MINE DEVELOPMENT ASSOCIATES
MINE ENGINEERING SERVICES

Amended Technical Report
World Beater Gold Property
Inyo County, California

Prepared for

CMC METALS LTD.

Report Date: January 9, 2015
Effective Date: October 1, 2012

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1.0 SUMMARY

CMC Metals Ltd. ("CMC") requested that Mine Development Associates ("MDA") prepare this amended Technical Report on the World Beater gold project, Inyo County, California. The purpose of this report is to provide a technical summary of World Beater in support of CMC financing and public disclosures and to provide a Technical Report to be filed with the TSX Venture Exchange and the British Columbia Securities Commission. 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. The World Beater project was previously described in a 2003 Technical Report by MDA that was prepared for a previous operator.

This Technical Report amends the Technical Report prepared by MDA and dated January 9, 2013. The following changes have been made in this report: 1) updating the effective date of the resource estimate to July 9, 2012; 2) adding a metallurgical Qualified Person as a co-author and making minor changes to the metallurgical section; 3) amending disclaimers in Section 3.0 and Ristorcelli's Certificate; and 4) providing additional clarification regarding the criteria used in classification.

1.1 Property Description and Ownership

The World Beater gold property is located in the west-central portion of the Panamint Range, Inyo County, southeastern California, just west of Death Valley National Park. The World Beater property covers both the historic Radcliff and World Beater mines, but the mineral resource described in this report lies entirely within the Radcliff mine area. CMC holds a 50% interest in the World Beater property through its wholly owned subsidiary CMC Metals Corp.; both are referred to as "CMC" in this report. Pruett-Ballarat Inc ("PBI"), a Nevada corporation, owns the remaining 50% interest in the property and is the current operator. The patented and unpatented claims are owned 50% by CMC and 50% by PBI, subject to a deed of trust in favor of WB & Ratcliff, Inc., the previous owner. There are four remaining property payments outstanding, totaling $650,000 plus accrued interest.

The World Beater property encompasses approximately 1,654 acres and consists of 10 patented mining claims, one patented mill site claim, 84 unpatented mining claims, and five unpatented mill sites, water claims and/or water rights known as the Stone Corral Water Claims.

There is a 5% net smelter returns royalty payable to WB & Ratcliff, Inc., November 1, 2012.

1.2 Exploration and Mining History

The World Beater and Radcliff gold deposits were discovered in 1896 and 1897, producing approximately 25,000oz of gold in total by 1908. Of that, about 15,000oz were produced from 15,000 tons at

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the Radcliff mine, where production came mostly from oxidized mineralization. Although development continued, there are no available details regarding subsequent production.

Kerr McGee Corporation began modern exploration of the property in 1989 with geophysical surveys, mapping, and sampling. In 1992, they joint ventured the property with Echo Bay Mines Ltd. ("Echo Bay"), who served as operator. Echo Bay's core and reverse circulation ("RC") drilling program of reportedly 87[1] holes outlined the current resource. In addition to drilling, Echo Bay conducted geologic mapping, rock-chip and underground channel sampling, and petrographic studies.

Compass Minerals Ltd. ("Compass") optioned the property in May 1995 and drilled 64 RC holes from 1995 to 1997. MDA completed resource estimates for Compass in 1995 and 1996.

Manele Bay Ventures Inc. ("Manele Bay") optioned the property from Compass in November 2002. In August 2003, they began a drill program that ultimately included 29 RC holes. This drilling was aimed at expansion of the resource to the south and southwest but also included some infill holes.

PBI optioned the property from the property owner in January 2007 and began development of a drift and a raise at the Radcliff mine in late 2009, which yielded two stockpiles totaling 96 to 110 tons of higher-grade material (greater than about 0.50oz Au/ton and averaging about 0.516oz Au/ton), a low-grade dump consisting of 250 to 266 tons averaging about 0.25 to 0.272oz Au/ton, and about 50 tons of waste.

CMC acquired its 50% interest in the property from PBI in December 2011 but has conducted no exploration to date.

The database used for the current resource estimate includes 81 of Echo Bay's 87 holes, all of Compass' 64 holes, and 67 of Echo Bay's underground channel samples.

1.3 Geology and Mineralization

The property is underlain by rocks of the Upper Proterozoic Pahrump Group and the underlying Middle Proterozoic World Beater Complex. The World Beater Complex is locally represented by a metamorphosed volcanic dome consisting of metarhyolite tuff (now schistose gneiss). The overlying Radcliff Schist (part of the Pahrump Group) is composed of metamorphosed volcaniclastic sedimentary rocks, tuffs, flows (schist and phyllite) and cherty exhalite horizons. The rocks underlying the World Beater project display complex facies changes and both prograde and retrograde metamorphism. They have been broadly folded and display both bedding-parallel and later cross-cutting faults.

The World Beater property encompasses two historic mines – the World Beater mine and the Radcliff mine. Most of the recent exploration and the all of the delineated resources are at the Radcliff mine. The gold mineralization at the Radcliff mine area is found in exhalative cherty rocks, mostly conformable with the enclosing metasedimentary rocks of the Radcliff Schist. Gold is the economic commodity and occurs as micron-sized grains in quartz gangue or associated with a massive sulfide assemblage

[1] Echo Bay reports 87 holes, but MDA has only 81 in the database.

consisting predominately of pyrrhotite. Gold also occurs as electrum. A secondary and as yet poorly defined style of mineralization is structurally controlled gold in the footwall World Beater Complex.

1.4 Metallurgical Testing and Mineral Processing

Numerous metallurgical tests dating from 1988 onward have demonstrated that World Beater mineralization generally responds well to conventional metallurgical processing by cyanidation, either on whole ore, or on flotation concentrates.

Best results are achieved with whole-ore cyanidation. Gold extractions of 90 to 95% have been achieved on material with grades ranging from 3 to 22g/t Au. Extractions as high as 98% have been reported from some tests. However, cyanide consumption is high at 3 to 10 kg/t and appears quite variable from test to test. The laboratory tests generally indicate that leach times of 48 to 72 hours are required; 24-hour tests frequently yielded low extractions, whereas tests run for up to 148 hours do not appear to offer any significant improvement.

The presence of pyrrhotite, a reactive, oxygen-consuming mineral, and electrum, a gold-silver alloy, are thought to be the controlling factors for both cyanide consumption and leach times. It is anticipated that in practice the operating conditions, particularly cyanide concentrations and aeration, can be controlled to ensure complete leaching in 48 hours, and this should be the target of future test programs.

Fewer tests have been conducted using flotation to pre-concentrate the gold, but it is likely that this approach can be developed into a viable means of reducing the tonnage of material to be transported and leached. In the most recent test, the concentrate assayed over 300 g/t Au and represented just 3.5% of the feed. To date, flotation results have been mixed with recoveries ranging from 73 to 91% of the contained gold, whereas concentrate leaching tests have generally yielded higher gold extractions. More systematic work will be required to confirm that the combination of flotation and concentrate cyanidation will consistently yield high gold recoveries. Particular attention should be paid to lower-grade samples, which may have lower sulfide mineral contents and be less amenable to flotation as a result.

1.5 Mineral Resource Estimate

The current resource estimate described below was completed by the author in November 1997 for a previous operator and reported in the 2003 Technical Report (Ristorcelli, 2003). The effective date of the resource estimate is here amended to July 9, 2012. This entire resource is in the Radcliff mine area.

Low-grade mineralization occurs in an apparently conformable relationship with the bedding/foliation, which strikes N20°W to N30°W and dips about 35°SW. These low-grade mineralized zones are typically 15ft to 60ft thick. Within these conformable low-grade zones and rarely outside them are narrow, less continuous zones of very high grades.

MDA constructed cross sections looking along an azimuth of 334°. The cross sections were digitized and sliced to level plans at 10ft intervals. Assays were coded from these cross sections and then composited to 5ft composites, honoring the cross-sectional geology. The high-grade domains and low-grade domains were interpolated separately in the Radcliff Schist and the underlying World Beater Complex. Only the low-grade domain in the Radcliff Schist was kriged. Because of the poor variography in both of the World Beater domains and high-grade Radcliff Schist domain, they were estimated using inverse distance weighting to the second power.

Search ranges in the high-grade zones were restricted to 60ft for samples greater than 1.0oz Au/ton. The cutoff was selected based on discontinuities in the grade distribution of the assays. The distance was derived by trial-and-error methodology using different distance restrictions and comparing the results to the composite distributions. In the end, a 60ft search restriction was chosen as the results of this estimate best matched the composites. This aspect of the estimate has the greatest impact on the resultant resource estimate, and the sensitivity of the deposit estimate to few high-grade intercepts is one reason for the lack of Measured resources. Any future work should emphasize the understanding of the high-grade material; there is no doubt of its existence, but an increased understanding of its distribution is critical to fully evaluating the economics of the deposit.

Table 1.1 shows the estimated resource for the Radcliff mine area. For this report's economic cutoff determination for "*…reasonable prospects for eventual economic extraction*", MDA used a gold price of $1,200, open pit mining costs of $3/ton, plant operating costs of $18/ton, and general and administrative costs of $6/ton. Gold metallurgical extraction rate is 95%, the upper limit of expected recoveries suggested in Section 13.8. Though there is tight drill spacing, the locally extreme high grades make the resource estimate very sensitive to a few samples. Some additional geologic studies, drilling, surveying and sampling studies should upgrade material to the Measured class.

Table 1.1 World Beater Project Resources

Indicated			
Cutoff (oz/T)	Tons	Grade (oz/T)	Ounces Gold
0.02	2,129,000	0.094	200,900
Inferred			
0.02	263,000	0.103	27,100

In 2003 and subsequent to publication of the resource estimate, Manele Bay drilled 29 holes for a total of 7,910ft of drilling. MDA reviewed these 2003 holes in light of the the estimate completed in 1997 and presented here as the current resource with an effective date of July 9, 2012. The conclusion of that review was the new drilling, if used in a resource update would:

- change the location of the deposit slightly by dropping the down-dip extensions by about 20ft;
- incrementally (not significantly) expand the resource size from the down-dip drilling; and
- cause minor changes in some grade distributions internal to the estimate.

The Manele Bay drilling would not change the classification of the resource from Indicated and Inferred.

The sequence of events that allows MDA to define Indicated resources begins in May 1995 when Compass contracted MDA to make a resource estimate for the World Beater project. This was followed by multiple RC drilling campaigns from 1995 to 1997, during which time they drilled a total of 17,320ft (5,279m) in 64 RC holes. Compass contracted with MDA to complete an updated resource estimate in 1996 after completing some post-1995-estimate drilling, and again in 1997 with post-1996-estimate drilling. There were only minor changes in the estimated resources in spite of extensive drilling. This confirms the confidence in the 1997 estimate allowing for Indicated classification.

PBI constructed about 290ft of underground workings plus a 42ft-long raise at the Radcliff mine subsequent to the 1997 mineral resource estimate. Preliminary mapping indicated the presence of a mineralized zone averaging about 40ft wide that aligns well with the modeled domains.

1.6 Conclusions and Recommendations

The World Beater project is worthy of additional exploration and technical studies. Positive aspects of the project include the high average grade of the deposit, which may overcome the issues of size and difficult terrain. A thorough geologic study should be made with mapping, sampling, and compiling all historic work to better assess exploration potential away from the defined resource. A survey should be conducted to locate as many drill holes as possible and to tie in the underground workings now being constructed; the survey should bring everything into real-world coordinates instead of the arbitrary local coordinates. A small amount of drilling should be done for resource expansion; the exact size of the program and the specific hole locations will be determined based on the proposed geologic studies. One of the greatest risks at the Radcliff mine is the continuity of the highest-grades in the high-grade zones. A substantial amount of in-fill drilling should be conducted to better estimate the continuity and location of these high-grade zones if underground mining is being considered. There is no doubt about the existence of these high-grade zones, but depending on the assumptions used in projecting them, the resource can vary considerably.

A current title report should be prepared that includes the unpatented and patented claims and all current agreements pertaining to the World Beater property. Engineering studies should be done to evaluate options for development. Major considerations include the type and location of processing, and whether the deposit should be developed by open-pit methods or underground methods. Once an envisioned operation is optimized, Preliminary Economic Assessment should be undertaken. Table 1.2 lists these recommendations and costs for Phase I.

Phase II would begin pre-feasibility or feasibility work on the optimal operation, if the project is demonstrated to be economic.

Table 1.2 World Beater Recommended Program

Exploration		
Geologic studies	$	30,000
Survey	$	25,000
Distal exploration drilling	$	100,000
Distal drilling near mineralized holes	$	250,000
Subtotal	**$**	**405,000**
Land Study/Economic Studies/Engineering		
Title Opinion	$	25,000
Processing options	$	40,000
Mining options	$	20,000
Preliminary Economic Assessment	$	60,000
Subtotal	**$**	**145,000**
Contingency (10%; rounded)	**$**	**55,000**
Grand Total	**$**	**605,000**

2.0 INTRODUCTION

Mine Development Associates ("MDA") has prepared this amended Technical Report on the World Beater gold property in Inyo County, California, at the request of CMC Metals Ltd. ("CMC"). CMC is a Canadian company listed on the TSX Venture Exchange. CMC has a 50% interest in the World Beater property through its wholly owned subsidiary CMC Metals Corp., a California corporation. Pruett-Ballarat Inc. ("PBI"), a Nevada corporation and the holder of the remaining 50% interest in the property, is the operator of the project. The World Beater project is presently being developed to provide feed at a rate of 50 to 100 tons per day for CMC's Bishop Mill, which CMC expects to be commissioned over the next few months (CMC Metals Ltd. news release, March 5, 2012). CMC reports that no feasibility study has been completed, and there is no certainty that the proposed operations at the Bishop Mill will be economically viable (CMC Metals Ltd. news release, March 5, 2012). The World Beater property includes two historic mines: the World Beater mine and the Radcliff mine. Most of the present exploration and all of the delineated resources are at the Radcliff site.

This report has been prepared in compliance with the disclosure and reporting requirements set forth in the Canadian Securities Administrators' National Instrument 43-101 ("NI 43-101"), Companion Policy 43-101CP, and Form 43-101F1. The resource is reported to meet the Canadian Institute of Mining, Metallurgy and Petroleum's "CIM Definition Standards - For Mineral Resources and Reserves, Definitions and Guidelines" ("CIM Standards") adopted by the CIM Council on November 27, 2010.

This Technical Report amends the Technical Report prepared by MDA and dated January 9, 2013. The following changes have been made in this report: 1) updating the effective date of the resource estimate to July 9, 2012; 2) adding a metallurgical Qualified Person as a co-author and making minor changes to the metallurgical section; 3) amending disclaimers in Section 3.0 and Ristorcelli's Certificate; and 4) providing additional clarification regarding the criteria used in classification.

2.1 Project Scope and Terms of Reference

The purpose of this report is to support CMC's financing and public disclosures and to provide a Technical Report on the World Beater project to be filed with the TSX Venture Exchange and the British Columbia Securities Commission.

This report has been prepared by Steven Ristorcelli, C. P. G., Principal Geologist for MDA. MDA has experience with the World Beater project, having visited the property and estimated the gold resources several times in the 1990s and having completed some informal and internal economic scoping studies. Mr. Ristorcelli prepared a Technical Report on the project in 2003 for a previous operator. The 2003 Technical Report included reporting a mineral resource estimate completed by Ristorcelli in 1997 prior to the existence of Canadian Instrument NI43-101. The 1997 Mineral Resources were estimated and classified under the supervision of Mr. Ristorcelli, who is a Qualified Person under NI 43-101. There is no affiliation between Mr. Ristorcelli and CMC except that of independent consultant/client relationships. No Mineral Reserves have been defined for this report.

The current Technical Report presents previous information relative to the general setting, geology, project history, exploration activities and results, methodology, quality assurance, interpretations, drilling programs, and metallurgy on behalf of CMC. MDA made extensive use of, and carefully evaluated, data and information from work completed by Echo Bay Mines Ltd. ("Echo Bay") and Compass Minerals

Ltd. ("Compass") for the completion of the 1997 estimate first reported in the 2003 Technical Report, and the author reviewed and commented on substantive public and private documents and technical information listed in Section 20.0. Minor sampling done by MDA for the 2003 report verified the existence of gold in grades similar to what has been previously reported, but this cannot validate the entire database. Having said that and having worked with project data in the 1990's and seen the corroboration of the estimate with post-1997-model drilling, the underlying geologic and analytical data appear reasonable in the opinion of the author as a Qualified Person.

The author's mandate from CMC was to update the 2003 Technical Report. The task also required on-site inspections and the preparation of this independent Technical Report containing the author's observations, conclusions, and recommendations. Since preparation of the 2003 Technical Report, work done at the project includes the development of a small underground mine and related infrastructure by PBI. The work done for the 2003 Technical Report is updated in this report only where new information makes it relevant to do so. No resource update has been performed since 1997 because the drilling by Manele Bay would only incrementally increase the existing resource estimate (see discussion in Section 14.5). The recent underground development work also supports the estimate as presently understood, but data from that work would not affect the estimate in a material way. Essentially, since the resource estimate in 1997, all subsequent work substantiates that estimate and does not materially change it. The 2003 drilling does emphasize the need, however, for better definition of the high-grade mineralization.

Mr. Ristorcelli visited the World Beater project on January 5 to 6, 1996 and on July 9, 2012. In April 2012 and May of 2012, Michael Brady, an associate of MDA, made two site visits to the World Beater. Brady made a preliminary map of the then-recently mined underground workings and made rough estimates of the tons and grade that had been mined. During the July 2012 site visit, Mr. Ristorcelli reviewed the recent mining conducted by PBI, though there was not active mining at the time.

The effective date of this report is October 1, 2012, with the exception of the information in Section 4.3.2 on the property purchase agreement, which is effective January 9, 2013.

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

Most of the data in this report was originally reported in Imperial units; however, metric units are also included in this report. Where data were originally reported in metric units, as in certain parts of the geologic description, Imperial units are also noted. The metallurgical section is an exception, as it was taken from work that exclusively used metric units, and Imperial units are not included.

Over the history of the mine, the project name has been reported as World Beater and Worldbeater, and a local geographic point of note, Claire Camp, has been written as both Claire and Clair. For consistency, this report uses World Beater and Claire.

Abbreviations used in this report include:

Ag	silver
As	arsenic
Au	gold
BLM	United States Department of the Interior, Bureau of Land Management
BX	1.432-inch diameter drill core (36.4 mm)

cfm	cubic feet per minute
Cu	copper
g/t	grams per metric tonne of material; 1 g Au/t = 1 ppm Au = 0.02917 oz/ton
Ga	billion years
ft	feet
Hg	mercury
in	inches
kg	kilogram
m	meter
Ma	million years
NX	1.875-inch diameter drill core (47.6 mm)
oz	troy ounce; 12 troy oz = 1 troy pound; 1 oz Au/ton = 34.2857 g Au/t
Pb	lead
ppm	parts per million
RC	reverse circulation (method of exploration drilling)
Sb	antimony
t, tonne	metric tonne 1 metric tonne = 1.1023 short tons
ton	short ton
Zn	zinc

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

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, mineral rights, and property agreements in the United States. Mr. Ristorcelli did not conduct any investigations of the environmental or social-economic issues associated with the World Beater project, and he is not an expert with respect to these issues.

MDA has relied upon information provided by Donald Wedman, P.Eng. and President and CEO of CMC, with regard to the following:

- Section 4.2 and 4.3, which pertain to land tenure and agreements;
- Section 4.4, which pertains to environmental liability; and
- Section 4.5, which pertains to environmental permitting.

MDA has relied on Donald Wedman of CMC to provide information concerning the legal status of CMC and its affiliates, as well as current legal title, material terms of all agreements, and material environmental and permitting information that pertain to the World Beater project. The author notes that MDA is relying on CMC, who did not contract with independent experts for updating this information for this Technical Report.

4.0 PROPERTY DESCRIPTION AND LOCATION

The author is not an expert in land, legal, environmental, and permitting matters. As far as MDA can determine, the last complete title report prepared for the World Beater project was undertaken for a previous operator in 2003. A current title report should be prepared that includes the unpatented and patented claims and all current agreements pertaining to the World Beater property. This Section 4.0 is based on information provided to the author by Donald Wedman of CMC. The author presents this information to fulfill reporting requirements of NI 43-101 and expresses no opinion regarding the legal or environmental status of the World Beater project. The effective date of this section of the report is October 1, 2012, with the exception of the information in Section 4.3.2 on the property purchase agreement, which is effective January 9, 2013.

4.1 Location

The World Beater gold property is located in the west-central portion of the Panamint Range, Inyo County, southeastern California, just west of Death Valley National Park. The property is approximately 60mi (100km) west of the California-Nevada border, and the center of the claim block is located about 20mi (33km) northeast of the town of Trona, California (Figure 4.1). The property is centered at 36.0248° N latitude and 117.1249° W longitude.

4.2 Land Area

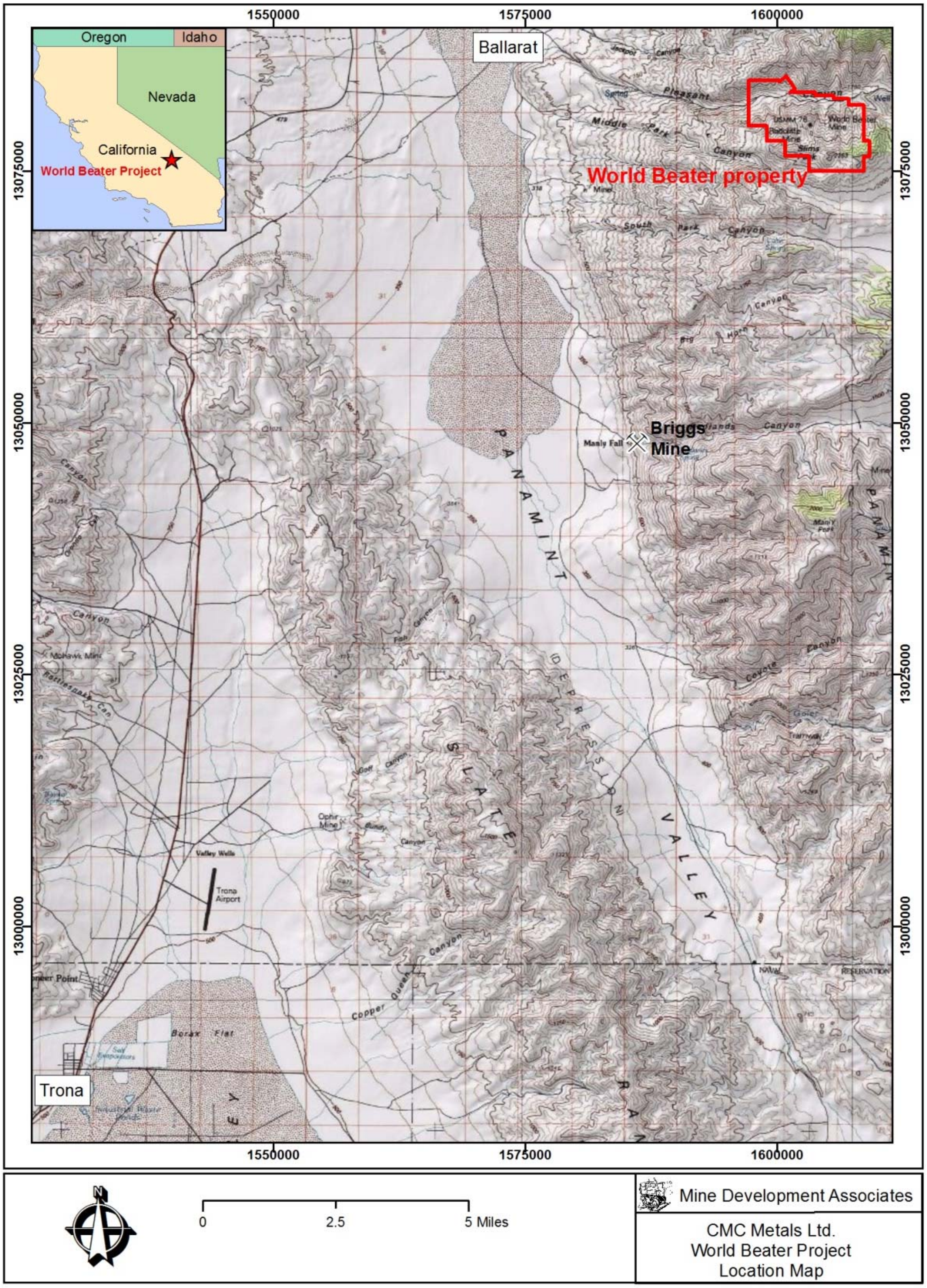
The property consists of 10 legally surveyed patented mineral claims, one legally surveyed patented mill site claim, 84 unsurveyed unpatented mining claims, and five unsurveyed unpatented mill site claims, aggregating approximately 1,654 acres (Figure 4.2, Appendix A). The defined resources are well within the claim boundaries (see Figures 7.2 and 7.3 with geology and drilling).

