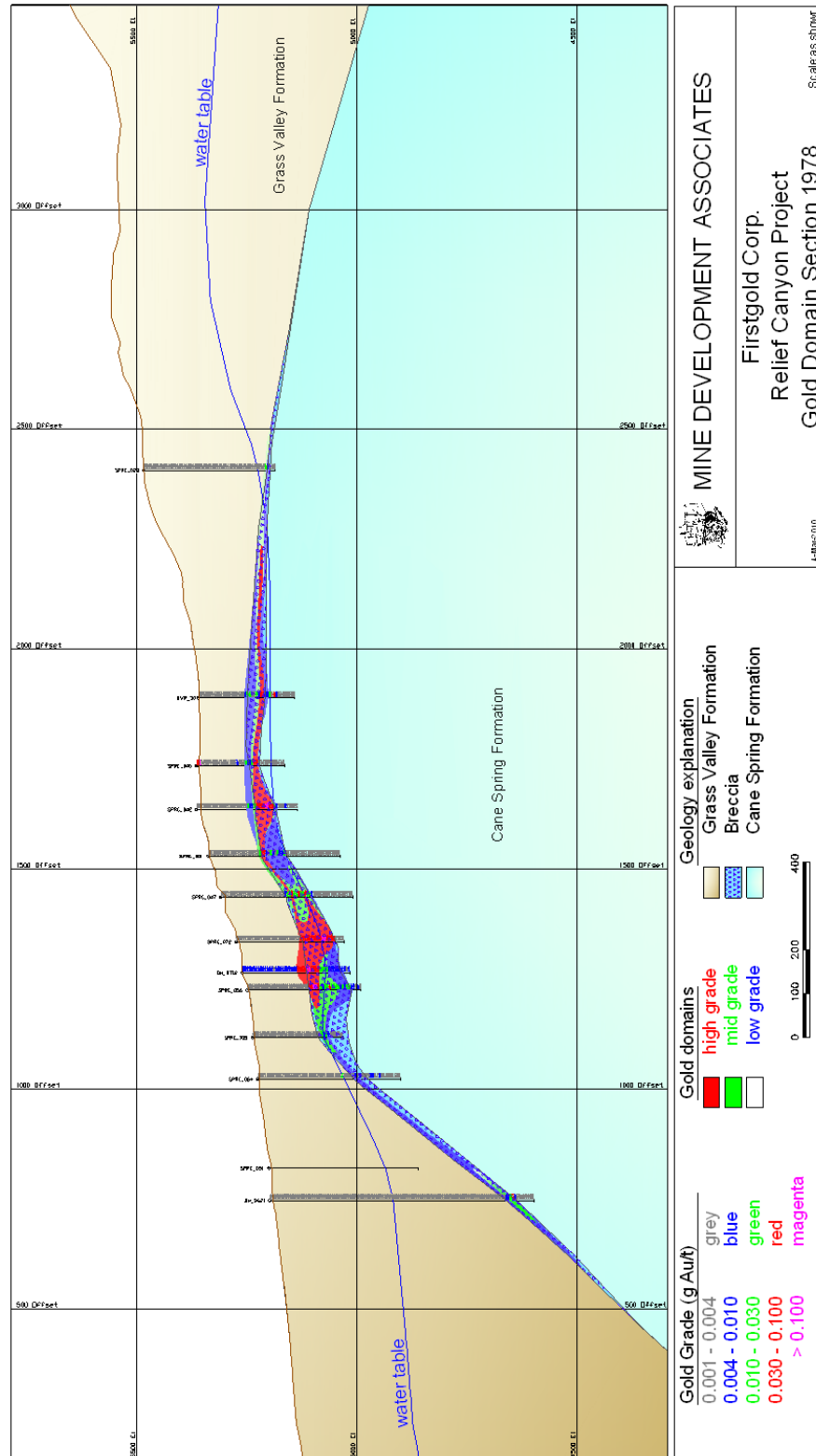
Due to inconsistencies in the geologic logs of holes drilled by various operators and at various times, as well as the fact that essentially all subsurface geologic information is derived from RC chips (there is only one core hole within the resource area), MDA was not able to correlate the three mineral domains to specific geologic characteristics that are captured in the project database. In a general sense, higher-grade zones of mineralization (domain 300) typically lie in the upper portions of the breccia, may be associated with jasperoid breccias, and are often thickest within the broad crest area of the antiform. The crests of small, sympathetic folds that lie within the crest of the larger antiformal structure also appear to exert some control on the higher-grade mineralization. The medium-grade (domain 200) and low-grade (domain 100) zones envelope the domain 300 mineralization, but they extend progressively further laterally within the breccia, especially down the dip of the northwest limb of the antiformal structure. Despite the unfortunate lack of geologic definition of the mineral domains, the modeled domains exhibit excellent continuity throughout the resource area.

A total of 44 vertical N31°E-looking cross sections spaced at 86-foot intervals across the deposit were used for the initial modeling of the Relief Canyon mineral domains. The cross-sectional spacing honors the unusual drill-fence spacing used at the project. The drill-hole traces, topographic profile, and Firstgold geologic interpretations were plotted on the sections, with gold assays (colored by the grade-domain population ranges) plotted along the drill-hole traces, and these data were used as the base for MDA's interpretations of the mineral domains. Mineral-domain envelopes were interpreted on the sections to more-or-less capture assays corresponding approximately to each of the defined grade populations. The domains were modeled through all available drill data, including volumes that had been mined. Representative cross sections showing gold mineral-domain interpretations are shown in Figure 17.1 and Figure 17.2.

The 86-foot spaced sectional mineral-domain polygons were digitized, and vertical slices of the polygons were created at 20-foot intervals orthogonal to the cross sections. The mineral domain interpretations were then rectified to the drill data and geology on 137 long sections. The 20-foot spacing was chosen to match the block width along the northwest-southeast axis of the model. The final product of the long section work is a set of 20-foot spaced mineral-domain envelopes that three-dimensionally honor the drill data at the resolution of the block model.

