CUMBERLAND RESOURCES LTD
Form 6-K
March 11, 2004

FORM 6-K

1SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

2Report of Foreign Private Issuer
Pursuant to Rules 13a-16 or 15d-16
Under the Securities Exchange Act of 1934

For the month of **March**

Commission File Number **001-31969**

Cumberland Resources Ltd.
(Translation of registrant's name into English)

950 - 505 Burrard Street, Box 72, One Bentall Centre, Vancouver, B.C., Canada, V7X 1M4
(Address of principal executive offices)

Indicate by check mark whether the registrant files or will file annual reports under cover Form 20-F or Form 40-F.

Form 20-F....[**X**]..... Form 40-F...[ ]...

Indicate by check mark if the registrant is submitting the Form 6-K in paper as permitted by Regulation S-T Rule 101(b)(1): ____

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Indicate by check mark if the registrant is submitting the Form 6-K in paper as permitted by Regulation S-T Rule 101(b)(7): ____

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Indicate by check mark whether by furnishing the information contained in this Form, the registrant is also thereby furnishing the information to the Commission pursuant to Rule 12g3-2(b) under the Securities Exchange Act of 1934.

Yes

[ ]

No

[**X**]

If "Yes" is marked, indicate below the file number assigned to the registrant in connection with Rule 12g3-2(b): 82-________

Note to U.S. Readers

The terms "Mineral Resource", "Measured Mineral Resource", "Indicated Mineral Resource, "Inferred Mineral Resource" used in this report are Canadian mining terms as defined in accordance with National Instrument 43-101 - Standards of Disclosure for Mineral Projects under the guidelines set out in the Canadian Institute of Mining, Metallurgy and Petroleum Standards. While the terms "mineral resource," "measured mineral resource," "indicated mineral resource," and "inferred mineral resource" are recognized and required by Canadian regulations, they are not defined terms under standards in the United States. As such, information contained in this report concerning descriptions of mineralization and resources under Canadian standards may not be comparable to similar information made public by U.S. companies subject to the reporting and disclosure requirements of the Securities and Exchange Commission. "Indicated mineral resource" and "inferred mineral resource" have a great amount of uncertainty as to their existence and a great uncertainty as to their economic and legal feasibility. These mineral resource estimates include inferred mineral resources that are normally considered too speculative geologically to have economic considerations applied to them that would enable them to be categorized as mineral reserves. It can not be assumed that all or any part of an "indicated mineral resource" or "inferred mineral resource" will ever be upgraded to a higher category. Investors are cautioned not to assume that any part or all of mineral deposits in these categories will ever be converted into reserves.

3

4Signatures

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

Cumberland Resources Ltd.

Date: March 10, 2004

By: /s/ Kerry M Curtis

Name: Kerry M Curtis

Title: President & CEO

IMPORTANT NOTICE

This report was prepared as a National Instrument 43-101 Technical Report, in accordance with Form 43-101F1, for Cumberland Resources Ltd. (Cumberland) by AMEC Americas Limited (AMEC). The quality of information, conclusions, and estimates contained herein is consistent with the level of effort involved in AMEC s services, based on: i) information available at the time of preparation, ii) data supplied by outside sources, and iii) the assumptions, conditions, and qualifications set forth in this report. This report is intended to be used by Cumberland, subject to the terms and conditions of its contract with AMEC. That contract permits Cumberland to file this report as a Technical Report with Canadian Securities Regulatory Authorities pursuant to provincial securities legislation. Except for the purposes legislated under provincial securities laws, any other use of this report by any third party is at that party s sole risk.

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1.0

SUMMARY

Cumberland Resources Ltd. (Cumberland) has asked AMEC Americas Limited (AMEC) to provide resource estimation assistance and a technical report for the Meadowbank project in Nunavut, Canada. Steve Blower, P.Geo., an employee of AMEC, served as the Qualified Person responsible for preparing the technical report as defined in National Instrument 43-101, Standards of Disclosure for Mineral Properties, and in compliance with Form 43-101F1 (the Technical Report). Steve Blower and Stephen Juras, P.Geo., Principal Geologist with AMEC, visited the Meadowbank project on 9 to 11 September 2003.

The Meadowbank property is located in the Kivalliq District of Nunavut, approximately 70 km north of Baker Lake. Cumberland is currently completing a feasibility study based on the resource estimates that are the subject of this report. Planned production scenarios involve open-pit mining from at least three deposits, Goose Island, Portage, and Vault that are located within 8 km of each other. The deposits occur at the south end of a north trending belt of mineralization that has been traced for over 20 km.

Meadowbank is an Archean-aged Iron Formation hosted gold deposit located within the Woodburn Lake Group. Most of the mineralization at the Goose Island and Portage deposits is hosted by highly tectonized iron formation, but intermediate volcanic rock assemblages host the majority of the mineralization at the more northerly Vault deposit. Mineralization is commonly associated with intense quartz flooding, disruption of banding in the iron formation and the presence of abundant pyrrhotite.

A total of 763 diamond drill holes have been drilled from surface at Meadowbank. AMEC has verified the accuracy of the database with a check of five percent of the assay and survey data against original source data records. Gold assays have been completed with industry standard fire assay techniques that in recent years are supported by Cumberland s QA/QC program. The program consists of the regular insertion of standard reference materials, blanks, and core duplicate samples into the sample stream.

A number of bulk density determinations have been completed on diamond drill core samples with a weight-in-air/weight-in-water technique. The samples were coded by lithology and intensity of mineralization, so that mean specific gravities could be applied to mineralized and unmineralized subsets of lithologic groups.

Mineral resource estimates at Meadowbank are based on geologically constrained grade block models that were constructed by interpolating composited assay values with inverse distance techniques. AMEC has checked the validity of the models with a number of methods and is satisfied that the resource models provide an acceptable estimate of tonnage and grade for the completion of a feasibility study.

The Meadowbank mineral resource estimate is summarized in Table 1-1 below.

Table 1-1: Meadowbank Resource Statement, 29 January 2004

Deposit	Deposit	Tonnes	Grade	Ounces
Portage (1.5 g/t cutoff)	Measured	1,013,000	5.5	179,000
	Indicated	10,805,000	4.5	1,563,000
	Sub-Total	11,818,000	4.6	1,742,000
	Inferred	774,000	4.3	107,000
Goose Island (1.5 g/t cutoff)	Measured	-	-	-
	Indicated	1,924,000	4.8	297,000
	Sub-Total	1,924,000	4.8	297,000
	Inferred	2,069,000	4.8	319,000
Vault Deposit (2.0 g cutoff)	Measured	38,000	3.4	4,000
	Indicated	7,905,000	3.6	915,000
	Sub-Total	7,944,000	3.6	919,000
	Inferred	2,513,000	3.8	307,000

All Deposits	Measured	1,051,000	5.4	183,000
	Indicated	20,634,000	4.2	2,786,000
	Sub-Total	21,685,000	4.3	2,998,000
	Inferred	5,356,000	4.3	740,000

*Note: the totals may not add due to rounding.

This resource estimate is reported above a cutoff grade of 1.5 g/t Au for the Portage and Goose Island deposits and 2.0 g/t Au for the Vault Deposit, reflecting a gold price of US$325/oz.

2.0

INTRODUCTION AND TERMS OF REFERENCE

Cumberland Resources Ltd. (Cumberland) has asked AMEC Americas Limited (AMEC) to assist with the estimation of mineral resources at the Meadowbank project in Nunavut, Canada, as part of an on-going Feasibility study also being completed by AMEC. Steve Blower, P.Geo., an employee of AMEC, served as the Qualified Person responsible for the preparation of the resource estimate and this technical report as defined in National Instrument 43-101, Standards of Disclosure for Mineral Properties.

Information and data for the report were obtained from a site visit by AMEC on 9 to 11 September 2003, as well as from reports received directly from Cumberland personnel. Pertinent geological information was reviewed in sufficient detail to prepare this report.

2.1

Terms of Reference

Unless otherwise specified, all units of measurement in this report are metric and all costs are expressed in Canadian dollars. The payable metals, gold and silver, are priced in United States dollars (US$) per ounce.

The statement of mineral resources as of 29 January 2004 is based on a gold price of US$325/oz and a conversion rate of 1.0 to 1.35 (Cdn$ to US$).

3.0

DISCLAIMER

No disclaimer statement is necessary for the issuance of this report.

4.0

PROPERTY DESCRIPTION AND LOCATION

The Meadowbank property consists of 10 Crown mining leases and 3 Nunavut Tunngavik Inc. (NTI) exploration concessions located in the Kivalliq District of Nunavut in Northern Canada; National Topographic Series Mapsheets 56 E/4 and and 66 H/1, UTM (Zone 14) coordinates 7214000 N and 638000 E, near latitude 65° 00 N and longitude 96° 00 W. The property lies in the Third Portage Lake area, approximately 70 km north of the village of Baker Lake (see Figure 4-1).

4.1

Mineral Tenure

Title to the 10 leases and 3 concessions is held 100% by Cumberland. Table 4-1 lists the status of mineral tenure for the Meadowbank Project. All of the mining leases and Exploration Concessions are currently in good standing, including the NTI Exploration Concession that contains the Vault deposit. All the surrounding claims are contiguous, with the exception of one sub-area of concession BL 14-99-02. The Crown mining leases have been legally surveyed, but the NTI Exploration Concessions have not. (Note: NTI concessions were acquired by map staking and there is nothing on the ground to survey)

Table 4-1 shows the status of mineral tenure for the Meadowbank Project, including the Vault deposit. The claim map is shown in Figure 4-2.

Table 4-1: Status of Mineral Tenure for the Meadowbank Project

Claim Name	Lease #	Effective Date	Expiry Date	Acreage	Hectares

		Crown Mining Leases			
Dick	3669	13 Dec. 1995	13 Dec 2016	1800	728.44
Carey	3670	13 Dec. 1995	13 Dec 2016	2545	1029.93
OY 2	3782	27 Apr. 1998	27 Apr. 2019	2547	1030.74
OY 3	3783	27 Apr. 1998	27 Apr. 2019	2582	1044.90
OY 4	3784	27 Apr. 1998	27 Apr. 2019	1954	790.76
YO 1	3777	27 Apr. 1998	27 Apr. 2019	1460	590.84
YO 2	3778	27 Apr. 1998	27 Apr. 2019	2020	817.47
YO 3	3779	27 Apr. 1998	27 Apr. 2019	1652	668.54
YO 4	3780	27 Apr. 1998	27 Apr. 2019	1105	447.18
YO 5	3781	27 Apr. 1998	27 Apr. 2019	607.76	245.95
		NTI Exploration Concessions			
BL 14-99-01		31 Dec. 2000			9234
BL 14-99-02		31 Dec. 2000			8502
BL 14-99-03		31 Dec. 2000			5390

Figure 4-1: Meadowbank Deposit Location

Figure 4-2: Claim Map

4.2

Permits and Agreements

The NTI Exploration Concessions are being explored under an agreement with Nunavut Tunngavik Inc., the non-profit organization responsible for administering mineral rights on Inuit-owned Lands. The agreement has undergone several years of review and has only recently been standardized by the NTI. Provisions include yearly exploration expenditures and fees and standard reporting requirements similar to those existing under federal jurisdictions for assessment. The yearly land fees and required exploration expenses for the NTI concessions increase as the exploration agreements mature. For 2004, the Exploration Concessions require payment of $46,252.00 for land fees and combined expenditures of $231,260.00 on exploration directed at the exploration areas.

During the exploration phase, lands within Exploration Concessions can be held for up to 20 years. The agreement incorporates a production lease, which can be activated upon delivery of a pre-feasibility study. Production from the new lands will be subject to a 12% net profits interest royalty in which annual deductions are limited to 85% of gross revenue. All deductions are placed into one deduction pool and can be carried forward until fully deducted. The agreement also allows for potential participation by the NTI in financing all or part of planned mine development.

Two permits are required to conduct exploration work on Inuit Owned Lands in the Territory of Nunavut. One is the Land Use Permit administered by the Kivalliq Inuit Association (KIA). The company applies for this permit annually by submitting a proposal of work that must be approved by the KIA and various boards that administer the Land Use Permits. The other required permit is the Water Use Permit, administered by the Nunavut Water Board, which covers the amount of water the project will use in camp and for exploration purposes in one calendar year.

5.0

ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE, AND PHYSIOGRAPHY

5.1

Accessibility

The Meadowbank Project is serviced via Baker Lake (70 km to the south), which provides summer shipping access and year-round airport facilities. Winter access to the project area is by helicopter, ski-equipped aircraft or snow vehicle over a winter ice road. Helicopter or float-equipped Twin Otter aircraft provide transportation during the summer. The camp is within 2 km of the Goose Island and Portage deposits, but is approximately 8 km from the Vault deposit.

5.2

Physiography

Land exposure consists of gently rolling hills and muskeg bound by numerous lakes and rivers. Vegetation is limited to small shrubs, lichen, and grasses.

5.3

Climate

Arctic winter conditions prevail from October through May, with temperatures ranging from +5°C to -60°C. This region is considered to have an arid arctic climate where snowfall rarely exceeds 1 m and annual rainfall is not significant. Light to moderate snowfall is accompanied by variable winds of up to 90 km/h. Summer temperatures usually range from -5°C to +25°C. Exploration work is generally conducted from March through to September.

5.4

Local Resources

The camp consists of a large wood framed head office/kitchen/dry facility, three large Weatherhaven all-weather structures (geology office/core shack/recreational facilities) and numerous insulated canvas tents and Weatherhaven sleeper tents (Figure 5-1). It can currently accommodate up to 60 people. Baker Lake has a year-round population of approximately 1,200 inhabitants and the services available there include a nursing clinic, motels and restaurants, expediters, an all season airport and 2.5 months of ice-free shipping access to Hudson Bay via Baker Lake and Chesterfield Inlet.

Figure 5-1: Meadowbank Camp

Figure -:

Figure 5-2: Baker Lake

6.0

HISTORY

6.1

Pre-1985

Exploration for gold in the Meadowbank area was motivated by the discovery of uranium in the Baker Lake basin in the 1970s. In the following decade, regional grassroots exploration programs outlined gold-bearing Archean greenstone belts in the Baker Lake area. In the Meadowbank area, this work culminated in the staking of ground by Wollex Exploration in 1983 due to the presence of anomalous gold and silver values in prospecting samples.

6.2

1985-1988

In 1985, a joint venture with Asamera Minerals (Asamera) (60%) and Comaplex Minerals Ltd. (Comaplex) (40%) was launched to explore gold and silver showings in the area. Over the next few years, several of these targets were evaluated by diamond drilling and by land-based magnetometer and VLF and airborne magnetometer geophysical surveys. In 1987, the Third Portage deposit the first of five gold deposits currently known at Meadowbank, was discovered.

6.3

1989-1991

Six exploration permits were acquired in 1989, and the joint venture was expanded to include Agnico-Eagle Mines, Hecla Mining Company, and Lucky Eagle Mines. This joint venture executed a detailed exploration program that consisted of ground magnetic and EM geophysical surveys, 1,529 m of core drilling and surface mapping. Over the next two years work was focussed on and around the Third Portage deposit. Three wide-spaced drill holes intersected mineralization in what is now known as the Goose Island deposit.

6.4

1992-1993

Agnico-Eagle, Hecla Mining, and Lucky Eagle did not fulfill their work obligations in 1992 and ceased to be partners in the joint venture.

6.5

1994-1997

In 1994, Cumberland Resources Ltd. entered the joint venture by acquiring Asamera s 60% interest. Drilling and geophysical programs, including detailed ground magnetic surveys and Max Min (HLEM) surveys, continued through to 1997. This work further delineated the Third Portage deposit and outlined the Goose Island deposit. The North Portage deposit was also discovered and delineated during this period. In 1997 Cumberland Resources Ltd. became the sole owner/operator of the project when it acquired Comaplex s 40% interest.