CMC holds a 50% interest in the World Beater property through its wholly owned subsidiary CMC Metals Corp.; both are referred to as “CMC” in this report. Pruett-Ballarat Inc. (“PBI”), a Nevada corporation, owns the remaining 50% interest in the property and is the current operator. The patented and unpatented claims are owned 50% by CMC and 50% by PBI, subject to a deed of trust in favor of WB & Ratcliff, Inc., although CMC reports (written communication, September 6, 2012) that Bureau of Land Management (“BLM”) records still reflect the previous owners (Charles Mott and WB & Ratcliff, Inc.) for the unpatented claims. CMC reports that all required access rights are in place through the Ridgecrest Bureau of Land Management (“BLM”) Plan of Operation (see Section 4.5).

There are four remaining property payments outstanding that are required under a promissory note to the previous owner, WB & Ratcliff, Inc.; see Section 4.3.2 for details. There are no other risks that CMC and PBI are aware of that would affect the access, title, or ability to perform work on the property.

Annual holding costs for the property include $1,206.52 in property taxes payable to Inyo County and $13,160.00 in maintenance fees payable to the BLM. CMC reports (written communication, September 6, 2012) that all costs have been paid for the current year.

Figure 4.1 Location Map



Property location is approximate.

4.2.1 Patented Mining and Mill-Site Claims

The 10 patented mining claims (MS 3713A) and one patented mill site claim (MS 3713B), historically known as the "Radcliff Consolidated Quartz mining and mill site claims," consist of the following: Sun Rise, Grover Cleveland, John G. Carlisle, Kentucky, Texas, Joker, Joker Extension, Never Give Up, Treasure Vault and W.G. Quartz Lode claims and the Cleveland mill site claim, designated by the Surveyor General as Lot Nos. 3713A and 3713B containing a total of 137.487 acres, more or less. The patented claims are located in all or portions of unsurveyed Sections 8, 9, and 16, T. 22 S., R. 45 E., Mount Diablo Base and Meridian.

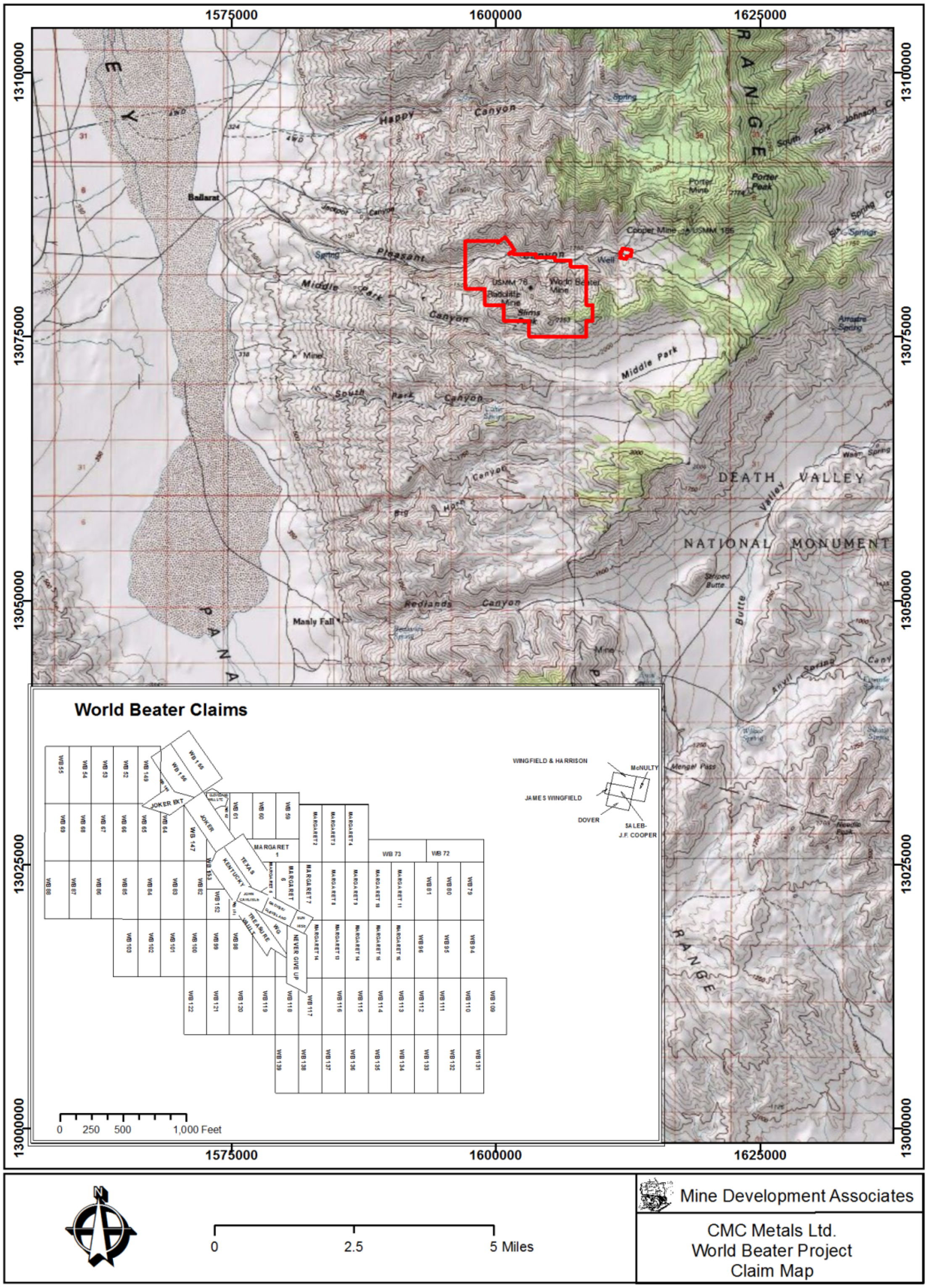
4.2.2 Unpatented Mining Claims

There are 84 unpatented mining claims (WB and Margaret series of claims) located in unsurveyed Sections 8-11 and 15-17, T. 22 S., R. 45 E., Mount Diablo Base and Meridian, South Park Mining District, Inyo County, California. Five additional unpatented mining claims originally part of the property have lapsed and are no longer valid (Donald Wedman, CMC, written communication, September 19, 2012); these five claims are not shown on Figure 4.2.

4.2.3 Unpatented Mill Sites, Water Claims and/or Water Rights

There are five unpatented mill sites, water claims and/or water rights known as the Stone Corral Water Claims as described in the deed recorded March 4, 1962 in Book 149, Page 593 of the Records of Inyo County, California, which are located in all or a portion of unsurveyed Section 11, T. 22 S., R. 45 E., Mount Diablo Meridian, County of Inyo, State of California (Figure 4.2). These claims are not contiguous with the unpatented mining claims and patented mining and mill site claims and are shown east of the main claim block in Figure 4.2. CMC reports that the location notices are recorded in the Office of the County Recorder of Inyo County and filed in the California State Office of the BLM.

Figure 4.2 World Beater Claim Map



Note: previous maps of Compass Minerals differ on the size of the James Wingfield claim; it may be smaller than shown here.

4.3 Agreements and Encumbrances

4.3.1 Agreement for Acquisition by CMC Metals of 50% Interest in the World Beater Project

On March 1, 2011, CMC signed a Letter of Intent with PBI to become a 50% joint-venture partner in the World Beater project by making an initial payment of $300,000 towards development costs for a 25% interest, plus the right to earn an additional 5% interest every six months with a payment of $60,000 for each 5% interest, to a maximum interest of 50% (CMC, written communication, September 6, 2012; CMC news release of May 3, 2011). CMC subsequently advanced an additional $150,000 toward the joint venture for road access and equipment (CMC news release dated December 21, 2011). The original agreement was subsequently amended, and CMC earned its 50% interest through the payments already made totaling $450,000. The only remaining obligation of CMC under the joint-venture agreement with PBI is to provide their 50% of the cost to carry and develop the property.

Also under the terms of the joint-venture agreement, the $1,000,000 provided by CMC towards the purchase of the property (see Section 4.3.2) and any pre-development capital provided by CMC will be returned on a first-priority basis from the net proceeds of the mine production (CMC news release dated December 21, 2011 and additional information provided by Donald Wedman of CMC by written communication, September 28, 2012).

4.3.2 Property Purchase Agreement

As described in CMC news releases dated December 21, 2011, May 1, 2012, and July 5, 2012 and information provided by CMC (Donald Wedman, written communication, September 28, 2012, January 7, 2013, and January 9, 2013), CMC signed a purchase agreement for a 50% ownership interest in the property with PBI and WB & Ratcliff, Inc. with the following terms:

- $100,000 payment made to the property owner (WB & Ratcliff, Inc.) on signing, which was paid;
- $100,000 payment completed on May 1, 2012;
- $100,000 payment made on June 15, 2012;
- $50,000 payment made September 17, 2012;
- $50,000 payment made November 1, 2012;
- $50,000 due on or before February 28, 2013;
- $50,000 due on or before April 30, 2013;
- $500,000 plus accrued interest due on or before August 31, 2013; and
- $50,000 amendment fee due on or before August 31, 2013.

This agreement is subject to a Deed of Trust dated April 18, 2012 in favor of WB & Ratcliff Inc. to secure the obligation of CMC and PBI under the terms of a promissory note dated April 18, 2012 and amended on June 7, 2012, September 14, 2012, and November 16, 2012.

This agreement includes a 5% net smelter returns ("NSR") royalty to WB & Ratcliff, Inc., with an option to buy out the royalty for $1,000,000 up to April 16, 2013.

4.3.3 Royalties

The only royalty encumbering the World Beater property is the 5% NSR payable to WB & Ratcliff, Inc. described in Section 4.3.2.

4.4 Environmental Liability

The World Beater and Radcliff mine property has a history of activity since the late 1800s. CMC conducted a Phase 1 and 2 Environmental Assessment as part of their due diligence during the acquisition of 50% interest in the property. On-site inspections and sampling of the past historic tailings and several other potential areas that would be suspected of contamination from past producers were conducted to identify if there was any significant environmental liability associated with the property. The engineering/environmental consulting firm of Brown and Caldwell conducted the assessments in February 2012 and found that there were no major concerns that could significantly impact the environmental liabilities (Licky and Turner, 2012). A reclamation bond valued at $102,242 has been provided to Inyo County, which covers all reclamation on the patented and unpatented claims (Donald Wedman of CMC, written communication, September 6, 2012).

4.5 Permits

In 2008, PBI applied for a Conditional Use Permit from Inyo County to access and develop the Radcliff mine, located at 5,600ft elevation. The Conditional Use Permit has been approved. A Plan of Operation that included an alternative access route was approved by the Ridgecrest BLM. Both the Plan of Operation and the Conditional Use Permit have had all required environmental studies performed, and closure reclamation bonds have been posted. A Negative Declaration has been issued on the property by Inyo County, stating that the proposed Plan of Operation "does not impact the environment significantly."

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

5.1 Access to Property

The World Beater property is accessible by road from the community of Trona, California, via approximately 21mi of paved road and 2mi of gravel road to the historic mining town of Ballarat. A four-wheel-drive road east of Ballarat extends up Pleasant Canyon for approximately 5mi to a point 1mi east of Claire Camp. From this point, a four-wheel-drive road crosses the property for approximately 2mi and accesses the Radcliff mine area.

5.2 Climate

The Panamint Range experiences hot summers and cold winters. The mean annual temperature ranges from about 35° to 76° F (USDA, 1997), and the mean freeze-free period is in the range of 100 to 275 days. Annual precipitation ranges from 4in to 20in. Much of the precipitation comes as snow at higher elevations. Runoff is rapid, and drainage is either to Panamint Valley on the west or Death Valley on the east. Streams are dry for most of each year, and the average evaporation rate for the area is ~12.5ft per year (USDA, 1997).

Within the property area, there is a spring located near Stone Corral. To the west of the property, surface water flows along Pleasant Canyon for a distance of 1mi, supporting a narrow zone of riparian vegetation. Surface water is generally limited to sheet flow and concentrated runoff from rainfall. Due to the limited vegetation and coarse soils, runoff normally contains high levels of sediment.

Exploration and mining can be conducted on the property year round.

5.3 Physiography

The Panamint Range has very rugged topography with deep valleys and canyons (Figure 5.1). Elevations range from about 1,000ft to 11,000ft. Within the property, elevations range from 4,600ft at Claire Camp to 6,600ft at the Radcliff mine. Mass wasting, fluvial deposition, and freeze-thaw are the main geomorphic processes. Shallow, rocky, well-drained soils are developed at the higher elevations on well-developed semi-continuous outcrop. The soils have been derived from either bedrock substrate or alluvial outwash materials. Much of the surface has been shaped by high-energy, flowing water. The ground surface has been disturbed by prior mineral exploration efforts and has not been reclaimed.

Vegetation within the property is sparse and covers approximately 10% of the area. This vegetation consists of a diverse mix of Mojave Desert and Great Basin shrub species.

Figure 5.1 View of the Panamint Range and the World Beater Property

View of the Panamint Range-- roads at the World Beater property are visible near skyline on the rounded reddish peak below and to the left of the highest pointed peak and to the left of the prominent white bands.

5.4 Local Resources and Infrastructure

Infrastructure in the immediate area of the property is minimal and consists of mineral exploration access roads constructed by Echo Bay, Compass, and PBI. A building located on the property has served as accommodations in past exploration programs.

Accommodations, supplies, and equipment can be obtained at Trona, California, a mining community of approximately 2,000 people. The C.R. Briggs Corp., a wholly owned subsidiary of Canyon Resources Corporation, operates a heap-leach, open-pit, gold mine (the Briggs mine, Fig. 4.1) approximately 6mi (10km) southeast of the World Beater property.

6.0 HISTORY

According to Sampson (1931), the World Beater and Radcliff gold deposits were discovered in 1896 and 1897. Production – reportedly on the order of 15,000oz of gold (~470kg Au) from 15,000 tons (~13,600 tonnes) of ore – came mostly from oxidized mineralization in the Radcliff mine during the period of 1898 to 1903. The World Beater mine produced on the order of 10,000oz of gold (~310kg Au) between 1896 and 1908. Total production for the two properties is approximately 25,000oz of gold (~780kg Au). The property continued to be developed after the Sampson report (1931) was written (Drobeck, 1990), but details regarding subsequent production are unavailable. All of the ore was reportedly transported by aerial tram to a small stamp mill with cyanide tanks located at Claire Camp in Pleasant Canyon.

Mr. Charles B. Mott, Jr. began consolidating the land block in the late 1980s. By July 1991, he had succeeded in acquiring the core block of claims, both patented and unpatented, which cover much of the deposit as it is presently known. Additional mineral claims have been located to give additional coverage of the known deposit as well as for potential new discoveries.

Modern exploration of the property commenced in 1989 when Kerr McGee Corporation ("Kerr McGee") began limited magnetic and induced polarization ("IP") geophysical surveying, mapping, and sampling of the Radcliff mine's underground workings. Kerr McGee signed a joint venture agreement with Echo Bay in 1992 with Echo Bay as operator of the property. Echo Bay conducted reconnaissance geological mapping, property-scale mapping, petrographic studies, rock-chip geochemical sampling, core drilling, and reverse circulation ("RC") drilling. A drill program of 87 holes spaced 140ft apart and totaling 16,806.5ft outlined the current resource; the MDA database has only 81 holes with 15,020ft. Echo Bay also took 110 underground channel samples throughout the six levels and 2,400ft of underground workings. Preliminary metallurgical studies were conducted for Kerr McGee and Echo Bay and by Battle Mountain Gold Co.; these are discussed in Section 0.

In May 1995, Compass optioned the property and immediately initiated a multi-phase RC drilling campaign from 1995 to 1997, during which time they drilled a total of 17,320ft (5,279m) in 64 RC holes. Compass contracted with MDA to complete a resource estimate in 1995 and then to update that estimate in 1996 and again in 1997. This final estimate was published in the 2003 Technical Report for Manele Bay Ventures Inc. (Ristorcelli, 2003).

The project remained idle from 1997 until Manele Bay Ventures Inc. ("Manele Bay;" name subsequently changed to MBA Gold Corp. and then Thunderbird Energy Corp.) optioned the property from Compass on November 5, 2002. On August 20, 2003, Manele Bay began an RC drilling program in order to understand the modes of gold occurrences in the World Beater Complex. Manele Bay drilled 29 RC holes totaling 7,910ft in their 2003 drill program (MBA Gold Corp. news release dated December 9, 2003). The drill program was aimed at expansion of the resource to the south and southwest but also included drilling of some infill holes (see discussion in Section 14.5).

Manele Bay relinquished its interest in the World Beater project in 2005, according to the October 31, 2005 financial statements of MBA Resources Corp. In 2005, Compass apparently dropped the World Beater project.

PBI optioned the property from the property owner, WB & Ratcliff, Inc. (Charles Mott, Jr., president), effective January 20, 2007 (CMC written communication, September 6, 2012). In late 2009, PBI began development of a drift and a raise at the Radcliff mine. PBI reports that as of April 19, 2012, surface stockpiles from this work consist of:

- Two stockpiles, one with 70 tons and one with 40 tons, located in Ballarat that consist of higher-grade material (>~0.50oz Au/ton);
- A low-grade dump at the Pleasant Canyon/mine road intersection that consists of 250 tons averaging ~0.25oz Au/ton; and
- The mine dump, which contains 10 separate piles totaling about 50 tons of waste.

This information on the stockpiles was reported to Mr. Michael Brady, as associate of MDA, when he visited the property on April 19, 2012.

According to PBI, each blasted round of muck, which represented roughly six feet of advance, was sampled twice; samples were assayed by Paul Skinner, consulting engineer with Brownstone Mining LLC of Lone Pine, California. Brownstone Mining LLC is not a certified assayer. The original copy of the assays has been lost, but Mr. Skinner reconstructed the assay listing recently by going back to his files. PBI recently took eight of the original samples that were missing from Mr. Skinner's listing to American Assay Laboratories ("American Assay") in Sparks, Nevada, for assay. American Assay analyzed for gold using 30g fire assay (their code "FA30") and ICP-AES analysis with a lower detection limit of 0.001oz Au/ton and for silver using gravimetric analysis (their code "GRAV") with a lower detection limit of 0.2oz Ag/ton. Samples with gold results exceeding 0.3oz Au/ton were reanalyzed using gravimetric analysis.

Using the assays from Mr. Skinner and American Assay along with his notes from his visits to the property on September 30, 2010 and April 19, 2012, Mr. Brady made a rough determination of the tons and grade of the various stockpiles at the property:

- High-grade material at Ballarat totals 96 tons averaging 0.516oz Au/ton; and
- Low-grade material at the Pleasant Canyon/mine road intersection totals 266 tons averaging 0.272oz Au/ton.

Mr. Skinner of Brownstone Mining LLC also conducted metallurgical testing for PBI in August 2010 (Skinner, 2010). Results are discussed in Section 0.

CMC purchased its 50% interest in the World Beater property from PBI in December 2011 and has conducted no exploration to date unrelated to the work of PBI described above.

6.1 Historic Resource Estimates

Historic resource estimates are tabulated in Table 6.1. MDA has not reviewed the Nash (1923; cited by Saunders, 1992) work and cannot make a judgment as to its accuracy or relevance. Saunders (1992) noted that the tons shown in Table 6.1 were described by Nash as "assured" and "probable;" with 8 million tons of "possible ore." The two estimates completed by Echo Bay, one in 1992 (Saunders, 1992) and a second one reportedly in 1993, were done on sections using polygonal methods. They are reasonable for preliminary estimates; they are simplistic but did honor the geology and were prepared in a manner considered appropriate given the level of information and understanding. These estimates would not comply with current reporting standards of NI 43-101.

This information on historic resource estimates mentioned above is provided as part of the historic record. These historic "resources" are not considered to be current resources and should not be relied upon. A qualified person has not done sufficient work to classify these historic estimates as current resources, and CMC is not treating these historic estimates as current mineral resources.

The estimates from 1995 (Ristorcelli, et. al., 1995) and 1996 (Ristorcelli, fax communication, 1996) are also shown on Table 6.1 and were prepared by the author of this report as an independent consultant for Compass. Current mineral resources, effective as of July 9, 2012, are described in Section 0.

Table 6.1 Historic Resource Estimates – Unclassified

Nash (1923)			
Cutoff (oz/ton)	**Tons**	**Grade (oz/ton)**	**Ounces Gold**
NA	1,038,000	0.342	355,000
Echo Bay (1992)			
Cutoff (oz/ton)	**Tons**	**Grade (oz/ton)**	**Ounces Gold**
0.03	1,078,068	0.160	172,819
Echo Bay (1993)			
Cutoff (oz/ton)	**Tons**	**Grade (oz/ton)**	**Ounces Gold**
0.03	1,659,181	0.173	287,040
0.07	1,148,978	0.244	280,350
Compass by MDA (1995)			
Cutoff (oz/ton)	**Tons**	**Grade (oz/ton)**	**Ounces Gold**
0.03	1,706,000	0.120	204,700
0.05	1,389,000	0.138	191,700
Compass by MDA (1996)			
Cutoff (oz/ton)	**Tons**	**Grade (oz/ton)**	**Ounces Gold**
0.02	2,209,000	0.095	210,000
0.05	1,081,000	0.156	168,500

7.0 GEOLOGICAL SETTING AND MINERALIZATION

7.1 Geologic Setting

The geology section of this report was largely compiled by the staff of a previous operator and was reviewed by MDA.