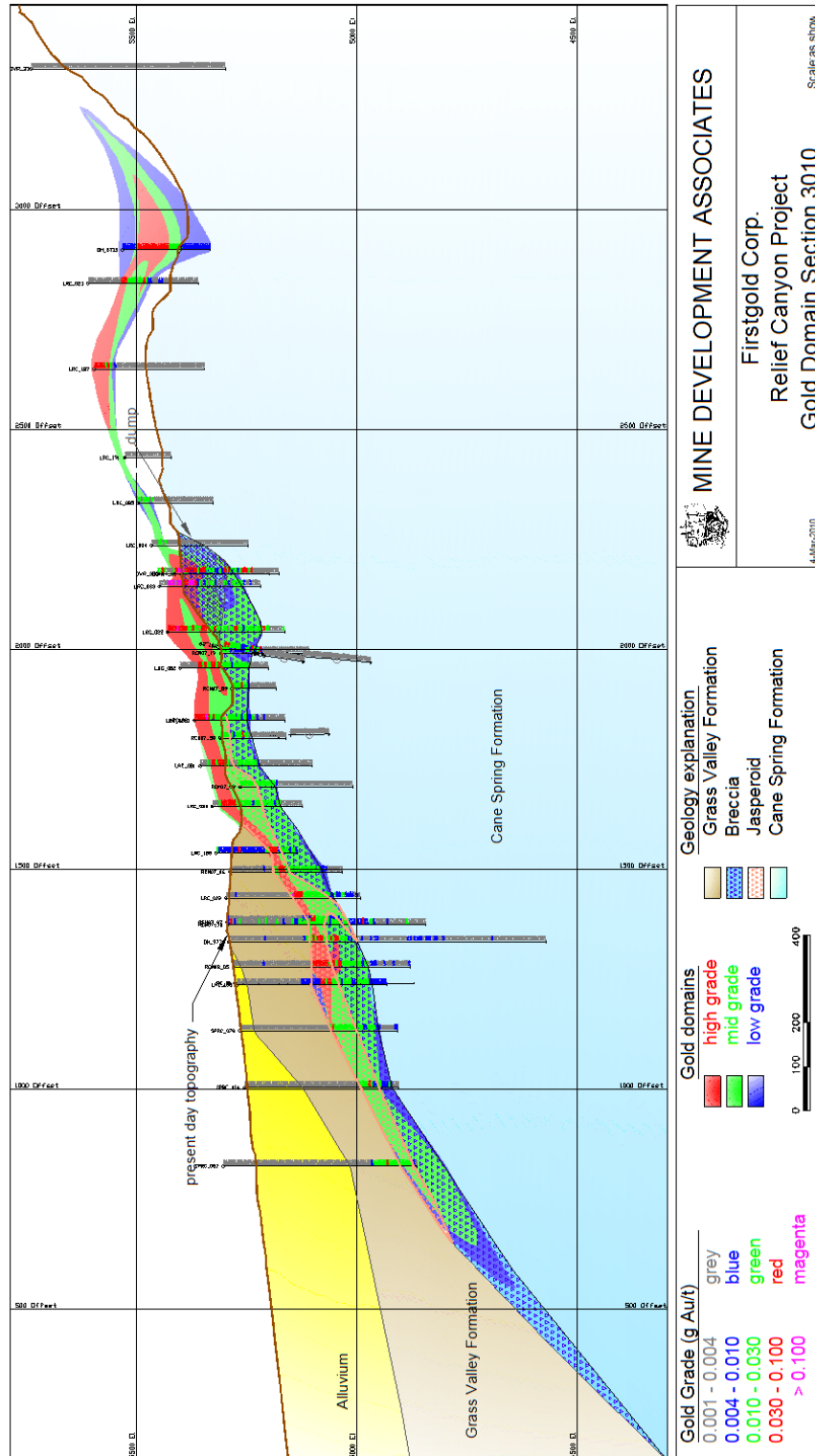


Figure 17.1 Cross Section 1978 Showing Gold Mineral Domains





**Figure 17.2 Cross Section 3010 Showing Gold Mineral Domains**  
(modeled mineralization lying above the present-day topography is not included in the mineral resources)





Assay Coding, Capping, and Compositing. Drill-hole gold assays were coded to the mineral domains using the long section mineral-domain envelopes. Descriptive statistics of the coded assays are provided in Table 17.4.

The process of determining assay caps began with inspection of quantile plots of the coded assays by domain to assess the mineral-domain populations and identify possible high-grade outliers that might be appropriate for capping. Descriptive statistics of the coded assays by domain and visual reviews of the spatial relationships of the possible outliers and their potential impacts during grade interpolation were also considered in the process of determining appropriate assay caps (Table 17.5). The effects of the final assay caps can be qualitatively evaluated by examination of the descriptive statistics of the capped and uncapped mineral-domain assays (Table 17.4).

**Table 17.4 Descriptive Statistics of Coded Gold Assays**

<b>All Coded Assays</b>								
	<b>Valid N</b>	<b>Mean</b>	<b>Median</b>	<b>Std. Dev.</b>	<b>CV</b>	<b>Min.</b>	<b>Max.</b>	<b>Units</b>
Drill Holes	478							
From	6982					0.0	555.0	feet
To	6982					5.0	560.0	feet
Length	6982	5.0	5.0	0.0		2.0	5.0	feet
Au	6982	0.024	0.016	0.031	1.305	0.000	0.961	oz Au/ton
Au Cap	6982	0.024	0.016	0.028	1.179	0.000	0.450	oz Au/ton
Domain	6982					100	300	
<b>Domain 100 Au Assays</b>								
	<b>Valid N</b>	<b>Mean</b>	<b>Median</b>	<b>Std. Dev.</b>	<b>CV</b>	<b>Min.</b>	<b>Max.</b>	<b>Units</b>
Drill Holes	390							
From	1897					0.0	555.0	feet
To	1897					5.0	560.0	feet
Length	1897	5.0	5.0	0.0		5.0	5.0	feet
Au	1897	0.007	0.006	0.005	0.713	0.000	0.078	oz Au/ton
Au Cap	1897	0.007	0.006	0.004	0.651	0.000	0.040	oz Au/ton
Domain	1897					100	100	
<b>Domain 200 Au Assays</b>								
	<b>Valid N</b>	<b>Mean</b>	<b>Median</b>	<b>Std. Dev.</b>	<b>CV</b>	<b>Min.</b>	<b>Max.</b>	<b>Units</b>
Drill Holes	419							
From	3408					0.0	550.0	feet
To	3408					5.0	555.0	feet
Length	3408	5.0	5.0	0.1		2.0	5.0	feet
Au	3408	0.018	0.016	0.009	0.521	0.000	0.112	oz Au/ton
Au Cap	3408	0.018	0.016	0.009	0.521	0.000	0.112	oz Au/ton
Domain	3408					200	200	
<b>Domain 300 Au Assays</b>								
	<b>Valid N</b>	<b>Mean</b>	<b>Median</b>	<b>Std. Dev.</b>	<b>CV</b>	<b>Min.</b>	<b>Max.</b>	<b>Units</b>
Drill Holes	304							
From	1677					0.0	405.0	feet
To	1677					5.0	410.0	feet
Length	1677	5.0	5.0	0.0		5.0	5.0	feet
Au	1677	0.056	0.044	0.049	0.876	0.000	0.961	oz Au/ton
Au Cap	1677	0.055	0.044	0.041	0.736	0.000	0.450	oz Au/ton
Domain	1677					300	300	



**Table 17.5 Relief Canyon Gold Assay Caps**

Domain	Capping Values	
	oz Au/ton	Number Capped (% of samples)
100	0.040	4 (<1%)
200	n/a	n/a
300	0.450	3 (<1%)

The capped assays were composited at 10-foot down-hole intervals respecting the mineral domains. Composites less than 5 feet in length were rejected. Descriptive statistics of the composites are shown in Table 17.6.

**Table 17.6 Descriptive Statistics of Relief Canyon Gold Composites**  
**All Au Composites**

	Valid N	Mean	Median	Std. Dev.	CV	Min.	Max.	Units
Drill Holes	478							
From	3947					0.0	555.0	feet
To	3947					10.0	565.0	feet
Length	3947	8.84	10.00	2.11	0.238	5.00	10.00	feet
Au	3947	0.023	0.016	0.025	1.084	0.000	0.415	oz Au/ton
Domain	3947					100	300	

**Block Model Coding.** The 20-foot spaced long sectional mineral-domain polygons were used to code a three-dimensional block model that is rotated 31° east of north and is comprised of 20 foot (width) x 20 foot (length) x 20 foot (height) blocks. In order for the block model to better reflect the irregularly shaped limits of the various gold domains, as well as to explicitly model dilution, the percentage volume of each mineral domain within each block is stored (the “partial percentages”).

Each block is assigned a tonnage factor listed on Table 17.3 based on its coded lithology. The blocks are coded as lying above or below the modeled water-table surface, and the percentage of each block that lies below the topographic surface is also stored.

**Grade Interpolation.** A variographic study was performed using the gold composites from each mineral domain, collectively and separately, at various azimuths, dips, and lags. The study was complicated by the antiformal to domal nature of the mineral domains, which leads to mineral continuity in multiple orientations. Examination of domain 200 and 300 composites together, as well as composites from all domains collectively, yields a maximum range of 165 feet in the horizontal direction at an azimuth of 020°, and 110 to 125 feet at an orientation of -20° at an azimuth of 290°, geologically reasonable orientations for the global strike and dip of the mineralization, respectively. Variograms in these strike and dip directions for the combined domain 100, 200, and 300 composites are shown in Figure 17.3 and Figure 17.4. The low nugget values are somewhat surprising due to the results of the paired-sample analysis presented in Section 14.6.