6.6

1998-1999

The Bay Zone was discovered in 1998. In 1998 and 1999, a total of 24,191 m of drilling was completed in 160 drill holes on all of the deposits. In 1999, extensive surface trenching at the Third Portage deposit was completed. Also in 1999, Cumberland initiated a regional prospecting program to the north of the known deposits. The focus was on re-assessing property that had been previously explored by the original joint venture. This work confirmed the existence of two mineralized trends in the Meadowbank area and led the company to acquire three mineral exploration agreements (NTI Exploration Concessions) on approximately 30,000 ha on 31 December 1999. These land parcels were contiguous with the mining leases surrounding the existing Meadowbank deposits.

6.7

2000

Exploration in 2000 focussed on the newly acquired concessions and concentrated on locating mineralization proximal to the existing Meadowbank deposits that would be amenable to open pit mining. In the spring, 37 drill holes were completed (3,546 m) on three showings, one of which was the Vault occurrence. This work resulted in the discovery of the Vault deposit.

Contemporaneously with the definition of the Vault mineralization in 1999 and 2000, Cumberland retained MRDI (now AMEC) to complete a pre-feasibility study on the Bay Zone, Goose Island, North Portage and Third Portage deposits. The work included an estimate of the mineral resource and reserve and involved a preliminary mine plan that utilized a combination of open pit and underground mining methods.

6.8

2001

The 2001 exploration program consisted of grid preparation, ground geophysics, and continued diamond drilling on the Vault prospect. The geophysical programs included ground magnetic, down-hole IP, and 1,590 line km of airborne magnetometer and EM surveys. Drilling in 2001 consisted of 4,044 m in 19 holes and targeted along-strike and down-dip extensions of the mineralization. It also filled in portions of the deposit drilled in 2000.

MRDI was again contracted by Cumberland to update the geological resource on the Vault deposit based on the 2000 and 2001 drilling results. This work was completed in November of 2001.

6.9

2002

In 2002, Cumberland completed 8,191 m of definition diamond drilling in 66 holes at the Vault deposit. Most of these holes were designed to increase the sampling density within the relatively near surface portion of the deposit and to improve confidence levels there in preparation for a feasibility study. Additionally, 18 holes totalling 1,783 m were completed on the PDF deposit. These holes followed up on scattered drill hole intersections obtained during 2000, and were successful in partially delineating a significant new zone of mineralization. In the Potage area, 6,022.5 m of drilling was completed in 58 holes. Most of the drilling in the Portage area focused on the newly discovered Connector zone and infill in the North Portage Deposit in preparation for a feasibility study. These holes successfully connected the North and Third Portage areas into one single deposit, providing continuous mineralization over 1800 m of strike length. Other exploration work in 2002 included the completion of a large program of overburden RC drilling in the area between the Vault and North Portage deposits in an effort to locate gold anomalies in the glacial till immediately down-ice of buried deposits. The work resulted in the definition of several anomalies.

7.0

GEOLOGICAL SETTING

After extensive discussions with the Cumberland geological staff, a review of trench exposures at Vault and Third Portage, and a review of diamond drill core, AMEC is satisfied that the level of understanding of the geology at Meadowbank is very good. The geological staff is generally using appropriate techniques to gather, store and utilize a large amount of detailed geological data.

7.1

Regional Geology

The deposits that make up the Meadowbank Project lie in the Rae subprovince of the western Churchill Province of the Canadian Shield (Figure 7-1). The host unit is the Archean (ca. 2.7 Ga) Woodburn Lake Group (Zaleski et al., 2000), which occurs as a narrow neck of structurally complex supracrustal rocks sandwiched between granite plutons (Henderson et al., 1991; Henderson and Henderson, 1994). Rocks of the Woodburn Lake Group have been correlated with units of the Prince Albert Group to the northeast towards Committee Bay. Correlations with supracrustal rocks to the south across the Snowbird Tectonic Zone near Baker Lake are less clear (Zaleski, 1997). The Paleo-proterozoic Baker Lake Basin unconformably overlies the Woodburn Lake Group to the south.

The Woodburn Lake Group consists of quartzites, komatiites, iron formation, felsic to intermediate volcaniclastic rocks and related sedimentary rocks. These units are variably deformed and metamorphosed at greenschist to granulite facies (Fraser, 1988). The regional metamorphic history is characterized by amphibolite facies assemblages to the south of the Meadowbank Project. To the north, chloritoid-bearing greenschist facies assemblages prevail, suggesting that the Meadowbank gold deposits lie near the greenschist-amphibolite transition (Zaleski et al., 1999b). A low-grade Hudsonian thermal metamorphic overprint is indicated by 1750 Ma K-Ar ages of micas (Ashton et al., 1996), and Hudsonian magmatic activity documented by 1835 Ma monzonite in an undeformed granite dyke south of Meadowbank (Roddick et al., 1992).

Three principal deformation increments are preserved throughout the Meadowbank region. These entail an early tight to isoclinal folding and profound transposition (D1), subsequent mesoscopic to macroscopic kink folding (D2) of D1-related fabrics, and a gentler crenulation overprint (D3), which weakly modifies D1-D2 fabrics. The morphologies of the D1-D3 structural fabric elements, and their relative timing relations, are consistent throughout the area.

Figure 7-1: Regional Geology (Alexander et al., 2003)

7.3

Property-Scale Lithology and Stratigraphy

The Meadowbank property is underlain by a complex, polydeformed package of Archean supracrustal rocks that is dominated by intermediate volcaniclastic rocks and wackes, with lesser interbedded iron formation, pelitic schist, ultramafic schist and quartzite (Figure 7-2).

Figure 7-2: Property Geology

7.2.1

Goose Island and Portage Deposit Areas

In the Third Portage Lake area, the supracrustal stratigraphy consists (from oldest to youngest) of: (1) ultramafic volcanics, (2) felsic to intermediate volcaniclastic and/or greywacke, (3) interbedded magnetite-chert iron formation and associated pelitic schists, and (4) quartzite (Alexander et al., 2003).

In the Portage - Goose Island area, the package of rocks occur in a recumbent fold geometry with the volcaniclastic/clastic units and interbedded pelitic and chemical sediments isoclinally folded about an ultramafic core. This geometry is best developed in the central part of Third Portage, where the fold closure can be seen. To the north and south of Third Portage, erosion has removed the closure and only the lower limb of the fold structure remains. A detailed description of the lithological units is provided below.

A north-south trending, steeply west dipping fault runs along the western margin of the Goose, Third Portage and North Portage deposits, rarely clipping the down-dip extension of mineralization. On section there is a very small apparent normal dip slip displacement, however Cumberland geologists believe that the more significant movement may be dextral strike slip, juxtaposing the Bay Zone against Third Portage.

In addition to the north-south trending structure, at least two northwest striking faults cut across the Portage area mineralized trend. Between the Third Portage and North Portage portions of the Portage deposit, a fault occurs beneath Second Portage Lake. Based on the displacement of geological marker horizons, it s apparent offset is sinistral, however modeling of the mineralized zones shows no significant displacement across the fault and therefore the apparent displacement may be due instead to a small dip slip movement across shallow dipping stratigraphy. A second northwest trending fault occurs between Third Portage and Goose Island (Powder Fault). This fault crosses the mineralized trend in an area of sparse drilling and its orientation and magnitude of displacement is not well understood.

Ultramafic Volcanics/Komatiites (UMV)

Ultramafic volcanics at Meadowbank are a pale blue-grey to blue-green, fine-grained to aphanitic, talc±serpentine chlorite schist. Numerous blebs and stringers of calcite that tend to be aligned parallel to the dominant foliation commonly cut the units. A variant of this unit, UMA, contains abundant coarse, randomly oriented actinolite/tremolite blades of metamorphic origin. UMA tends to occur near contacts of UMV and iron formation.

Iron Formation (IFMQ or IFQM)

Oxide facies iron formations are the most common host of mineralization at Meadowbank. These units consist of banded magnetite (brown) and chert (grey/white). The bands are 0.5 cm to 5 cm thick and often display impressive evidence of strong folding that is related to regional stresses. Sulphide minerals (pyrrhotite and/or pyrite) commonly occur as a replacement of magnetite in the iron formation or aligned along later fabrics as a fracture fill. Gold in the iron formations is intimately associated with this sulphide mineralization.

Intermediate Volcaniclastic (IV)

These units are clastic to volcaniclastic units that are commonly grey-green to yellow-green and are fine to medium grained schists that have been subjected to varying amounts of sericite and/or chlorite alteration. The units are commonly cut by 1% to 5% grey to white quartz veinlets, which tend to be aligned parallel to the dominant foliation. The unit can also be host to significant gold mineralization, with gold associated with pyrite and pyrrhotite. The sulphides commonly occur either as disseminations or fracture fillings associated with the quartz veinlets. The main subtypes of the IV that have been identified at Meadowbank include:

•

IVchl: An aphanitic, chlorite rich unit that is best described as a pelitic schist. These units commonly contain significant biotite and lesser garnet porphyroblasts.

•

IVt: A medium to coarse grained member of the IV, commonly containing clasts >3 mm in size. It generally has the same mineralogy as the IV described above.

Quartzite/Chert Pebble Conglomerate (QTZT/CPC)

This is a fine to medium grained unit, which contains minor muscovite and sericite on foliation planes. Often contains minor fuchsite and disseminated pyrite. Quartzite often grades into or is interbedded with chert pebble conglomerate. The chert pebble conglomerate generally contains subrounded clasts (1 cm to 5 cm in size) of chert and/or quartz. Minor disseminated pyrite is often present in the matrix.

7.2.2

Vault Deposit Area

The stratigraphy of the Vault deposit area is similar to that described above (for Goose Island and Portage) but with a notable absence of ultramafic units and a decrease in abundance and continuity of the oxide facies iron formation (IFMQ or IFQM). The deformational history in the Vault area appears to be similar to that of the Portage deposits with a dominant early isoclinal folding event, with associated transposition, and subsequent minor modification by later deformation.

The Vault deposit is disrupted by two sets of normal faults. The first set is a series of east-west striking, moderately south dipping structures. These faults are spaced 75 m to 150 m apart and have minor dip slip displacements of up to 15 m or 20 m (often less). The second set are north-south trending, steeply east dipping structures with dip slip displacements in the range of 30 m to 50 m. The relative timing of the two sets is uncertain.

The Vault area is underlain by a thick succession of intermediate to felsic volcaniclastic rocks and wackes, and subordinate interlayered iron formation and pelitic schists. Stratigraphy at the Vault deposit consists of fine-grained, feldspar-quartz-chlorite-sericite schist (IV) (intermediate volcaniclastics and meta-greywacke), intercalated with feldspar-chlorite schist (IVchl), oxide facies iron formation (IFMQ) and medium-grained, quartz-feldspar-sericite±chlorite schist (IVT/FV). The IV units appear to be similar to those in the Portage area and are variably sericite and/or chlorite altered. This alteration is generally thought to be a reflection of the original composition of the units, but it may also locally be an alteration product related to mineralization.

8.0

DEPOSIT TYPE

The Meadowbank area contains numerous showings of a wide range of types of mineral occurrences, including massive sulphide, polymetallic vein, vein gold, iron formation hosted gold and disseminated gold (Kerswill et al, 1998). Gold mineralization in the Meadowbank deposits can be classified in two main deposit types: iron formation hosted gold and Lode gold (disseminated/replacement style); although several different styles of mineralization can be commonly found in the same area. The iron formation hosted deposits are represented by Portage and Goose Island, while the disseminated/replacement Lode gold deposits are best represented by Vault.

Similarities in the stratigraphic setting, lithogeochemical and geophysical signatures imply a genetic link between massive sulphide and pyrrhotite-rich sulphide iron formation mineralization, and between pyrite-rich oxide iron formation and pyritic exhalite mineralization (Kerswill et al, 1998). These same similarities led Cumberland geologists to theorize that the genetic link between iron formation hosted deposits and the Vault deposit is related to the introduction of hydrothermal fluids (gold and sulphide bearing) during the Archean isoclinal fold event.

8.1

Portage and Goose Island Deposits

The mineralization in the Portage and Goose Island areas at Meadowbank is iron formation hosted. Typically, gold in these types of deposits occurs as fine disseminations associated with pyrite, pyrrhotite, and arsenopyrite, or in cross-cutting quartz veins and veinlets hosted in iron formations and adjacent rocks within volcanic or sedimentary sequences. Mineralization is generally within, or near, favourable iron formations. Most deposits occur adjacent to prominent regional structural and stratigraphic features, and mineralization is often related to local structures. Contacts between ultramafic (commonly komatiitic) rocks and tholeiitic basalts or sedimentary rocks are important. All known deposits occur in Precambrian sequences; however, there are some potentially favourable chemical sediment horizons in Paleozoic rocks. Changes in pinch-outs and facies within geologically favourable units are important loci for ore deposition.

Examples of this style of deposit in Canada are Lupin and Cullaton Lake (Northwest Territories and Nunavut), and Musselwhite, Detour Lake, Madsen Red Lake, Pickle Crow, and Dona Lake (Ontario). International examples are Homestake (South Dakota, USA); Mt. Morgans (Western Australia); Morro Vehlo and Raposos, Mineas Gerais (Brazil); Vubachikwe and Bar 20 (Zimbabwe); and Mallappakoda, Kolar District (India).

Good arguments have been presented supporting both syngenetic exhalative (Kerswill et al., 1998) and epigenetic, structurally controlled (Armitage et al., 1996) origins to the iron formation hosted gold mineralization at Meadowbank. Observations from drill core can support both models. However, in AMEC s opinion, observations of an association between increased gold grades and the presence of secondary silica flooding along with disruptions of the finely banded lamellae in the iron formation supports the latter model of origin.

8.2

Vault Deposit

The Vault Deposit can probably best be described as a disseminated/replacement Lode gold deposit. Disseminated and replacement gold deposits comprise mainly stratabound auriferous bodies of disseminated to massive sulphides, commonly pyritic, that are hosted either by micaceous and/or aluminous schists, derived from tuff and volcanic sandstone or by carbonate-clastic sedimentary rocks; spatial associations with granitoid rocks are common (Poulsen, 1996). In most cases, minor folds have been noted to be contemporaneous with foliation and the transposition of bedding into parallelism with foliation is a common attribute. Such transposition accounts for the straightness of belts and is largely responsible for obscuring the primary relationships between the ore deposits and their host rocks (Paulsen, 1996). Sericitic alteration is also a common feature of most deposits of this type and ore distribution is not dictated by vein quartz.

Canadian examples of this type of deposit include the Hemlo deposit in Ontario, QR and Equity Silver deposits in British Columbia and the Hope Brook deposit in Newfoundland. International examples include the Archean Big Bell and Sons of Gwalia deposits in Western Australia and the late Proterozoic Paleozoic Haile, Brewer and Ridgeway deposits in South Carolina, US.

The morphology, alteration and geometry of the Vault Deposit appear to support the disseminated/replacement Lode gold classification, however the main ore zone also appears to coincide with a zone of high strain, which may indicate that structural controls are also important at Vault. There are also varieties of volcanic associated auriferous sulphide deposits, such as the Bousquet No. 1 Deposit in the Abitibi Belt, that may also be correlatives of the Vault.

9.0

MINERALIZATION

Gold mineralization in the Meadowbank deposits is intimately associated with sulphides, dominantly pyrite and pyrrhotite. The styles and timing of gold mineralization discussed below are based on observations of the banded iron formation hosted deposits near Third Portage Lake: Portage Deposit and Goose Island, and the Bay Zone, and from work on the more recently discovered shear hosted Vault Deposit, seven km to the north. Similarities in the styles of mineralization found in these deposits indicate that these observations are valid in a regional context.