7.1.1 Regional Geology

The Panamint Range lies within the most southwestern portion of the Great Basin and has the tectonic and physiographic characteristics of the Basin and Range Province. This north-south elongated mountain range is a fault-bounded block composed of a diverse assemblage of Precambrian to Cenozoic sedimentary, volcanic, plutonic, and metamorphic rocks with a complex geologic history (Figure 7.1).

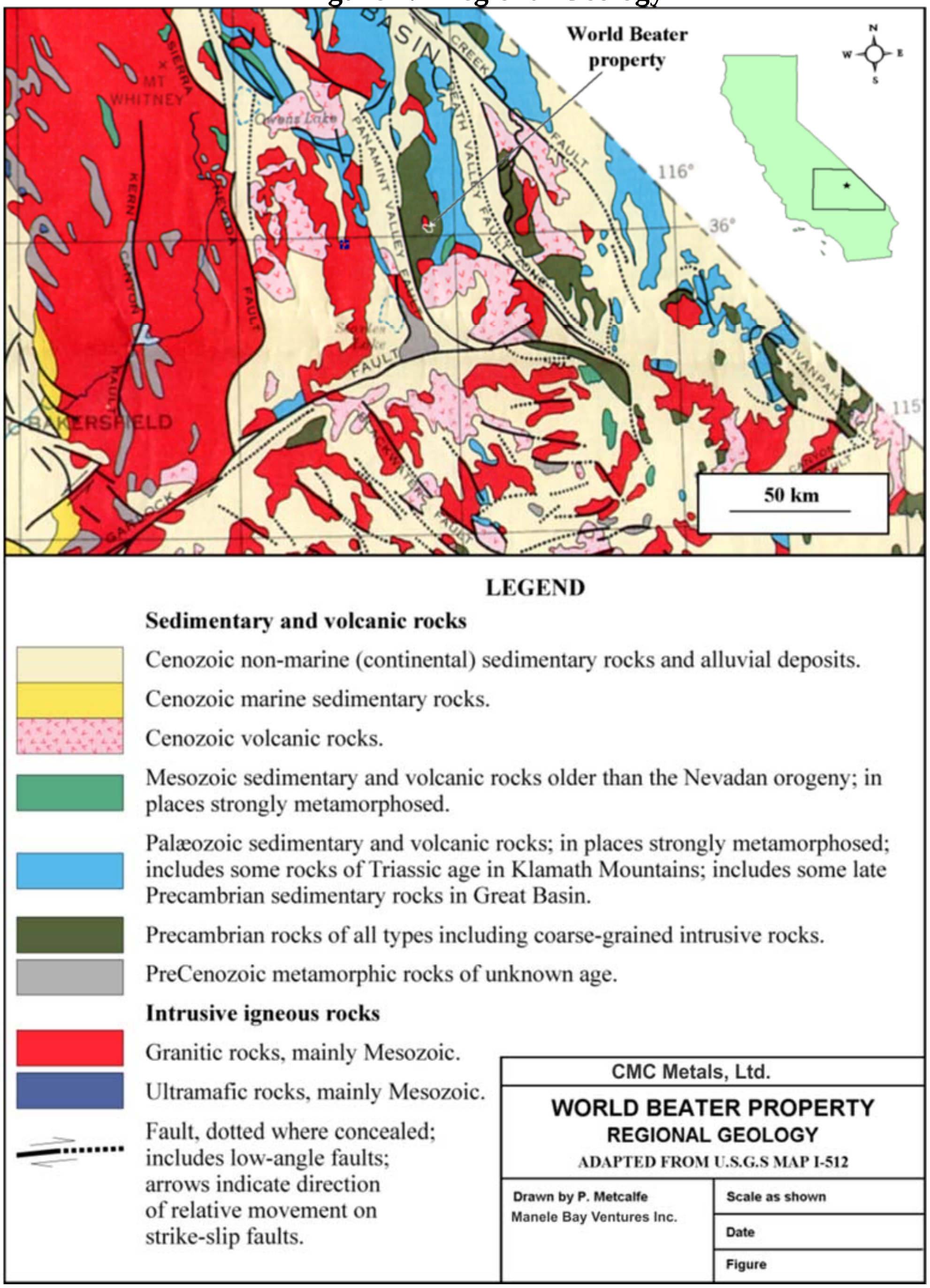
The western Panamint Range consists of Precambrian rocks of many types, which occupy an area of 50mi by 15mi (80km by 25km). These Precambrian rocks are made up in large part of the Middle to Upper Proterozoic Pahrump Group. The Pahrump Group consists of an approximately 5,000ft (1,500m)-thick assemblage of extremely heterogeneous metasedimentary rocks originally deposited in a variably dynamic marine environment. This assemblage has been broken down into three formations, of which only the Upper Proterozoic Kingston Peak Formation (Andrew, 2000) is pertinent to the property. The lower part of the Kingston Peak Formation consists of metagreywacke, pelitic and amphibolitic schist, quartzite, and metaconglomerate, overlain by metabasalt, metalimestone, and metasandstone. The Kingston Peak Formation is overlain by a carbonate-dominant sequence of formations of Upper Proterozoic age, while the base of the Pahrump Group lies with either conformity or unconformity on a Middle Proterozoic basement known as the World Beater Complex and granodiorite gneiss in Goler Canyon (Andrew, 2000).

The World Beater Complex is a metamorphic dome (oral comm., M. McClaren, 2003) that occupies an area of approximately 7.5mi^2 (20km^2). It is made up of augen gneiss, quartzo-feldspathic gneiss, and muscovite biotite gneiss dated at 1,700 Ma (Lanphere et al., 1964). This complex has been intruded by undeformed gray granite dated at 1,400 Ma (Lanphere et al., 1964). Diabase sills and dikes (probable correlative age: 1,087 Ma; Heaman and Grotzinger, 1992) intrude the World Beater Complex and the Middle Proterozoic Formations of the Pahrump Group.

The Precambrian rocks have undergone both prograde and retrograde regional metamorphism. Prograde metamorphism reached upper amphibolite facies. Retrograde metamorphism was lower greenschist facies (Labotka et al., 1980). The Precambrian rocks were folded along north-northwest trending axes, and a prominent anticline and the World Beater dome dominate the structure of the central Panamint Mountains.

Uplift was accomplished by vertical displacement along north-trending, high-angle faults. Extensional tectonics during the Tertiary generated faults with shallow west dips and normal displacement. Tertiary faults were intruded by Miocene dikes (Labotka et al., 1980). Cenozoic non-marine sedimentary rocks occur in the Panamint Valley graben that lies to the west of the Panamint Range. The Panamint Valley fault zone is classified as a major “active” fault, which has had numerous displacements during the last 200 to 20,000 years (Cleary, 1993). Fanglomerates were shed to the west of the Panamint Range and have been uplifted along faults related to the Panamint Valley fault zone.

Figure 7.1 Regional Geology



7.1.2 Property Geology

The local geology of the World Beater property is summarized in Figure 7.2. Property-scale geologic mapping (Fuchs, 1994a; Echo Bay Exploration Inc. 1994; Saunders, 1992), drill-hole logging, and petrographic studies (Long, 1993; Schurer & Fuchs, 1993a, 1993b) have refined the understanding of the stratigraphy of the upper portions of the immediate project area (Figure 7.3, Figure 7.4).

7.1.2.1 Lithologic Descriptions

The north-northeast-trending World Beater fault cuts the property and passes through the World Beater mine (Figure 7.2). The World Beater Complex (Fuchs, 1994a) is lithologically different on each side of the World Beater fault. West of the fault, the lower portion of the complex is dominantly augen gneiss with feldspar augen (K-feldspar dominant). The upper portion is dominantly schistose gneiss of limited areal extent, which is locally moderately to strongly altered to sericite and/or muscovite and is silicified. This schistose gneiss consists of metarhyolite tuff (fragmental, lapilli quartz-rich rhyodacite to rhyolite tuff) and fine-grained metagranite. The metagranite intrudes the augen gneiss, and the metatuff may have a close genetic relationship with the metagranite.

There is no apparent unconformity between the World Beater metarhyolite tuff and the overlying metasedimentary rocks, west of the World Beater fault. A transitional and alternating sequence of tuff and sedimentary rock is found at this lithological boundary. This lithological sequence is interpreted to represent a waning stage of volcanism and an onset of sedimentation (Fuchs, 1994a). Regionally, this contact is either a structural or an unconformable contact.

Within the area of the Radcliff mine, the metarhyolite tuff (schistose gneiss) is pervasively altered to sericite and constitutes a thickened volcanic section, which thins northwestward. The thickened metarhyolite forms a domal pile within the area of the Radcliff mine, which has a close spatial relationship to mineralization (Fuchs, 1994a and Comba, 1994).

East of the World Beater fault, there is a lower unit of intermixed gneissic laminated metasedimentary rocks that have been intruded and assimilated by a metagranite. The presence of a basal metaconglomerate separating gneiss from overlying metasandstone and metasiltstone clearly indicates an unconformity in this portion of the property.

Overlying the World Beater Complex is a metasedimentary section that is locally referred to as the Radcliff Schist. This unit is more formally recognized as a submember of the Limekiln Spring Member of the Kingston Peak Formation (Andrew, 2000). The submember varies in thickness from 50m to 500m (150ft to 1,500ft) and is of regional extent.

Figure 7.2 World Beater Project Area Geology

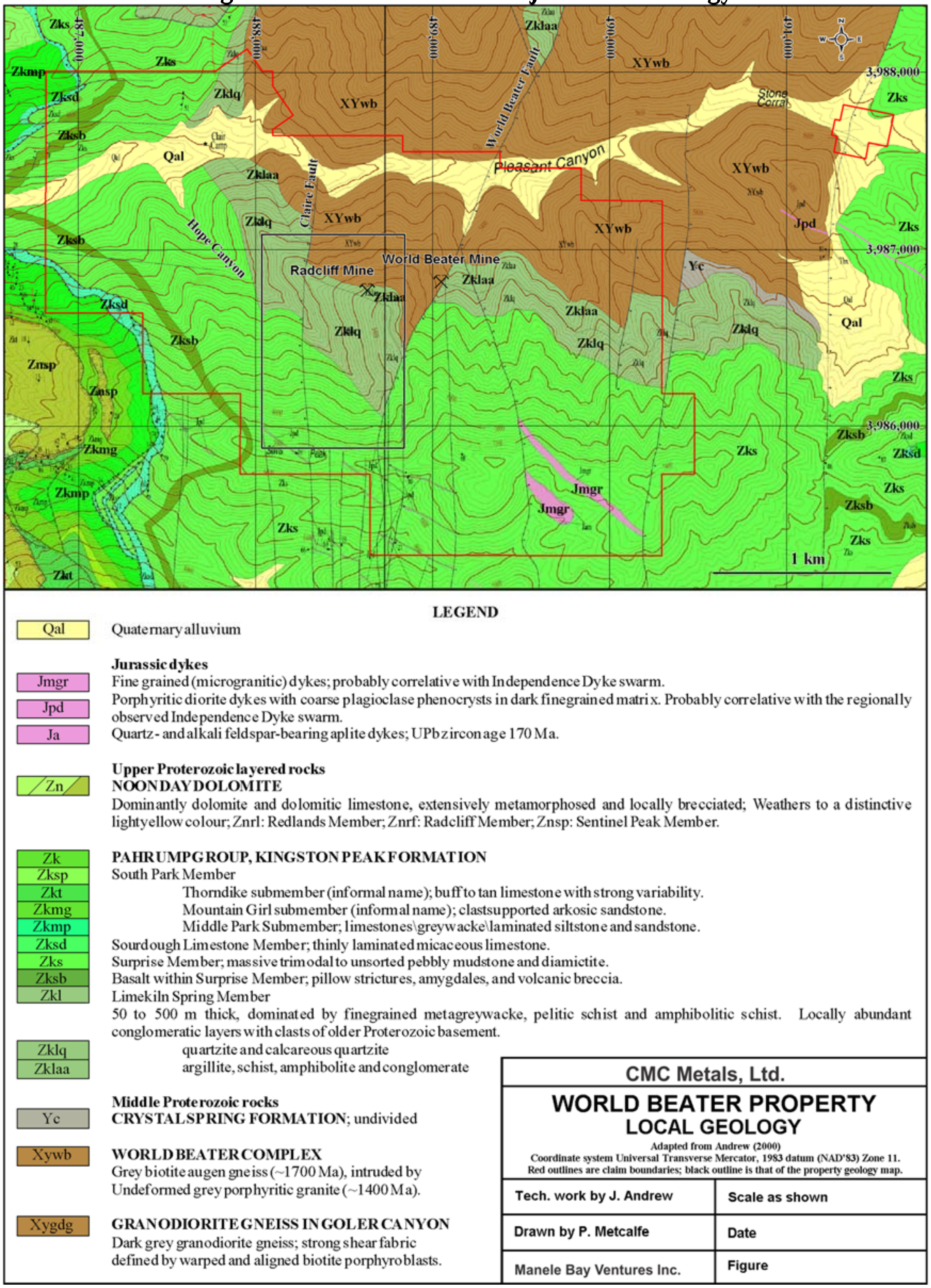


Figure 7.3 Detailed Project Area Geology

(From Echo Bay, 1994; see Figure 7.2 for location of this figure and Figure 7.4 for units)

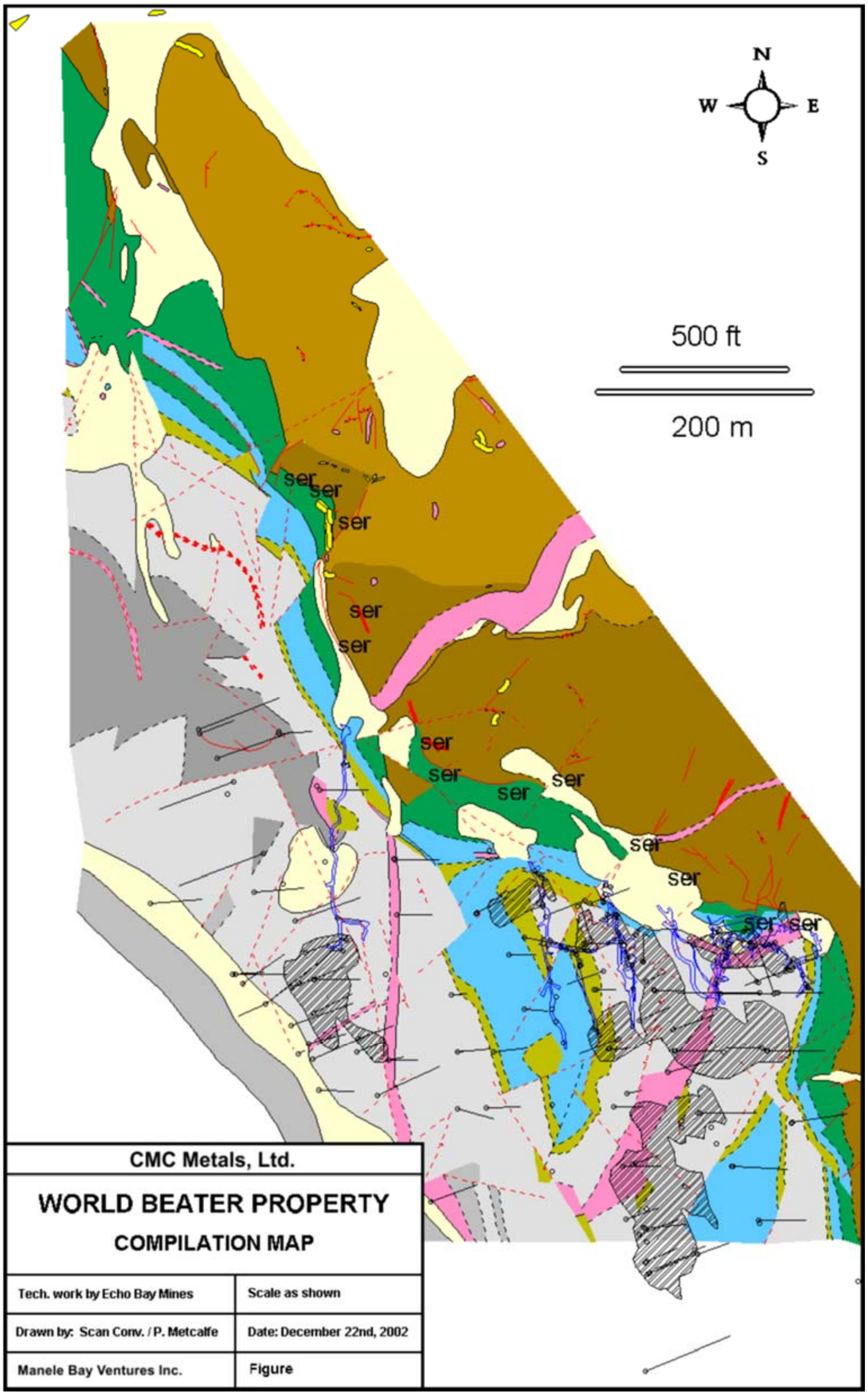


Figure 7.4 Facies West of World Beater Fault

FACIES WEST OF WORLD BEATER FAULT

Qal — **Quaternary: dominantly talus, but in places includes dump material, colluvium and road material; not mapped where lithology is interpreted.**

PROTEROZOIC

Pec — Diorite: metadiabase, amphibolite and camptonite (a lamprophyre) undifferentiated; dikes, stocks and small pods intrusive into all other "World Beater Complex gneiss units" (except possibly pegmatite), "Radcliff Schist" and Kingston Peak Formation; found both east and west of World Beater fault, but more common west of fault.

KINGSTON PEAK FORMATION

Kpdm — Metadiamictite: medium to dark gray, fissile chlorite + quartz argillic schist matrix with quartzite, dolomitic marble, calc-silicate schist and gneissic quartz monzonite clasts. Some quartzose (metasiltstone) matrix. Clasts often severely stretched along foliation. Contains a ±10' flow of metabasalt. Thickness >1000'.

Kpma — Mica Quartz Schist: light tan to tan weathering, laminated thin bedded, fine-grained muscovite + quartz (>80%) schist. Many beds appear to be pyritic: (metapyritic (?), slightly carbonaceous quartzose siltstone) apparently eroded from ridge west of 7th level. Appears conformable on orthoquartzite, thickness >150'.

KpOq — Orthoquartzite: light tan weathering, massive to thickly bedded with muscovite schist partings. Base 35' thick quartzite bed overlain by ±10' schistose muscovite + quartz schist, then ±25' massive quartzite bed. Dark blue gray hornfels near diorite intrusions. Thickness>45'.

"RADCLIFF SCHIST"

Rqs — Quartz Schist: tan weathering, thin bedded, fine-grained, slightly calcareous muscovite + quartz schist. Includes 34" green actinolite calc-silicate bed in mid-section in Clair Camp Canyon. Thickness >20'.

Rcs — Calc Schist: orangish brown weathering, thinly interbedded dolomitic sandstone, quartzite, dolomitic marble and arenaceous dolostone, contains blue quartz layer, usually near base. Severely deformed into isoclinal and "Z" folds. Converted to calc-silicate hornfels or silicified and pyritized in upper Radcliff Canyon and SW dip slope. Contains strongly magnetic dark brown layer near 7th level that appears to be magnetite + diopside (?) + biotite (?) skarn bed. Thickness 22'.

Rph — Phyllite: lower unit (±45') of medium gray, highly foliated pyrite + muscovite + chlorite + quartz phyllite with base of white arkosic to muscovite + quartz (palæoregolith?) up to 5' thick above schistose quartz monzonite basement. Lower phyllite unit grades upward into more massive, hackly weathering metasiltstone and metasandstone. Thickness 85'. In Clair Camp Canyon upper part is calcareous, tremolite calc-silicate hornfels and heavily Mn-stained, grainy weathering metasandstone near top. The formation appears thicker in this area.

WORLD BEATER FORMATION

Wbg — Schistose Gneiss: upper unit of the World Beater Complex; dominantly schistose gneiss, which is almost pervasively moderately sericitic/muscovitic due to alteration; foliated and strongly sericitic/muscovitic only along Radcliff megashear zones; represents a metarhyolite tuff (particularly at higher levels), but includes metagranite (feeder to the tuff) and some pegmatite which is clearly later.

Wbga — Augen Gneiss: lower unit of the World Beater Complex; augen gneiss, feldspar (mostly K-feldspar) augen of at least 1" in size distinguish this unit from the metarhyolite tuff above (which can have quartz augen in the lower portion); contains biotitic zones and some foliation; represents former intrusive; is intruded by (and therefore is older than) Wbg; includes some (and in places considerable) pegmatite which is clearly later.

ser — Intense sericitic/muscovitic alteration; note that unit Wbg has pervasive mild to moderate sericitic/muscovitic alteration

Quartz veining: often with iron oxide; where labelled Fe, quartz is sparse and iron oxide dominates the mineralization

FeO — Iron oxide

Outline of areas of mineral resource

Fault, dashed where approximate, arrow shows dip

Mylonitic/phyllonitic fault

Low angle fault; possible thrust fault

Exploration drill holes

Adit

CMC Metals, Ltd.	
WORLD BEATER PROPERTY COMPILATION MAP LEGEND	
Tech. work by Echo Bay	
Drawn by P. Metcalfe	Date
	Figure

Regionally, metagreywacke, pelitic schist, and amphibolitic schist dominate the Radcliff Schist. At the property scale and particularly within the area of the Radcliff mine, the World Beater Complex is conformably overlain by a succession of at least four recognizable units that make up the Radcliff Schist (see Figure 7.5). These units strike northwest and are tilted west at approximately 35o. Rapid lateral facies changes are characteristic of the Radcliff Schist. The complex facies changes, in addition to tectonic repetition of the stratigraphy, make stratigraphic correlations difficult.

A lower cherty intermediate-composition metatuff unit (unit 1, Figure 7.5) may be present. This stratigraphic unit, in the main Radcliff area, has chert, minor carbonate, and sulfide (up to several percent with pyrrhotite greatly exceeding pyrite). Where developed, this lower unit hosts the basal chert and massive sulfide exhalative beds, is about ~5m (~15ft) thick and contains gold mineralization (Long, 1993).

Overlying the metatuff is a variable mafic interval. This unit (unit 2, Figure 7.5) may be laminated (mafic tuff) or massive (basalt flow). Basalt flows are best developed to the north of Claire Camp (Fuchs, 1994b), and pillow structures have been recognized. This unit is about ~15m (~50ft) thick and can contain cherty sulfidic layers, which may be gold bearing.