Figure 17.3 Variogram of Domain 200 and 300 Composites in Strike Direction

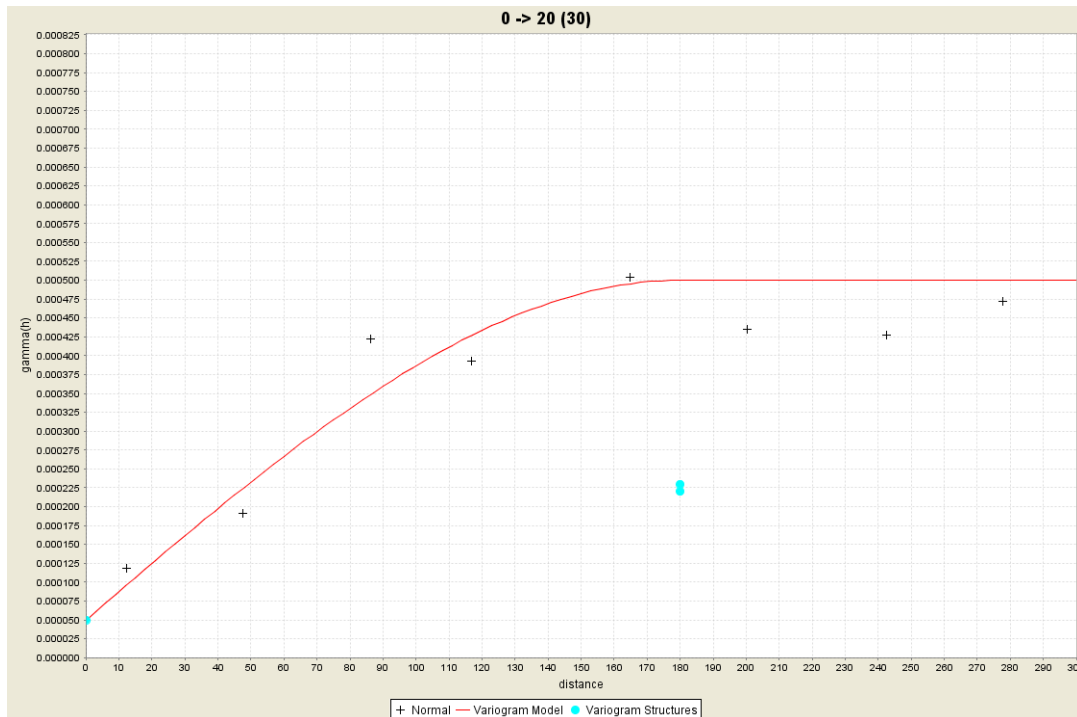
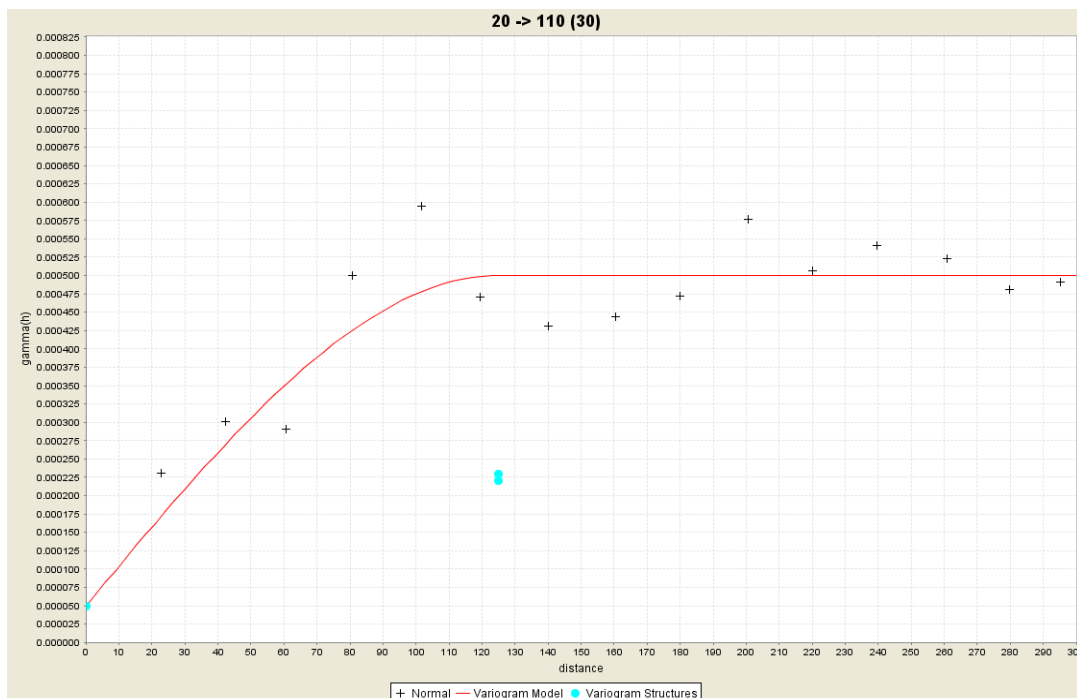


Figure 17.4 Variogram of Domain 200 and 300 Composites at Dip Direction





Parameters from the variography were used in the ordinary kriging interpolation and provided information relevant to the estimation parameters used in the inverse-distance interpolation and resource classification.

The complicated shape of the Relief Canyon mineralization necessitates the use of multiple search-ellipse orientations. Three solids were therefore created that capture areas of mineralization that have grossly consistent orientations, including a portion of the crest of the antiform that has little to no plunge (the “Horizontal Crest” domain), the remaining southwest-plunging portion of the crest of the antiform (the “Plunging Crest” domain), and the northwest limb of the antiform (the “NW Limb” domain). These three estimation domains were then coded into the block model using the solids, and each block was interpolated using its associated search ellipse (Table 17.7). Other estimation parameters are shown in Table 17.8.

**Table 17.7 Search Ellipse Orientations**

Search Ellipse Orientations			
Estimation Domain	Major Bearing	Major Plunge	Tilt
Horizontal Crest	20	0	0
Plunging Crest	120	0	-20
NW Limb	20	0	25

**Table 17.8 Summary of Relief Canyon Estimation Parameters**

Estimation Parameters: Au Domain 100, 200, 300						
Estimation Pass	Search Ranges (m)			Comp Constraints		
	Major	S-Major	Minor	Min	Max	Max/hole
1	200	200	70	2	20	3
2	350	350	175	1	20	3

Krige Parameters <sup>1</sup>												
Model	Orientation			Nugget	First Structure			Second Structure				
	Major Bearing	Major Plunge	Clockwise Tilt	c <sub>0</sub>	c <sub>1</sub>	Ranges (m)			c <sub>2</sub>	Ranges (m)		
SPH-Normal	20	0	20	0.005	0.023	165	125	8.5	0.020	165	125	30

<sup>1</sup> kriging interpolation used as a check against the reported inverse-distance interpolation

The major and semi-major axes of the search ellipses approximate the average strike and dip directions of the gold mineralization in each estimation domain. The first-pass search distances take into consideration the results of both the variography and multiple interpolation iterations to obtain optimal ranges. The second pass was designed to estimate grade into all blocks coded to the mineral domains that were not estimated in the first pass.

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



### **17.2.6 Oxidation Modeling**

The project database includes oxidation codes (1-5, with 1 = completely oxidized and 5 = completely unoxidized) for 367 drill holes, although less than 70% of the holes within the modeled mineralization have these codes. The codes were interpreted by a number of different geologists from a variety of companies based on logging of RC drill chips. These data are therefore subjective by nature and may or may not correlate with ultimate recoveries achieved in a cyanide heap-leach scenario.