9.1

Detailed Mineralized Zone Descriptions

9.1.1

Goose Island and Portage Deposits

In the main deposit area, near Third Portage Lake, pyrrhotite and pyrite occurs in two main habits. Most predominant is as replacement of magnetite in the oxide iron formations where the sulphides tend to be concentrated along SO//S1 planes and possibly S2 in fold limbs. Also important is sulphide occurring as fracture fill ± silica and disseminations in both the iron formation and surrounding clastic units. Total sulphide content generally varies from 1% to 2% up to approximately 10%. Locally over very short widths sulphide content, the proportions of pyrrhotite versus pyrite and replacement versus fracture fill can be higher and variable. In the Goose Island and Third Portage areas pyrrhotite replacement is dominant while in North Portage pyrite replacement is dominant. Gold grades do generally increase with increasing sulphide content however there does not appear to be a specific correlation with either pyrrhotite or pyrite.

The bulk of the gold mineralization in the deposits is contained within the iron formations (wrapped around a core of ultramafic rocks), with mineralization in the clastic units probably representing remobilization and secondary enrichment by gold bearing fluids. The gold tends to be concentrated along the lower limb and in the hinge areas of the recumbent fold, and shows excellent continuity both along strike and down dip through the deposits. The concentration of sulphides and gold along S1 and S2 in the deposits indicates that the bulk of the mineralization must have occurred during the D1-D2 deformational event (syn D1-D2). Later concentrations of pyrite ± pyrrhotite and gold are associated with local quartz veins that appear to occur along the axial planes of F3 folds. This style of mineralization is probably related to remobilization of pre-existing gold during the D3 deformational event. Figures 9-1 and 9-2 depict the surface geology and a typical section of the Portage deposit.

Figure9-1: Portage Surface Geology Plan

Figure 9-2: Portage Geology Section - 3P2 Grid, Section 180N

Defined over a 1.85 km strike length and across lateral extents of 100 m to 230 m; the geometry of the Third and North Portage deposits consists of a NNW striking recumbent fold with limbs that extend to the west. The hinge area is only expressed in parts of the strike and the lower limb is preserved throughout (splitting into several strands in the hinge area). The lower limb is typically 6 m to 8 m in true thickness, reaching up to 20 m in the hinge area. Later folding event have created a north-south porpoising effect on the gold-bearing units. This deposit group remains open along the strike to the north, at depth and southwards towards the Goose Island deposit.

Goose Island deposit is similar in its geometry and setting, with a NNW trend and a steep westerly dip. Mineralized zones typically occur as a single unit near surface, splaying into several limbs at depth. The deposit is currently defined over a 750 m strike length and down to 500 m at depth (mainly in the southern end); with true thicknesses of 10 m to 12 m (reaching up to 20 m locally).

9.1.2

Vault Deposit

At the Vault Deposit pyrite is the dominant gold bearing sulphide mineral. Sulphides occur in several planar, shallowly dipping lenses that are associated with a zone of deformation that is generally expressed by a strong foliation (SO/S1 plane). Mineralization tends to be concentrated in the volcaniclastic units, where the sulphides occur as weak to strong disseminations and as fracture fill, with percentages ranging from 1% up to 10% to 15%. Later cross cutting quartz-carbonate veinlets carrying minor chalcopyrite, sphalerite, galena and occasionally grains of native gold, are present locally.

There is a strong correlation between sulphide content and sericite-silica alteration. The association between sericite alteration and gold is also prevalent in the mineralized clastic units of the other deposits at Meadowbank. In the Vault area, the iron formations tend to lack significant gold mineralization, this may be due partly to their discontinuous and wispy nature. The gold mineralization in the Vault deposit shows excellent continuity both down dip and along strike.

The Vault Deposit is planar with a defined strike of 1,100 m at an azimuth of 047° (UTM zone 14). It remains open down its dip of 22° to the southeast; but has been defined for 700 m, down dip. The deposit has been disturbed by two sets of normal faults striking east-west and north-south and dipping moderately to the southeast and steeply to the east respectively. The main lens has an average true thickness (based on 1g/t shell) 8 m to 12 m, reaching as high as 18 m locally. The hanging wall lenses are typically 3 m to 5 m (up to 7 m) in true thickness.

Figure 9-3 and 9-4 depict the surface geology and a typical section of the Vault deposit.

Figure 9-3: Vault Surface Geology Plan

Figure 9-4: Vault Geology Section 4575N

9.1.3

Other Mineral Occurrences

Numerous gold showings are known to exist on the Meadowbank property from previous programs of mapping and prospecting. Currently only the PDF Deposit, located approximately 10 km north-northwest of Vault, has been drilled with sufficient density to calculate an inferred resource.

Mineralization in the PDF Deposit is also dominantly associated with pyrite. Sulphide mineralization appears to be concentrated along So//S1 and possibly S2 as in the other Meadowbank deposits. Gold mineralization tends to be concentrated in a package of interbedded pelitic schist and chert-magnetite iron formation, which is generally silicified and may contain significant quartz veining. Although higher grades may be associated with the quartz veining, ore grade material is also found associated with disseminated pyrite in both pelitic schists and iron formations.

9.2

Relationship of Mineralization to Deformation

The relative timing of these deformational events and the paragenetic sequence outlined below is largely based on the work of regional mappers, including Henderson et al. (1992), Ashton (1982), Zaleski et al. (1997,1999) and Pehrsson et al. (2000). Regionally, S1 foliations are present in Archean granites that are themselves folded by map scale, northwest vergent F2 folds. This suggests that D1 deformation was ongoing by ca. 2620 Ma., the age of the oldest Archean granite in the area. Concentration of sulphides and gold along S1 implies that the earliest stages of mineralization had commenced before or during intrusion of the granites.

Work by Pehrsson et al. (2000) suggests that the regional northwest-vergent D2 fold-fault stack deforms the Archean granites, and does not predate their intrusion. The maximum age for D2 is 2599 Ma, the age of the youngest granite with S2 foliation (cf. Ashton, 1982). The lower bound for D2 deformation is 1840 Ma, the age of a crosscutting pegmatite dyke (Roddick et al., 1992). The similarity between the attitude and vergence of D2 structures of the Woodburn Lake group and the Amer fold-thrust belt lead Ashton (1988), and Davis and Zaleski (1998) to suggest that D2 is Paleoproterozoic, an interpretation consistent with present data. Isotopic studies are presently underway to better constrain the timing of S2 development. Data from this ongoing study suggests that mineralization is pre- to syn-D2 (Pehrsson et al., 2000). This allows that earliest mineralization predates granite intrusion and is Archean in age. The age of D2, whether late Archean or Proterozoic, remains to be established.

D3 deformation post-dates intrusion of the late Archean granitoids but has no lower bound. Zaleski et al. (1999) have previously drawn attention to the nearly identical orientation, geometry, and vergence of F3 folds and D2 structures in the Amer group. These folds locally overprint structures in the deposit area but do not appear to have any link to mineralization.

10.0

EXPLORATION

10.1

Recent Exploration

In 2003, exploration at Meadowbank was focussed on three main objectives: (1) infill drilling at the Vault, Portage and Goose Island deposits, (2) regional mapping and other follow-up work on targets generated by the 2002/2003 overburden reverse circulation drilling program, and (3) additional drilling at the PDF deposit.

10.1.1

Infill Drilling at the Vault, Portage and Goose Island Deposits

A combined total of 165 holes (16,153.5 m) were drilled at the Vault, Portage and Goose Island deposits in 2003. One hundred and five (9,058 m) of the holes were drilled at Vault, 55 (6,817.5 m) were drilled at Portage, and 5 (278 m) were drilled at Goose Island. All of these holes were designed as infill holes to improve confidence levels for future resource estimates.

10.1.2

Exploration Drilling

Ten holes totalling 1,103 m were drilled to test the Wally south area, 3 km to the north of the Vault deposit. Results from this program have helped to refine 2004 exploration drilling targets

10.1.3

Regional Mapping and Other Follow-up Work on Targets from the 2002 RC Program

A program of geological mapping and sampling was carried out on the Meadowbank project between 3 July and 8 September 2003. Fieldwork was initiated on historical prospecting sites and RC overburden drilling targets generated during the spring 2002 & 2003 programs. In all, approximately 90 km2 was covered by 1:10,000 scale mapping and sampling to cover prospective regional stratigraphy in the PDF, *Crown, Wally South, Longroot, Ron, Jim* and *Ukalik* zones. Mapping was concurrent with and partially overlapped a 1:10,000 scale structural geological mapping program (Barclay, W.A., November 2003).

Objectives of the mapping program were:

1.

Evaluation of RC till and bedrock anomalies.

2.

Target evaluation and generation through geological mapping, prospecting, and rock sampling.

3.

Structural data collection and interpretation to support a model of re-folded but generally flat-lying, thrust imbricated stratigraphy at Meadowbank (Barclay, W.A., March 2002).

The main components of the program were:

4.

1:10,000 scale geological mapping over roughly 90 km^2

5.

Prospecting and rock sampling (326 samples).

A five person mapping crew, covering the aforementioned zones, conducted fieldwork on the Meadowbank trend. Lithogeochemical sampling totalled 326 samples with 26 (8%) assaying at over 1.0 g/t Au. The geological mapping program successfully enhanced the understanding of the geology in the area, and recognized several regional faults that may offset mineralization in the *Vault* and *North Portage* areas. In the *Crown* area north of *Vault*, several important stratigraphic marker units were recognized that appear to be similar to those in the Vault deposit.

10.1.4

Additional Drilling at the PDF Deposit

Diamond drilling in the *PDF* area in 2003 was successful in further delineating the gold deposit, located approximately 22 km north of the Meadowbank camp on the eastern shores of Pipedream Lake. The *PDF* deposit is located in exploration area BL14-99-02 on NTS map sheet 66 H/1 and is centred at approximately 7228700N 636800E (NAD 27 zone 14).

A total of 912 m of NQ size drill core was drilled in seven holes from 22 July to 1 August 2003 on the *PDF* grid. A total of 438 samples from this program were sent to International Plasma Laboratories of Vancouver for assay. To date gold mineralization has been intersected in 23 of 31 holes drilled in the *PDF* deposit area, including hole PDF03-028 that intersected 2.54 g/t over 4.04 m.

The mineralized zone has been traced along strike for approximately 300 m and up to 250 m down dip locally. The auriferous vein set(s) show good continuity both down dip and along strike but may pinch and swell as it passes through the deposit area. Inferred resource estimates for the *PDF* deposit calculated in 2003 outlined 344,000 t at 5.2 g/t Au for a total of 57,511 oz of contained gold.

10.1.5

Reverse Circulation Overburden Drill Program

A program of reverse circulation overburden drilling (RC) was conducted in the period 15 April to 8 May 2003 covering 12.2 km^2 of prospective volcaniclastic stratigraphy between the *Crown* and *Longroot* target areas. Combined with 2002 RC drilling, the 2003 program extends the gold grain, till geochemical, bedrock geochemical and bedrock lithologic data coverage to 16.5 km of the volcaniclastic belt north from and encompassing the *Portage* and *Vault* gold deposits.

The 2003 RC drill program utilized a 100 m x 300 m grid pattern oriented approximately parallel to the dominant ice direction of 350°. A total of 381 vertical holes (1517.4 m) were completed during the RC program with 131 holes (34.4%) drilled in exploration concession BL14-99-01 and 250 holes (65.6%) drilled in concession BL14-99-02.

A total of 414 till samples collected during the program received gold grain analysis from Overburden Drilling Management in Ottawa along with fire assay for gold with ICP trace element geochemistry from International Plasma Labs in Vancouver. A total of 377 bedrock samples received fire assay for gold with a 30 element ICP analysis at International Plasma Labs in Vancouver.

The reverse circulation drill program appears to be an effective prospecting tool for the Meadowbank Project, enabling the systematic evaluation of large areas of ground in a relatively short time period. The program was successful in generating a number of exploration targets, including several high priority targets proximal to the Vault

Deposit.

A strong gold in till anomaly was identified at the *Crown* target with a single sample returning 2,220 pristine plus modified gold grains (normalized to 10 kg).

Elevated gold (up to 170 ppb), arsenic and zinc in bedrock and localized gold counts up to 909 pristine plus modified grains suggest good exploration potential at *Longroot.*

10.2

Future Exploration

Mapping, prospecting, airborne geophysics, RC drilling and ongoing interpretation of the geochemistry and the geometry of the gold deposits have recently defined several high priority target areas. The prime objective of the 2004 exploration program is to drill test these anomalies in a phased program commencing in March. Phase one involves a spring drill program on ice-based targets and phase two will entail a mapping and drill program during the summer.

The priority drill targets include but are not limited to the following:

Phase One	
Goose Island Deeps	7 holes, 3,200 m
Goose Portage Gap	5 holes, 1,500 m
Vault Area	20 holes, 1,900 m
Phaser Lake Vault SW Vault East Vault South	
Crown Area	12 holes, 1,800 m
Regional Targets	8 holes, 1,200 m
Total	52 holes, 9,600 m
Phase Two	
Jim Zone	6 holes, 800 m
Vault Area	7 holes, 900 m
Longroot	4 holes, 700 m
Total	17 holes, 2,400 m

11.0

DRILLING

11.1

Data

A total of 678 drill holes were used for the resource estimate. Out of these 217 were drilled on the Vault deposit, 69 on Goose Island, and 392 on Portage. Complete lists of the drill holes and mineralized intervals are provided in Appendix A.

11.2

Drilling Methods

All of the drilling data stored in the Meadowbank resource modelling database has been collected from diamond core holes. Almost all of the holes were completed with NQ sized equipment, with the only exceptions being 11 metallurgical holes and 8 geotechnical holes that were completed with larger HQ sized equipment. One contractor, Boart Longyear Drilling of Saskatoon, Saskatchewan, has completed all of the holes at Meadowbank, utilizing two LY-38 drill rigs that were joined in 1999 by a hydraulic LF70 rig.

In AMEC s opinion, the equipment and methods used to collect drill core at Meadowbank are consistent with industry standard practices.

11.3

Surveying

Surveying at Meadowbank is accomplished with a Total Station instrument and calculations are referenced to a series of control points tied to a local geodetic monument.

All of the Goose Island and Portage drill hole and trench sample data is stored in the Gemcom database with Portage local grid coordinates (baseline at 022.58° from true north) and UTM Nad83 Zone14 coordinates. All of the Vault drill hole and trench sample data is stored in the Gemcom database with Vault local grid coordinates (baseline at 044.39° from true north) and UTM Nad83 Zone 14 coordinates. Figure 11-1 shows the relationships between: (1) true, (2) magnetic, (3) UTM and (4) local grid azimuths.

Figure 11-1: Relationship between Local Grids at Meadowbank with Respect to True (astro), UTM and Magnetic North

11.3.1

Collar Locations

Drill Hole Layout

With the exception of some very old holes drilled prior to 1990, all collar locations that were drilled prior to the summer of 2002 were laid out along a surveyed reference grid marked by wooden stakes and flagging that had been previously set out with a transit. Hole locations drilled prior to 1990 were laid out with a compass and chain. Hole locations drilled after the spring of 2002 were laid out with a Total Station.

Figures 11-2 to 11-4 are plan maps of the three main deposit areas Vault, Goose Island and Portage respectively. These figures show the pattern and location of the drilling preformed in these areas to date.

Figure 11-2: Vault Drill Hole Location Map

Figure 11-3: Goose Island Drill Hole Location Map

Figure 11-4: Portage Drill Hole Location Map

Drill Hole Pick-up

The majority of the drill hole collar locations at Meadowbank have been surveyed with a Total Station after or during drilling. However, drill holes collared on lake ice before 2002 were not surveyed. Contract surveyors located the hole collars drilled on land prior to 2002 with a Total Station in batches after the drilling campaigns were complete. During 2002 and 2003, Cumberland personnel surveyed the drill holes with a Total Station while the drill was set-up on the hole.

AMEC is confident that the drill hole collar locations are accurate. Any risk due to a lack of collar location surveys for the holes drilled from lake ice prior to 2002 is minimized by Cumberland s use of a Total Station instrument to layout the hole collar position prior to drilling.