Overlying this unit is a 10 to 30m- (~30ft to ~100ft) thick unit (unit 3, Figure 7.5) dominated by intermediate composition metatuff and blue quartz chert exhalite. The tuff forms fine, wispy laminations, pumiceous blocks, and a somewhat reworked-appearing volcanic wacke. Interspersed throughout this intermediate tuff horizon is cherty, sulfidic exhalative material. This exhalative material dominates the section in places, forming massive beds of chert and semi-massive to massive sulfides. Sedimentary slump structures are common where the sulfide content increases. The chert has other exhalite minerals, particularly where sulfide content increases. The exhalite mineral assemblage may include: bedded sulfates, sphene, molybdenite, galena, sphalerite, chalcopyrite, and gold. The predominant sulfide is recrystallized pyrrhotite, with subordinate pyrite. Evidence suggests that, at least locally, a paleo-downslope direction of this unit is N70^{o}W (Long, 1993).

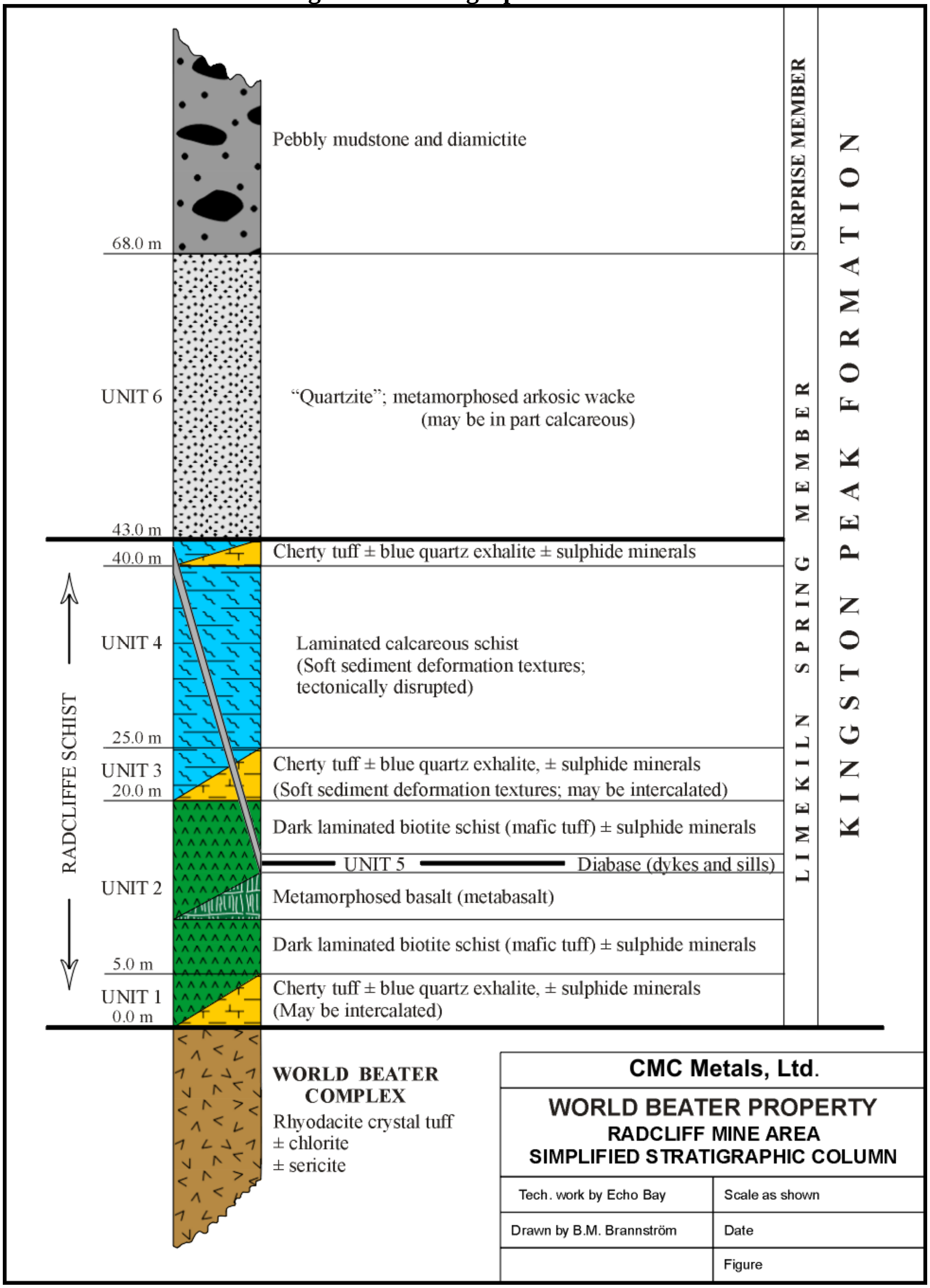
The next successive unit (unit 4, Figure 7.5) is referred to as calc-schist and is an intermediate-composition metatuff with minor to intense carbonate alteration and minor, but persistent, chert and iron carbonate chemical sediment. Soft-sediment-deformation features and regional deformation features are commonly observed in this unit.

Much of the stratigraphy that comprises the Radcliff Schist is thought to have undergone subaqueous slumping and sliding due to the high relief of the submarine paleotopography (Fuchs, October 1994b).

Diabase dikes and sills (unit 5, Figure 7.5) cut the Word Beater Complex and the various units previously described. This unit probably correlates with the diabase (Middle Proterozoic) of Andrew (2000).

The uppermost unit (unit 6, Figure 7.5) is present in the central Radcliff mine area and is informally referred to as “quartzite.” It appears to be a significantly reworked felsic metatuff (Schurer & Fuchs, 1993b). This is more formally recognized as a submember of the Limekiln Spring Member of the Kingston Peak Formation (Andrew, 2000) and may be present over a 60m (100ft) thickness.

Figure 7.5 Stratigraphic Column



Overlying the Limekiln Spring Member is the Surprise Member of the Kingston Peak Formation. (Andrew, 2000). On a regional basis, this unit consists of 250m to 1,000m (800ft to 3,000ft) of clastic rocks that are massive, bedded to unbedded, unsorted pebbly mudstone and diamictite. Clastic rock types include: quartzo-feldspathic gneiss, quartzite, dolomite, argillite and diabase. This unit may, in part, be a series of basin-fill sediments with repeated lahars and debris flows.

7.1.2.2 Structural Geology

The property has a number of significant structural features. A shear zone at the base of the Radcliff Schist disrupts the contact with the World Beater Complex and forms a mylonitic zone that extends for about 30m (100ft) below the Radcliff Schist into the World Beater Complex. The amount of movement that has taken place on this structure has not been determined; however, measurement of sections across the Radcliff Schist shows that there are large stratigraphic variations at several locations that can be partially explained by bedding-parallel attenuation faulting. This would imply significant offset along the Radcliff shear. Other bedding-parallel faults are intensely developed in the Radcliff mine. These faults are restricted to the Radcliff Schist and have not been observed in other rock units (Drobeck, 1990). Due to the fact that the rocks overlying and underlying the Radcliff Schist are very competent, the Radcliff Schist accommodated structural deformation.

North- to north-northeast-striking normal faults are prominent structural features. One major fault of this set cuts the Radcliff Schist and has been named the World Beater fault (Figure 7.2). This fault has one major shear plane and numerous parallel fault planes, forming a complex fault zone. The World Beater fault and most of the normal faults mapped are east-dipping.

There is approximately 450m (1,500ft) of sinistral movement and 300m (1,000ft) of apparent east-side-down movement on the World Beater fault. An antithetic set of west-dipping normal faults is present and includes the Claire fault, along which there has been reported approximately 100m (300ft) of dextral movement. A structural wedge that displaces the stratigraphy in a southerly direction was created by the combined movements on the World Beater and Claire fault zones (Figure 7.2).

Northwest- and east-northeast-trending normal faults have been mapped by Echo Bay and have relatively small vertical and horizontal displacements. A northwest-trending anticline occurs in the Radcliff Schist at the 2,000m (6,500ft) elevation in east Hope Canyon. This anticline may reflect irregularities in the basement topography.

7.2 Mineralization

7.2.1 World Beater Mine

The World Beater mine is located approximately 1,500ft (~450m) northeast of the Radcliff mine area (MDA has not visited the World Beater mine, and this description was compiled by a previous operator). Two adits have been developed for a distance of approximately 300ft (~100m) on a quartz vein structure located within the World Beater fault system. The vein has been traced for about 10mi (~15km) (Labotka, *et al.*, 1980). The vein strikes N20°E and dips 50° to 70° ESE. Sampling by Echo Bay (Drobeck, 1990) yielded the best results of 0.717ppm Au (0.021oz Au/ton) over 35ft (10m) and 3.91ppm (0.114oz Au/ton) over 120ft (37m). The latter result is skewed by a single high-grade sample of 23.0ppm Au (0.672oz Au/ton), and the width of the zone may overstate the true width due to fault repetition. Previous sampling indicates that there are two fault zones of significant width with strongly anomalous gold mineralization in the World Beater mine area.

No resource is reported for the World Beater mine area.

7.2.2 Radcliff Mine

Gold mineralization at the World Beater property, specifically in the Radcliff mine area, can be found in several forms, with the present drill-indicated gold resource primarily in three stratigraphically separate and stratabound metasedimentary chert and sulfides horizons. The most significant of these horizons is a basal exhalite horizon that lies stratigraphically above the underlying World Beater Complex.

Gold mineralization is found in a mylonite shear zone at the base of the Radcliff Schist and was the focus of early mining activities (Long, 1993). This bedding-parallel shear is oxidized and fractured. At the Radcliff mine, seven levels, aggregating approximately 3,000ft (~1,000m) of tunnels and stopes over a vertical extent of 500ft (150m), were developed in this structural zone between 1898 and 1903. These workings produced approximately 15,000 ounces (~470kg Au) of gold from about 15,000 tons (~13,600 tonnes) of ore. In addition to the oxidized mineralization, siliceous and sulfidic gold-bearing exhalite has been encountered in these workings. The exhalite appears to be stratabound, contains pyrrhotite, and commonly has dark bluish-gray quartz. Limited studies on five samples of Radcliff area mineralization indicate that the gold occurs as micron-sized grains in a variety of mineral associations, both enclosed in, and adjacent to, grains of sulfides and/or gangue minerals. Gold also occurs as electrum. Bismuth is strongly associated with gold. Pyrite and pyrrhotite are the most common associated sulfide minerals (Schurer and Fuchs, 1993a).

In addition to the stratabound mineralization, gold occurs in quartz-sulfide veins, and as disseminated and locally massive sulfides emplaced along zones of shearing and dilatency within argillite and amphibolite that overlie quartzofeldspathic gneiss and granite of the World Beater Complex (CMC Metals Ltd. news release, December 21, 2011).

At the Radcliff mine area, MDA estimated an Indicated resource of 2.13 million tons at 0.094oz Au/ton (1.9 million tonnes grading 3.22g Au/t) at a cutoff of 0.02oz Au/ton. The drilled mineralization has been identified along a strike length of almost 2,500ft (~750 m) and down dip for 1,600ft (490m). Thickness of the mineralization reaches up to 50ft (15m) and probably averages about 20ft (6m). The high-grade mineralization reaches over 10ft (3m) thick and averages about 6ft (2m) thick.

Some drill holes in the Radcliff mine area have intersected mineralized structures as opposed to the stratabound mineralization. Characteristic of these mineralized intercepts is the association of chlorite and pyrite of hydrothermal origin (Schurer & Fuchs, 1993a). This mineralization is predominately found within the World Beater Complex and may represent the structural channelways for hydrothermal fluids that precipitated exhalite mineralization. This zone appears to be structurally truncated to the west-southwest, and its extension has not been identified. Significant drill-hole intercepts of this style of mineralization include the following:

- C-34 from 205ft to 220ft (62.5m to 67.1m): 15ft of 1.313oz Au/ton (4.6m of 45.03g Au/t), and

- C-34A from 19ft to 245ft (59.4m to 74.7m): 45ft of 0.333oz Au/ton (13.7m of 11.42g Au/t).

A number of additional intercepts of mineralization have been encountered in the World Beater Complex. Bismuth and tellurium minerals have been identified in some exhalite mineralization. A previous operator, Manele Bay, believed that this mineralization was formed proximal to footwall conduits. At present, the manner of distribution, the structural controls, and the geometry and continuity of this mineralization style are not understood, and further exploration is required to determine its significance.

Rock sampling in the Radcliff mine area by Echo Bay and to the northwest towards Claire Camp has outlined areas that are geochemically anomalous in gold, bismuth, and copper. The gold anomalies are best developed in the area of past drilling; however, isolated gold anomalies were located over a distance of approximately 1,500ft (~460m) to the northwest of the Claire fault (Figure 7.3). These anomalies are associated with much broader anomalies of copper and bismuth.

Trace element geochemistry from 88 samples taken by Drobeck (1990) showed that the World Beater project gold mineralization has trace elements in low concentrations (Table 7.1).

Table 7.1 Trace Element Geochemistry

	Radcliff Mine Area		World Beater Mine Area	
Element	**Mean (ppm)**	**Std. Dev. (ppm)**	**Mean (ppm)**	**Std. Dev. (ppm)**
Ag	0.22	0.48	0.33	0.89
As	43	157	201	264
Sb	57	2.2	10.5	14.2
Hg	0.10	0.10	0.53	0.43
Cu	297	218	245	275
Pb	1.5	3.7	12	27
Zn	49	26	73	70

8.0 DEPOSIT TYPES

The World Beater property is underlain by a succession of metavolcanic and metasedimentary rocks where mineralization is found above a thickened metarhyolite formation (schistose gneiss of the World Beater Complex). The upper portion of the rhyolite is sericitized and silicified. The overlying submarine exhalite and tuff (chert and phyllite of the Radcliff Schist) and its accompanying massive sulfide mineralization and footwall mineralized hydrothermal alteration are characteristic of the volcanic-associated massive sulfide gold class of deposit (Poulsen and Hannington, 1995). More specifically, the deposit type is that in which gold is a primary commodity and base metals are of lesser economic importance. These deposits are gold deposits in a strict economic sense.

Gold mineralization found on the World Beater project to date is, for the most part, stratabound and primarily occurs within exhalative tuff units (phyllite and schist) of the Radcliff Schist. Thickness of the exhalative tuff may reflect paleotopography related to the primary topography of the rhyolite dome(s) (Comba, 1994).

The recognition of a distinct suite of bismuth and tellurium-bearing minerals (Schurer & Fuchs, 1993a) both in mineralized exhalite and in areas of mineralized hydrothermal alteration suggests that portions of the exhalite mineralization formed in proximity to underlying footwall structurally controlled mineralization (Marcoux *et al*., 1996; Poulsen and Hannington, 1995).

A deposit model that discusses the style and characteristics of exhalite mineralization and footwall quartz-sericite and chloritic mineralization has been described by Carvalho (1979) and is presented in Figure 8.1 and described below:

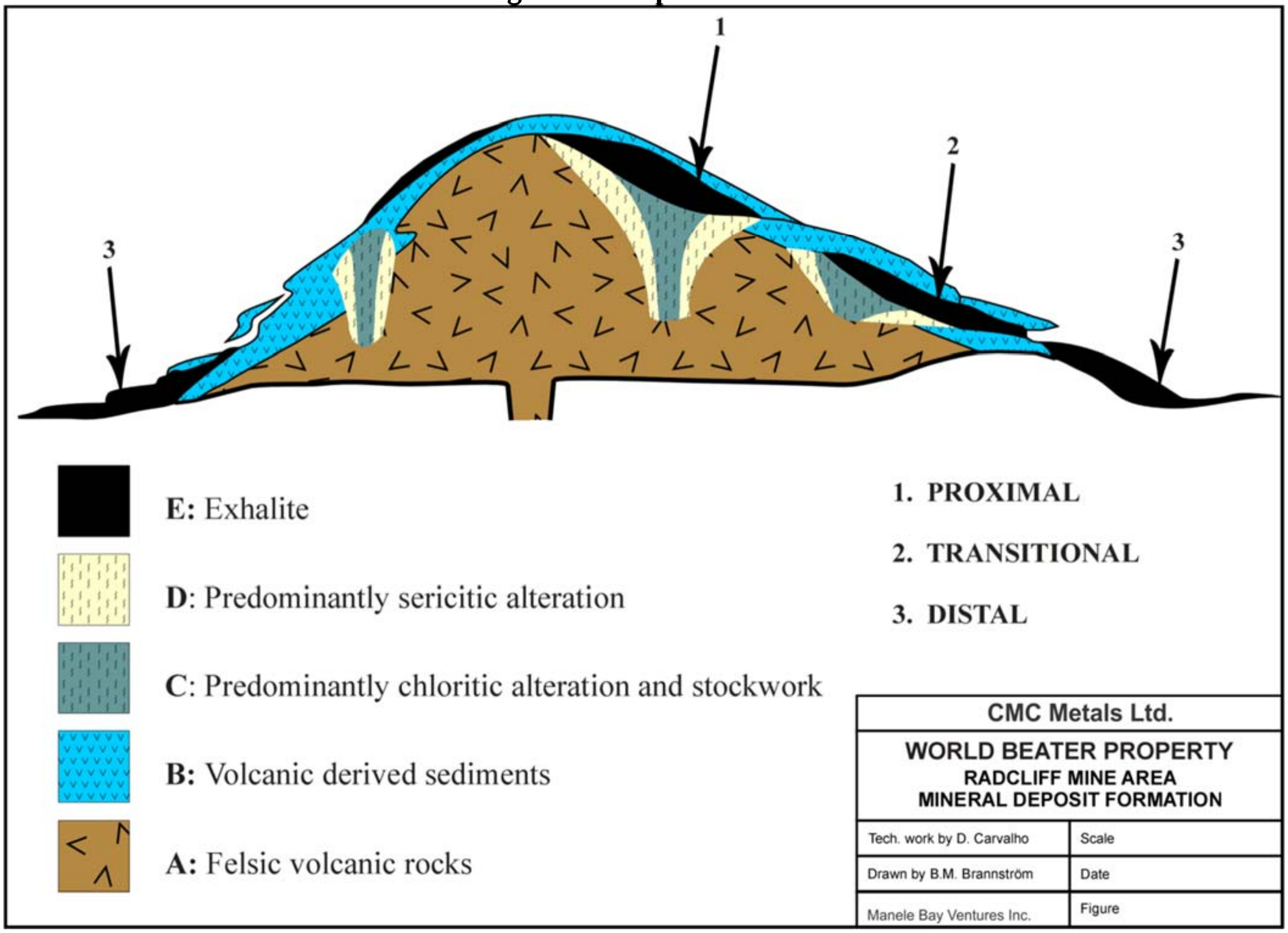
1. Rooted or proximal type
   This type is distinguished by being located near volcanic centers and has associated footwall mineralization with quartz-sericitic and chloritic hydrothermal alteration.

2. The transition type
   Intermediate between the characteristics of the rooted (proximal) and the unrooted (distal) types in that footwall mineralization and associated alteration are, at least in part, present while the exhalite is, in part, interstratified in sedimentary rocks.

3. The unrooted or distal type
   The distal type corresponds to deposits in which no direct connections with volcanic centers can be observed and may be completely interstratified in sedimentary rocks. Typical footwall mineralization is absent, and hydrothermal alteration may be missing. A variety of sedimentary structures in the exhalite are frequently observed.

Exhalite mineralization found at the base of the Radcliff Schist and adjacent to the World Beater Complex is thought to be predominately of a proximal and transitional type, while exhalite zones located stratigraphically higher in the Radcliff Schist section are thought to be of a distal type. The auriferous massive sulfide deposits can have geometrically stratabound mineralization as well as geometrically pipe-like disseminated and stockwork-like vein systems.

Figure 8.1 Deposit Model



Examples of auriferous volcanic-associated massive sulfide deposits in which gold is a primary commodity and base metals are of lesser economic importance are summarized in Table 8.1.

Table 8.1 Deposits Similar to World Beater

Deposit	Location	Type	Age	Ore Tonnes	Au ppm	Ag ppm	Cu %	Zn %	Pb %	Au Tonnes
Bousquet No. 1	Bousquet Quebec	Pyritic gold	Archean	20,737,000	4.5	-	-	-	-	93
Agnico Eagle	Joutel Que-bec	Pyritic gold	Archean	5,279,000	6.4	<10	-	-	-	34
Montauban North	Grenville Quebec	Pyritic gold	Archean	600,000	5.0	-	-	-	-	3
Starra	Mt Isa Inlier Queensland	Pyritic gold	Cambrian	5,300,000	5.0	-	2.0	-	-	26

Adapted from: Poulsen and Hannington, 1995

The Bousquet No. 2 deposit, Quebec is cited as an example in which gold occurs in both stratabound deposits as well as in stockwork-like vein systems (Poulsen and Hannington, 1995).

9.0 EXPLORATION

Exploration by prior operators and by PBI, who is the current operator on the property, is discussed in Section 6.0. Since acquiring its interest in the World Beater property in 2011, CMC has not done any exploration unrelated to the work of PBI.

10.0 DRILLING

Drilling at the World Beater property began in 1992 and has been concentrated in the Radcliff area (Figure 10.1). Echo Bay began drilling in 1992 and drilled a total of 16 diamond drill core holes for a total of 2,761ft (842m). Leroy Kay of Yerington, Nevada was the drill contractor, using two Longyear 38 core rigs and drilling NX and BX core. This program was helicopter supported by Aris Helicopters of San Jose, California. Core drilling through an upper "quartzite" horizon proved to be both difficult and expensive, so Echo Bay utilized RC drilling techniques in subsequent drill programs. Echo Bay contracted with Saga Exploration of Reno, Nevada, for the RC drilling, who used a rubber-tired, articulating Cantera CT 312 drill unit coupled to a 350 cubic feet per minute ("cfm") compressor. Some of the RC drilling was helicopter supported. RC holes were 3in in diameter, and total samples for 5ft intervals were about two gallons in volume. Echo Bay completed a total of 12,259ft (3,737m) in 65[2] RC holes between 1992 and 1994. Almost all RC drilling was done dry (oral comm.., F. Saunders, 2003).

In 1995, Compass began their drill program with the same Saga Exploration Cantera rig employed by Echo Bay but changed to a track-mounted MPD-1000 coupled to a 750 cfm compressor in subsequent phases. This change was prompted by cost considerations and improved sample recovery for the deeper drill holes. Compass completed a total of 17,320ft (5,279m) in 64 RC holes. Most of Compass' drilling was done dry (oral comm., M. Slater, 2003).

MDA has seen no data on drill-hole collar surveys or down-hole surveys for the Echo Bay or Compass drilling.

In 2003, Manele Bay drilled 29 RC holes for a total of 7,910ft of drilling. This drilling post-dated the resource model and was not used in the estimate reported herein; these holes are not included in Table 10.1. Implications of the Manele Bay drilling with respect to the estimate are described in Section 14.5 of this report. MDA has no information on the drill contractor or type of rig used for Manele Bay's drilling.

Overall, the drill spacing of the Echo Bay and Compass holes is just over 100ft (~30m), with the more important areas drilled on tighter centers. Drilling was done mostly perpendicular to the plane of the identified mineralization.

In general, the quality of drilling appears good with only a few instances of possible down-hole contamination noted, though this should not have materially impacted the resource estimate. But as there was a large reliance on RC drilling, MDA cautions that a detailed study of drill-sample integrity should be completed. In addition, surveying of drill holes has revealed some inconsistencies, and the confidence in the drill-hole locations is not great.