A review of the oxidation data in the context of the geology reveals that the breccia horizon that hosts essentially all of the modeled mineralization is typically oxidized or partially oxidized, even when this horizon lies well below the oxide/sulfide boundary as evidenced in other lithologies. The deepest drill intercept within the modeled mineralization is partially oxidized at a vertical depth of 560 feet below the surface. Although some unoxidized pods of breccia are present, the breccia horizon is clearly a significant control on oxidation at Relief Canyon.

A nearest-neighbor estimation of the oxidation codes constrained by the modeled mineralization was performed using the search-ellipse orientations listed in Table 17.7. Based on visual inspections of the variability of the oxidation data, the search distances were restricted to 100 feet in the major and semi-major orientations and 50 feet in minor axis.

While the data density are not sufficient to entirely fill the mineral domains with oxidation codes, MDA believes that the relative amounts of oxidized, mixed, and unoxidized material estimated within the mineral domains are likely to be reasonably representative of the entire breccia horizon. At the resource cutoff of 0.005 oz Au/ton (discussed below), approximately 52% of the blocks lying below present-day topography are estimated as oxidized (codes 1 and 2), 29% as partially oxidized (code 3), and 19% as unoxidized (codes 4 and 5), while the mined-out portion of the model is estimated to include about 60% oxidized material, 33% partially oxidized, and 7% unoxidized. The unoxidized zones occur unsystematically throughout the breccia horizon and would require a significant amount of additional drill data to be properly defined.

The oxidation data are not used to define variable cutoffs in the tabulation of resources discussed below due to: (1) the lack of sufficient oxide data to fill all blocks coded to the mineral domains; (2) uncertainties with respect to the consistency of the oxidation logging; (3) the preponderance of oxidized and partially oxidized material within the mineral zones; and (4) the lack of definitive metallurgical data that can be used to assign different recoveries to materials characterized by differing degrees of oxidation.

### **17.2.7 Relief Canyon Mineral Resources**

The Relief Canyon mineral resources are listed in Table 17.9 using a cutoff grade of 0.005 oz Au/ton. This cutoff was chosen to capture mineralization potentially available to open-pit extraction and heap-leach processing. The block-diluted resources are also tabulated at additional cutoffs in order to provide grade-distribution information, as well as to provide for economic conditions other than those envisioned by the 0.005 oz Au/ton cutoff. Only modeled mineralization falling within the Firstgold Relief Canyon property are reported.





**Table 17.9 Relief Canyon Mineral Resources**

Relief Canyon Indicated Resources			
Cutoff (oz Au/ton)	Tons	oz Au/ton	oz Au
<b>0.005</b>	<b>6,533,000</b>	<b>0.017</b>	<b>113,000</b>
0.008	5,329,000	0.020	106,000
0.010	4,655,000	0.022	100,000
0.015	3,065,000	0.026	81,000
0.020	1,756,000	0.034	59,000
0.025	1,189,000	0.04	47,000
0.050	200,000	0.071	14,000
0.100	15,000	0.127	2,000

Relief Canyon Inferred Resources			
Cutoff (oz Au/ton)	Tons	oz Au/ton	oz Au
<b>0.005</b>	<b>2,719,000</b>	<b>0.015</b>	<b>42,000</b>
0.008	1,988,000	0.019	38,000
0.010	1,616,000	0.021	35,000
0.015	949,000	0.028	27,000
0.020	566,000	0.036	20,000
0.025	414,000	0.041	17,000
0.050	84,000	0.066	5,500
0.100	6,000	0.109	700

The Relief Canyon resources are classified on the basis of the distance of the model blocks to the nearest composite and the minimum number of composites and drill holes used in the grade interpolation of each block (Table 17.10). No Measured resources are assigned due to: (1) the lack of core holes that could allow for verification of the RC data; (2) the general lack of QA/QC data that could be used for verification purposes; (3) uncertainties related to the possible presence of down-hole contamination, especially below the water table; (4) the limited amount of density data; and (5) remaining uncertainties with respect to the location of some drill holes.

**Table 17.10 Relief Canyon Classification Parameters**

Classification Parameters			
Class	Min. Number of Composites	Max. Dist. to Nearest Composite	Min. Number of Drill Holes
Measured	n/a		
Indicated	2	30	1
	4	60	2
Inferred	all remaining estimated blocks		

Figure 17.5 and Figure 17.6 show cross sections of the block model that correspond to the mineral-domain cross sections in Figure 17.1 and Figure 17.2, respectively.



### **17.2.8 Model Checks**

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

The pre-mining deposit was modeled and estimated, after which the mined-out material was removed to allow for reporting of the present-day resources. The estimate of the mined-out grade and tons can be compared to the reported production from the pits as a very rough check on the resource estimation. At a cutoff of 0.010 oz Au/ton, the MDA model estimates that a total of about 7.4 million tons of material grading 0.030 oz Au/ton (219,000 ounces) were mined by Lacana and Pegasus. Using the available production data and estimates of recoveries, approximately 205,000 ounces of gold were mined by Lacana and Pegasus, which is seven percent lower than the MDA model. Given uncertainties regarding mining cutoff grades, reported production, and actual recoveries realized by Lacana and Pegasus, the MDA model and estimated production numbers are close.

### **17.3 Comments on the Resource Modeling**

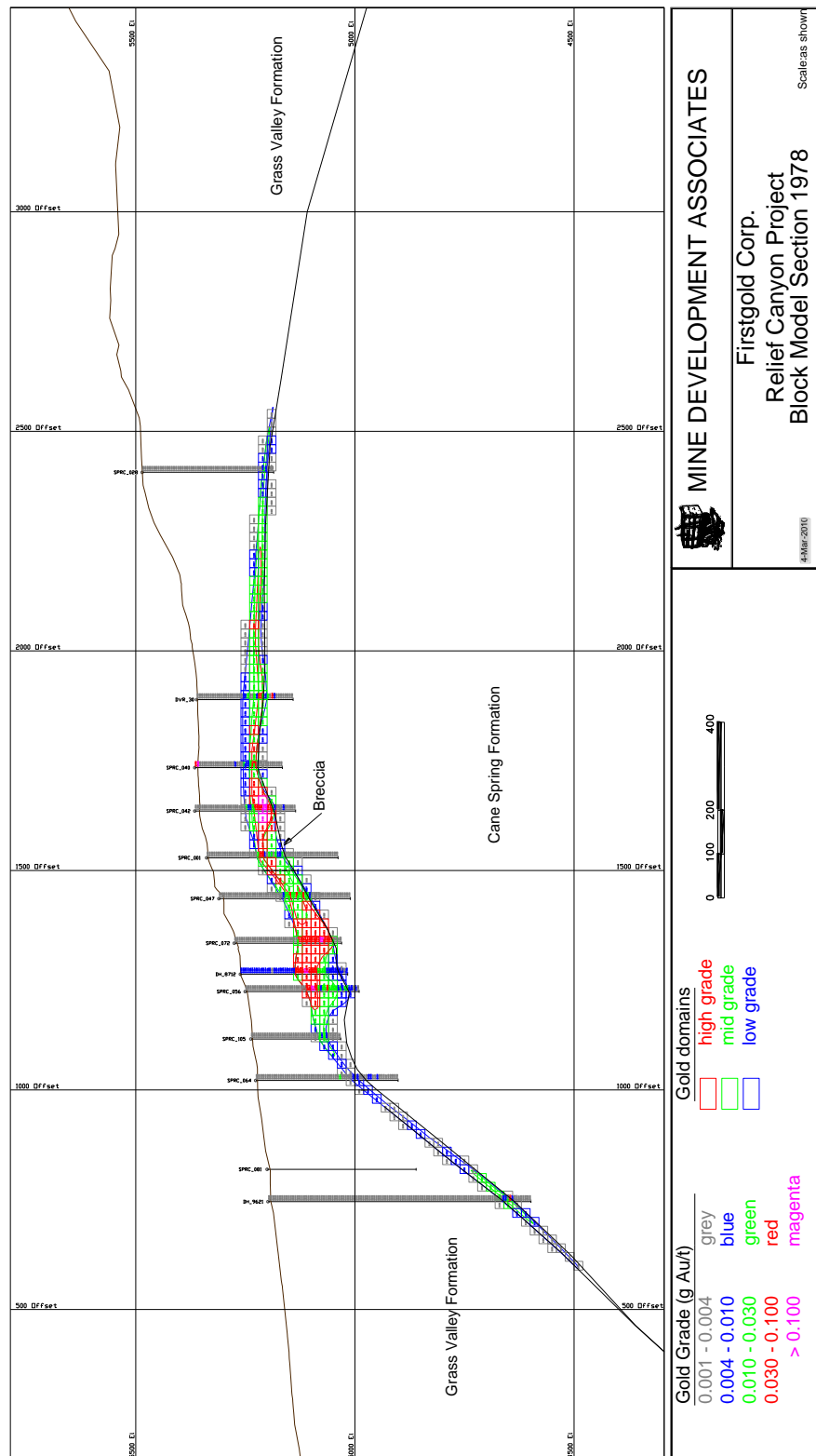
The project database provided to MDA includes a number of holes drilled outside of the limits of Firstgold's property. From an estimation standpoint, these holes provide data that are critical to the estimation of the resources controlled by Firstgold, as modeling of the entire deposit is needed to properly estimate any subset of the mineralization. The resources reported in Table 17.9 are restricted to the Firstgold property and represent approximately 60% of the total resources estimated.