11.3.2

Collar Orientations

The collar orientations for the holes completed in 2002 and 2003 were measured by surveying two points on the drill string with a Total Station while the drill was set up on the hole. Prior to 2002, idealized collar orientations have been utilized because the drill hole collars were surveyed after the drill was moved off the hole. The idealized orientations are based on two assumptions: (1) that the drill azimuth was set up parallel to the wooden stake grid reference line, and (2) that the line was correctly located. To test the validity of those assumptions, AMEC plotted the difference between the surveyed azimuths and the designed (ideal) azimuths for the holes drilled at Portage in 2002 and 2003 (Figure 11-5). The variability of these azimuths can be reasonably assumed to reflect the variability of the unsurveyed pre-2002 azimuths.

Figure 11-5: Comparison of Idealized and Surveyed Drill Hole Collar Azimuths at Portage

The data in Figure 11-5 demonstrates that 86% of the azimuths surveyed in 2002 to 2003 were within 5° of the intended azimuth, and that all of the hole orientations were within 10° of the intended azimuth. AMEC considers the collar azimuth deviations measured in 2002 to 2003 to be reasonable and similar to those encountered in other definition drilling campaigns. It is also AMEC s opinion that: (1) the true collar azimuths of the holes drilled prior to 2002 are probably scattered around the idealized azimuth with a similar amount of variability, and (2) that this will have little or no influence on the reliability of the drill hole data at Portage. The impact of the azimuth variability is expected to be minor due to the short down hole distances to the intersections at Portage (average 66 m) and the relatively steep dips of the drill holes at Portage (average -65°). AMEC recommends that Cumberland continue the practice of surveying the collar orientations while the drill is set-up on the hole during future drilling campaigns.

11.3.3

Down hole Surveys

All of the drill holes have been subjected to down-hole orientation surveys with a single shot Sperry-sun instrument. Azimuth data for holes located at Goose Island and Portage were not retained because of the influence of the highly magnetic BIF on the readings. Some of the azimuth data at Vault has been incorporated into the database due to the absence of BIF there.

The drilling contractors conduct the Sperry-sun surveys and the readings were collected at 50 m intervals during drilling or after the hole was complete. Cumberland geologists interpret the surveys and applied adjustments for the magnetic declination, UTM correction, and local grid rotation when applicable (Vault only).

A total of 16 holes (11 at Goose Island and five at Third Portage) have been surveyed with a Light-log instrument. Light-log surveys record the position of a focused light beam at the end of a rod to determine the curvature of the hole and thus magnetic rocks do not affect the results. Table 11-1 summarizes the deviations recorded by the Light-log.

AMEC is encouraged by the relatively small amount of down hole deviation recorded by the Light-log surveys at Goose Island and Third Portage. However, the number of surveyed holes is too small to draw any conclusions on the amount and significance of down-hole deviation in the unsurveyed holes. For Portage, and the relatively shallow northern portion of Goose Island, it is AMEC s opinion that the risk due to the lack of down hole azimuth surveys is largely mitigated by the short distances to the mineralized intersections and the moderate to steep dips of the drill holes. The risk is higher at the deep southern portions of Goose Island and AMEC recommends that future drilling campaigns targeted at south Goose employ non-magnetic down hole survey methods. AMEC also recommends that all new drill holes greater than 150 m in length be surveyed with non-magnetic down hole survey methods.

Table 11-1: Light-log Down Hole Survey Results

Hole-id	Length	Collar Dip	Collar Az	Toe Dip	Toe Az	Dev Dip	Dev Az
G96-134	275.0	-57.50	90.00	-56.30	93.99	1.20	3.99
G96-138	257.0	-66.00	90.00	-69.10	96.07	3.10	6.07
G97-160	473.6	-72.00	90.00	-74.00	91.92	2.00	1.92
G97-161	543.0	-67.00	90.00	-71.00	88.91	4.00	1.09
G97-163	571.0	-63.00	90.00	-66.00	91.12	3.00	1.12
G97-165	551.0	-66.50	90.00	-69.00	91.80	2.50	1.80
G98-232	510.0	-62.50	90.00	-59.90	83.14	2.60	6.86

TP98-237	347.0	-66.00	90.00	-67.00	98.42	1.00	8.42
G98-238	661.0	-64.00	90.00	-64.20	98.80	0.20	8.80
TP98-243	456.0	-70.00	90.00	-67.00	87.47	3.00	2.53
TP98-270	351.0	-67.00	90.00	-65.55	82.09	1.45	7.91
TP98-272	338.0	-66.00	90.00	-63.00	95.52	3.00	5.52
G99-325	231.0	-55.00	90.00	-53.50	94.61	1.50	4.61
G99-332	201.0	-49.00	90.00	-47.20	94.22	1.80	4.22
G99-333	246.0	-50.00	90.00	-47.80	93.53	2.20	3.53
TP99-343	230.0	-66.00	90.00	-66.00	95.86	0.00	5.86
Average	390.1	-62.97	90.00	-62.91	92.34	2.03	4.64

11.3.4

Topography and bathymetry

Eagle Mapping Services surveyed the topography at Goose Island and Portage with aerial photogrammetry in 1998. Air photo coverage was extended north to include the Vault area in the summer of 2002. Deliverables from the surveys included 1:10,000 and 1:20,000 scale colour air photos, and digital topographic contour lines at 2 m intervals.

Golder Associates completed a bathymetric survey on the lake ice in the spring off 2002 and 2003. The survey utilized ground penetrating radar with the location controlled by real-time GPS (Golder, 2003).

In AMEC s opinion, the methods used to collect topographic and bathymetric data at Meadowbank are consistent with industry standards.

11.4

Core Logging Procedures

Cumberland geologists logged the drill core in camp. Data on lithology, mineralogy, alteration and structure were routinely collected along with some basic geotechnical parameters such as RQD, fracture density and recovery. Sample intervals were marked by the geologists and assigned sample numbers after geological logging. External consultants completed more detailed geotechnical logging of selected drill holes when warranted.

On the final logs, percentage estimates of sulphide and alteration mineralogy were accompanied by assay results and text descriptions of consistent geological intervals. Lithological unit codes often contained alteration type descriptors. For example, IV*sc* was a lithologic code used for *sericite* altered IV. The result of the alteration/lithology combinations is an large number of unique lithologic codes. Collar coordinates and drill hole orientation data were also included on the logs. For most holes, the film disks from the Sperry-sun surveys were attached to the original log. An example drill log is provided in Appendix B.

In AMEC s opinion, the core logging facilities presently on-site are spacious and well equipped. The drill logs are well organized and contain sufficient detail to adequately characterize the geology of the Meadowbank deposits. To reduce the number of lithologies and simplify geological coding of assay and composite assay intervals, AMEC recommends keeping alteration codes separate from lithological codes. AMEC also recommends that a copy of the original assay certificates be attached to each drill log to facilitate future checks and audits.

12.0

SAMPLING METHOD AND APPROACH

Generally, all of the sulphidic core drilled at Meadowbank was sampled along with a minimum shoulder of 1 m of waste material on either side of the sulphide-bearing interval. Sample intervals are geologically constrained and are generally determined on the basis of sulphide content or at lithological contacts. Sample lengths in the database range from 9 cm up to a maximum of 7.27 m, but only 20% of the samples have a length greater than 1.0 m, and only 0.3% of the samples have a length greater than 2.0 m. A histogram and probability plot of all of the Meadowbank sample lengths is provided in Appendix C.

The sample intervals marked by the geologists during core logging were split in half longitudinally with a mechanical core splitter. One half was bagged for analysis and the other was returned to the core box and kept as a permanent record. Sampled intervals were marked in the box with metal tags that indicate the interval meterage and the sample number (Figure 12-1). Details of logging and sampling procedures, as described by Cumberland geologists, are included in Appendix B.

Figure 12-1: Metal Sample Interval Markers

AMEC considers the sampling methods to be consistent with industry standard practices. All of the sampled drill core observed by AMEC during the site visit had been split with care to maximize sample representativity. That is, all of the core pieces returned to the boxes were completely split and of a uniform size.

13.0

SAMPLE PREPARATION, ANALYSIS, AND SECURITY

Several different operators have conducted drill programs on the Meadowbank project since 1989, and consequently several different labs have been used for sample analysis.

13.1

Sample Preparation

No information is available on the sample preparation protocols that were in place prior to 1995. From 1995 to the present, the samples were prepared at International Plasma Laboratory Ltd in Vancouver, BC IPL s sample preparation protocol involved crushing the sample in a jaw crusher to 95% passing -10 mesh (2 mm). The crushed sample was then split in a riffle splitter to a 250 g subsample, which was pulverized in it s entirety to 90% passing 150 mesh (100 µm). Details of sampling procedures, including the insertion of QA/QC samples and shipping methods, as described by Cumberland geologists, is included in Appendix B.

Due to the lack of information on the sample preparation protocols prior to 1995, AMEC is unable to comment on their suitability. For the period from 1995 to the present, it is AMEC s opinion that the protocol generally corresponds to industry standard practices. However, AMEC is concerned about the relatively small subsample of crushed material that is pulverized. The gold content of the subsample may not be representative of the gold content of the entire sample and this is probably contributing to the poor analytical precision discussed below in Section 13.3. Prior to executing any future infill or pre-production drilling, AMEC recommends that Cumberland complete a detailed heterogeneity study to determine the minimum subsample sizes required at each stage of the sample preparation/analytical process.

13.2

Analysis

The majority of the analyses completed since 1995 have been conducted by International Plasma Laboratories of Vancouver, BC. Below is a list of the labs used and assaying procedures from 1989 to present. Detailed fire assay protocols from IPL are provided in Appendix D.

13.2.1

1989

- Analysis conducted by X-Ray Assay Laboratories (XRAL), Don Mills, Ontario
- Sample analysis by fire assay with DCP (direct couple plasma) finish; results reported in ppb
- These results were then converted to g/t
- Second assay completed on samples assaying >10,000 ppb, using gravimetric finish.

13.2.2

1990

- Analysis conducted by TerraMin Research Labs, Calgary, Alberta
- Sample analysis by fire assay with AA finish
- Second assay completed on samples assaying >5 g/t, again using AA finish (from the split rejects).

13.2.3

1991

- Analysis conducted by Bondar-Clegg, North Vancouver, BC
- Sample analysis by fire assay with AA finish
- Second assay completed on samples assaying >3 g/t using gravimetric finish (although second assays were completed on some samples, only one value reported on sample certificates).

13.2.4

1995

- Analysis conducted by International Plasma Laboratory Ltd., Vancouver, BC
- Sample analysis by fire assay with AA finish
- No second assays completed in 1995.

13.2.5 1996-2003

- Analysis conducted by International Plasma Laboratory Ltd., Vancouver, BC
- Sample analysis by fire assay with AA finish.
- Second assay completed on samples assaying >1 g/t, using gravimetric finish
- A QA/QC program was initiated in 1998 check assaying conducted by Chemex Labs.

In AMEC s opinion, the analytical methods used to determine the gold content of rocks at Meadowbank are consistent with industry standard practices.

13.3 Quality Assurance/Quality Control

13.3.1 Introduction

QA/QC programs were implemented at the Meadowbank gold project in 1998 in conjunction with Prefeasibility studies concluded in 2000. QA/QC protocols were improved in 2001 in anticipation of future feasibility studies and will continue as development advances and exploration continues. A summary of QA/QC during this period is shown in Table 13-1. The QA/QC program has encompassed a wide variety of assays from 42,647 surface and drill core samples from the six known gold deposits on the property.

Table 13-1: Summary of Meadowbank Project QA/QC 1998-2003

Type of Sample & Year	# of Samples	2nd Lab (if applicable)	QA/QC included	Total # Samples Submitted
Duplicates				
2001	61	n/a	n/a	61
2002	385	n/a	n/a	385
2003	597	n/a	n/a	597
Total Duplicates				**1,043**
Check Assays				
Pre 1998 Pulp	42	Chemex	1 blank/2 standards	45
Pre 1998 Reject	90	Chemex	5 blanks/5 standards	100
1998 Pulp	102	Chemex	?	102
1998 Reject	37	IPL	?	37
1999 Pulp	129	Chemex	4	133
1999 Reject	81	IPL	?	81
1998-1999 MRDI Pulp	70	IPL	?	70
2000 Pulp	74	Chemex	?	74
2001 Pulp	80	Chemex	5 standards	85
2002 Spg. Pulp	176	Chemex & Acme	10 standards	186
2002 Sum. Pulp	296	Acme	18 standards	314
2003 Pulp	623	Acme	33 standards	656
Total Check Assays				**1,883**
Standards				
1998	46	n/a	n/a	46
1999	54	n/a	n/a	54
2001	60	n/a	n/a	60
2002	387	n/a	n/a	387
2003	609	n/a	n/a	609
Total Standards				**1,156**
Blanks				
2001	60	n/a	n/a	60
2002	390	n/a	n/a	390
2003	596	n/a	n/a	596
Total Blanks				**1,046**
Re-Runs				

2000	55	IPL	3 standards	58
2003	580	IPL	28 standards	608
Total Re-runs				**666**
Total all Sample Types				**5,794**

The first program, which was initiated in 1998, was designed by MRDI Canada at the request of Cumberland. The program consisted of Canmet standard reference materials (SRM s) and blanks inserted into the sample stream by the primary lab (IPL), which also prepared and assayed coarse reject duplicates. Check assays were performed on pulps forwarded to a second lab (Chemex). In addition, a limited number of pulp and reject check assays were performed in 1998 on materials from the 1995, 1996 and 1997 drilling programs.

A more rigorous QA/QC program was instituted by Cumberland in 2001. That program, which is currently in use, consisted of the insertion of CDN Resource Laboratories Ltd. SRM s, field blanks and field (core) duplicates at the project site. For check assays, 5% of annual samples were submitted to a second lab (Acme) for analysis. In 2003, pulps for a further 5% of the years samples were obtained from the primary lab, new blind standards were inserted, new sample numbers were assigned and the samples were re-submitted to the primary lab.

13.3.2

Summary of QA/QC Results

Duplicates, Check Assays, & Re-runs

Results for field duplicates, check assays and re-runs from all programs including 2003, consistently demonstrate an unbiased scatter typical of a coarse gold component or nugget effect. Work to date, including prefeasibility level QA/QC analysis in 2000 yielded similar conclusions. The unbiased nature of the scatter was verified through blind submission of previously assayed pulp samples to IPL and Chemex in 1998. Results from this re-submission program verified that erratic results were likely not the result of poor accuracy or precision, suggesting coarse or liberated gold was the most likely cause of the erratic but unbiased duplicate and check assays. A study needs to be undertaken to determine an ideal pulp sample size, the results of which will be applied to preparation of future exploration program and grade control samples. This will help to reduce this scatter giving greater precision.

Standards

Since 2001 the QA/QC program has employed standards (SRM s) at four different grade levels. Results from SRM s over the course of the project generally fall within acceptable limits. With the application of a more rigorous QA/QC program in 2001, the Company began re-assaying all sample runs containing a failed SRM. If the SRM passed upon re-assay, revised results for the run were entered into the database.

Most SRM s were not submitted blind by Cumberland to the primary lab. In 2003 a blind re-submission program, similar to that completed in 1998, returned results demonstrating higher variability and failure rates than those submitted with normal sample shipments. Efforts will be made to ensure that SRM s in future sample submissions are blind to the lab.

Blanks

The field blank that is submitted by Cumberland is, in most cases, indicating that no contamination is occurring in the sample preparation and assaying processes. Approximately 1% of the blanks submitted, however, have returned anomalous gold values of > 0.10 g/t Au. Investigation suggests the presence of occasional low-grade gold values associated with the material, rather than contamination.

13.3.3

Recommendations

The current QA/QC program is deemed adequate, however AMEC recommends the following improvements:

- A study to determine an ideal pulp sample size for all future sampling at the Meadowbank Project. An optimized sample split or pulp size will help towards maintaining acceptable precision of duplicate pair data.