CMC has not conducted any drilling at World Beater to date. Table 10.1 describes the sampling data in the database for World Beater.

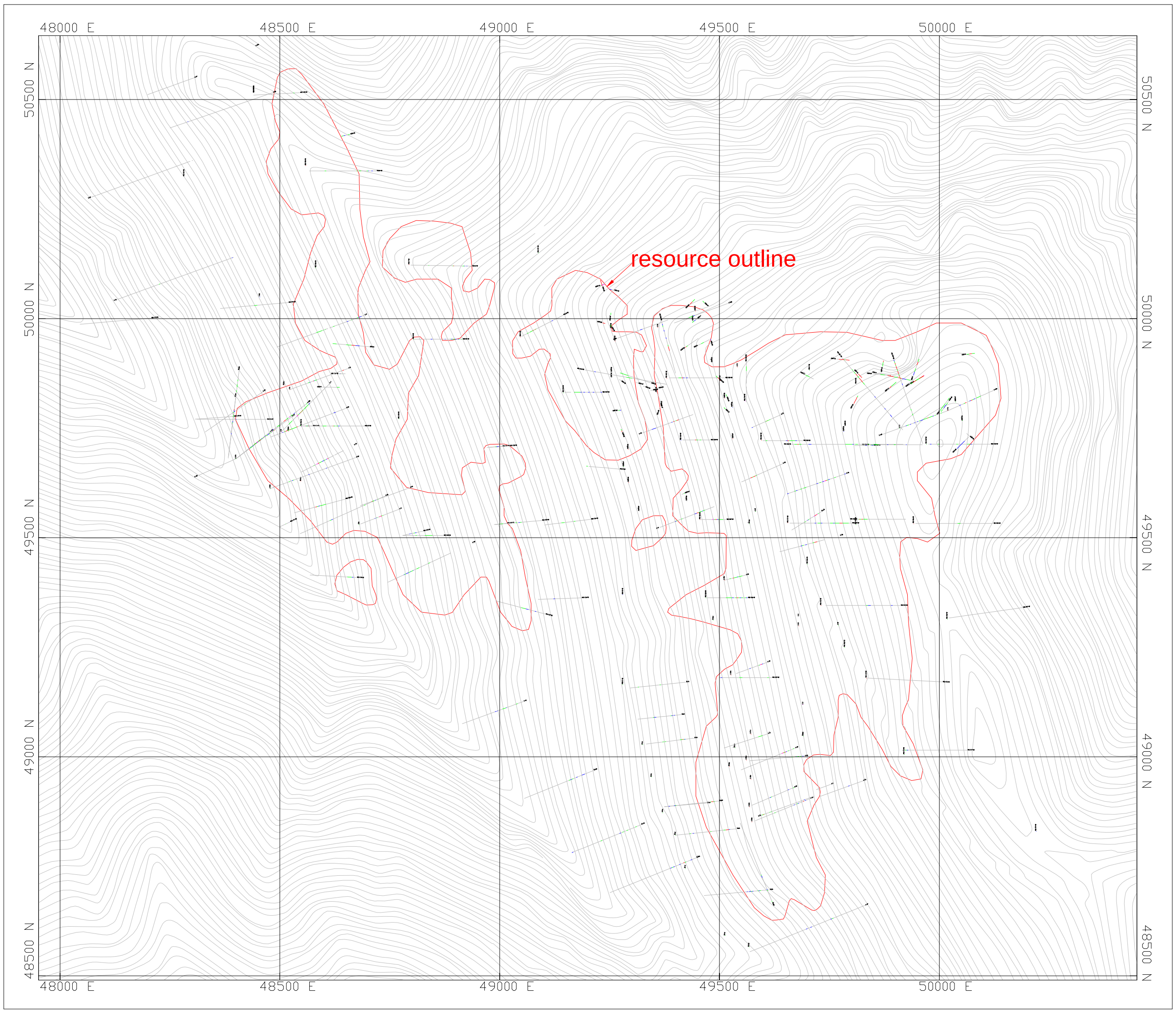
[2] Echo Bay reports a total of 87 holes, but MDA has only 81 in the database.

Table 10.1 Summary of Drill-Hole and Channel-Sampling Data in the World Beater Database

Type	Number	Ft (m)	Comments
RC drill holes	129	29,579 (9,016)	
Diamond drill holes	16	2,761 (842)	
UG channel samples	**67**	**1,023 (312)**	**Groups of samples**

Note that this table does not include drilling by Manele Bay.

Figure 10.1 Radcliff Mine Area Drill-Hole Map Showing Resource Outline



Map includes Manele Bay drill holes.

11.0 SAMPLE PREPARATION, ANALYSES AND SECURITY

11.1 Sampling Method and Approach

Echo Bay split in half all apparently unmineralized core and sawed in half apparently mineralized core, with one half of the core sent for assay. Splitting and sawing were done under the direction of the project geologist. No analyses have been conducted on core recovery.

Echo Bay split RC drill cuttings on site, and the split portion was further reduced using a Jones splitter. One half was shipped to the lab, and one half went to Echo Bay's storage facilities in Reno. An additional small split was retained as a reference sample. RC sample recovery was not recorded.

Compass drilled all RC holes. The samples were collected in a cyclone and then passed into a Jones splitter. The samples were split down to ~20lbs (~9kg).

A proposed sample protocol for Manele Bay's drilling indicated that samples were to be split on site using a Jones splitter placed below the cyclone outline. The splitter was to be cleaned with an air hose between samples. Care was to be taken to shield tines from the wind to prevent loss and to include wind skirts on the splitter. Duplicate samples of each 1m or 5ft interval were to be taken by the drill contractor's sampler, with one sample sent to the assay lab and the duplicate sample stored on site. Samples were to be numbered consecutively with non-descriptive sample numbers, and these non-descriptive sample numbers were to be used on the assay laboratory's sample submittal form. MDA cannot verify whether these procedures were actually followed during Manele Bay's drilling.

11.2 Sample Preparation and Analysis

There is no documentation or record of sample preparation and handling procedures for samples collected by either Echo Bay or Compass.

Bondar Clegg of Reno, Nevada was the principal assay lab for Echo Bay, and Cone Geochemical ("Cone") of Reno, Nevada was used as the check lab. Bondar-Clegg systematically reran all samples that were fire assayed with an atomic absorption finish and assayed greater than 0.10oz Au/ton.

Compass used Barringer Laboratories Inc. ("Barringer") of Reno, Nevada as the principal laboratory and Cone and ALS Chemex of Reno, Nevada for check assaying.

Quality control measures implemented by these operators are described in Section 12.2.

MDA has limited information on the sample preparation and analysis performed by Manele Bay. Copies of assay certificates from some holes indicate analysis was performed by American Assay Laboratories ("American Assay") in Sparks, Nevada. Gold was assayed by 30g fire assay, but there is evidence from one assay certificate that gravimetric analysis was also used at least for some holes for samples with an original assay exceeding 10,000 ppb. A proposed sample protocol indicated that a third sample would be taken randomly in every 30m or 100ft interval to be included as the next consecutive sample number and that a standard pulp was to be added as the last sample of each hole. MDA cannot verify whether these protocols were actually followed in Manele Bay's drill program. American Assay also performed 12 specific gravity measurements on samples from three holes.

11.3 Security

Echo Bay hauled the samples from the site to Ballarat, where they remained locked in a warehouse until the sample prep laboratory arrived for sample pickup. The bagged splits for assay were trucked directly to the respective laboratories on a weekly basis under the supervision of the project geologist.

For Compass' RC drilling, samples were stored at the drill site after splitting. Compass personnel took the samples directly from the site to the laboratories in Reno, Nevada. Compass did not have any particular security measures, although a Compass representative was always at the site while drilling was being conducted.

In both cases, the samples were left at the drill site until taken away after each drill hole was completed or each drill shift was completed. No special security arrangements were applied during exploration, although project geologists were always at the site during drill operations.

For Manele Bay's drill program, a proposed sample protocol indicated samples were to be stored in a locked shed or shipping crate until transported to the assay laboratory. A geologist was to be present during sample pickup to maintain the chain of custody. MDA cannot verify whether these protocols were actually followed during drilling.

11.4 Summary Statement

It is the author's opinion that sampling and sample preparation procedures used by Echo Bay and Compass followed industry standards, although security and quality control protocols were not rigid.

12.0 DATA VERIFICATION

12.1 Database Audit

MDA performed a complete database audit. The geology data and assays in the database were, for the most part, entered properly. Those found to be in error were corrected, and the database is considered clean and reliable.

12.2 Quality Assurance and Quality Control

Data verification for the World Beater project was limited to check assaying, and MDA has not taken any check samples. However, MDA did recommend procedures to Compass when collecting their own check samples. The program was carried out by Compass, and the results were analyzed by MDA.

Echo Bay used Bondar-Clegg to assay their samples, while Barringer assayed all Compass samples. Each laboratory conducted random in-house check assays on approximately 10% of the assayed material. Additional check assays were performed by outside laboratories on higher-grade samples.

Echo Bay conducted a statistical analysis on the 221 randomly selected in-house check assays on pulps with results that indicated "good assay reproducibility on the sample pulps with an almost 1:1 straight-line correlation" (Saunders, 1992). Correlations for all samples (221) and those samples with gold grades greater than the detection limit (101 samples) yielded correlation coefficients of 0.975 and 0.973, respectively. Check assays conducted by Cone had similar means (0.140oz Au/ton and 0.132oz Au/ton) and a correlation coefficient of 0.996 with assays produced by Bondar-Clegg.

Under the direction of MDA, Compass completed a check sampling program in 1997 on coarse reject samples. There were 133 check samples representing ~2% of the database. Overall, the correlation was good (r = .986). The original assays' mean grade was 0.219oz Au/ton (7.509 g Au/t), and the checks averaged 0.259oz Au/ton (8.880 g Au/t) for an 18% difference with the checks being higher. Removing two high-grade outliers, the means differed by only 9%.

There appeared to be a problem with the original fire assays for hole C-16B. Two substantial intercepts of mineralization, 0.334oz Au/ton and 0.319oz Au/ton, were originally reported, but check assays values for these intervals were only 0.022oz Au/ton and 0.012oz Au/ton, respectively. This is likely a clerical error rather than a manifestation of sample integrity and bias issues.

Overall, the Compass sample check assay program suggests reasonable reproducibility.

MDA reviewed the standards inserted into the sample stream by Manele Bay. Two standards were used, NBM-4b and NBM-5b, both obtained from the Nevada Bureau of Mines and Geology. The accepted gold values for these are 0.012oz Au/t +/-0.002, and 1650+/-450 ppb (0.0481oz Au/ton +/-0.013oz Au/ton). Manele Bay inserted 18 standards into their sample stream. Of those eighteen samples, one most likely was mislabeled, which would be an error. After removing that sample from the analysis, two of sixteen samples were outside the two standard deviations and one was outside three standard deviations.

12.3 Summary Statement

It is the author's opinion that the historic data are adequate for resource estimation up to Indicated resources. This opinion is within the context of repeated drilling and re-estimation in the 1990s and drilling in 2003, each time corroborating the model (see Sections 14.5 and 14.6 for discussion).

13.0 MINERAL PROCESSING AND METALLURGICAL TESTING

Note: Throughout this section the term "ore" is used in a metallurgical sense and is not intended to imply that any particular sample could be mined economically.

13.1 Introduction

The metallurgical sections of this Amended Technical Report (Sections 1.4 and 13) were prepared by Dr. W. Joseph Schlitt, P.Eng. He is a registered Qualified Person through The Mining & Metallurgical Society of America (No. 01003QP, with specialty in metallurgy). Although he has not visited the property, he is very familiar with the major laboratories that have conducted most of the testwork on samples from the deposit. These include Hazen Research, Inc. (Hazen) McClelland Laboratories, Inc. (MLI) and Kappes, Cassiday & Associates (KCA). Colorado Mineral Research Institute (CMRI) has been closed for some time, but Dr. Schlitt is acquainted with Dr. Robert Cuttriss, who directed that laboratory and managed the 1995 and 1996 work done on World Beater. Dr. Schlitt has been able to discuss the CMRI results at some length with Dr. Cuttriss.

The section on metallurgy was originally compiled for MDA's 2003 Technical Report by Dr. Robert Cuttriss of the Colorado Minerals Research Institute ("CMRI") where metallurgical testwork on samples from the deposit was conducted in 1995 and 1996. The section has now been amended, taking into account results from a limited number of tests performed thereafter. As part of the updating, all available metallurgical reports were reviewed in their entirety. Some of the earlier reports are no longer accessible, requiring reliance on summaries or reviews by others. More reliance was placed on information obtained from the complete reports. These include reports from CMRI, Hazen, MLI, KCA, Schurer & Fuchs; and Skinner.

Metallurgical studies on the World Beater project span more than 25 years. The earliest was a study done by Legend Metallurgical Laboratory (Reno, NV) for Kerr-McGee (1988). Most of the testwork programs were conducted between 1992 and 1996. Two rather limited studies were done in 2010, one by Skinner and one by Newmont. The latest work was done by KCA (2013). In almost all these programs the main emphasis has been on gold recovery and how this has been impacted by process variables such as particle size and leach cycle time. Secondary consideration has been given to reagent consumption. Recovery methods tested include direct leaching of whole ore; flotation, with treatment of the flotation concentrate; and gravity concentration. To date, most of focus has been on whole ore leaching.

13.2 Samples and Head Grades

The samples used in the metallurgical test programs are given in Table 13.1 and Table 13.2.

Where available, sample analyses obtained in the exploration program are shown together with values obtained by direct assay of the metallurgical samples and the "calculated" head grades derived from the metallurgical testwork. Reasonable agreement was observed in most cases, but the higher-grade samples tended to show greater variation between replicated samples. However, the effect is not great, with almost all sets of values differing by less than 10%. Therefore, normal sampling practice should yield acceptable, representative samples.

The metallurgical test composites used in the Hazen and CMRI programs (from drilling programs by Echo Bay and Compass, respectively) gave broad coverage of the mineralized region (as recognized at the time). The metallurgical results from these programs are expected to be generally applicable to the overall deposit, as metallurgical samples were composited from material throughout the deposit. The samples of RC cuttings that MLI received from Pegasus Gold Corp. covered a wide range of head grades from 1.64 to 25.34g Au/t, so this composite should also be widely representative. However, none of these would evaluate local variability in metallurgical responses, if there are any.

Table 13.1 List of Metallurgical Test Samples

Date	Campaign/Laboratory	Drill/Exploration Sample No.	Proportion in Met. Sample	Met. Sample Designation	Sample Analyses					
					Expln.	Metallurgical Test Program (ave. all tests)				
					g Au/t (Assay)	g Au/t (Assay)	g Au/t (Calc.)	g Ag/t (Assay)	%S (Assay)	Cu ppm (Assay)
1988	Legend Metallurgical Laboratory, Reno, NV	3875 (?)	100% (?)	3875		4.11	4.49	1.7		295
		3876 (?)	100% (?)	3876		8.67	8.23	1.7		650
		3885 (?)	100% (?)	3885		18.89	17.41	1.7		345
		3894 (?)	100% (?)	3894		5.04	6.14	1.7		271
1992	Battle Mountain Gold Co. (in-house met. lab)	R-14130	100%	14130	2.88	3.12	2.94			
		R-14138	100%	14138	9.60	10.53	11.03			
1992	McClelland Laboratories Inc., Sparks, NV	D-2582	10%		4.49					
		D-2583	10%		5.62					
		D-2584	10%		3.67					
		D-2585	10%		4.22					
		D-2586	10%		25.33					
		D-2587	10%		1.65					
		D-2588	10%		11.07					
		J-2729	10%		5.93					
		J-2730	10%		6.58					
		J-2731	10%		8.09					
			100%		7.68	6.83	7.70			
1993	Hazen Research Inc., Golden, CO	MET-1 (see Table 13.2)	100%	HRI 46897-1	7.35	7.16	7.57	1.9		
		MET-2		HRI 46897-2						
			100%		10.3	8.47	10.36	2.3		
1996	Colorado Minerals Research Institute (CMRI) Golden, CO	UM 2-30-3C11/180-185	17%							
		UM 1-30-2C12/60-62.5	8%							
		UM 1-51-2C13/80-92.5	42%							
		UM 2-91-1C114/75-82.5	25%							
		UM 1-31-3C15/112.5-115	8%	M1		4.22	4.33	1.8	1.04	327
			100%							
		LM 2-31-2C7/80-82.5	11%							
		LM 2-31-2C7/85-87.5	11%							
		LM 2-31-2C7/75-80	22%							
		LM 2-50-2C8/90-95	22%							
		LM 3-50-2C8/115-120	22%							
		LM 3-31-2C9/107.5-110	12%	M2		7.73	5.79	1.2	1.79	213
			100%							
		LM 3-31-2C7/75-77.5	33%							
		C8/97.5-100	33%							
		C9/110-112	34%							
			100%	M3		21.59	18.50	1.9	3.84	423
2010	Paul M Skinner	"recently mined ore"	n/a	n/a	n/a	15.46	14.52	n/a	n/a	n/a
2010	Newmont Mining Corp.	"small sample representing ore from the Ballaratt deposit"	n/a	Baseline	n/a	16.46	15.49	0.61	1.67	153
				After Roast			15.98			
2013	Kappes, Cassiday & Associates Reno, NV	5515 Drift Ore Zone	100%	68750	n/a	12.19	11.45	0.78	0.68	997.6

Table 13.2 Echo Bay Test Sample Met 1

Date	Campaign/Laboratory	Drill/Exploration Sample No.	Proportion in Met. Sample	Met. Sample Designation	Explorn. Sample Assay Au, g/t
1993	**Hazen Research Inc,**	**MET-1 Composite**			
	Golden, Colorado	RAD3:41.5-44.0	0.78	HRI# 46897-1	0.00
		44.0-46.5	1.05		0.00
	(American Assay)	RAD7: 120-122.5	1.14		1.37
	Lab Inc SP024157	122.5-127.5	1.66		2.81
	Echo Bay Met Sample	127.5-130	1.03		5.31
		130-132.5	1.10		2.74
		RAD 9: 130-132.5	0.83		0.00
		RRC-113-93: 165-170	1.98		2.74
		170-175	1.98		0.82
		175-180	1.98		7.82
		180-185	1.98		4.42
		185-190	1.98		4.11
		190-195	1.98		1.71
		195-200	1.98		12.92
		200-205	1.98		26.53
		205-210	1.98		3.12
		RRC-115-93: 205-210	1.98		3.26
		210-215	1.98		5.96
		RRC-116-93: 75-80	1.98		3.77
		80-85	1.47		2.54
		RRC-122-93: 40-45	1.98		14.81
		45-50	1.98		3.60
		RRC-124-93: 35-40	1.98		47.51
		45-50	1.98		9.67
		55-60	1.98		3.98
		RRC-125-93: 35-40	1.98		10.56
		45-50	1.98		2.16
		RRC-126-93: 65-70	1.98		5.07
		70-75	0.00		0.00
		RRC-128-93: 65-70	1.98		3.77
		RRC-129-93:100-105	1.98		4.90
		105-110	1.98		4.01
		110-115	1.66		3.77
		RRC-159-93: 245-250	1.98		1.95
		250-255	1.98		4.52
		RRC-160-93: 370-375	1.65		5.90
		375-380	1.98		1.61
		RRC-161-93: 215-220	1.83		2.67
		225-230	1.74		18.10
		230-235	1.55		13.81
		235-240	1.91		13.13
		240-245	1.30		4.32
		245-250	1.25		2.43
		250-255	1.86		6.17
		260-265	1.23		2.88
		RRC-162-93: 265-270	1.98		4.59
		275-280	1.98		1.03
		280-285	1.98		1.65
		285-290	1.98		5.90
		290-295	1.98		23.10
		295-300	1.94		2.78
		300-305	1.98		4.32
		305-310	1.98		13.51
		310-315	1.74		1.58
		RRC-164-93: 75-80	1.98		15.25
		80-85	1.98		22.93
		85-90	1.98		8.02
		Weighted average	100.00		7.35

13.3 Process Mineralogy

The Schurer and Fuchs report (1993a) on ore microscopy and electron microprobe analysis was limited to five samples, but it highlights several features of the occurrence of precious metals and accessory minerals, which are relevant to the processing of Radcliff mine area mineralization:

- The size distribution of the gold is not well defined but appears to be in the range 2 to 50 microns (Schurer and Fuchs note a previous report indicating the gold was finer than 2.5 microns);
- A portion of the gold occurs as electrum; in Sample RAD-2-92-44.5 there was sufficient electrum to account for the sample assay of 0.522oz Au/ton with 1.29oz Ag/ton;
- Gold/electrum was observed enclosed in pyrrhotite, chalcopyrite, bismuth, and bismuth tellurides, and along grain boundaries with these minerals and with pyrite;
- Gold also occurs along grain boundaries with non-sulfide minerals and in goethite;
- No gold tellurides were detected, and the report makes the interesting observation that refractory gold tellurides tend to be absent if bismuth tellurides are present; and
- The bulk of the silver is carried in galena and silver telluride.

The occurrence of gold as electrum and the presence of pyrrhotite, an avid consumer of oxygen, would be expected to lead to slow leaching kinetics. Pyrrhotite and its oxidation products also react with cyanide and could make a significant contribution to the high cyanide consumptions observed in much of the leaching test work. An alkaline-aeration pretreatment at pH 11.0 prior to cyanide leaching should be tested as a way to oxidize the pyrrhotite, precipitate iron and reduce reagent consumption.

The presence of gold with goethite (in oxidized zones) and with other non-sulfide associations explains the incomplete gold recoveries achieved by flotation. The fine size of the gold, together with its association with lighter gangue minerals, suggests that gravity concentration will have limited application with this material.

13.4 Pre-concentration by Flotation or Gravity

Initial efforts with both flotation and gravity concentration were not particularly successful for samples of World Beater material (Legend Metallurgical Lab, 1988; Battle Mountain Gold Co., 1992; MLI, 1992; Hazen, 1993; CMRI, 1996). In these tests, rougher flotation yielded recoveries in the range of 73% to 91%, but the concentrate grades were low, ranging from 21 to 85g Au/t (0.613oz Au/ton to 2.479oz Au/ton). MLI demonstrated that the concentrate grade could be increased to 102g Au/t (2.975oz Au/ton) by retreating in a single cleaner stage, but the final recovery fell to 68%.

CMRI achieved 88% and 91% gold recoveries from samples assaying 23.1g Au/t (0.674oz Au/ton) and 6.4g Au/t (0.187oz Au/ton), respectively. Although the concentrates represented 24% and 14% of the feed weight, they were very responsive to cyanidation, yielding 98% to 99% extraction of the contained gold. Such an approach may be considered if pre-concentration were needed to reduce the tonnage of material to be transported. However, a lower grade sample [head grade 4.9g Au/t (0.143oz Au/ton)] yielded only 73% gold recovery, suggesting that the flotation route may not be applicable to all of the ore-types present at World Beater.