As discussed in Section 4.0, there are some uncertainties regarding the validity of three unpatented lode mining claims at Relief Canyon. This report assumes that claims R-6 and R-8 are not valid, while R-5 is valid. No modeled mineralization lies within R-5, while approximately 6,500 ounces lie within R-6 and R-8 at a 0.005 oz Au/ton cutoff. This information is provided in the event that R-6 and R-8 prove to be valid and controlled by Firstgold.

The modeling could be improved by the incorporation of detailed geologic controls that correlate with, and therefore assist in the definition of, the various mineral domains.

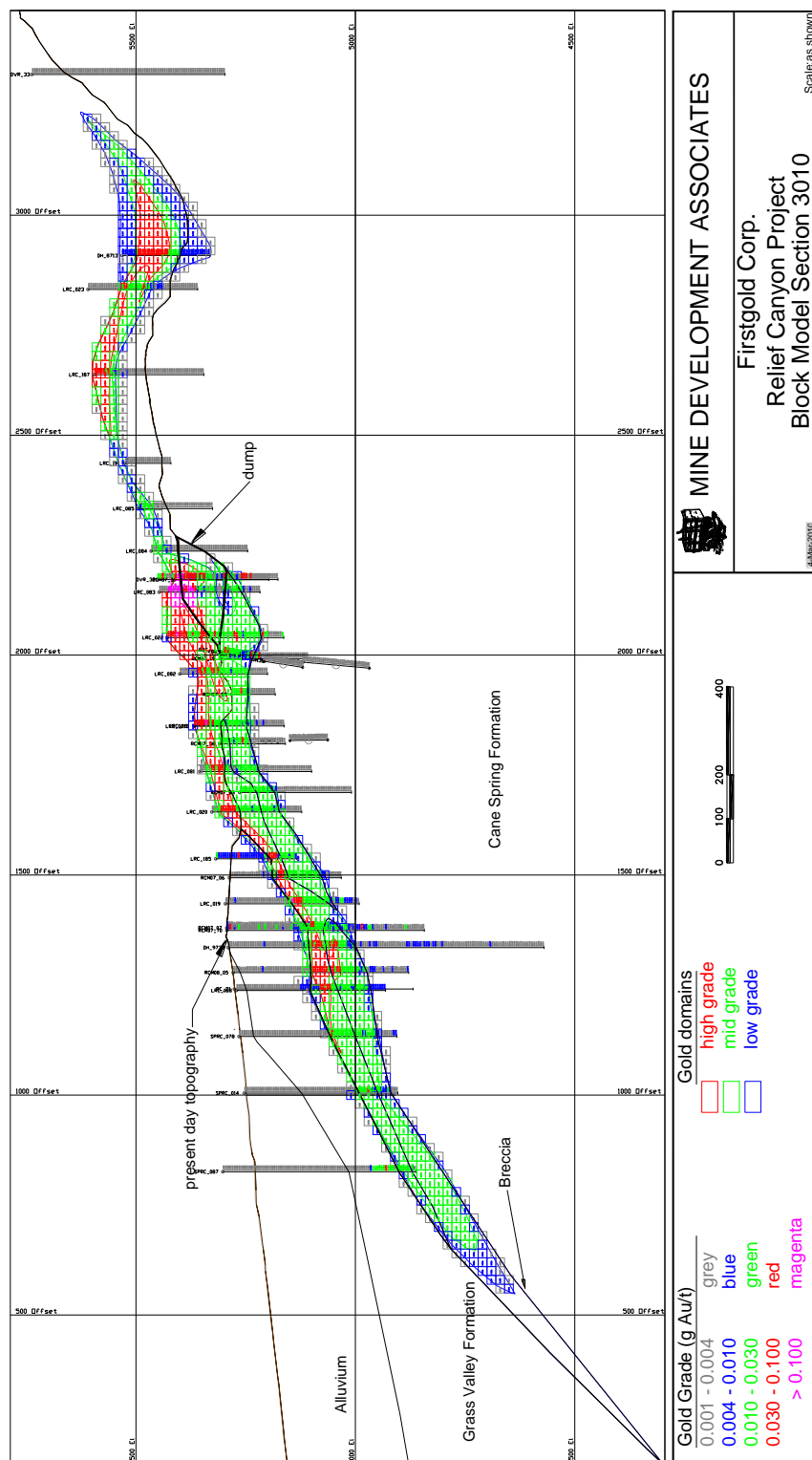


Figure 17.5 Cross Section 1978 Showing Block Model Gold Grades





**Figure 17.6 Cross Section 3010 Showing Block Model Gold Grades**  
(model blocks lying above the present-day topography are not included in the mineral resources)





## 17.4 Mineralization Outside of the Mineral Resource Modeling

As previously discussed, the modeling of mineral resources at Relief Canyon was almost exclusively restricted to the breccia horizon lying below the Grass Valley Formation. As such, gold intersected below the breccia within the resource model area, as well as to the north of the model, is excluded from the resources. In both cases, these intersections were excluded due to: (1) the lack of a sufficient geologic framework from which to model the mineralization; and (12) uncertainties as to what portion of the intersected gold is actually representative of *in situ* mineralization (due to down-hole contamination issues; see Section 12.7).

While down-hole contamination is almost certainly a factor in the drilling outside of the limits of the resources, some of the gold values returned from the holes are undoubtedly representative of *in situ* mineralization.

Significant intersections of gold from predominantly unoxidized intervals have been obtained in holes lying below the modeled breccia horizon, especially in the northern extents of the resources, and these intersections continue in a northerly direction for about 500 feet beyond the resources (the North Target area), where the intersections increase in both grade and thickness. These thick and locally high-grade intersections in the North Target area are defined by vertical holes, most of which are RC, which leads to a lack of understanding of the pertinent geologic controls. Angled core holes are needed to aid in the understanding of the mineralization, in terms of geometry, grade, and true thickness.



## **18.0 MINERAL RESERVE ESTIMATE**

No mineral reserve estimate has been made on the Relief Canyon deposit for this report.