- Stronger measures to ensure that SRM s submitted to the primary lab are blind.

- A source of blank material be located that is proven to contain no anomalous gold, so that it can more effectively serve its purpose of detecting contamination in the sample prep phase.

- A comprehensive project QA/QC database should be compiled to keep all data together. This database should be monitored and maintained by designated QA/QC personnel, which will help to monitor lab performance over time.

13.3.4

QA/QC Program

A sample preparation flow sheet, representing the implementation of the current QA/QC program is shown in Figure 31-1. In earlier programs coarse reject duplicates were also prepared at the crushing stage of preparation at IPL. Field blanks were used to check for the presence of contamination in both sample preparation and assaying. Analytical results from the SRMs were used to evaluate laboratory accuracy and precision. Core duplicates were used to evaluate the sample preparation performance. Pulp check assay duplicates provided a measure of the accuracy of the initial determination performed by the primary laboratory and an estimate of the analytical variance + pulp sub-sampling variance.

Figure 13-1: QA/QC Sample Preparation Flow Sheet For The Meadowbank Property

The acceptance limits for each set of checks and control samples are:

For standards, the accepted range should be the accepted value plus or minus two standard deviations. Less than 5% of the results from the submitted standard material should fall outside these limits.

Blanks should return values less than or equal to three times the detection limit.

Duplicate analyses (Original A1 and Duplicate A2) performed on core duplicates should be within ±30% relative difference, where the relative difference is defined as:

$$|(A1-A2)/(0.5*(A1+A2))| < 0.3$$

Duplicate analyses (A and B) performed on pulps should be within ± 10% relative difference:

$$|(A-B)/(0.5*(A+B))| < 0.1$$

In the formulae above, results below detection are assigned a value of zero. The equations are undefined where both values are below detection. Approximately 10%, except for standards as described above, of the values may fall outside of the limits. If these are random occurrences, for example one in every ten may fall outside the limits if the outliers do not tend to be occurring in some pattern.

13.3.5

Standards Performance

The two standards listed below were used during the 1998/1999 programs, followed by the graphs of their performance, as shown in the Pre-feasibility report (prepared by MRDI) in 2000:

Table 13-2: CANMET Standard Reference Material

SRM	Certified Value	95% Confidence Interval
MA-3a	8.56 g/t	0.09 g/t
CH-3	1.40 g/t	0.03 g/t

During the 1998 program, approximately 8% of the assays of the lower grade SRM, CH-3 (Figure 13-2) and approximately 36% of the higher grade SRM, MA-3a (Figure 13-3), fell outside the 95% confidence limits. These results lead to the recommendations for an audit of the IPL laboratory and re-assaying those batches where the SRM result fell outside of the confidence limits.

Figure 13-2: Meadowbank SRM Control Chart for Canmet SRM: CH-3 (1998)

13-3: Meadowbank SRM Control Chart for Canmet SRM: MA-3A (1998)

As shown in Figures 13-4 and 13-5 below, the same two SRM s returned much better results in 1999; where no assays fell outside of the control or confidence limits for either standard.

Figure 13-4: Meadowbank SRM Control Chart for Canmet SRM: CH-3 (1999)

Figure 13-5: Meadowbank SRM Control Chart for Canmet SRM: MA-3A (1999)

During 2001 to 2003, Cumberland used six different standard reference material samples, purchased from CDN Laboratories of Vancouver. Table 13-3 lists these SRM samples and their corresponding grade ranges.

Table 13-3: SRM Samples Used in 2001-2003

SRM ID	Mean Value		2*STD
Standard GS-1:	5.07	±	0.43
Standard GS-2:	1.53	±	0.18
Standard GS-3:	0.79	±	0.07
Standard GS-4:	3.45	±	0.21
Standard GS-9:	1.75	±	0.14
Standard GS-10:	0.82	±	0.09

Figures 13-6 through 13-11 display the results of the above SRM samples during the 2001 to 2003 period. The current protocol for the insertion of SRM samples, in use by Cumberland is not considered entirely blind, as the lab can recognize the pulp bags of standards in between samples of split core. To test the effect of this a reassay program was implemented; where 5% of the 2003 samples were re-sent to IPL as pulps together with 28 SRM sample. The results are shown as orange triangles in the charts for SG-1, SG-4, SG-9, and SG-10. These clearly show a wider scatter (~21% outside of the accepted limits) suggesting lab familiarity with the standards used. Recommendations with regards to this have been made by AMEC and Cumberland will be adjusting their SRM insertion protocol to address this issue.

Figure 13-6: Meadowbank SRM Control Chart for GS-1 (2001-2003)

Figure 13-7: Meadowbank SRM Control Chart for GS-2 (2001-2003)

Figure 13-8: Meadowbank SRM Control Chart for GS-3 (2001-2003)

Figure 13-9: Meadowbank SRM Control Chart for GS-4 (2001-2003)

Figure 13-10: Meadowbank SRM Control Chart for GS-9 (2003)

Figure 13-11: Meadowbank SRM Control Chart for GS-10 (2003)

13.3.6

Blank Sample Performance

Field blank samples have been utilized by Cumberland, as part of their QA/QC program since 2001. Figure 13-12 shows the results of these blanks samples (by the year of their submission).

Figure 13-12: Meadowbank SRM Control Chart for GS-10 (2003)

Overall, the blank samples have preformed well and the samples that returned with anomalous gold values have been investigated. It was concluded that the failure of the blanks was caused by mineralization within the blank material as opposed to contamination problems with the laboratory. Based on AMEC s recommendations, Cumberland will be looking into a better source of blank material (and/or better choosing criteria), in order to more effectively serve its purpose of detecting contamination.

13.3.7

Duplicates and Checks Performance

The QA/QC program at Meadowbank, throughout the years, has used several types of duplicate samples. There have been coarse reject duplicates, pulp duplicates (to an umpire laboratory) and field duplicates (1/4 core until 2003, then ½ core vs. ½ core primary sample).

Results from Pre-2000

Details of the results and discussions for the pulp and coarse reject Checks can be found in Appendix E. Up to the year 2000, 343 pulp, and 208 coarse reject checks had been taken and analyzed.

Results show that approximately 80% of the pulp check assays fall within a 20% relative difference (calculated as shown in Section 13.3.3). Although, these have a higher discrepancy than is normally deemed acceptable (i.e. 90% within a 10% relative difference), the discrepancies were observed to be un-biased and randomly distributed.

The results from the coarse reject checks were also found to be slightly below the usual acceptance limit (of 90% within a 30% relative difference) at approximately 80% within a 30% relative difference. These also were found to be un-biased differences.

Results from 2000 to 2003

During this period duplicated samples comprised of two types; pulp checks (to an umpire laboratory) and field duplicates.

Figures 13-13 and 13-14, graphically display the results from the pulp-check assays against the umpire laboratories Chemex and ACME. A more detailed set of graphs, separated by analytical method (i.e. AA, Grav. And the combination of the two as used in the database) can be found in Appendix F.

Figure 13-13 shows the scatter of the checks versus the original IPL assays (up to a 10 g/t value) with the 10% acceptance range.

Figure 13-13: 2000 2003 Check Assays (AA and Grav.) Scatter Plot

Based on 327 pairs for Chemex and 1,091 pairs for ACME, this chart shows an unbiased scatter, with Chemex results displaying a tighter distribution. Figure 13-14 below, shows the same data pairs in terms of relative percent difference (calculated as per the equation in Section 13.3.4). Once again, the scatter of the paired data, although higher than the desired range, shows an un-biased distribution, with Chemex performing slightly better than ACME.

Figure 13-14: 2000 2003 Check Assays (A.A. & Grav.) Relative Percent Difference

Figure 13-15 better quantifies these distributions, showing that approximately 80% of the Chemex umpire pairs fall within a 20% absolute relative difference in comparison with ACME for which 80% of the pairs are within 30%. For the purpose of this chart pairs with a mean gold value of less than 0.2 g/t were eliminated, leaving 153 and 477 pairs for Chemex and ACME respectively.

Figure 13-15: 2000 2003 Check Assays (A.A. & Grav.) Percentile Rank

The nature of this less-than-desirable scatter can likely be attributed to the nature of the gold distribution and grain-size. Although unfavourable, the un-biased nature of this variance mitigates the risks involved in using the data. However, AMEC recommends the completion of a study to determine an ideal pulp sample size to increase the precision of the assaying for future use in detailed mine design and grade control.

The field duplicate data behaved similarly. Up until the 2003 drilling program, Cumberland had been using one half of the core as the primary sample and one quarter (or half of the remainder) as a duplicate. This practice was changed in 2003 to using the complete second half as the duplicate sample (leaving none of the core for the sample interval behind).

Figure 13-16 is a graphical representation of the results of the field duplicate samples taken at Meadowbank from 2001 to 2003. The graph shows an un-biased distribution falling outside of the desirable relative difference range of 30%. For better visibility in the lower grade ranges the graph has been truncated at a maximum mean grade of 10 g/t.

Figure 13-16: Relative Percent Difference

For comparison, these were split into three groups by deposits. Figures 13-17 to 13-19 show the same distribution pattern, about the relative percent difference axis, for Vault, Portage/Goose Island and PDF deposits. The total number of field duplicate pairs used for these comparisons are 1,042 with 558 from Vault deposit, 399 from Goose Island and Portage deposits combined and only 85 from PDF.

Figure 13-17: Relative Percent Difference Vault

Figure 13-18: Relative Percent Difference Goose Island and Portage Deposits

Figure 13-19: Relative Percent Difference PDF

Figure 13-20 better demonstrates the comparison between Vault and Goose Island/Portage deposits with respect to each other and the overall group. For the purpose of this chart, duplicate pairs with a mean gold grade lower than 0.2 g/t, were removed, leaving a total of 479 pairs (325 from Vault and 146 from Goose Island/Portage). Unlike duplicated pulp samples, field duplicates are not only affected by the variability of the analytical procedures, but also (and likely to a larger extent) by the inherent variability of the mineralization. In this case, the different style of mineralization, which exists at Vault displays a lower variance, with approximately 62% of the data falling within a 30% absolute percent difference. Comparatively, at Goose Island and Portage deposits, only about 45% of the duplicated pairs fall within a 30% absolute difference range. A more thorough list of charts for the field duplicate samples can be found in Appendix F.

Figure 13-20: Percentile Ranking

13.4

Specific Gravity

Cumberland has obtained a total of 224 specific gravity determinations from rocks at Meadowbank. IPL completed all of the determinations with a weight in air weight in water technique with an electronic Jolly balance. Competent pieces of core were weighed in air and then in water and the density was calculated according to the equation specific gravity=$weight_{air}/(weight_{air}-weight_{water})$. Under normal conditions, specific gravity, a unitless ratio, is equivalent to the density in grams per cubic centimetre. The core was not dried prior to the analysis, but because of the compact, non-porous nature of the rocks at Meadowbank, drying of the samples prior to specific gravity determinations was not required.

Average specific gravity results are summarized by deposit and rock type in Table 13-4. A complete list of results is attached in Appendix G.

Table 13-4: Mean Specific Gravity Determinations

Deposit	Mineralization	Rocktype	No. of Determinations	Mean Specific Gravity
Goose Island	Mineralized	IF	32	3.18
	Mineralized	IV	12	2.79
	Unmineralized	None	0	na
TP - Bay Zone	Mineralized	IF	46	3.30
	Mineralized	IV	10	2.89
	Unmineralized	IF	26	3.44
	Unmineralized	IV	8	2.82
	Unmineralized	UM	10	2.91
Vault	Mineralized	IV	39	2.76
	Unmineralized	IV	41	2.75
Total			**224**	**3.02**

For resource modelling purposes, the average specific gravity for each rock type was applied to all blocks with that rock code. Lithological solid models prepared by Cumberland were used to select the blocks for specific gravity assignment.

In AMEC s opinion, the specific gravity data meets minimum quantity requirements and is of sufficient quality to support a feasibility study resource model. However, AMEC also considers that the resource model would benefit from additional specific gravity tests and recommends that at least 5% of the assay samples should have an accompanying SG determination. With over 26,000 assays in the Meadowbank database, Cumberland should strive for at least 1,300 specific gravity determinations. Cumberland personnel can complete the determinations on site and the results can be validated by a series of check determinations at commercial labs.

AMEC also cautions that the specific gravity tests have been completed on competent pieces of core due to the inherent difficulties involved in testing incompetent samples. This is a common and potentially serious problem, given that competent core will have a higher bulk density than incompetent core. This sample bias can lead to overestimation of tonnage in deposits with significant components of incompetent rock. In AMEC s opinion, the rocks at Meadowbank are generally very competent and the risk of over-estimation of tonnage due to specific gravity sample bias is minimal.

14.0

DATA VERIFICATION

14.1

Assays

AMEC tested the integrity of the assay database with three methods: (1) a 5% data comparison against original records, (2) a check of all of the very high grade assays (>100 g/t Au) in the database, and (3) Gemcom s database validation tools. Cumberland s assay data is stored in a Gemcom database containing 26,580 assays from 480 drill holes.

14.1.1

Five Percent Data Check

Five percent of the drillholes at each of the Goose Island, Portage, and Vault deposits were selected at random and the assay data for these holes was dumped from the Gemcom database and checked manually against the original assay certificates. Table 14-1 summarizes the number of records checked and the number of errors found for each deposit. A list of all of the drill holes checked is provided in Appendix H.

Table 14-1: Five Percent Data Validation Results

	Assays				Surveys			
Deposit	**# Checked**	**Errors**	**Error Rate**	**Nature of Errors**	**# Checked**	**Errors**	**Error Rate**	**Nature of Errors**
Goose Island	186	0	0.0%	na	86	0	0.0%	na
Portage	1,043	1	0.1%	NP96-140 163 m to 164 m should be 0.20 g/t.	59	0	0.0%	na
Vault	453	0	0.0%	na	48	1	2.08%	VLT00-024 at 134 m dip should be 70
Total	**1,682**	**1**	**0.05%**		**193**	**1**	**0.5%**	

14.2

Surveys

The integrity of the collar and down hole survey database was tested by comparing 5% of the survey records dumped from the Gemcom database with the original records. The holes checked were the same as those that were checked for assay errors. Original survey records were a combination of: (1) spreadsheets obtained by Cumberland from contract surveyors, (2) digital data dumps from the Total Station survey instrument, or (3) records recorded on the drill logs.

Only one minor transcription error was encountered in a down-hole survey dip, which has been noted in Table 14-1 (VLT00-024 at 134 m, dip should be -70; not -73).

In AMEC s opinion, the data used for the resource estimate is robust and essentially free of error.

15.0

ADJACENT PROPERTIES

This section is not applicable.

16.0

MINERAL PROCESSING AND METALLURGICAL TESTING

SGS Lakefield Research (Lakefield) located in Lakefield, Ontario, is conducting the feasibility metallurgical testwork for the Meadowbank project.

The current feasibility test work is being conducted on freshly prepared core samples from the three main Meadowbank deposits; Portage, Vault and Goose Island. An earlier Preliminary Assessment study completed in early 2002 was conducted on old assay rejects crushed to 10 mesh, and no special handling techniques or storage precautions were in place to minimize potential surface oxidation of the samples. The results showed a range of inconclusive metallurgical responses that were characterized by high cyanide consumptions. Ultimately it was recognized that sample ageing could be a significant factor in explaining this and it was decided to initiate a new phase of test work using fresh core as the basis of the feasibility testwork.

Four new composites representing each of the deposits have been tested to date by gravity, flotation, and cyanidation. This gave significant improvements in the metallurgy over previous testwork results. At the end of April 2003 the new test data was used to conduct an economic trade-off study on three alternative flow sheet options; whole ore cyanidation, float concentrate cyanidation, or cyanidation of both float concentrate and tails.