Recently Skinner (2010) reported 90.2% gold recovery into a rougher flotation concentrate representing 17.4% of the sample weight. The feed was ground to 90% passing 106 µm and floated at natural pH for 7 minutes. The most recent results (KCA, 2013) replicated the flotation conditions used by Skinner and achieved an average gold recovery of 90% for the 10 flotation tests run on splits from the 5515 drift ore zone. Average silver recovery was only 78%, as expected for such a low head grade. However, unlike most previous flotation tests, the average mass pull in the KCA program was just 3.5% of the ore feed. This resulted in production of a high-grade concentrate that averaged 310.36g Au/t (9.0521oz Au/T). The results suggest that if properly optimized, flotation could be capable of producing a small quantity of high grade material suitable for transportation to an off-site processor. As discussed below, the main intent of the KCA test was to provide flotation tails for environmental tests. Thus, no effort was made to recover gold from the concentrate or the tails.

Recoveries from gravity concentration were less than from flotation. Hazen achieved a yield of 35% at a concentrate grade of 7.76kg Au/t (226oz Au/ton) by cleaning a gravity concentrate on a Gemini Table. Even this product is too low grade for direct smelting to doré. Further upgrading may be possible, but multiple stages of gravity concentration introduce security issues. A centrifugal concentrator, e.g., a Knelson concentrator or similar apparatus, may collect the coarser gold, although the preponderance of minus 50 micron gold and the presence of sulfides suggest there would be little advantage for the typical lower grade ore. However, a simple gravity concentration device on the mill discharge may be beneficial for the occasional higher grade zones, which are likely to host coarser gold.

Flotation and gravity concentration test results are summarized in Table 13.3, except for the KCA results discussed above.

Table 13.3 Flotation and Gravity Concentration Test Results

Date	Campaign/Laboratory	Met. Sample Designation	Sample Analyses					TEST RESULTS			Test Procedure (comments)
			Metallurgical Test Program					Concentrate			
			g Au/t (Assay)	g Au/t (Calc.)	g Ag/t (Assay)	%S (Assay)	Cu ppm (Assay)	% wt	Grade g Au/t	Recov. %	
1988	Legend Metallurgical	3875			NA						
	Laboratory, Reno, NV	3876			NA						
1992	Battle Mountain Gold	14130			NA						
	Co., (in-house met. lab)	14138	10.53	10.44	0.7		15	21.4	37.8	77.4	Rougher flotation
1992	McClelland Laboratories		6.83	7.92				9.7	59.4	72.7	Rougher flotation
	Inc, Reno, NV							5.3	102.2	68.3	Cleaner flotation
1993	Hazen Research Inc,	HRI# 46897-1	7.16	8.23	1.7			14.1	26.1	44.5	Gravity rougher conc.
	Golden, CO							0.1	976.4	11.3	Gravity cleaner conc.
		HRI# 46897-2	8.47	11.76	1.0			12.8	57.7	63	Gravity rougher conc.
								0.05	7760.7	34.5	Gravity cleaner conc.
1996	Colorado Minerals	M1	4.22	4.87	1.79	1.04	327	16.8	21.28	73.2	Rougher flotation
	Research Institute (CMRI)							Overall extraction		71.6	%
	Golden, CO							Conc. leach time (h		96+4	leach+aeration
								Cyanide conc.		2.8	kg/t ore
		M2	7.73	6.4	1.15	1.79	213	13.6	43.03	91.1	Rougher flotation
								Overall extraction		90.2	%
								Conc. leach time (h		96+4	leach+aeration
								Cyanide conc.		2.6	kg/t ore
		M3	21.59	23.09	1.9	3.84	423	23.8	85.13	87.8	Rougher flotation
								Overall extraction		87.3	%
								Conc. leach time (h		96+4	leach+aeration
								Cyanide conc.		8.7	kg/t ore
2010	Paul M Skinner	"recently mined ore"	15.46	14.52	n/a	n/a	n/a	17.4%	75.3	90.2	rougher flotation

EXPLANATORY NOTES ON TEST PROCEDURES:

Rougher Flotation - a flotation operation conducted on the ore sample with the objective of maximizing the recovery of gold or another desired mineral, the flotation product is called the "flotation rougher concentrate"

Cleaner Flotation - an additional stage of flotation performed on a rougher concentrate to improve the grade by rejecting waste rock or low grade minerals, the flotation product is called the "flotation cleaner concentrate"

Rougher Gravity Concentration - a gravity concentration operation performed on the ore sample with the objective of maximizing the recovery of gold or another mineral, the gravity concentration product is called the "gravity rougher concentrate"

Cleaner Gravity Concentration - an additional stage of gravity concentration performed on a gravity rougher concentrate to improve the grade by rejecting waste rock or other minerals, the gravity concentration product is called the "gravity cleaner concentr

13.5 Whole Ore Leaching

The earliest metallurgical response of samples from the World Beater project was summarized by Saunders (1992) for Echo Bay. The samples were found to be amenable to cyanidation with gold recoveries ranging from 88 to 95%. Leaching required:

- Fine grinding (P_{80} of 74 to 45 microns);
- Long leach times (24, 96, and 148 hours in test work); and
- High cyanide consumptions (2 to 11 kg/t).

Several investigators commented on the need to optimize conditions, but Echo Bay found “no fatal flaws” in the metallurgical response (Saunders, 1992).

These early investigations, together with subsequent tests by Hazen (1993), were reviewed in detail by CMRI (CMRI, 1995). The reported metallurgical response was attributed to the fine size of the gold (no free gold was visible in a flotation concentrate observed under a microscope) (MLI, 1992)) and the presence of sulfides, particularly pyrrhotite, as reported in the mineralogical study by Schurer and Fuchs (1993a).

Further test work was conducted on core samples drilled by Compass (CMRI, 1996). That work generally supported the earlier findings and pointed to opportunities to optimize the flow sheetAn assay-sizing of the residue after 96 hours of leaching with the cyanide concentration maintained at 1kg/t, demonstrates that most of the unleached gold occurs in the coarser size fractions (MLI, 1992; Table 13.5). Cyanide consumption was 2.3kg/t. In this case, increasing the cyanide addition would be expected to have improved extraction, but the result serves to demonstrate both the particle-size dependence and the slow leaching rates, which characterize this material.

Recently Skinner (2010) achieved 95.5% gold extraction in a 48-hour leaching test on a relatively coarse product (72% passing 80 mesh) with an addition of 4.54kg/t of cyanide and pH 10.9. Assaying the sized residue confirmed that 63% of the un-leached gold was in the +80 mesh fraction which assayed 1.55g/t compared to an assay of 0.36g/t in the -80 mesh fraction.

Newmont (Arthur, 2010) achieved 97.4% gold extraction in a 24-hour cyanidation carbon-in-leach bottle roll test at their facilities in Elko, Nevada, on a sample crushed to -10 mesh with addition of 0.735kg/t of cyanide and pH 10.0 to 10.8. A second split of the same sample that was roasted prior to a 24-hour cyanidation carbon-in-leach bottle roll test yielded 95.8% gold extraction with addition of 1.21kg/t of cyanide and pH 10.2 to 10.8. MDA is unable to determine from Newmont's report (Arthur, 2010) whether they ground the test charge as part of the leaching test. Also, it is unclear how much variability there is in the carbon-in-leach protocol. It may be that the difference in the two recoveries is merely the result of experimental variability and not caused by variation in the operating parameters.

Whole ore leaching test results are summarized in Table 13.4.

Table 13.4 Whole Ore Leaching (Cyanidation) Test Results

Date	Campaign/Laboratory	Met. Sample Designation	Sample Analyses – Metallurgical Test Program: g Au/t (Assay)	g Au/t (Calc.)	g Ag/t (Assay)	%S (Assay)	Cu ppm (Assay)	TEST RESULTS: Au Extn %	Grind, P_{80}	Time hours	Cyanide Consumed kg/tonne	24-hr Au extn	48-hr Au extn
1988	Legend Metallurgical Laboratory, Reno, NV	3875	4.11	4.49	1.7		295	94.6	74*	148	7.3	82	NA
		3876	8.67	8.23	1.7		650	85.8	74*	148	9.1	NA	NA
		3885	18.89	17.41	1.7		345	93.1	74*	148	9.9	NA	NA
		3894	5.04	6.14	1.7		271	90.5	74*	148	10.9	40	NA
1992	Battle Mountain Gold Co., (in-house met. lab)	14130	3.12	2.94				93	74	24	2.55	93	NA
		14138	10.53	11.62				88.3	n/a	24	5.8	88.3	NA
1992	McClelland Laboratories Inc, Reno, NV		6.83	7.47				87.6	74	96	2.32	79.5	84.3
1993	Hazen Research Inc, Golden, CO	HRI# 46897-1	7.16	7.40	2.0			93.2	74	72	5		
								94.3	45	72	5.35		
								86.2	74	24	1.75	86.2	
								94.2	74	72	4.65	96 (?)	95
		HRI# 46897-2	8.47	10.01	2.6			98.3	74	72	5		
								97.1	45	72	5.1		
								71.2	74	24	1.25	71.2	
								98.7	74	72	3.4	94	97
1996	Colorado Minerals Research Institute Golden, CO (CMRI)							92.1	105	72	3.3	90	92
								94.3	44	72	3.4	97 (?)	95 (?)
		M1	4.22	4.33	1.8	1.04	327	90	44	67+4aeratn	3.8	88	89
								94.3	105	72	3.4	75	88
								91.8	44	72	6.8	87	91
		M2	7.73	5.79	1.2	1.79	213	97.7	44	69+4aeratn	4.1	98	97
								93.6	105	72	8.04	60	94
								85.5	44	72	14.7	56	79
		M3	21.59	18.50	1.9	3.84	423	95.2	44	66+7aeratn	5.02	76	95
2010	Paul M Skinner	"recently mined ore"	n/a	15.46	n/a	n/a	n/a	95.5	n/a	48	4.5 added	n/a	95.5
2010	Newmont Mining Corp.	Baseline	16.46	15.49	0.6	1.67	153	97.4	n/a	24	0.735	97.4	n/a
		After Roast	16.46	15.98	0.6	1.67	153	95.8	n/a	24	0.875	95.8	n/a

EXPLANATORY NOTES:

g Au/t (Assay)	Refers to the gold content of the sample in grams of gold per tonne (metric ton) as determined by chemical analysis
g Au/t (Calc.)	Refers to the gold content of the sample in grams of gold per tonne (metric ton) calculated from knowledge of the gold content of metallurgical test products
Grind, P_{80}	A measure of the fineness of grinding; 80% of the particles are finer than the P_{80} size
74*	Samples reported to be "pulverized to 150 mesh " would generally pass a 150 mesh sieve with approx. 80% also passing a 200 mesh (74 microns) sieve
Au Extn, %	The percentage of gold that was extracted into a cyanide leach solution at the conclusion of the test
24-hr Au Extn	The percentage of gold that was extracted into a cyanide leach solution after 24 hours
48-hr Au Extn	The percentage of gold that was extracted into a cyanide leach solution after 48 hours
66+4 aeration	A cyanide leaching test in which the sample was first aerated for 4 hours followed by 66 hours cyanide leaching

Table 13.5 Leach Residue Assay-Size Distribution

Particle Size Range (microns)	Weight Distri-bution (%)	Au assay (g/t)	Au Distribution (%)
+106	12.1	2.47	32.3
-106 + 74	9.1	1.61	16.0
-74 + 53	16.0	0.86	14.9
-53 + 45	4.8	0.86	4.5
-45	58.0	0.51	32.3
Total	100.0	0.93	100.0

13.6 Leaching Kinetics

Although all laboratories referred to the extended leaching times required for this material, to some extent, this may be a result of the un-optimized test procedures used in the preliminary evaluations.

Of the 20 whole-ore leaching tests (Table 13.6) that reported 24-hour extractions, 40 percent yielded extractions over 90%, and a further five tests yielded extractions in the range 80 to 90%.

Table 13.6 Range of 24-hr Leach Extractions

24-hr Au Extraction	No of Tests	% of Tests
+90%	8	40
80 – 89.9%	5	25
70 –79.9%	4	20
< 70%	**3**	**15**
Totals	20	100

Several tests that gave poor 24-hour extractions appear to have been limited by low cyanide levels (cyanide consumed early in the test was not replenished soon enough to expedite the leach). Optimizing the leaching conditions is expected to lead to significantly improved leaching kinetics.

Special attention will need to be paid to the response of the high-grade samples. Three tests by CMRI on a sample assaying 21g Au/t (0.613oz Au/ton) and 3.8%S yielded only 60%, 56%, and 76% gold extraction in 24 hours. The corresponding 48-hour extractions were 94%, 79%, and 95%. The inference is that the high sulfide content may slow the leaching rate by competing for oxygen and consuming cyanide. Attempts to improve leaching rates by magnetic separation of the pyrrhotite ahead of leaching were not successful; too much gold was entrained in the magnetic product.

13.7 Acid Generating Capacity of Waste Rock and Test Products

The acid neutralization potential (ANP) of a rock sample is a measure of its ability to neutralize acid rock drainage. The acid generating potential (AGP) of that sample is a measure of the amount of acid that can potentially be generated by oxidation of the sulfidic sulfur content in the natural environment. The net neutralization potential (NNP) is the difference between the ANP and AGP, which is expressed in kilograms of $CaCO_3$-equivalent per tonne of sample. A positive difference indicates that the material has a net neutralizing effect and will not be a net generator of acid; a negative value indicates that the material will generate acid. An additional parameter used as a predictor of acid rock drainage is the ratio of ANP to AGP. If the ratio exceeds 2.0, acidic drainage would not be expected under any conditions. If the ratio is less than 1.0, acidic rock drainage is to be expected and a plan of mitigation should be developed. The possibility of acid drainage is uncertain when the ratio is between 1.0 and 2.0 and additional testing is required.

To assist in the permitting and tailings management, two rock samples and selected test products from the three samples (M1, M2 and M3) used in the CMRI metallurgical program were evaluated for their acid neutralization potential. The tests were conducted by Commercial Testing and Engineering, Denver CO, using the accepted B.C./Coast Research procedure. Results from these tests are presented in

Table 13.7. As indicated in Table 13.4, each sample was subjected to direct leaching under three different sets of conditions: a coarse grind, a fine grind and a fine grind where aeration preceded cyanidation.

Table 13.7 Acid Neutralization and Related Environmental Test Results

Date	Laboratory	Sample ID	Metallurgical Test Product	Kg $CaCO_3$ equivalent/t sample			Ratio
				ANP	AGP	NNP	ANP:AGP
1996	CMRI	M1	Cyanide leach residue				
			P_{80} = 105 µm	131	31	100	4.23
			P_{80} = 44 µm	121	31	90	3.90
			P_{80} = 44 µm w/ aeration	307	30	277	10.23
			Flotation tailings	262	7	255	37.43
			Flot. concentrate cyanide leach residue	167	147	20	1.14
1996	CMRI	M2	Cyanide leach residue				
			P_{80} = 105 µm	84[1]	53	31	1.58
			P_{80} = 44 µm	240	51	189	4.71
			P_{80} = 44 µm w/ aeration	188	52	138	3.62
			Flotation tailings	81	17	64	4.76
			Flot. concentrate cyanide leach residue	191	373	-182	0.51
1996	CMRI	M3	Cyanide leach residue				
			P_{80} = 105 µm	74	104	-30	0.71
			P_{80} = 44 µm	81	93	-12	0.87
			P_{80} = 44 µm w/ aeration	70	101	-31	0.69
			Flotation tailings	47	12	35	3.92
			Flot. concentrate cyanide leach residue	185	421	-236	0.44
1996	CMRI	Quartzite	Barren waste	10	0	10	Undefined
1996	CMRI	Chlorite schist	Barren waste	268	50	218	5.36
2013	KCA	5515 Drift	Flotation tailings	25	3.2[2]	21	7.81

Note 1. This value appears to be spurious, as it is less than half that for the other M2 whole ore leach residues.
Note 2. Based on the acid-generating capacity of the pyritic sulfur only.

As expected, quartzite and chlorite schist country rock have little acid generating potential and display a net neutralizing potential. Thus, if either rock type is mined as dilution material, it should not contribute to acid drainage. The flotation tailings in both the CMRI and KCA tests also have ratios greater than 2.0 and would clearly be non-acid generating if impounded in a tailing management facility. This would be expected since the bulk of the sulfidic sulfur would report to the rougher concentrate. .Leach residues from the low- and intermediate-grade composites (M1 and M2) also have ratios well above 2.0.indicating that acid generation in the tailings dam will not be an environmental issue for these products. However, products derived from the high-grade composite [M3 – 21g Au/t (0.613oz Au/ton), 3.8% S], consistently exhibited ratios below 1.0, , indicating a potential acid-generation problem with the high-sulfide portions of the World Beater material. Even so, if the proportion of ore similar to M3 is small, when mixed with the balance of the material, the composite ratio could prove to be at least 2.0, avoiding acidic drainage.

13.8 Mineral Processing and Metallurgy Conclusions

Although there have been six metallurgical “scoping studies,” there have only been a total of 24 whole-ore leaching tests and a combined total of 11 flotation and gravity concentration tests. A comprehensive test program is now required to confirm the metallurgical response on a wider range of sample grades and mineralization types and to establish design criteria for a processing plant.

Metallurgical samples were derived from both core and RC cuttings. RC cuttings have undergone pulverization and, in some cases, put into slurry during sample transport from the bottom of the hole. As a result changes in the sample characteristics may have occurred that impact metallurgical performance. Therefore, additional metallurgical sampling should be done on core. Furthermore, as most metallurgical samples were composed of composites of multiple samples, additional work should be done on individual samples that represent specific ore types or head grade ranges. At this stage, work should focus on optimizing gold recovery and reagent consumption.

The composite samples evaluated by Hazen and CMRI appear to have provided good coverage of the mineralized area as recognized in 1993 to 1996. The style of mineralization is generally similar across the known deposit with variations primarily in the sulfide content and associated gold grade. As the MLI test work addressed gold sample grades ranging from 1.7 g/t to 21.6 g/t, it is expected that these results will be broadly applicable to the overall deposit and that the test samples are reasonably representative of the style of mineralization and the deposit as a whole. The overall metallurgical response was found to be favorable, although the CMRI work suggests that better definition of the response of high-grade samples is required. It appears that leaching conditions may need to be more aggressive to deal with high-grade (presumably high-sulfide) material. The significance of this in overall flow sheet definition and plant design needs thoughtful evaluation.

Based on the studies to date, the most appropriate flow sheet is whole-ore cyanidation. Gold recoveries are expected to be in the range 90% to 95%. Relatively fine grinding will be required (e.g., to around 80% passing 75 microns). Leach time and reagent conditions remain to be confirmed, but optimum conditions are likely to fall in the range 24 to 48 hours leaching and 2 to 5kg/t cyanide addition.

There is a negative aspect to the whole ore leaching. With this approach, the entire ore output will be contaminated with cyanide and will require detoxification prior to final impoundment in a tailings management facility. If off-site processing of the ore is planned, then the entire ore output will require shipment. On the other hand, if flotation recovery can be increased to the point where the tailings can simply be discarded, then only the residue from cyanidation of the concentrate will require detoxification. It the concentrate is to be treated off-site the amount of material to be shipped will also be reduced. In view of these potential benefits, some further flotation optimization appears warranted. These optimization tests should include a variety of head grades and sulfide sulfur levels.

Tailings from high-sulfide materials are likely to be acid generators, but because most of the samples display a net neutralizing potential, the overall mill tailings are not expected to be acid generating.

If the project continues to look attractive as the work progresses, the metallurgical program will have to be expanded. Areas needing attention will include comminution studies to provide the design basis for the grinding circuit, liquid/solid separation studies to support design of the thickening and any filtration circuits, cyanide destruction tests, and carbon loading tests.

14.0 MINERAL RESOURCE ESTIMATES

MDA had prepared resource estimates of World Beater resources in 1995 and 1996 for a previous operator as described in Section 6.1. The current resource estimate described below was completed by the author in November 1997 for a previous operator and reported in a 2003 Technical Report (Ristorcelli, 2003). There has been additional drilling on the property since the resource estimate was originally made. That drilling was compared to the model; an assessment of its impact on the estimate is given in Section 14.5. The author also evaluated the model and the resource estimate in light of the later and very limited underground mining development. This mineral resource estimate only covers mineralization at the Radcliff mine.

The effective date of the resource estimate reported herein is July 9, 2012, the date of the latest site visit. While the estimate was completed on November 24, 1997, MDA has evaluated that resource in light of Manele Bay's post-model drilling in 2003 and in light of some underground development inspected on site in April and May of 2012, by Mr. Brady and on July 9, 2012 by Ristorcelli. Because Manele Bay's drilling did not materially affect the total estimated resource, but rather supported it (see discussion in 14.6), MDA did not update the resource estimate.

14.1 Deposit Geology Pertinent to Resource Estimation

The World Beater property contains three stratigraphically separate horizons of gold-bearing exhalite mineralization. The most significant of these horizons is a basal exhalite horizon that lies stratigraphically above the underlying World Beater Complex.

Low-grade mineralization occurs in an apparently conformable relationship with the bedding/foliation. Within this, and in abrupt contact with the lower-grade mineralization, are narrow zones of very high grades located in blue quartz and/or massive sulfides.

The units, and consequently also the mineralization, strike N20°W to N30°W and dip about 35° SW. The high-grade zones range in thickness from about 5ft to about 20ft (~1.5m to ~ 6m), while the low-grade zones typically range from 15ft to 60ft (~ 4.6m to ~ 20m) in thickness. The higher-grade zones have less continuity than the low-grade zones and are usually, although not exclusively, within the low-grade zones. There is some evidence that the higher-grade zones may occur most frequently in locations where the rock units have been folded or faulted.

It appears that internal low-angle thrusting or bedding-plane faulting may have complicated the stratigraphy. Normal faulting may be present but cannot be positively located based on the existing drilling. Broad gentle folding is present.

14.2 Data

Table 14.1 presents descriptive statistics of the database from which the resources were calculated. These data were derived from both the drilling by Echo Bay and Compass described in previous sections and underground sampling. There are 145 holes in the World Beater database[3] and numerous underground samples grouped as "drill holes."

[3] Exclusive of post-model drilling by Manele Bay

The World Beater database has, in addition to the above-described gold and silver assays, data on lithology, percent sulfide, percent carbonate, oxidation, and structure, though structural data are confined to core holes.

Table 14.1 Descriptive Statistics of the World Beater Database

	Valid N	Mean	Std. Dev.	CV	Min.	Max.	Units
From		127.4			0	595.00	ft
To		132.0			1.0	600.0	ft
Length		4.6			1.0	153.0	ft
Au	6,996	0.021	0.166	8.058	-	7.490	oz/ton
Ag	1,748	0.01	0.03	2.28	0.010	1.290	oz/ton
Sulfides	6,668	2.9			0	70	%

CV = coefficient of variation = standard deviation / mean

14.3 Specific Gravity

Compass had 13 samples tested for specific gravity by McClelland Laboratories, Inc. (Table 14.2). MDA believes that, although an insufficient number of density measurements have been made, the value of 10.5ft^3/ton (3.048g/cm^3) used to determine the resource tonnage is reasonable. This value is 5% less than the mean value of the bulk density determinations to account for the inevitable bias of selecting more competent samples for test work and a potential bias associated with selecting high-grade samples that may have a higher density. Additional sampling is needed to upgrade the resource to Measured.