## **19.0 OTHER RELEVANT DATA AND INFORMATION**

### **19.1 Firstgold Heap Reprocessing Program**

Although not the focus of the present report, Firstgold has investigated the potential for reprocessing the heaps remaining from the Lacana and Pegasus gold mining operations (Newgold, Inc., 2006b). In 2006, Firstgold collected over 200 samples to help characterize the gold distribution within the heaps, and McClelland Laboratories, Inc. (“McClelland”) was retained to perform cyanide-leach amenability tests (Newgold, Inc., 2006b). McClelland conducted column percolation leach testing on two samples of residue from the Relief Canyon heap in late 2006 and early 2007 (McPartland, 2007) in order to estimate the amount of gold that could be recovered by heap leaching the products after re-crushing to 80% -3/4-inch size. KCA conducted metallurgical testing of samples from leach pad #4 in 2008 (Kappes, Cassiday & Associates, 2008). During 2007, Firstgold drilled 57 sonic drill holes and 125 RC holes on existing heap-leach pads (Firstgold 2007d); these are not included in the drilling discussed in Section 11.0.

Firstgold began stacking material for reprocessing on a newly constructed heap-leach pad in December 2008, (Firstgold, 2008g), but the reprocessing project was only operated for a short period of time.

### **19.2 Crushing and Processing Facilities at Relief Canyon**

The crushing, processing, and heap-leach pad facilities constructed at the Relief Canyon site for Firstgold’s reprocessing program could also potentially support crushing and leaching of newly mined material from a pit.

A crushing circuit was installed by Firstgold to crush the heap material as part of the reprocessing project. The crushing circuit was designed to operate at approximately 750 tons per hour and includes a vibrating grizzly feeder, jaw (30 inch x 42 inch) crusher, vibrating screen, cone crusher (4.5-foot standard), four transfer conveyors, six truss conveyors, and one radial stacker (Figure 19.1).

A new 72-acre pad design was completed by Dyer and Associates as part of the reprocessing program (Figure 19.2). An existing Reclamation Permit limits ore stacking on the pad to a height of 60 feet, giving the pad design a 7,000,000-ton capacity. The pad design consists of a double-lined system with a compacted soil/clay liner and an 80-mil HDPE plastic liner, which are overlain by 2.5 feet of drain rock. Only one quarter of the allowable leach pad area has been constructed.

The process plant at Relief Canyon (Figure 19.3 and Figure 19.4) was designed to operate at approximately 3,000 gallons per minute. The plant includes four 8-ton carbon columns with the necessary operating ponds. The plant is fully operational and includes all pumps, piping, and electrical system for leaching/processing operations.

On site mine facilities include a modular office complex, warehouse (fabric building), electrical distribution system, power line, back-up generator, and water wells. A small amount of heavy equipment and light vehicles are also available. In addition, an office complex and assay laboratory is located in Lovelock, Nevada.



5'-1% MIN ROAD SURFACE  
18" HDPE PREG. SOLUTION  
2' MIN 14" STEEL BARRIER

10.0 3.0 21.0 8.0 2.5

38.0

SOLUTION TRANSMISSION CHANNEL (PIPE DITCH)

5'-1% MIN 27' x 43" CMP 18" 34" MIN. COVER 2' MIN

10.0 11.5 28.5 3

42.0

ROAD CROSSING

PHASE I HEAP

CELL 1A CELL 1B CELL 1C CELL 1D CELL 1E

PHASE II HEAP

CELL 2A CELL 2B CELL 2C CELL 2D CELL 2E CELL 2F CELL 2G CELL 2H CELL 2I CELL 2J CELL 2K CELL 2L CELL 2M CELL 2N CELL 2O CELL 2P CELL 2Q CELL 2R CELL 2S CELL 2T CELL 2U CELL 2V CELL 2W CELL 2X CELL 2Y CELL 2Z

CRUSHER AND CONVEYOR EQUIPMENT

WATER TANK

POWER LINE

SECURITY STATION

NOTE: SODIUM HYDROXIDE WILL BE STORED INSIDE PROCESS BUILDING

NOT TO SCALE

PLAN VIEW DURING REPROCESS OPERATIONS

NOTE: FOR CLARITY, THIS DRAWING SHOWS BOTH THE NEW AND OLD HEAPS AND CRUSHER LOCATION. ORIGINAL GROUND CONTOUR LINES ARE SHOWN FOR NEW CELLS.

AT THE START OF THE PROJECT, ONLY THE WEST PORTION OF NEW CELL 2B AND ONLY THE CRUSHER SITE AND CONVEYOR FROM THE OLD CELL 4 TO NEW CELL 2B WILL BE CONSTRUCTED.

DIVERSION DITCHES AND REQUIRED SOLUTION DITCHES WILL BE COMPLETED PRIOR TO BEGINNING OPERATIONS.

REVISED 2008-05-28

RELIEF CANYON MINE PROJECT  
FIRSTGOLD CORP

SITE PLAN

OVER ENGINEERING CONSULTANTS, INC.

DATE: 05/28/08

PROJECT: RELIEF CANYON MINE PROJECT

SCALE: 1" = 100'

1





Figure 19.3 Processing Plant Layout

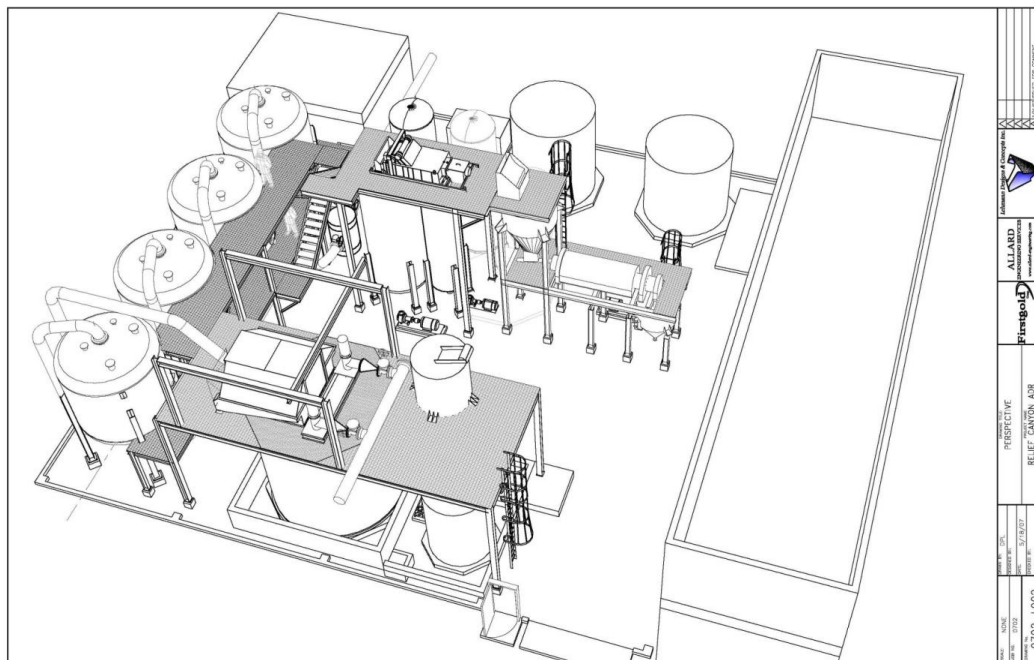


Figure 19.4 Interior of Processing Plant



MDA is not aware of any other information relevant to this technical report of the Relief Canyon project.



## **20.0 INTERPRETATIONS AND CONCLUSIONS**

MDA reviewed the project data and the Relief Canyon drill-hole database and has visited the project site. MDA believes that the data provided by Firstgold are generally an accurate and reasonable representation of the Relief Canyon project and adequately support the mineral resource estimation.