The trade-off study indicated the Meadowbank deposits are more economically amenable to whole ore cyanidation than the more complex bulk sulphide flotation and concentrate cyanidation flowsheet used in the preliminary assessment study. Subsequently whole ore cyanidation was selected for the basis of the current feasibility study. Lakefield also completed checks on residue assays from this testwork and these continue to support the economic selection of whole ore cyanidation.

Using whole ore cyanidation, including pre-aeration and gravity, projected recoveries have marginally improved from the original Preliminary Assessment study and vary from 91% to 95%; generally with finer grinds having the higher recoveries. In addition, cyanide consumption is significantly lower.

Lakefield have recently completed the feasibility test program, but their report has not been issued at time of writing. It is expected some additional variability mapping work will be completed once the feasibility production schedule has been established.

17.0

MINERAL RESOURCE AND MINERAL RESERVE ESTIMATES

17.1

Mineral Resource Statement

The mineral resource estimate at Meadowbank is summarized in Table 17-1.

Table 17-1: Meadowbank Resource Statement

Deposit	Deposit	Tonnes	Grade	Ounces

Portage (1.5 g/t cut-off)	Measured	1,013,000	5.5	179,000
	Indicated	10,805,000	4.5	1,563,000
	Sub-Total	11,818,000	4.6	1,742,000
	Inferred	774,000	4.3	107,000
Goose Island (1.5 g/t cut-off)	Measured	0	0.0	0
	Indicated	1,924,000	4.8	297,000
	Sub-Total	1,924,000	4.8	297,000
	Inferred	2,069,000	4.8	319,000
Vault Deposit (2.0g cut-off)	Measured	38,000	3.4	4,000
	Indicated	7,905,000	3.6	915,000
	Sub-Total	7,944,000	3.6	919,000
	Inferred	2,513,000	3.8	307,000
All Deposits	Measured	1,051,000	5.4	183,000
	Indicated	20,634,000	4.2	2,786,000
	Sub-Total	21,685,000	4.3	2,998,000
	Inferred	5,356,000	4.3	740,000

17.2

Mineral Resource Estimation Methods

Mineral resources at all three Meadowbank deposits were estimated with three dimensional block models interpolated with inverse distance methods. The interpolations were constrained by geologically controlled three dimensional wireframe solid models of the mineralization.

17.2.1

Geological Model

Three-dimensional solid models of geology and mineralization for each of the Meadowbank deposits were created by Cumberland. They were built by interpreting the geology and extent of mineralization on paper plots of vertical sections displaying diamond drill hole data. Geological interpretations were hand-drawn by Cumberland geological staff and included all lithological and structural features. Care was taken to ensure that the interpretations were consistent from section to section. Grade shells of 1 g/t were constructed with similar methods and utilized mineralized interval composites from the diamond drill holes and the interpreted geology as the primary references. No minimum thickness was applied. Care was taken to ensure that dilution was minimized through the application of consistent rules. Up to 2.0 m of internal waste was allowed, provided that the length-weighted average grade of the waste plus the outer assay result(s) was 0.9 g/t Au or higher. The geometry of the grade shells was heavily influenced by the geological interpretation and as a result they are generally stratabound. However, in some cases they do cross lithologic boundaries in keeping with the current epi-genetic model of mineralization.

The lithology outlines and one-gram shells were then digitized from the paper copies into Gemcom© software as polylines. The polylines were snapped to the drill hole lithology units and composites, respectively, and then wobbled to smooth the outlines between snapping points. The outlines (3-D rings) were then stitched together using tie lines to create separate three-dimensional solids for each of the primary rock types and the one-gram shells. Contour lines were used to create intermediate outlines or to pinch out rock or one-gram solids where needed.

A complete list of solids is provided in Appendix I.

17.2.2

Compositing

Capped assays were composited into 1.5 m down hole composites inside the grade shells based on the intervals from the 1 g composites used to construct the grade shell wireframes (Section 17.2.1). Residual composites at the down-hole end of the intervals with a length of less than 0.50 m were not used for grade interpolation.

17.2.3

Capping

Goose Island

The primary tool for assessing the appropriate capping level at Goose Island was a Monte Carlo simulation study that was augmented with statistical analysis. In the Monte Carlo simulation, 4% of the samples met a high-grade threshold of 30 g/t and accounted for 45% of the metal in the deposit. Approximately 111 samples (4,800 t/sample) will be mined in the course of a year, with four of those being from the high-grade portion of the distribution. The results indicated that 28% of the metal was of sufficiently high risk to be removed from the model. With this amount of metal removed (equivalent to a flat cap of 30 g/t), the mine can be expected to achieve more metal than forecast, four years out of five. One year out of five, the mine can be expected to achieve less metal than forecast. The removal of metal at Goose Island was accomplished by a combination of high-grade capping of assays and high grade composite restriction. Instead of a flat cap of 30 g/t, a more relaxed cap level of 50 g/t Au was used, and high grade composites in excess of 30 g/t were restricted to a range of influence equivalent to 2 block lengths in each dimension (20 m in the strike direction and 12 m in the others). The net effect, based on contained metal value, was to emulate a 30 g/t capping value but allow some local participation of the higher-grade values. This strategy also helped control the amount of grade smoothing produced by the interpolation.

The flat cap level of 30 g/t suggested by the Monte Carlo simulation compares well to the results of a decile analysis that suggested a flat cap of 38 g/t. As well, a pick of probable inflection points on a cumulative probability plot suggests that a flat cap of 30 g/t, corresponding to the 97th percentile of the assays would be reasonable.

Portage

A combined capping/restriction strategy similar to that employed at Goose Island was adopted at Portage. Monte Carlo simulations suggested that 12.5% of the metal at Portage was of sufficiently high risk to be removed from the model, which equated to a flat cap of 35 g/t Au. However, as with Goose Island, the removal of metal was actually achieved by capping the assays at 50 g/t Au, and restricting the influence of composites greater than 25 g/t to two block lengths in each dimension (20 m in the strike direction and 12 m in the others).

The flat cap of 35 g/t Au suggested by the Monte Carlo simulation is corroborated by an inflection point on the assay probability plot at 35 g/t (~the 97.5th percentile).

Vault

At Vault, the Monte Carlo simulation analysis suggested that 16% of the metal was of sufficiently high risk to be removed from the model, which equates to a flat cap of 17 g/t. Unlike the other two deposits, which utilized a combination of capping and high-grade restriction to remove the appropriate amount of metal from the model, the Vault metal reduction was achieved with a simple flat cap of 17 g/t. The flat cap option was selected by Cumberland because it is consistent with Cumberland s interpretations of the distribution of gold grades at Vault. In Cumberland s opinion, the gold grades at Vault are more regularly distributed and less skewed than at the other two deposits, and this is supported by the statistical analysis discussed in Section 17.2.4, after the removal of one very high grade outlier.

As with the other two deposits, the cap level suggested by the Monte Carlo simulation exercise is consistent with a marked inflection point on the cumulative probability plot at 13 g/t, corresponding to the 98th percentile.

17.2.4

Statistics

The statistical properties of the assay and composite populations are discussed below for the three deposits. Table 17-1 summarizes the key statistical parameters for both the assays and the composites.

17-2: Summary of Assay and Composite Statistics

		Mean	CV	1st Quartile	Median	3rd Quartile	Max	Number
Goose Island	Assays	7.1	3.86	1.2	2.3	5.6	570.2	930
	Composites	6.3	3.21	1.5	2.7	5.0	450.8	796
Portage	Assays	6.1	2.70	1.2	2.5	5.9	642.0	4,309
	Composites	5.4	1.66	1.5	2.7	5.7	170.9	3,072
Vault	Assays	4.5	9.60	1.2	2.1	4.0	2,318.0	2,998
	Composites	3.6	2.12	1.5	2.4	4.1	260.1	1,551

Goose Island

The assays at Goose Island within the 1 g/t mineralized shell can be characterized as relatively high grade and moderately skewed. The mean gold grade is 7.1 g/t and the coefficient of variation (CV) is 3.86. The 1.5 m composite grade is slightly lower and less skewed with a mean of 6.3 g/t and a CV of 3.21. A histogram and probability plot of the Goose Island assays and composites are provided in Appendix J.

Most of the Goose Island mineralization is hosted by Iron formation or intermediate volcanics. Table 17-2 summarizes the assay grades by rock type within the mineralized shell.

Table 17-3: Goose Island Gold Assays by Rock Type

Rock Type	Mean Au Grade (g/t)	Number of Assays
Felsic Dyke	5.0	20
Iron Formation	5.6	695
Intermediate Volcanic	12.2	179

Quartz Vein	20.5	16
Ultramafic	4.6	10
Grand Total	7.1	930

Figure 17-1 is a contact plot showing the nature of the gold grades near iron formation/intermediate volcanic contacts.

Figure 17-1: Contact Plot of Iron Formation and Intermediate Volcanic Gold Grades at Goose Island

Figure 17-1 demonstrates that the assay gold grades in iron formation are very similar to the assay gold grades in nearby intermediate volcanics.

Portage

The mean gold assay grade at Portage is 6.1 g/t Au, slightly lower than the mean gold assay grade at Goose Island. The distribution of Portage assay grades is less skewed than at Goose Island, with a CV of 2.70. The Portage 1.5 m composites are slightly lower grade and less skewed than the assays with a mean gold grade of 5.4 g/t and a CV of 1.66. A histogram and probability plot are provided in Appendix J.

Table 17-3 summarizes the assay gold grades by rock-type. Note that the data set does not include the 3P2 or Bay zone portions of the Portage deposit.

Table 17-4: Portage Gold Assays by Rock Type

Rocktype	**Mean Au Grade (g/t)**	**Number of Assays**
Felsic Dyke	1.23	10
Felsic Volcanic	3.40	43
Iron Formation	5.80	1,622
Intermediate Volcanic	5.33	608
Quartz Vein	9.63	66
Ultramafic	11.39	12
Grand Total	**5.75**	**2,361**

As with Goose Island, it is clear from Table 17-3 that most of the mineralization within the Portage 1 g/t Au grade shell is hosted by iron formation and intermediate volcanics. The mean grades of the assays from those two rock types are very similar. Figure 17-2 is a contact plot showing the relationship between the grades of the two rocktypes and the distance between them.

Figure 17-2: Contact Plot of Iron Formation and Intermediate Volcanic Gold Grades at Portage

Figure 17-2 demonstrates that the mean intermediate volcanic gold grades are slightly lower on average than the mean iron formation grades near their contacts.

Vault

The mean gold assay grade at Vault is slightly lower than the mean grades of the other two deposits at 4.5 g/t. The dataset is also the most skewed with a CV of greater than nine. However, a large proportion of the skew in the assay data is due to one very high grade assay of 2,318 g/t Au. When this assay is removed from the population, the mean assay grade drops to 3.7 g/t Au and the CV indicates a much less skewed distribution with a value of 2.03. After compositing all of the assays to 1.5 m equal lengths, the grade drops to 3.6 g/t and the CV decreases to 2.12. A histogram and probability plot for the assays and composites is provided in Appendix J.

Almost all of the mineralization at Vault is hosted by intermediate volcanics and therefore no summary table of grades by rock type is provided. For the same reason, no contact plots are provided either.

17.2.5

Geostatistics

As discussed in Section 17.2.7, all of the interpolations utilized inverse distance weightings and therefore variography played only a minor role in the resource estimate at Meadowbank. At Portage and Vault, the variography was used to guide the shape and size of the search ellipses, and was also used in the confidence limit studies for classification (Section 17.4) and in the validation exercises (Section 17.3).

Goose Island

At Goose Island, the variography was difficult to interpret due to: (1) a lack of data, and (2) the nature of the tight to isoclinal folding that is currently interpreted to have occurred after the deposition of the gold mineralization. Nevertheless, the variograms are included in Appendix K for the sake of completeness.

Portage

At Portage, the direction of maximum continuity is oriented subhorizontally in the along strike direction with a slight plunge to the south of -9° towards 160°. The maximum range in this direction is 260 m. However, it should be noted that over 90% of the variability (including the nugget effect) can be attributed to a first structure with much a much shorter maximum range of 35 m in a similar orientation. The nugget effect was modelled from the down-hole variogram at 50% of the total variability. The variograms are included in Appendix K.

Vault

The direction of maximum continuity at Vault was modelled with one structure oriented with a plunge of -11° toward 123°. The maximum range in this direction was 84 m. The nugget effect was modelled at 10% of the total variability. The variograms are included in Appendix K.

17.2.6

Block Model Definitions

Three different block models were required, one each for the three deposits. The Goose Island, Portage, and Vault models are stored in the GCDBG2, GCDBMB, and GCDBVT Gemcom© projects, respectively. Their definitions are summarized in Table 17-5.

Table 17-5: Block Model Definitions

	Origin (m local grid)			Size (m)			Number of Blocks			
Deposit	**X**	**Y**	**Z**	**Row**	**Column**	**Level**	**Row**	**Column**	**Level**	**Rotation**
G.I.	-450	-1,800	150	10	6	6	115	170	92	0
Portage	-900	-650	168	10	6	6	225	216	40	0
Vault	-5,200	3950	166	10	6	6	150	220	81	0

17.2.7

Interpolation Methods

Goose Island

At Goose Island, 1.5 m composite gold grades were interpolated with the inverse distance squared method. Poor quality variograms precluded the use of geostatistical methods at Goose Island, see Section 17.2.4. Due to a change in the strike direction of the Goose Island mineralization, two search domains were utilized, north and south. The strike direction in the north domain is 010° and the strike direction in the south domain is 020°. A three-pass interpolation scheme was used in each of the search domains, with each successive pass utilizing longer search radii. A table of interpolation parameters is provided in Appendix L. As outlined in Section 17.2.2, a high grade search restriction was utilized in combination with a high grade cap level to control excessive smoothing of high grade samples, while at the same time allowing local high grade results to be honoured in the block grades.

To prevent interpolation across lenses, the blocks were coded with a series of polygons in plan-view so that unique codes could be assigned to each lens and lens-split. Figure 17-3 is an example of the lens coding polygons employed at Goose Island. A matrix of lens code relationships is attached in Appendix M.

Figure 17-3: Lens Coding Polygons on the 0 m Planview at Goose Island

Portage

The interpolation plan at Portage was similar to that utilized at Goose Island. An inverse distance squared weighting scheme was used to interpolate composite grades. Three passes were used, with each successive pass utilizing longer search radii (see Appendix L). The search radii of the first pass were equal to twice the range of the first structure of the Portage variogram (70 m x 30 m x 20 m). The radii of the second pass were equal to twice the radii of pass one (140 m x 70 m x 40 m), and the radii of the third pass were equal to the maximum range of the second structure (260 m x 145 m x 100 m). A total of six search domains were utilized to rotate the search ellipses into the plane of the mineralization (see Appendix L). As mentioned in Section 17.2.2, unwanted smearing of high grade composite values was achieved with a high grade restriction added to the search. Composites greater than 25 g/t Au were not utilized in the interpolation neighbourhood if their distance from the block being estimated was more than two block lengths.

As with Goose Island, polygons were used to uniquely code individual lenses and splays to prevent interpolation across lenses. The polygons were outlined on vertical sections every 20 m through the deposit. A matrix of lens code boundary relationships is attached in Appendix M.

Vault

The interpolation plan used at Vault was similar to that at the other two deposits, except that a flat cap was used to control the high grades, rather than a restricted high-grade search. As with the other deposits, the interpolation utilized an inverse distance squared weighting and three passes were used to successively fill blocks with longer search radii. Each lens at Vault was uniquely coded with wireframed solids to prevent cross-lens interpolation.

17.3

Mineral Resource Validation

The Meadowbank grade models were validated with four methods:

1.

Visual comparison of colour coded blocks and composites on plans and sections

2.

Global comparisons of mean block grades and mean composite grades

3.

Local comparisons of mean block grades and nearest neighbour model grades on a series of section or level slices through each deposit

4.

Change of support checks with Herco comparisons of model grade and tonnage curves against transformed nearest neighbour grade and tonnage curves.