Table 14.2 Bulk Density Determinations

Hole	Depth (ft)	S.G.	T.F. (ft^3/ton)	oz Au/ton
RAD-2	44.0	4.16	7.29	0.522
RAD-2	44.2	4.81	6.65	0.522
RAD-2	52.0	3.08	10.38	0.183
RAD-2	54.0	3.05	10.49	0.071
RAD-6	138.0	3.36	9.52	0.190
RAD-6	138.5	2.89	11.07	0.190
RAD-7	122.5	3.26	9.82	0.040
RAD-7	129.0	3.06	10.46	0.155
RAD-7	130.0	3.20	10.00	0.155
RAD-13	95.4	2.66	12.03	0.343
RAD-13	97.5	2.59	12.36	0.343
RAD-13	114.8	2.63	12.17	0.158
RAD-14	99.8	3.17	10.10	0.222

14.4 Methodology

MDA defined the structure and stratigraphy of the Radcliff area along 1in = 100ft cross sections looking along an azimuth of 334^o (N26^{o}W). The mineralized domains were plotted on the sections, honoring both the geology and the gold grades; two examples are given in Figure 14.1 and Figure 14.2. The cross sections were digitized and sliced to level plans at 10ft intervals and edited and verified. Underground workings were used to help guide the design of these domains. Assays were coded from these cross sections and then composited to 5ft composites, honoring the cross-sectional geology. Table 14.3 gives descriptive statistics of the coded assays prior to compositing.

Table 14.3 Descriptive Statistics of Coded Samples

	Valid N	Mean	Std. Dev.	CV	Min.	Max.	Units
High-grade	146	0.551	0.930	1.690	0.00	7.490	oz Au/ton
Low-grade	908	0.05	0.88	1.68	0.00	1.392	oz Au/ton

CV = coefficient of variation = standard deviation / mean

Several samples were eliminated from the database because of their extraordinarily high-grade assays and their suspect locations. Underground channel samples were used in estimation, though they should be removed for feasibility reserve analysis.

Variograms were generated from the composite database, which were acceptable for the low-grade domain in the Radcliff Schist. The high-grade domains in all formations and the low-grade domains in the World Beater Complex did not produce interpretable variography. No structure was discernible in these domains. Spherical models were fitted to the low-grade domains in the Radcliff Schist.

The high-grade and low-grade domains were interpolated separately in the Radcliff Schist and the underlying World Beater Complex. This made for four separate modeling "runs." Only the low-grade domain in the Radcliff Schist was kriged. Because of the poor variography in all the World Beater Complex mineralization and high-grade Radcliff Schist domain, these domains were estimated using inverse distance weighting to the second power (ID2).

Search ranges in the high-grade domains were restricted to 60ft for samples greater than 1.0oz Au/ton. The cutoff was selected based on discontinuities in the grade distribution of the assays. The distance was derived by trial-and-error methodology using different distance restrictions and comparing the results to the composite distributions. In the end, a 60ft search restriction was chosen, as the results of this estimate best matched the composites. This aspect of the estimate has the greatest impact on the resultant resource estimate, and the sensitivity of the deposit estimate to few high-grade intercepts is one reason for the lack of Measured resources. Any future work should emphasize the understanding of the high-grade material; there is no doubt of its existence, but increased understanding of the distribution is critical to fully evaluating the economics of the deposit.

Figure 14.1 Typical Cross Section of the Radcliff Area Deposit (Section 1300)

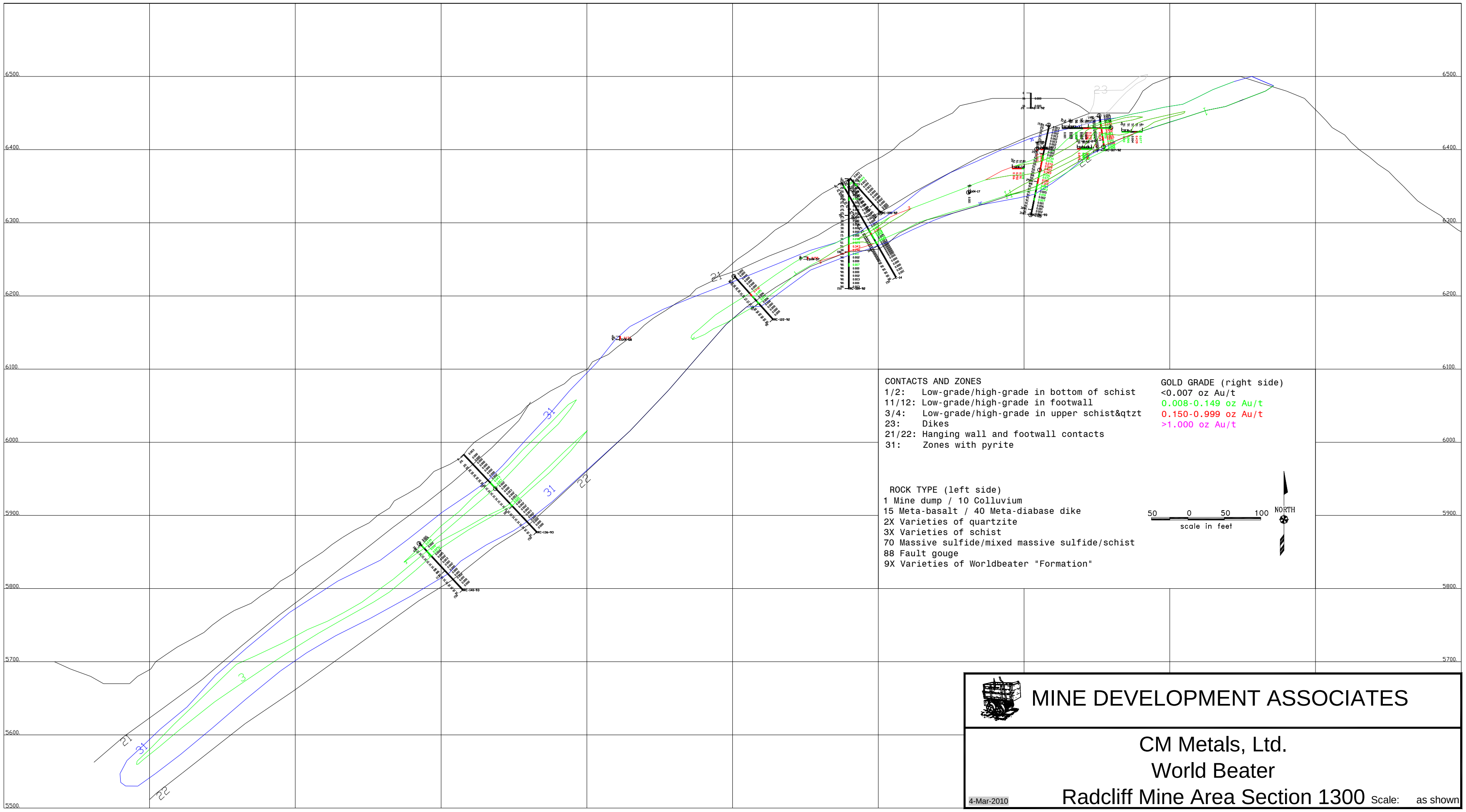
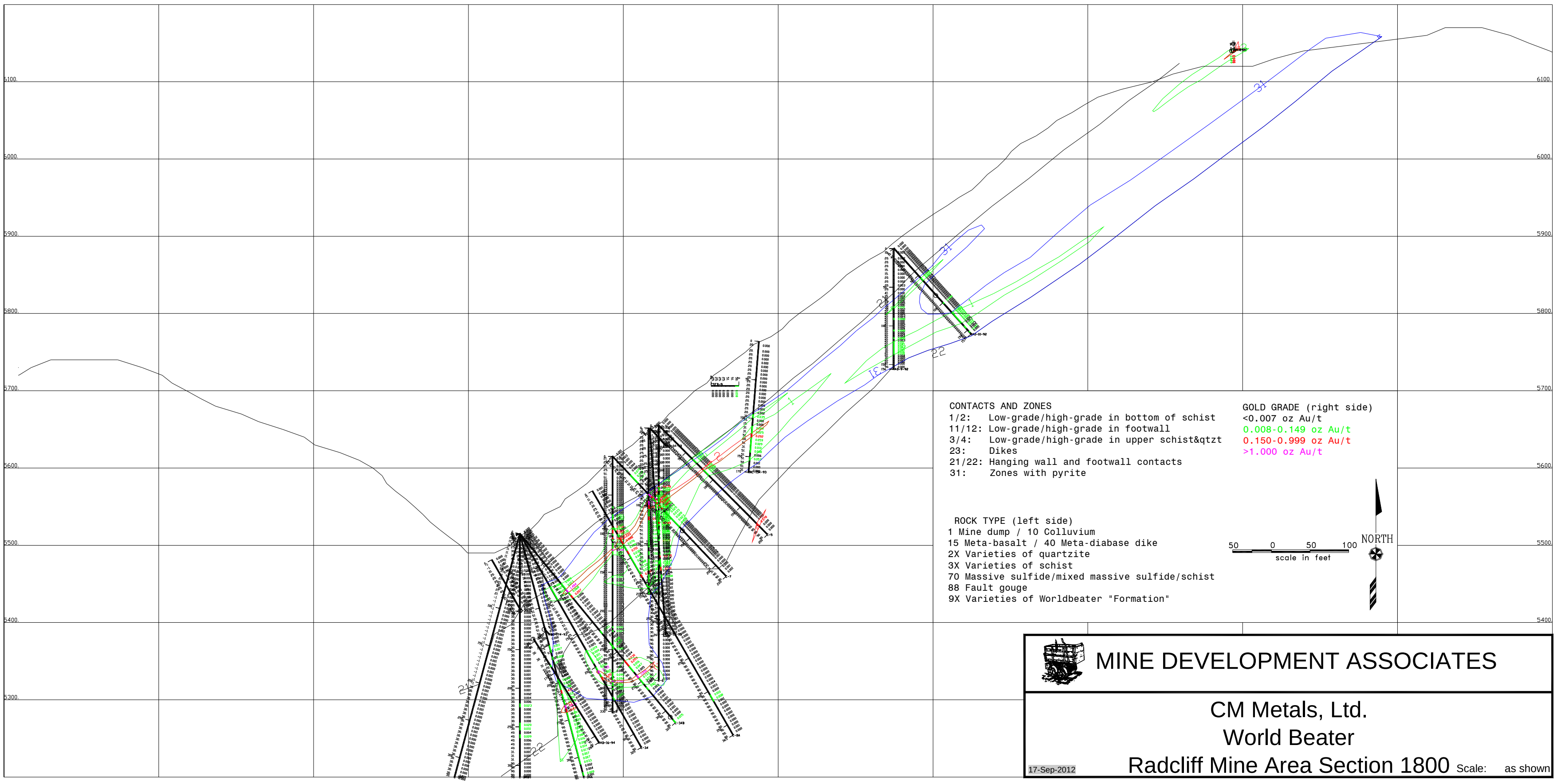


Figure 14.2 Typical Cross Section of the Radcliff Area Deposit (Section 1800)



14.5 Mineral Resources

Although the resource was estimated in 1997 before the initiation of NI 43-101, MDA classified it in order of increasing geological and quantitative confidence into Inferred, Indicated, and Measured categories such that it conforms to the "CIM Definition Standards - For Mineral Resources and Mineral Reserves" (2010) and therefore reportable in a Canadian National Instrument 43-101-compliant Technical Report. CIM mineral resource definitions are given below, with CIM's explanatory material shown in italics:

Mineral Resource

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

A Mineral Resource is a concentration or occurrence of diamonds, natural solid inorganic material, or natural solid fossilized organic material including base and precious metals, coal, and industrial minerals 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.

The term Mineral Resource covers mineralization and natural material of intrinsic economic interest which has been identified and estimated through exploration and sampling and within which Mineral Reserves may subsequently be defined by the consideration and application of technical, economic, legal, environmental, socio-economic and governmental factors. The phrase 'reasonable prospects for economic extraction' implies a judgement by the Qualified Person in respect of the technical and economic factors likely to influence the prospect of economic extraction. A Mineral Resource is an inventory of mineralization that under realistically assumed and justifiable technical and economic conditions might become economically extractable. These assumptions must be presented explicitly in both public and technical reports.

Inferred 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 from 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. Confidence in the estimate is insufficient to allow the meaningful application of technical and economic parameters or to enable an evaluation of economic viability worthy of public disclosure. Inferred Mineral Re-

sources must be excluded from estimates forming the basis of feasibility or other economic studies.

Indicated Mineral Resource

An 'Indicated Mineral Resource' is that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics 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.

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

Measured Mineral Resource

A 'Measured Mineral Resource' is that part of a Mineral Resource for which quantity, grade or quality, densities, shape, and physical characteristics are 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.

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

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

MDA classified the World Beater resource by distance to the nearest sample, geologic controls, and with consideration of the underlying data. MDA did not classify any of the resource as Measured because of: a) the limited documentation of historic QA/QC, b) poor documentation of surveying and evidence of poor surveying, c) few density measurements, d) inability to verify sample integrity, and e) inadequate definition of the very high-grade mineralization.

In spite of these data characteristics, MDA has classified the resource as Indicated because of other compensating information. The sequence of events that allows MDA to define Indicated resources began in May 1995 when Compass contracted MDA to make a resource estimate for the World Beater project. This was followed by RC drilling campaigns from 1995 to 1997, during which time they drilled a total of 17,320ft (5,279m) in 64 RC holes. Compass contracted with MDA to complete an updated resource estimate in 1996 after completing some post-1995-estimate drilling, and again in 1997 with post-1996-estimate drilling. There were only minor changes in the estimated resources (1995 and 1996 in Table 6.1, 1997 and current estimate in Table 14.4) in spite of extensive drilling. That corroboration of estimates by post-model drilling was sufficient to verify the underlying data and confirms the confidence in the estimate, allowing for Indicated classification. What is not evident in this discussion was the good local correlation and confirmation of the model with post-model(s) drilling, something MDA believes is a most-important criterion for more confident resource classification. MDA expects little deviations to this estimate with additional infill drilling. This corroboration and confirmation by drilling occurred again in 2003 by the next World Beater operator, Manele Bay (see Section 14.6 for discussion).

Table 14.4 presents the undiluted Indicated and Inferred World Beater resources. These are at a reporting cutoff of 0.02oz Au/ton, because the lowest-cost likely type of mining operation to exploit this deposit is by a small open pit and milling operation. MDA is also reporting this resource at higher cutoffs to describe the resource available to underground mining. To give a sense of the high-grades, at a cutoff of 0.15oz Au/t, there are 202,000 tons grading just over 0.5oz Au/t for a total of 101,000oz of gold in the Indicated category. For this report's economic cutoff determination, MDA used a gold price of $1,200, open pit mining costs of $3/ton, plant operating costs of $18/ton, and general and administrative costs of $6/ton. Gold metallurgical extraction rate is 95%, the upper limit of expected recoveries suggested in Section 13.8.

Table 14.4 World Beater Gold Resource

Indicated			
Cutoff (oz/ton)	**Tons**	**Grade (oz/ton)**	**Ounces Gold**
0.02	**2,129,000**	**0.094**	**200,900**
0.05	949,000	0.169	160,800
0.07	620,000	0.228	141,600
Inferred			
Cutoff (oz/ton)	**Tons**	**Grade (oz/ton)**	**Ounces Gold**
0.02	**263,000**	**0.103**	**27,100**
0.05	113,000	0.195	22,100
0.07	75,000	0.264	19,800

14.6 Discussion of the World Beater Resources

Overall, the World Beater resource is well-defined. The lower-grade mineralization in the Radcliff Schist has good geologic support and is well-understood. On the other hand, the material in the underlying World Beater Complex, a small part of the resource (<~5%), is poorly understood but has potential to expand. A significant risk in any estimate of this resource is the large amount of metal contained in just a few drill holes in the very high-grade mineralization.

Additional sample integrity studies, geologic studies on the mineralization, surveying, specific gravity, and sensitivities to the high-grade mineralization are required prior to upgrading the resources to Measured.

In 2003, subsequent to the mineral resource estimate described herein, Manele Bay drilled 29 RC drill holes for a total of 7,910ft of drilling with 1,583 sample-interval assays. MDA loaded these data and reviewed the block model in context with these post-model drill holes. Nineteen of these drill holes were drilled to expand the high-grade resource, although they were never far (maximum distance of 135ft) from projected high-grade zones. The remainder of the holes were drilled internal to the estimated area. MDA reviewed these new holes in light of the previously estimated resource and concludes the new drilling would, if used in a resource update:

- change the location of the deposit slightly by dropping the down-dip extensions up to about 20ft;
- incrementally and not significantly expand the resource size from the down-dip drilling; and
- cause minor change in some grade distributions internal to the estimate, which would happen in any estimate using new drilling.

MDA has included two cross section examples that typify the impact of Manele Bay's 2003 drilling on the estimate (Figure 14.3 and Figure 14.4).

In short, an update to the block model estimate could have been done, and still could be done, but the impact would be small. The project operator in 2003 (Manele Bay) and the current project owner (CMC Metals), in concurrence with MDA, chose not to embark on an update. Consequently, until the estimate is updated with those 29 post-1997 drill holes, any incremental additional mineralization is not considered to be a resource or used in any financial analyses. Because the differences would be small, and the resource would be larger, MDA considers the 1997 estimate to be the current estimate.

In April 2012, Michael Brady, an associate of MDA, made a preliminary map of the underground workings that had been constructed by PBI at the Radcliff mine since late 2009 using a Brunton and tape. The underground workings are ~290ft long, and a raise is 42ft long. One drill hole was intersected by the raise. This mapping indicated the presence of a mineralized zone averaging about 40ft wide. The mineralized zone appears to have abrupt hanging wall and footwall contacts that are generally marked by a shear. The new data were digitized and loaded into the model and evaluated in light of the previous resource estimate. The mineralized zone aligned very well with the modeled domains and even to the extent that the high-grade in the model ended between two cross sections where the underground mining indicated the high grades decreased. Later, in May of 2012, Mr. Brady returned to the mine to evaluate their stockpiles. Based on Pruett's assays, MDA estimated at that time there may have been just over 350 tons grading about one third of an ounce of gold per ton (rounded numbers are presented to more fairly portray potential accuracy of such an estimate.

Figure 14.3 Cross Section of Manele Bay Drilling Looking to Northwest (Section 1800)
("M"-series holes are Manele Bay, 2003, earlier holes not labeled)

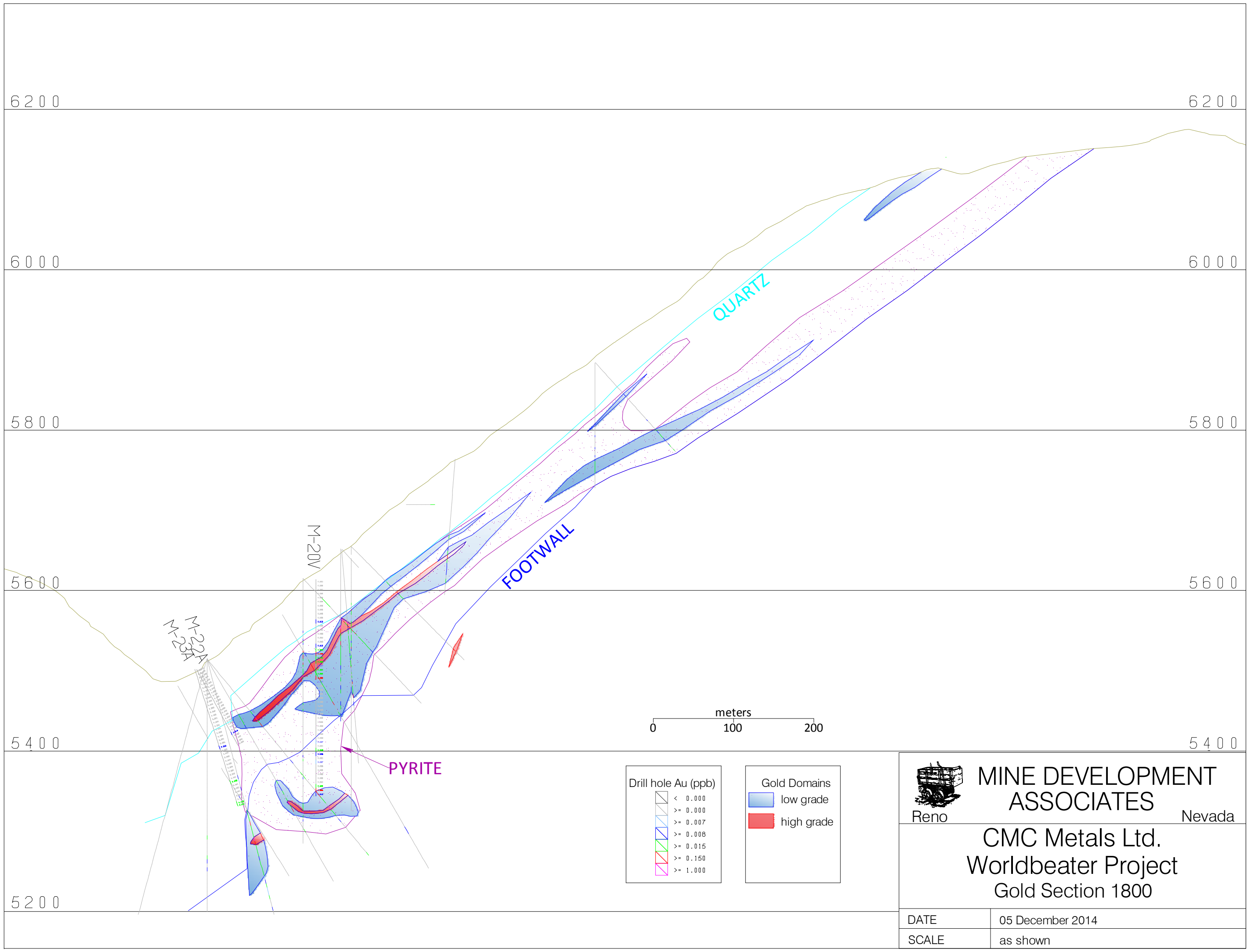
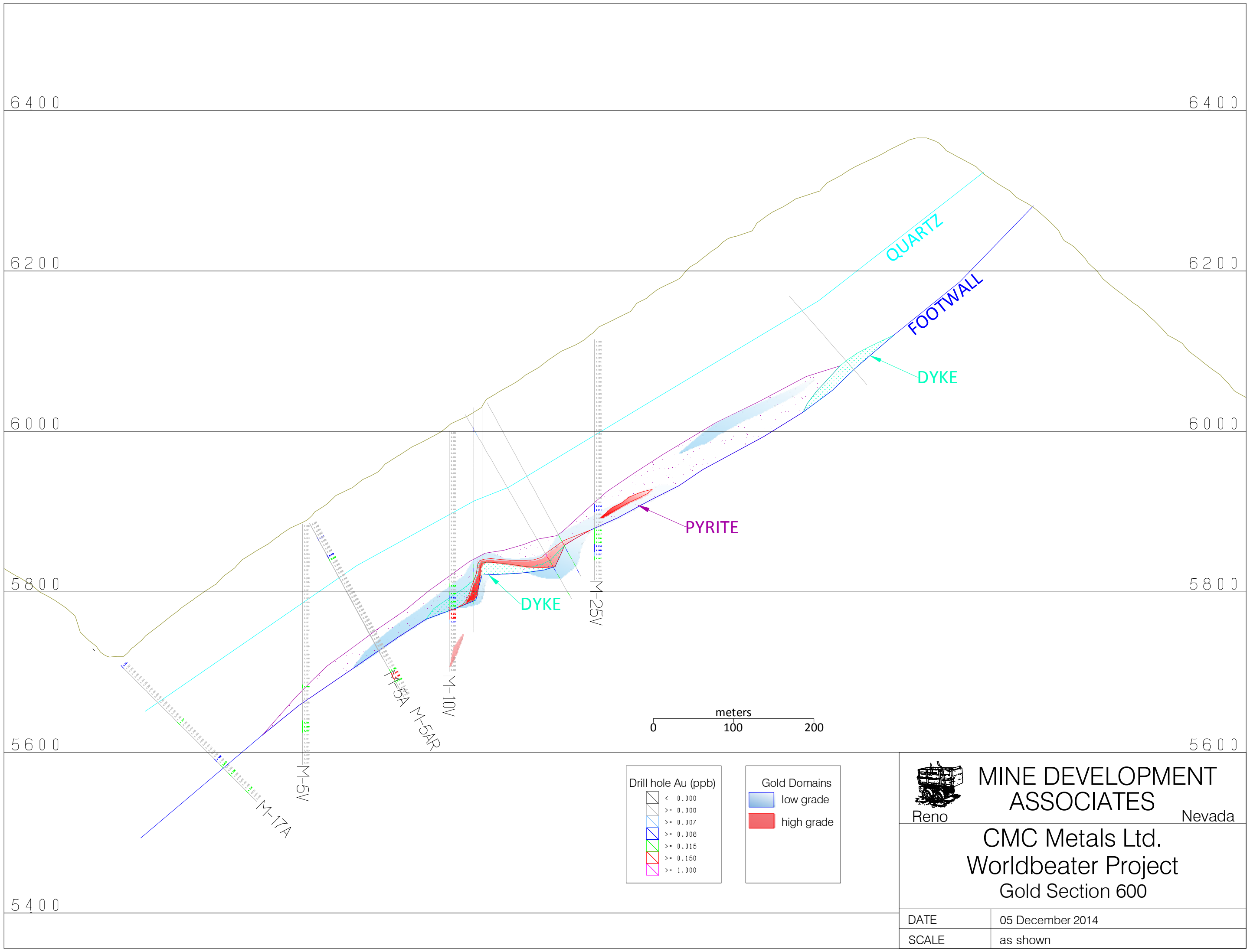


Figure 14.4 Typical Cross Section of the South Radcliff Area Deposit (Section 600)
("M"-series holes are Manele Bay, 2003, earlier holes not labeled)



15.0 MINERAL RESERVE ESTIMATES

There are no current mineral reserve estimates for the World Beater project.