Disseminated gold mineralization at Relief Canon is predominantly found within a horizon of breccia that lies at the contact of Late Triassic platform carbonate units (Cane Spring Formation) and overlying Late Triassic pelitic deltaic rocks (Grass Valley Formation). There are varying interpretations of the nature of this stratabound breccia – sedimentary, structural, and solution-breccia origins have been invoked. The highest gold grades typically are found in the upper portions of the breccia, where jasperoid and jasperoidal breccias are common. Gold grades decrease towards the bottom portion of the breccia horizon, where fragments of limestone dominate the breccia. Silicification, sericitization, and argillization are associated with the mineralization.

The Relief Canyon gold deposit was discovered in the early 1980s and was explored by several major mining companies prior to being acquired by Firstgold. The Relief Canyon mine was put into production by Lacana in 1984 as an open pit heap-leach mine, but was closed in 1985 due to poor recoveries after producing about 14,000 ounces of gold. Pegasus reopened the mine in 1986, mined through 1989, and produced about 117,000 ounces of gold. Other than rinsing the existing heaps, as well as a recent attempt by Firstgold at reprocessing the heaps, there has been no further production from the property.

Gold occurs primarily as disseminated native gold or electrum associated with silica, calcite, fluorite, and clay minerals. Silver, arsenic, antimony, and mercury are also associated with the gold. The breccia mineralization is predominantly oxidized or partially oxidized to the depths of the existing drill data, although pods of unoxidized breccia are not uncommon.

The drill data strongly suggest that down-hole contamination of gold values occurred in some portion of the RC sample database. This issue was mitigated to a large extent in the resource modeling by the exclusion of suspect intervals, but some uncertainty persists in the reported resources due to the potential of unrecognized contamination in the remaining RC data, especially in areas lying below the water table.

Metallurgical testing and actual mining experience indicate that the Relief Canyon deposit is amenable to cyanide heap-leach processing. Lacana's operation experienced gold recoveries of about 45 to 50% from run-of-mine material, while Pegasus achieved recoveries reported to be in the 65 to 70% range by leaching crushed and agglomerated ore.

This report provides the first NI 43-101-compliant mineral resources for Relief Canyon. Based on a cutoff of 0.005 oz Au/ton, Indicated resources total 6,533,000 tons grading 0.017 oz Au/ton (113,000 ounces) and Inferred resources total 2,719,000 tons grading 0.015 oz Au/ton (42,000 ounces).

Significant on-site facilities are present at Relief Canyon, including a 750 tons-per-hour two-stage crushing circuit, a permitted 72-acre heap-leach pad that is one-quarter constructed, one radial stacker,



a 3,000 gallons-per-minute processing plant, and mine office and warehouse facilities. Additional office facilities, as well as an assaying laboratory, are located in Lovelock.

Significant exploration targets exist at Relief Canyon. Of primary interest is the North Target area, which extends from the northern extents of the mineral resources, where significant gold intersections have been returned from intervals below the modeled resources, to at least 500 feet to the north. The thick and locally high-grade intersections in the North Target area are defined by vertical holes, most of which are RC, and the geology of the mineralization is not understood, which has precluded this mineralization from being included in the resource modeling. While there are uncertainties as to what portion of the gold intersections are representative of *in situ* mineralization due to possible down-hole contamination, the North Target mineralization clearly warrants additional exploration work. Angled core holes are needed to gain an understanding of the geometry, grade, true thickness, and metallurgy of the mineralized zones.



## **21.0 RECOMMENDATIONS**

Due to the present corporate difficulties Firstgold is experiencing, outlining detailed programs for future work serves little purpose. The following generalized recommendations are provided to Firstgold in case the company emerges from bankruptcy and obtains sufficient funding to move the project forward.

A confirmatory core-drilling program is recommended within the mineral resources. The goal of this program would be to: (1) provide data that may help to verify the geologic, hydrologic, oxidation, and grade models developed from the existing RC data; (2) obtain representative samples for metallurgical testing and bulk-density determinations; and (3) test areas below the resources that returned significant values in the RC holes.

An additional exploration core-drilling program is recommended to test the North Target area. This program should primarily use angled core holes to: (1) define the true extents and grade of the mineralization indicated by the existing RC holes; and (2) gain an understanding of the critical geologic controls.

A scoping-level economic study should be completed on the existing resource base to provide an initial indication of the potential viability of the project. This study should account for in-pit resources both above and below the modeled water table.



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## **23.0 DATE AND SIGNATURE PAGE**

Effective Date of report: May 1<sup>st</sup>, 2010

Completion Date of report: June 7<sup>th</sup>, 2010

***“Michael M. Gustin”***

June 7<sup>th</sup>, 2010

Michael M Gustin, P. Geo.

Date Signed



## 24.0 CERTIFICATE OF AUTHOR

### MICHAEL M. GUSTIN, P.GEO.

I, Michael M. Gustin, P. Geo., do hereby certify that I am currently employed as Senior Geologist by Mine Development Associates, Inc., 210 South Rock Blvd., Reno, Nevada 89502 and:

1. I graduated with a Bachelor of Science degree in Geology from Northeastern University in 1979 and a Doctor of Philosophy degree in Economic Geology from the University of Arizona in 1990. I have worked as a geologist in the mining industry for more than 25 years. I am a Licensed Professional Geologist in the state of Utah (#5541396-2250), a Licensed Geologist in the state of Washington (# 2297), and a member of the Society of Mining Engineers and the Geological Society of Nevada.
2. I have read the definition of “qualified person” set out in National Instrument 43-101 (“NI 43-101”) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101), and past relevant work experience, I fulfill the requirements to be a “qualified person” for the purposes of NI 43-101. I am independent of Firstgold Corporation, and all of its subsidiaries, as defined in Section 1.4 of NI 43-101 and in Section 3.5 of the Companion Policy to NI 43-101.
3. I visited the Relief Canyon project site on November 4, 2008.
4. I am responsible for all sections of this report titled, “**Technical Report, Relief Canyon Gold Project, Pershing County, Nevada, U.S.A.**”, dated June 7, 2010 (the “Technical Report”), subject to my reliance on other experts identified in Section 3.0.
5. I have had no prior involvement with the property or project that is the subject of the Technical Report.
6. As of the date of this certificate, to the best of my knowledge, information, and belief, this Technical Report contains all the scientific and technical information that is required to be disclosed to make this technical report not misleading.
7. I have read NI 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.
8. The Technical Report contains information relating to mineral titles, permitting, environmental issues, regulatory matters, and legal agreements. I am not a legal, environmental or regulatory expert, and do not offer a professional opinion regarding these issues.
9. A copy of this report is submitted as a computer readable file in Adobe Acrobat© PDF© format. The requirements of electronic filing necessitate submitting the report as an unlocked, editable file. I accept no responsibility for any changes made to the file after it leaves my control.