17.3.1

Visual Comparisons

For all three deposits, the visual comparisons of block and composite grades show a reasonable correlation between the two values. No major discrepancies have been noted. Appendix N contains a representative plan and section from each of the three deposits showing colour coded composite and block grades.

17.3.2

Global Comparisons

The global block grade statistics are compared to the global composite and nearest neighbour model grade statistics in Appendix N for each of the three deposits.

The comparison demonstrates that on a global basis, the block model grade at Goose Island is essentially unbiased with respect to the input data. It is within 3.2% of the nearest neighbour model grade and is within 5.4% of the mean composite grade (capped at 30 g/t Au). The mean composite grade is higher than both the nearest neighbour and inverse distance block model grades because the data is slightly clustered. Data clustering is commonly encountered in resource estimation data sets, especially among high-grade composites.

The same can be said of the Portage grade block model, which is within 6.5% of the nearest neighbour model grade and within 9.8% of the mean capped (at 35 g/t Au) composite grade. As with Goose Island, the mean composite grade is higher than both the nearest neighbour and inverse distance block model grades because the data is slightly clustered. No global bias is evident.

At Vault, the mean inverse distance block model grade is within 1% of the mean nearest neighbour model grade and within 4% of the mean capped composite grade. The close agreement between these values indicates that the Vault data is not very clustered and no bias is evident in the block model grades.

17.3.3

Local Comparisons

For the three deposits, the mean inverse distance block grade has been compared to the mean nearest neighbour block grade on a series of parallel slices in section and plan view. The results are presented as line graphs in Appendix N.

Generally, the graphs show good agreement between the two sets of block grades, with the inverse distance model curves being slightly smoother than the nearest neighbour model curves, as they should be. Exceptions occur where the number of blocks contributing to the mean grade is low.

17.3.4

Change of Support Checks

The distribution of grades in the 20 m x 10 m x 10 m sized model blocks will be different from (smoother than) the distribution of grades in smaller SMU sized blocks. Therefore, the grade and tonnage curves for the 20 m x 10 m x 10 m sized blocks have been compared to grade and tonnage curves for the nearest neighbour models after transformation with a hermite polynomial (Herco), to ensure that the level of smoothing is appropriate. The graphs are attached as Appendix O.

In each case, the curves are similar at the 1.5 g/t Au cutoff grade, indicating that the 20 m x 10 m x 10 m block grades are appropriately smoothed and the grade and tonnage curves should be achievable at this cutoff grade. It should be noted, however, that the grade and tonnage curves tend to diverge at higher cutoff grades, and therefore the grades and tonnages that they predict at higher cutoff grades may not be achievable.

17.4

Classification

In determining the appropriate classification criteria for the Meadowbank deposits, several factors were considered:

- NI43-101/CIM requirements and guidelines
- observations from the site visit in 2003
- confidence limit analyses
- experience with similar deposits
- historical classification schemes at Meadowbank.

The classification criteria for each deposit were assessed individually and the results are summarized below in Table 17-5. The excellent trench exposures of mineralization at Portage and Vault give sufficiently high confidence to the material within 25 m of them to justify classification as Measured. The confidence limit analyses at these two deposits supports the classification of material drilled with a spacing of 50 m x 50 m as Indicated. However, the continuity of grade and mineralization in areas drilled with a larger spacing cannot be sufficiently demonstrated for classification as Indicated, but can be reasonably assumed, given the geological model employed by Cumberland. Therefore this material is eligible for classification as Inferred.

At Goose Island, the lack of trench exposures and relatively wide spaced drilling precludes the classification of mineralization as Measured. Confidence limit analyses indicate that the portions of the deposit drilled at a spacing of 35 m x 35 m are eligible for classification as Indicated. The remainder of the mineralization can be classified as Inferred. The criteria for classification as Indicated is more conservative at Goose Island than at Portage and Vault because the mineralization at Goose Island is more irregular.

Table 17-6: Classification Criteria

Deposit	Measured	Indicated	Inferred
Goose Island	None	Drill Spacing of 35 x 35 m or less	All remaining blocks in the 1 g/t grade shell
Portage	Within 25 m of a trench exposure	Drill Spacing of 50 x 50 m or less	All remaining blocks in the 1 g/t grade shell
Vault	Within 25 m of a trench exposure	Drill Spacing of 50 x 50 m or less	All remaining blocks in the 1 g/t grade shell

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18.0

OTHER DATA AND INFORMATION

This section is not applicable.

19.0

REQUIREMENTS FOR TECHNICAL REPORTS ON PRODUCTION PROPERTIES

This section is not applicable.

20.0

CONCLUSIONS AND RECOMMENDATIONS

AMEC has assisted Cumberland with the estimation of Mineral Resources at the Meadowbank project. AMEC s general conclusions from this work are as follows:

- Three main gold deposits have been delineated at Meadowbank: Goose Island, Portage and Vault. The first two can be categorized as Iron Formation Hosted deposits, while Vault can be classified as a Disseminated/Replacement Lode gold deposit. The geology of the Meadowbank Project, including the controls on mineralization are well understood.

- The database used to estimate the mineral resource for the Meadowbank Project consists of samples from 678 diamond drill holes and a small number of trenches. Almost all of the drill hole collar locations have been surveyed with a total station instrument, and most of the holes have undergone some type of down-hole surveying as well. Those holes that have not been subjected to down hole surveys will not have an adverse effect on the reliability of resource estimates due to their small number and short length. In AMEC s opinion, the methods used to collect samples at Meadowbank are consistent with standard industry practices.

- The core logging facilities and procedures generally meet or exceed industry standard practices. To simplify geological coding of assay and composite assay intervals, AMEC recommends keeping alteration codes separate from lithological codes. AMEC also recommends that a copy of the original assay certificates be attached to each drill log to facilitate future checks and audits.

- The transfer of data to the resource database was verified with a 5% check of the assay database and survey records against original records.

- Cumberland s sampling procedures and assaying methods are consistent with standard industry practices. Since 2001, Cumberland has followed a comprehensive quality assurance program that includes the submission of standards, blanks, field duplicates, and pulp duplicates. Program accuracy and overall precision were good. Results from the pulp duplicate analyses indicate poor precision, possibly due to insufficient pulp sample size for the nature of the gold mineralization. Notwithstanding the imprecision in the pulp duplicates, it is AMEC s opinion that the data used for the resource estimate is under sufficient control to form the basis of the mineral resource estimate. However, prior to executing any future drilling programs, AMEC recommends that:

  - A study be undertaken to determine the appropriate pulp sample size. An optimized sample split or pulp size will help towards maintaining acceptable precision of duplicate pair data.

  - Stronger measures be implemented to ensure that SRM s submitted to the primary lab are blind.

-

A source of blank material be located that is proven to contain no anomalous gold, so that it can more effectively serve its purpose of detecting contamination in the sample prep phase.

-

A comprehensive project QA/QC database be compiled to keep all data together. This database should be monitored and maintained by designated QA/QC personnel, which will help to monitor lab performance over time.

•

Three dimensional block models have been used to estimate the mineral resource at Meadowbank. The models were constructed with inverse distance weighting techniques on capped and composited assays. The models have been subjected to several validation exercises and based on those results AMEC considers the estimate to be robust.

•

The models have been classified into Measured, Indicated or Inferred categories consistent with the CIM definitions referred to in NI43-101.

This independent mineral resource estimate supports the 29 January 2004 Meadowbank mineral resource statement.

21.0

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APPENDIX A

Example Core Logging Form
Core Logging and Sampling Procedures

CONSOL

VLT03-156

			STRUCTURE								ALTERATION								MINERA	
ROCK OVB	CT-A	BD-A	FOL1	FOL2	SH-A	SH-I	RQD	VN-T	VN%	GA	BT	GRU	CHL	SIL	SER	MT	PO	PY	ASPY	C
Vcs;porph;IVchl								q	1				25		1			1		
Vcs;porph;IVchl			75					q	1				25		1			1		
Vcs;porph;IVchl			80					q	20				15		1			1		

IVT;sil		80	q	40	5	2	1		0
IVT;sil			q	35	10	2	1		0
IVcs;sil	80	80	q	1	10	2	1		1
IVcs;sil			qc	3	10	2	1		1
B IVcs;sil			q	1	10	3			
IVchl;IFMQ	80	75	qc	1	20			1	2
IVchl;IFMQ		65	qc	1	20			1	1
IVchl;IFMQ			qc	1	20			1	1

D														
IVchl;IFMQ		50	50	90				qc	2	20			1	2
IVchl;IFMQ		65	65					qc	2	20			1	3
IVchl;IFMQ								qc	1	20			1	1
S 2														
IVcs;QV								qc	30	20				1
IVcs;FZ;BX					55	2	0	cc	20	20				2
IVcs			60					qc	2	25		1		1
IVT	40		75					qc	1	5	1	2		1

IVchl;IVcs	80		cc	1	25	1	0
IVchl;IVcs			qc;cc	1	25	1	0
IVchl;IVcs		55	cc	1	25		1
IVchl;IVcs		60	cc	1	30	1	1

22.00	22.33	IVT Same as 16.33 - 17.72m, w strong foln and few 1cm cubic py xtals = S1 @ 70 dtca Lr ct - irreg	22.00	22.33	IVT	85	70		q	10	10	1	0		74055	0.33	0.34
22.33	23.10	IVchl/IVcs Same as 17.72 - 22m = S0/S1 @ 65 dtca @ 22.75m Lr ct @ 85 dtca	22.33	23.10	IVchl;IVcs		85	85	q	2	30	1	3		74056	0.77	0.07
23.10	29.00	IVT Same as 16.33-17.72m; 2-3% chl-py filled fractures,	23.10	24.50	IVT	85	65		q	5	5	2	0		74057	1.40	0.02
		2-5% white qtz	24.50	26.00	IVT		80		q	5	3	2	1	0	74058	1.50	0.06
			26.00	27.50	IVT				q	4	3	2	1		74059	1.50	0.09
		Mod ser-pot altn.	27.50	29.00	IVT		75		q	7	3	2	0		74060	1.50	0.39
		= S1 @ 80 dtca @ 26.1m		B											74061		0.01
		Lr ct - lost core															

		at block.														
29.00	29.59	IVcs Mottled green, fine grained, chl-ser altd, mod foln. w 3-5% discontinuous qtz vns and 5% anhedral py blebs & bands in fractures. = S1 @ 65 dtca @ 29.34m Lr ct @ 80 dtca	29.00	29.59	IVcs		65	q	5	15	1	5	74062	0.59	4.21	4.
29.59	30.76	IVT Same as 16.33-17.72m; 2-3% chl-py filled fractures = S1 @ 80 dtca @ 29.97m Lr ct @ 75 dtca	29.59	30.76	IVT	80	80	q	5	3	2	1	74063	1.17	2.45	2.
30.76	31.03	IVcs Same as 29-29.59m, 5% cubic py	30.76	31.03	IVcs	75	80	qc	2	20	1	5	74064	0.27	0.38	
		= S1 @ 80 dtca @ 31.05 Lr ct ~80 dtca, undulating			D								74065		0.31	
31.03	34.01	IVT	31.03	32.52	IVT	80		q	20	5	2	2	74066	1.49	0.25	
			32.52	34.01	IVT		70	q	5	3	2	1	74067	1.49	0.09	
		and qvts give a foliated texture. 20-35 % rounded qtz eyes surrounded by ser.														

		Py occurs in fractures.																	
		31.66-32.01m: 50% undulating white qtz vn w gal-py in fractures																	
		= S1 (qvt) @ 70 dtca @ 33.21m																	
		Lr ct @ 80 dtca																	
34.01	45.58	IVcs/IVsc	34.01	35.00	IVcs	80		85	qc	1		15	1	0		74068	0.99	0.13	
		Very homogeneous, unfoliated to weakly foliated, fine grained IVcs w	35.00	35.71	IVcs							15	1	0		74069	0.71	0.14	
		tr-3% vfg py dissem interbedded w 20% creamy ser-rich bands of	35.71	35.95	IVsc		85	85			5	10	2	3		74070	0.24	1.29	1.
		IVcs, with foln and qtz stringers, fg py in foln/dissem	35.95	37.30	IVcs							20	1	1		74071	1.35	0.12	
		= S0/S1 @ 85 dtca @ 35.74m	37.30	38.28	IVcs			85	qc	1		20	1	1		74072	0.98	0.04	
		= S0/S1 @ 85 dtca @ 44.66m			S 4											74073		3.56	3.
		Lr ct @ 80 dtca	38.28	39.29	IVcs				qc	2		15	1	0		74074	1.01	0.05	
			39.29	40.29	IVcs				qc	2		15	1	0		74075	1.00	0.02	
			40.29	40.72	IVsc		90	90	qc	1		10	2	3		74076	0.43	0.63	
			40.72	41.19	IVcs				qc	1		15	1	1		74077	0.47	0.21	
			41.19	41.41	IVsc;IVcs			85				10	2	2		74078	0.22	0.99	
			41.41	42.00	IVcs				qc	2		15	1	1		74079	0.59	0.29	
			42.00	42.82	IVsc			85	qc	1		7	2	7		74080	0.82	10.23	10
			42.82	44.00	IVcs;IVsc				q	1		15	1	1		74081	1.18	0.82	
			44.00	44.86	IVcs		85	85	qc	1		15	1	2		74082	0.86	0.41	
			44.86	45.58	IVcs;IVsc				qc	1		10	2	3	0	74083	0.72	2.61	2.

					B										74084	<0.01	
45.58	46.32	IVsc	45.58	46.32	IVsc	80		75	q	1			3	7	74085	0.74	6.
		Creamy & beige, well foliated, fine grained IVsc w ~7% vfg dissem py,															
		strong ser altn.															
		= S1 @ 75 dtca @ 46.12m															
		Lr ct @ 85 dtca															
46.32	46.71	IVcs	46.32	46.71	IVcs	85		80	q	2	5	1	1	5	74086	0.39	10
		Light to med grey, fine grained, mod silicified, weakly chl altd interval			S 1										74087		5.
		w fg py dissem along foln															
		= S1 @ 80 dtca @ 46.49m															
		Lr ct @ 85 dtca															
46.71	48.85	IVT	46.71	47.80	IVT									1	74088	1.09	0.
			47.80	48.85	IVT									1	74089	1.05	0.
		and qvts give a foliated texture. 20-35 % rounded qtz eyes surrounded			D										74090		0.
		by ser. Fg IVT near lr ct.															
		Py occurs in fractures.															
		= S1 (qvts) @ 65 dtca @ 46.74m															
		Lr ct @ 90 dtca															
48.85	50.75	IVchl/IVcs	48.85	49.41	IVchl;IVcs	90	85	85	q	3	25		1	3	74091	0.56	5.
		Dark green, aphanitic, strongly altd IVchl with ~30% bands of fg															
		more	49.41	50.00	IVchl;IVcs			85	q	2	25		1	1	74092	0.59	0.

		grey-green IVcs. Few 1cm quartz veins parallel foln and some qtz & qtz-carb veining at lr ct. Py is both cubic and fg dissem in foln = S0/S1 @ 85 dtca @ 49.3m Lr ct @ 85 dtca	50.00	50.75	IVchl;IVcs		90	90	q;qc	5	30			4	74093	0.75	6.
50.75	51.79	IVsc/IVcs Well foliated/laminated, fine grained, mod ser-chl altd, w dark green,	50.75	51.79	IVsc;IVcs	85	80	80	q	2	10	2		5	74094	1.04	5.
		beige, and cream bands. Fg py (3 up to 15% locally) dissem in S1 foln = S0/S1 @ 80 dtca @ 51.03m Lr ct @ 85 dtca			B										74095		0.
51.79	52.42	IVT Same as 48.85 - 50.75m, locally silicified, trace py in fractures = S1 @ 80 dtca @ 52.28m Lr ct @ 70 dtca	51.79	52.42	IVs	85		80	q	10	2	2		0	74096	0.63	0.
52.42	54.02	IVsc/IVcs Same as 50.75 - 51.79m; locally med grained in more chl-rich	52.42	53.20	IVsc	70	75	75	q	2	5	3		4	74097	0.78	2.
		bands Py fg ff/dissem, 2 blebs po = S0/S1 @ 75 dtca @ 53.23m Lr ct @ 80 dtca	53.20	54.02	IVsc			80	q	1	10	2	0	5	74098	0.82	2.