16.0 ADJACENT PROPERTIES

The most significant gold deposit in the vicinity of the World Beater property is the Briggs mine (Figure 4.1), now controlled by Atna Resources Ltd. The Briggs mine is located roughly eight miles (13km) south-southwest of the World Beater property. Similarities to World Beater have not been studied for this report, and implications of potential similarities should not be made at this time. However, a brief description of the Briggs mine is given for completeness.

The Briggs mine was an open pit and underground mine with gold recovery by heap leach. The mine was constructed in 1996. As of October 31, 2002, the mine had produced 661,702 ounces of gold.

According to Atna Resources Ltd.'s web site as of August 15, 2012 (http://www.atna.com/s/Briggs.asp):

> *In May 2009, Atna announced the restart of gold production at the wholly owned Briggs Mine* in *Inyo County, California. The Company expects to produce approximately 213,000 ounces of gold with an annual average full year production rate that ranges from 40,000 to 50,000 ounces per year, with residual gold recovery in 2017.*

A NI 43-101 Technical Report dated May 22, 2012 (Noble *et al.*, 2012) described estimated mineral reserves of 12,238,000 tons of Proven and Probable reserves averaging 0.020oz Au/ton for a total of 246,929 contained ounces of gold. Including these reserves, Noble *et al*. (2012) estimated total Measured + Indicated resources of 33,598,000 tons averaging 0.020oz Au/ton for a total of 661,700 ounces of contained gold plus 12,940,000 tons of Inferred resources averaging 0.018oz Au/ton for a total of 228,600 contained ounces of gold. The author has been unable to verify this information, and this information is not necessarily indicative of the mineralization on the World Beater property.

Other properties in the region include the Gold Bug mine, which is owned privately and is mined on an intermittent basis.

17.0 OTHER RELEVANT DATA AND INFORMATION

One challenge to production at the Radcliff mine is the rugged terrain. There have been preliminary engineering studies showing that production is possible, but the rugged terrain will make operations difficult and will add to operating costs, capital costs, and site infrastructure.

CMC owns the Bishop mill facility, which has a current capacity of 50 tons per day; a proposed Plan of Operations under review by the BLM would increase the capacity to 100 tons per day (CMC Metals Ltd. news release, May 24, 2011). CMC intends to process ore from the World Beater property at the Bishop mill. The Water License for the mill was issued on July 13, 2011 (CMC Metals Ltd. news release, July 18, 2011).

18.0 INTERPRETATION AND CONCLUSIONS

The World Beater property contains three stratigraphically separate horizons of gold-bearing exhalite mineralization. The most significant of these horizons is a basal exhalite horizon that lies stratigraphically above the underlying World Beater Complex. The geology is well-understood and predictable, and mineralization in low-grade zones is relatively predictable in the exhalite horizons. There is the potential to increase the size of the known exhalite resource with additional exploration drilling. Relatively untested gold mineralization occurs in footwall structures that may have acted as hydrothermal conduits and offers additional upside potential. This type of mineralization occurs primarily within the World Beater Complex and has been intersected by widespread drill holes within the Radcliff mine area. Although there is no reason to believe that the footwall World Beater-hosted mineralization will not be expanded, it will be complicated to explore as it is poorly understood.

The exhalite zones consist of low-grade mineralization encompassing higher-grade gold zones. Most of the deposit is sufficiently well drilled, but because of local, extreme high grades and the resource estimate's sensitivity to those high-grade intercepts, additional drilling near those high-grade intercepts is required for upgrading a portion of the resources to Measured. Post-estimate drilling did expand the Radcliff-hosted mineralization to the southwest, albeit only incrementally.

The estimated resources at World Beater are reasonably well-defined and understood though, as mentioned, the dependence of the resource on the high-grade zones presents both an opportunity and a risk. It is an opportunity because these high-grade zones represent very high-quality resources and a risk because of the very high value attributable to so few drill intercepts. Other aspects of the resource that must be studied and evaluated are the drill-sample integrity, density studies, and the surveying. As there is a large dependence on RC drilling, an evaluation of the sample quality must be made again prior to justifying upgrading the resource. As the Radcliff mineralization is locally very high grade, and often thin, drilling with RC will alter the measurement of these high-grade zones by expanding the width and decreasing the grade. Potential for down-hole contamination must also be addressed. While working with the data, MDA found some inconsistencies with drill-hole surveying. Though these should not materially change the estimate of total metal content, they could alter the estimate of location.

No resource update has been performed since 1997 because the drilling by Manele Bay would only incrementally increase the existing resource estimate. All subsequent work since the resource estimate in 1997, including the recent underground development work, substantiates that estimate and does not materially change it.

19.0 RECOMMENDATIONS

World Beater is a project of merit deserving more advanced-stage work as well as some exploration and some better delineation of high-grade mineralization. A two-stage program is recommended for the World Beater project, with the second phase being contingent upon results from the first.

19.1 Phase I Recommendations

The World Beater project is worthy of additional exploration and technical studies. Positive aspects of the project include the high average grade of the deposit, which may overcome the issues of size and difficult terrain. The major effort of future work should be to define the optimal method of development and production, but additional drilling should also be done to better define the extents of the high-grade mineralization, which at the Radcliff mine, can be quite extraordinary.

Early in the project, a thorough geologic study should be made with mapping, sampling, and compiling all historic work to better assess exploration potential away from the defined resource. An emphasis should be placed on stratigraphic correlations and structures to better define down-dip and southward extensions. Tens to a hundred samples should be taken for density studies; those samples can be taken from underground workings with a few from the surface. At the same time, a survey should be conducted to locate as many drill holes as possible and to tie in the underground workings now being constructed; the survey should bring everything into real-world coordinates instead of the arbitrary local coordinates. The survey should also include corners along the property boundary.

A small amount of drilling should be conducted for resource expansion, but the exact size of the program and the specific hole locations will be determined based on the proposed geologic studies. This drilling should emphasize the delineation and continuity of the high grades, which is one of the largest risks at Radcliff. A substantial amount of in-fill drilling should be done to better estimate the continuity and location of the high-grade zones. If the drilling is done dry, RC drilling would be the preferred method of drilling. There is no doubt about the existence of those high-grade zones, but depending on the assumptions used in projecting them, the resource can vary considerably.

This drilling should include a rigorous QA/QC program and sample integrity studies in an attempt to increase the confidence in historic work that had poor levels of documentation.

As far as MDA can determine, the last complete title report prepared for the World Beater project was undertaken for a previous operator in 2003. A current title report should be prepared that includes the unpatented and patented claims and all current agreements pertaining to the World Beater property.

Engineering studies should be undertaken to evaluate options for development. Major considerations include the type and location of processing – whether constructing a small mill, toll milling, or shipping to other mills for contract milling. A detailed assessment of whether the deposit should be developed by open-pit methods or underground methods is important. Once an envisioned operation is optimized, a Preliminary Economic Assessment should be performed.

Phase I work recommendation costs are presented in Table 19.1.

Table 19.1 Recommended Programs

Exploration		
Geologic studies	$	30,000
Survey	$	25,000
Distal exploration drilling	$	100,000
Distal drilling near mineralized holes	$	250,000
Subtotal	**$**	**405,000**
Land Study/Economic Studies/Engineering		
Title Opinion	$	25,000
Processing options	$	40,000
Mining options	$	20,000
Preliminary Economic Assessment	$	60,000
Subtotal	**$**	**145,000**
Contingency (10%; rounded)	**$**	**55,000**
Grand Total	**$**	**605,000**

19.2 Phase II Recommendations

If the World Beater project is demonstrated to be economic, Phase II would begin with pre-feasibility or feasibility work on the optimal operation. That phase of work could cost on the order of four times the cost of Phase I work.

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21.0 DATE AND SIGNATURE PAGE

Effective Date of report: October 1, 2012

Completion Date of report: January 9, 2015

"S Ristorcelli" Date Signed: January 9, 2015

Steven Ristorcelli, C.P.G.

"W. J. Schlitt" Date Signed: January 9, 2015

W. Joseph Schlitt, Ph.D, P.Eng.

22.0 AUTHORS' CERTIFICATE AND SIGNATURE PAGES

STEVEN RISTORCELLI, C. P. G.

I, Steven Ristorcelli, C. P. G., do hereby certify that:

1. I am currently employed as Principal Geologist by Mine Development Associates, Inc., 210 South Rock Blvd., Reno, Nevada 89502.

2. I am the co-author of the report entitled "Amended Technical Report on the World Beater Gold Property, Inyo County, California" prepared for CMC Metals Ltd. and dated January 9, 2015; the effective date is October 1, 2012.

3. I graduated with a Bachelor of Science degree in Geology from Colorado State University in 1977 and a Master of Science degree in Geology from the University of New Mexico in 1980. I am a Registered Professional Geologist in the states of California (#3964) and Wyoming (#153) and a Certified Professional Geologist (#10257) with the American Institute of Professional Geologists. I have worked as a geologist continuously for 36 years since graduation from undergraduate university. My experience in the last 25yrs has involved estimating resources, evaluating databases, sample integrity and QAQC, as well as auditing and reviewing other's estimates on multiple deposit types worldwide. My experience was with multiple metals and deposit types, particularly but not exclusively precious and base metals. Prior to those 25yrs, I was a geologist involved in mineral exploration and advanced mining project development in the United States.

4. I have read the definition of "qualified person" set out in National Instrument 43-101 ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.

5. I visited the property on January 5-6, 1996 and on July 9, 2012. I take responsibility for all sections of the Technical Report, except for Sections 4.2, 4.3, 4.4, and 4.5 and Section 0.

6. I am independent of CMC Metal Ltd. and all their subsidiaries as defined in Section 1.5 of NI 43-101 and in Section 1.5 of the Companion Policy to NI 43-101. I am also independent of Pruett Ballarat Inc. and WB & Ratcliff, Inc. as defined in Section 1.5 of NI 43-101 and in Section 1.5 of the Companion Policy to NI 43-101.

7. I have had prior involvement with the World Beater gold project in that I have estimated resources and authored previous Technical Reports on the World Beater gold project.

8 I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.

9. As of the effective date of this report, 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.

Dated this 9th day of January, 2015.

"Steven Ristorcelli"
Signature of Qualified Person
Steven Ristorcelli

CERTIFICATE OF QUALIFIED PERSON

WILLIAM JOSEPH SCHLITT

I, W. Joseph Schlitt, do hereby certify that:

- I am President of Hydrometal, Inc., P.O. Box 309, Knightsen, CA, 94548, U.S.A.
- I graduated with a Bachelor of Science degree in Metallurgical Engineering (with highest honors) from Carnegie Institute of Technology, Pittsburgh, PA in 1964 and with a Doctor of Philosophy degree in Metallurgy (with honors) from The Pennsylvania State University, University Park, PA in 1968.
- I am a Qualified Professional member of the Mining and Metallurgical Society of America No. 01003QP with specialty in metallurgy and a Registered Professional Metallurgical Engineer (Texas No. 53603).
- I have worked continuously as a Metallurgist for over 45 years since my graduation from university. Much of my career has involved designing and managing testwork programs to be undertaken at either in-house or third-party commercial laboratories. This includes interpretation of the test results and their translation into design parameters for facilities engineering. Projects have involved both base and precious metals, mainly copper and gold/silver. Processing options have included milling and flotation and direct leaching in both agitated circuits and heaps.
- 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 responsible for the preparation of Section 13.0 Mineral Processing and Metallurgical Testing, plus Subsection 1.4 Metallurgical Testing and Mineral Processing in the Technical Report entitled "Amended Technical Report on the World Beater Gold Property, Inyo County, California" prepared for CMC Metals Ltd. and dated January 9, 2015; the effective date is October 1, 2012. I have not visited the World Beater property. I have visited several of the metallurgical laboratories where portions of the test work were performed on the various samples.
- I have had no prior involvement with the World Beater project.
- I am independent of CMC Metal Ltd. and all their subsidiaries as defined in Section 1.5 of NI 43-101 and in Section 1.5 of the Companion Policy to NI 43-101. I am also independent of Pruett Ballarat Inc. and WB & Radcliff, Inc. as defined in Section 1.5 of NI 43-101 and in Section 1.5 of the Companion Policy to NI 43-101
- I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.
- As of the effective date of this Technical Report, to the best of my knowledge, information, and belief, those parts of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 9th Day of January, 2015

"***W. J. Schlitt***"

Signature of Qualified Person
W. Joseph Schlitt, Ph.D, P.Eng.

Appendix A

List of Claims

The 10 patented mining claims (MS 3713A) and one patented mill site (MS 3713B) known as the Radcliff Consolidated Quartz mining and mill site claims consist of the following:

Sun Rise

Grover Cleveland

John G. Carlisle

Kentucky

Texas

Joker

Joker Extension

Never Give Up

Treasure Vault

W.G. Quartz

Cleveland mill site

89 unpatented lode mining claims and mill site claims are listed below:

Name of Claim	Date of Location	Recording Data Doc. Number	BLM Serial No.
WB 52	1-12-1989	89 1368	CA MC 221764
WB 53	1-12-1989	89 1369	CA MC 221765
WB 54	1-12-1989	89 1370	CA MC 221766
WB 55	1-12-1989	89 1371	CA MC 221767
WB 59	1-26-1989	89 1372	CA MC 221768
WB 60	1-26-1989	89 1373	CA MC 221769
WB 61	1-26-1989	89 1374	CA MC 221770
WB 62	1-26-1989	89 1375	CA MC 221771
WB 64	1-15-1989	89 1376	CA MC 221772
WB 65	1-15-1989	89 1377	CA MC 221773
WB 66	1-12-1989	89 1378	CA MC 221774
WB 67	1-12-1989	89 1379	CA MC 221775
WB 68	1-12-1989	89 1380	CA MC 221776
WB 69	1-12-1989	89 1381	CA MC 221777
WB 72	1-20-1989	89 1384	CA MC 221780
WB 73	1-20-1989	89 1385	CA MC 221781
WB 79	1-16-1989	89 1391	CA MC 221787
WB 80	1-16-1989	89 1392	CA MC 221788
WB 81	1-15-1989	89 1393	CA MC 221789
WB 82	1-15-1989	89 1394	CA MC 221790
WB 83	1-15-1989	89 1395	CA MC 221791
WB 84	1-15-1989	89 1396	CA MC 221792
WB 85	1-15-1989	89 1397	CA MC 221793
WB 86	1-15-1989	89 1398	CA MC 221794
WB 87	1-15-1989	89 1399	CA MC 221795
WB 88	1-23-1989	89 1400	CA MC 221796
WB 94	1-16-1989	89 1406	CA MC 221802

Name of Claim	Date of Location	Recording Data Doc. Number	BLM Serial No.
WB 95	1-16-1989	89 1407	CA MC 221803
WB 96	1-16-1989	89 1408	CA MC 221804
WB 97	1-15-1989	89 1409	CA MC 221805
WB 98	1-15-1989	89 1410	CA MC 221806
WB 99	1-15-1989	89 1411	CA MC 221807
WB 100	1-15-1989	89 1412	CA MC 221808
WB 101	1-15-1989	89 1413	CA MC 221809
WB 102	1-15-1989	89 1414	CA MC 221810
WB 103	1-15-1989	89 1415	CA MC 221811
WB 109	1-17-1989	89 1421	CA MC 221817
WB 110	1-17-1989	89 1422	CA MC 221818
WB 111	1-17-1989	89 1423	CA MC 221819
WB 112	1-17-1989	89 1424	CA MC 221820
WB 113	1-17-1989	89 1425	CA MC 221821
WB 114	1-17-1989	89 1426	CA MC 221822
WB 115	1-17-1989	89 1427	CA MC 221823
WB 116	1-18-1989	89 1428	CA MC 221824
WB 117	1-18-1989	89 1429	CA MC 221825
WB 118	1-18-1989	89 1430	CA MC 221826
WB 119	1-18-1989	89 1431	CA MC 221827
WB 120	1-18-1989	89 1432	CA MC 221828
WB 121	1-18-1989	89 1433	CA MC 221829
WB 122	1-18-1989	89 1434	CA MC 221830
WB 131	1-17-1989	89 1443	CA MC 221839
WB 132	1-17-1989	89 1444	CA MC 221840
WB 133	1-17-1989	89 1445	CA MC 221841
WB 134	1-17-1989	89 1446	CA MC 221842
WB 135	1-17-1989	89 1447	CA MC 221843
WB 136	1-17-1989	89 1448	CA MC 221844
WB 137	1-18-1989	89 1449	CA MC 221845
WB 138	1-18-1989	89 1450	CA MC 221846
WB 139	1-18-1989	89 1451	CA MC 221847
WB 147	3-17-1989	89 2117	CA MC 223448
WB 148	3-18-1989	89 2118	CA MC 223449
WB 149	3-18-1989	89 2119	CA MC 223450
WB 150	3-17-1989	89 2120	CA MC 223451
WB 151	3-17-1989	89 2121	CA MC 223452
WB 152	3-17-1989	89 2122	CA MC 223453
WB 153	3-17-1989	89 2123	CA MC 223454
WB 155	9-16-1993	93 5160	CA MC 261458
WB 156	9-16-1993	93 5161	CA MC 261459

Name of Claim	Date of Location	Date of Re-cording	Recording Data Doc. Number	BLM Serial No.
Margaret 1	03-16-1989	04-18-1989	89 2101	CA MC 223432
Margaret 2	03-16-1989	04-18-1989	89 2102	CA MC 223433
Margaret 3	03-16-1989	04-18-1989	89 2103	CA MC 223434
Margaret 4	03-16-1989	04-18-1989	89 2104	CA MC 223435
Margaret 5	03-16-1989	04-18-1989	89 2105	CA MC 223436
Margaret 6	03-16-1989	04-18-1989	89 2106	CA MC 223437
Margaret 7	03-16-1989	04-18-1989	89 2107	CA MC 223438
Margaret 8	03-16-1989	04-18-1989	89 2108	CA MC 223439
Margaret 9	03-16-1989	04-18-1989	89 2109	CA MC 223440
Margaret 10	03-16-1989	04-18-1989	89 2110	CA MC 223441
Margaret 11	03-16-1989	04-18-1989	89 2111	CA MC 223442
Margaret 12	03-16-1989	04-18-1989	89 2112	CA MC 223443
Margaret 13	03-16-1989	04-18-1989	89 2113	CA MC 223444
Margaret 14	03-16-1989	04-18-1989	89 2114	CA MC 223445
Margaret 15	03-16-1989	04-18-1989	89 2115	CA MC 223446
Margaret 16	03-16-1989	04-18-1989	89 2116	CA MC 223447

Unpatented Mill Sites, Water Claims and/or Water Rights

Name of Claim	Legal Description	Location Notice/Record Date	Recording Data Book/Page	BLM Serial No.
Dover	Sec. 11 T. 22S.,R. 45E	08-24-1898 01-03-1899	L&W BK.A., Pg.8(LN) Vol.B-1, Pg. 456(Deed)	CA MC 6856
Wingfield and Harrison	Sec. 11 T. 22S.,R. 45E	08-24-1898 09-07-1898	L&W Vol.I, Pg.650 (LN) Vol.D-1 Pg.64 (Deed)	CA MC 6856
Sales-J.F. Cooper	Sec. 11, T. 22S R.45E	04-22-1897 04-23-1897	So. Park Mining District Records Page 226 (LN) Vol.C-1, Pg. 132(Deed)	CA MC 6856
McNulty	Sec. 11, T.22S R. 45E.	12-17-1898 12-28-1898	L&W BK.A, Pg 7 (LN) Vol.C-1 Pg. 178 (Deed)	CA MC 6856
James Wingfield	Sec. 11, T.22S R. 45E	01-12-1899 02-20-1899	L&W BK.A, Pg 13(LN) Vol.C-1 Pg.182 (Deed)	CA MC 6856