Dated June 7, 2010

**“Michael M. Gustin”**

Michael M. Gustin

Appendix A  
List of Lode and Millsite Claims Owned by Firstgold  
(details provided by Firstgold)

<b>Claim Name</b>	<b>Serial Number</b>	<b>Type of Claim</b>	<b>Location Date</b>
NGR-1	NMC929649	Lode Claim	6/5/2006
NGR-2	NMC929650	Lode Claim	6/5/2006
NGR-3	NMC929651	Lode Claim	6/5/2006
NGR-4	NMC929652	Lode Claim	6/5/2006
NGR-5	NMC929653	Lode Claim	6/5/2006
R 1	NMC902710	Lode Claim	5/30/2005
R 2	NMC902711	Lode Claim	5/30/2005
R 3	NMC902712	Lode Claim	5/30/2005
R 4	NMC902713	Lode Claim	5/30/2005
R 5	NMC902714	Lode Claim	5/30/2005
RCL 46	NMC902717	Lode Claim	5/30/2005
RCL 47	NMC902718	Lode Claim	5/30/2005
RCL 48	NMC902719	Lode Claim	5/30/2005
RCL 49	NMC902720	Lode Claim	5/30/2005
RCL 50	NMC902721	Lode Claim	5/30/2005
RCL 60	NMC902722	Lode Claim	5/30/2005
RCL 61	NMC902723	Lode Claim	5/30/2005
RCL 62	NMC902724	Lode Claim	5/30/2005
RCL 63	NMC902725	Lode Claim	5/30/2005
RC 1	NMC902731	Mill Site	5/31/2005
RC 10	NMC902740	Mill Site	5/31/2005
RC 11	NMC902741	Mill Site	5/31/2005
RC 12	NMC902742	Mill Site	5/31/2005
RC 13	NMC902743	Mill Site	5/31/2005
RC 14	NMC902744	Mill Site	5/31/2005
RC 15	NMC902745	Mill Site	5/31/2005
RC 16	NMC902746	Mill Site	5/31/2005
RC 17	NMC902747	Mill Site	5/31/2005
RC 18	NMC902748	Mill Site	5/31/2005
RC 19	NMC902749	Mill Site	5/31/2005
RC 2	NMC902732	Mill Site	5/31/2005
RC 20	NMC902750	Mill Site	5/31/2005
RC 21	NMC902751	Mill Site	5/31/2005
RC 22	NMC902752	Mill Site	5/31/2005
RC 23	NMC902753	Mill Site	5/31/2005
RC 24	NMC902754	Mill Site	5/31/2005
RC 25	NMC902755	Mill Site	5/31/2005
RC 26	NMC902756	Mill Site	5/31/2005
RC 27	NMC902757	Mill Site	5/31/2005
RC 28	NMC902758	Mill Site	5/31/2005
RC 29	NMC902759	Mill Site	5/31/2005
RC 3	NMC902733	Mill Site	5/31/2005
RC 30	NMC902760	Mill Site	5/31/2005
RC 31	NMC902761	Mill Site	5/31/2005
RC 32	NMC902762	Mill Site	5/31/2005
RC 33	NMC902763	Mill Site	5/31/2005
RC 34	NMC902764	Mill Site	5/31/2005

<b>Claim Name</b>	<b>Serial Number</b>	<b>Type of Claim</b>	<b>Location Date</b>
RC 35	NMC902765	Mill Site	5/31/2005
RC 36	NMC902766	Mill Site	5/31/2005
RC 37	NMC902767	Mill Site	5/31/2005
RC 38	NMC902768	Mill Site	5/31/2005
RC 39	NMC902769	Mill Site	5/31/2005
RC 4	NMC902734	Mill Site	5/31/2005
RC 40	NMC902770	Mill Site	5/31/2005
RC 41	NMC902771	Mill Site	5/31/2005
RC 42	NMC902772	Mill Site	5/31/2005
RC 43	NMC902773	Mill Site	5/31/2005
RC 44	NMC902774	Mill Site	5/31/2005
RC 45	NMC902775	Mill Site	5/31/2005
RC 46	NMC902776	Mill Site	5/31/2005
RC 47	NMC902777	Mill Site	5/31/2005
RC 48	NMC902778	Mill Site	5/31/2005
RC 49	NMC902779	Mill Site	5/31/2005
RC 5	NMC902735	Mill Site	5/31/2005
RC 50	NMC902780	Mill Site	5/31/2005
RC 51	NMC902781	Mill Site	5/31/2005
RC 52	NMC902782	Mill Site	5/31/2005
RC 53	NMC902783	Mill Site	5/31/2005
RC 54	NMC902784	Mill Site	5/31/2005
RC 55	NMC902785	Mill Site	5/31/2005
RC 56	NMC902786	Mill Site	5/31/2005
RC 57	NMC902787	Mill Site	5/31/2005
RC 6	NMC902736	Mill Site	5/31/2005
RC 7	NMC902737	Mill Site	5/31/2005
RC 8	NMC902738	Mill Site	5/31/2005
RC 9	NMC902739	Mill Site	5/31/2005
RM1	NMC929654	Mill Site	6/5/2006
RM10	NMC929663	Mill Site	6/5/2006
RM11	NMC929664	Mill Site	6/5/2006
RM12	NMC929665	Mill Site	6/5/2006
RM13	NMC929666	Mill Site	6/5/2006
RM14	NMC929667	Mill Site	6/5/2006
RM15	NMC929668	Mill Site	6/5/2006
RM16	NMC929669	Mill Site	6/5/2006
RM17	NMC929670	Mill Site	6/5/2006
RM18	NMC929671	Mill Site	6/5/2006
RM19	NMC929672	Mill Site	6/5/2006
RM2	NMC929655	Mill Site	6/5/2006
RM20	NMC929673	Mill Site	6/5/2006
RM21	NMC929674	Mill Site	6/5/2006
RM22	NMC929675	Mill Site	6/5/2006
RM23	NMC929676	Mill Site	6/5/2006
RM24	NMC929677	Mill Site	6/5/2006
RM25	NMC929678	Mill Site	6/5/2006
RM26	NMC929679	Mill Site	6/5/2006
RM27	NMC929680	Mill Site	6/5/2006
RM28	NMC929681	Mill Site	6/5/2006
RM29	NMC929682	Mill Site	6/5/2006

<b>Claim Name</b>	<b>Serial Number</b>	<b>Type of Claim</b>	<b>Location Date</b>
RM3	NMC929656	Mill Site	6/5/2006
RM30	NMC929683	Mill Site	6/5/2006
RM31	NMC929684	Mill Site	6/5/2006
RM32	NMC929685	Mill Site	6/5/2006
RM33	NMC929686	Mill Site	6/5/2006
RM34	NMC929687	Mill Site	6/5/2006
RM35	NMC929688	Mill Site	6/5/2006
RM36	NMC929689	Mill Site	6/5/2006
RM37	NMC929690	Mill Site	6/5/2006
RM38	NMC929691	Mill Site	6/5/2006
RM39	NMC929692	Mill Site	6/5/2006
RM4	NMC929657	Mill Site	6/5/2006
RM40	NMC929693	Mill Site	6/5/2006
RM41	NMC929694	Mill Site	6/5/2006
RM42	NMC929695	Mill Site	6/5/2006
RM43	NMC929696	Mill Site	6/5/2006
RM44	NMC929697	Mill Site	6/5/2006
RM45	NMC929698	Mill Site	6/5/2006
RM46	NMC929699	Mill Site	6/5/2006
RM47	NMC929700	Mill Site	6/5/2006
RM48	NMC929701	Mill Site	6/5/2006
RM49	NMC929702	Mill Site	6/5/2006
RM5	NMC929658	Mill Site	6/5/2006
RM50	NMC929703	Mill Site	6/5/2006
RM51	NMC929704	Mill Site	6/5/2006
RM52	NMC929705	Mill Site	6/5/2006
RM53	NMC929706	Mill Site	6/5/2006
RM54	NMC929707	Mill Site	6/5/2006
RM55	NMC929708	Mill Site	6/5/2006
RM56	NMC929709	Mill Site	6/5/2006
RM57	NMC929710	Mill Site	6/5/2006
RM58	NMC929711	Mill Site	6/5/2006
RM59	NMC929712	Mill Site	6/5/2006
RM6	NMC929659	Mill Site	6/5/2006
RM60	NMC929713	Mill Site	6/5/2006
RM61	NMC929714	Mill Site	6/5/2006
RM62	NMC929715	Mill Site	6/5/2006
RM63	NMC929716	Mill Site	6/5/2006
RM7	NMC929660	Mill Site	6/5/2006
RM8	NMC929661	Mill Site	6/5/2006
RM9	NMC929662	Mill Site	6/5/2006