54.02	58.62	IVT	54.02	55.00	IVT	80			q	3	2	1	2		1		0.1	74099	0.98	0.
		Same as 48.85 - 50.75m, locally silicified, trace py in fractures	55.00	56.00	IVT				q	2	2		2	0	1			74100	1.00	0.
		= S1 @ 70 dtca @ 56.1m	56.00	57.00	IVT			70	q	2	2	1	2		1		0.1	74101	1.00	0.
		57.9-58.03m: khaki band of IVcs with strong foln @ 75 dtca	57.00	57.80	IVT				q	1	2	1	2		1	0	0.1	74102	0.80	0.
		Lr ct @ 80 dtca	57.80	58.10	IVT;IVcs			75	q	3	5		2		1			74103	0.30	0.
			58.10	58.62	IVT				q	1	2		2		1			74104	0.52	0.
					S 3													74105		0.
58.62	59.35	IVcs/IVT	58.62	59.35	IVcs;IVT	80	80	80	q	2	10		2		1			74106	0.73	0
		Mixed zone of 60% IVcs bands (fg, green-grey, fol) and IVT as above.			D													74107		0
		= S0/S1 @ 80 dtca @ 58.93m																		
		Lr ct @ 60 dtca																		
59.35	62.98	IVT/IVsc	59.35	60.10	IVT	60		80	q	3	2		2		1			74108	0.75	0
		Same IVT as 48.85 - 50.75m, w 15% bands of khaki IVsc w fg py	60.10	61.00	IVT				q	5	2		2		2	0	0.1	74109	0.90	4
		61.19m: 0.8cm wide py-sph-gal band, very nice @ 65 dtca	61.00	62.00	IVT		80	80	q	2	5		2		1			74110	1.00	1
		= S0/S1 @ 80 dtca @ 61.67m	62.00	62.98	IVT		80	80	q	4	5		2		1			74111	0.98	0
		= S0/S1 @ 80 dtca @ 62.88m			B													74112		<
		Lr ct @ 80 dtca																		
62.98	63.91	FV/IVs/IVcs	62.98	63.91	FV;IVs;IVcs	80	70	70	qc	1	5	2	2		6			74113	0.93	7
		Strongly silicified FV																		

		(55%) interbedded w softer yellowy IVs w py														
		= S0/S1 @ 70 dtca @ 63.35m														
		Lr ct @ 80 dtca														
63.91	64.75	IVT	63.91	64.75	IVT	80			q	15	3	1	2	1	74114	0.84
		Same as 48.85 - 50.75m, locally silicified, trace py in fractures														
		Lr ct @ 75 dtca														
64.75	65.26		64.75	65.26		80			q	1	10		1	1	74115	0.51
		Brecciated texture with crackled IVT with 10% chl in fractures, weak														
		Lr ct @ 80 dtca														
65.26	68.65	IVcs/IVsc,minor bio	65.26	66.00	IVcs;IVsc;IVT	80	90	90	q	2	15		1	3	74116	0.74
		Well foliated, fine grained, beige to dark brown to green-grey interval	66.00	66.88	IVcs;IVsc			80	q	5	20		1	3	74117	0.88
			66.88	67.74	IVcs;IVsc				q	3	20		1	1	74118	0.86
		the S1 foln plane.	67.74	68.65	IVcs;IVsc			85	q	4	20		1	2	74119	0.91
		65.8-65.9m: band of silicified IVT														
		= S0/S1 @ 90 dtca @ 65.9m														
		Lr ct @ 85 dtca														
68.65	68.99	IVT	68.65	68.99	IVT	85		85	q	5	5	1	2	1	74120	0.34

		Same as 48.85 - 50.75m. = S1 (qvt) @ 85 dtca @ 68.91m Lr ct @ 85 dtca														
68.99	69.39	IVcs Dark khaki, fine grained IVcs with mod-strong chl-ser altn, 5-10% fg dissem py along S1 foln plane. = S1 @ 85 dtca @ 69.13m Lr ct @ 80 dtca	68.99	69.39	IVcs	85		85	qc;q	3		15	2	7	74121	0.40
69.39	69.90	IVT Same as 48.85 - 50.75m. = S1 (qvt) @ 80 dtca @ 69.51m Lr ct @ 80 dtca	69.39	69.90	IVT	80		80	q	3		1	1	0	74122	0.51
69.90	71.16	IVchl/IFQM Dark green, aphanitic IVchl interbedded w grey, aphanitic chert>mt iron formation. Minor thin py-rich bands // to foln = S0/S1 @ 75 dtca @ 70.64m Lr ct @ 65 dtca	69.90	71.16	IVchl;IFQM	80	75	75	qc	2		25	1	2	74123	1.26
71.16	74.00	IVcs/IVsc, bio Well foliated, fine grained, beige to	71.16	72.21	IVcs	65		75	qc	2	5	15	1	2	74124	1.05
			72.21	72.75	IVsc				qc	4		10	2	3	74125	0.54

green-grey interval with minor biotite rich zones. F gr py in dissem in fractures and along	72.75	73.20	IVcs;bio	80	qc	4	5	15	1	1	74126	0.45	
the S1 foln plane. Trace sph-gal along a couple of fractures.	73.20	74.00	IVsc	80	qc	7		10	2	4	74127	0.80	
= S1 @ 75 dtca @ 72.0m			D								74128		1
= S1 @ 80 dtca @ 73.49m													
Lr ct @ 70 dtca													

77.00	IVT	74.00	75.00	IVT	70		75		q;qc	4	3	1	1	0		74129	1.00	1.04	0.98
	Same as 48.85 - 50.75m.	75.00	76.00	IVT					q;qc	3	2	1	1	0	0.1	74130	1.00	2.92	2.83
	few thin py-rich stringers, and 5% qtz-carb-chl veins	76.00	77.00	IVT			70		q;qc	4	3	1	1			74131	1.00	3.15	3.46
	= S1 @ 70 dtca @ 76.48m			S 2												74132		1.51	1.52
	Lr ct - broken core																		
78.00	IVcs/FV	77.00	78.00	IVcs		70	70	75	q	5	20	2	2			74133	1.00	0.80	
	Dark grey, and khaki banded interval w mod ser-chl altn. This section																		
	may be so dark because of alteration from fluids from bx/fault below.																		
	= S0/S1 @ 70 dtca @ 75.48m																		
	Lr ct @ 75 dtca																		

79.17		78.00	79.17	IVcs;BX;FZ	75			75	qc	15	15		1	6	74134	1.17	1.48	1.60
				B											74135		0.01	
	are rounded/milled w 30% matrix of chl-py. Core intact (not broken). Large qtz-carb (4-7cm) irreg, no sulphide, at top of interval. Lr ct @ 65 dtca																	
81.52	IVsc, sil	79.17	79.73	IVsc	65				q	10	2	2	2	20	74136	0.56	4.59	4.95
	Beige to khaki, fine grained portion with mod-strong ser altn and	79.73	80.55	IVsc;sil		75	75		q	15	2	2	2	7	74137	0.82	3.09	3.13
	locally strongly silicified/qtz flooded. Py-ser bands define foln.	80.55	81.52	IVsc					q	8	2	2	2	15	74138	0.97	5.19	5.40
	= S0/S1 @ 75 dtca @ 80.25m Lr ct @ 80 dtca																	
90.65	IVcs/IVsc	81.52	82.50	IVcs;IVsc	80	80	80		q	5	15		1	0	74139	0.98	0.54	
	Medium to dark grey, fine grained, clouded interval w 20% khaki more	82.50	83.38	IVcs;IVsc					q	2	15		1	1	74140	0.88	0.34	
	sericitic bands. Minor fg py in fractures, up to 2% locally.	83.38	84.30	IVcs;IVsc			80		q	4	15		1	0	74141	0.92	0.16	
	Minor thin qtz carb stringers // to core axis	84.30	90.65	IVcs;IVsc			80		q;qc	3	15		1	0	NS	6.35		
	= S0/S1 @ 80 dtca @ 81.85m = S1 @ 80 dtca @ 86.06m																	

	Lr ct @ 75 dtca													
91.02	QIVT Med-dk green-grey, med to coarse grained, 50-70% white qtz eyes, surrounded by a lt gr ser-py matrix. Lr contact of unit is a 3cm chl-rich shear zone (sil?) which crosscuts the S1 foln in this unit. S1@ 75 dtca; SH @ 40 (155R)	90.65	91.02	QIVT	75		75						NS	0.37
103.76	IVcs/IVcs,tuff Med - dark grey-green; fine grained, weak to mod chl altn, wk ser altn, locally tuffaceous w qtz eyes. 2% thin qtz stringers, mostly at high angles to core axis. Trace cubic py dissem. Few <2cm IVchl bands. = S1 @ 70 dtca @ 96.42m 100.82-101m: bull white qtz-carb vn w ur ct @ 30 dtca Lr ct - gradational; S1 @ 80 dtca	91.02	103.76	IVcs	40		70	q;qc	2	15	1	0	NS	12.74
116.00	IVcs/FV	103.76	116.00	IVcs;FV	80	85	85	q;cc	1	15	1		NS	12.24

IVcs, as above but in this portion there is 5% bands of "cherty-looking" (not hard) FV, creamy to light pink, aphanitic to very fine grained, well foliated. Only trace qvts and calcite stringers. Minor IVchl bands.
= S0/S1 @ 85 dtca @ 107.68m

E. O. H.

Cumberland Resources Ltd.

Meadowbank Project

Memorandum

To:

File

From: Andrew Hamilton

Re:

Drill Core Sampling Procedures at Meadowbank

Date:

January 23, 2004

During the core logging procedure (described in a memo by Roger March dated July 25, 2003) the core logger is also responsible for layout of drill core samples and insertion of QA/QC materials.

Sampling intervals are coincident with the geodet intervals (based on lithology, structure and sulphide content) and are marked on the core in red china marker, and arrows are drawn to indicate the sample interval. A sample tag with unique number is placed under a piece of core at the end of the interval. Sample lengths on drilling programs up to and including 2003, vary from 15 cm to 1.5 metres, although sample lengths of between 30 cm and 1.0 metre are the most common. The shorter lengths were used on narrow intervals containing visible gold or extreme sulphide concentrations, while samples longer than 1.0 metre were used over intervals of low but consistent sulphide content or alteration. A minimum sample length of 30 cm is to be used on future programs.

The logger also places into the core a strip of flagging tape indicating where in the sample sequence standards, blanks and duplicates are to placed. One standard, one blank and one duplicate are inserted randomly by the logger in every 22 samples.

In the sampling room the samples are split using a manual splitter, with one half being placed in a plastic sample bag and the other half being returned to the box. An aluminium tag is stapled to the core box at the start of each sample interval giving the down hole depth and the sample number. The sample tag is placed in the plastic sample bag, the number is written on the outside of the bag in black marker, and the bags are sealed with locking ties.

When a standard flag is encountered the sampler selects the appropriate standard (4 are used) and writes the sample number on the tin top bag. The label on the standard (has standard name and grade) is peeled off and the standard is placed in a bag with the sample tag and sealed as above. The remaining label is stuck to the appropriate sample tag in the tag booklet so a record is maintained that the correct standard was used.

A field blank is used at Meadowbank. Boxes of NQ core from previously drilled intervals of ultramafic are in the core shack. Blanks are pre-screened by the geologists for sulphides such that anything containing excessive sulphide is not chosen. When a blank flag is encountered the sampler selects about 20 cm of ultramafic material, splits it and places it in a plastic sample bag as if it is a normal sample.

Field duplicates are also used at Meadowbank. Prior to 2003 the sample intervals designated for duplicates were cut by saw in half and then one side was cut in half again to create quartered core. One quarter was designated as the original sample while the second sample number was designated as the duplicate. Starting with the 2003 program and upon the advice of AMEC, Cumberland started to submit only manually split core with one half as the original sample and the second half as the duplicate. Thus all core from these intervals is assayed and no core record remains.

Boxes of split core are labelled with an aluminium tag that states the drill hole number, box number and the from/to measurements of the core contained in the box. The boxes are stored sequentially in commercially constructed core racks next to the core logging facility. A spreadsheet and map of the core racks is updated at the end of each drilling season.

Sample shipments are always prepared in multiples of 22, which correspond directly to a given loggers sampling sequence. This way the QA/QC protocol is followed all the way through the logging, shipment and analytical processes. The samples are placed in rice sacks that are securely tied at the top with baling wire and labelled both with a shipping tag and on the side of the bag in felt marker, with the lab address, shipment number and bag number. The shipment number, bag number and the samples each bag contains are also recorded in a logbook and spreadsheet that is kept on site for reference. A sample shipment form from the primary lab is filled out, a copy of which is kept in a binder while the original is put in one of the bags.

Sample shipments are transported to Baker Lake via helicopter, bombardier or delta, and then shipped via Calm Air and Air Canada Cargo to IPL Labs in Vancouver, B.C. The lab confirms that all bags from the shipment are received and that all samples on the sample shipment form are received before proceeding with any analytical work. If there is a discrepancy the shipment is put aside until it is resolved.

Cumberland Resources Ltd.

Meadowbank Project

Memorandum

To: File

From: Roger March

Re: Drill core logging procedures

Date: July 25, 2003.

Once the core is received in camp, it is geotechnically logged by geological technicians on site who record geotechnical data: % Recovery, % RQD, and fracture density for all holes with detailed geotech logging completed on select holes as required based on consultation with Golder personnel. Once the geotech work is complete, the holes are then logged in detail by company geologists.

In the past, drill logs were completed on paper at the site and entered into digital format (excel) in the office at the end of the field season. Since 2002, this step has been removed, and all logs are now completed in excel as the logging takes place in the field. The logging still records all the same parameters as in the past. Data is entered in spreadsheet format in excel and then used to create comma delimited ASCII files which are dumped into the GEMCOM database.

During logging, geological units are broken out, described, and structural elements are recorded. To facilitate compilation of our GEMCOM database, a visual estimation of the percentage of certain commonly occurring elements such as veining, chlorite, sulphide content, etc. are recorded in spreadsheet format in a geological detail (geodet) section. Silica, sericite alteration and magnetite content is also recorded, but these items use a 1 to 3 scale indicating whether an item is weak, moderate, or strong (see appendix for example of core logging sheet).

Such descriptive parameters as rock type, colour, texture and grain size, percentage and type of sulphide mineralization are recorded in the text section of the log as well as in spreadsheet format, along with measurements of the orientation of structural fabric relationships which includes foliations, veins and shearing/faulting.

Once the logging is complete, separate excel sheets are created by cutting and pasteing the required data. These sheets are used to create the GEMCOM dump files. Details on the creation of the dump files are provided in a separate memo.

APPENDIX B

Sample Length Histograms and Probability Plots

APPENDIX C

IPL Analytical Protocols

Method of Gold analysis by Fire Assay / AAS

(a)

10.00 to 30.00 grams of sample was weighed into a fusion pot which contained a combination of fluxes such as lead oxide, sodium carbonate, borax, silica flour, baking flour or potassium nitrate. After the sample and fluxes had been mixed thoroughly, some silver inquart and a thin layer of borax was added on top.

(b)

The sample was then charged into a fire assay furnace at 2000 F for one hour, at this stage, lead oxide would be reduced to elemental lead and slowly sunken down to the bottom of the fusion pot and collected the gold and silver along the way.

(c)

After one hour of fusion, the sample was then taken out and pour into a conical cast iron mould, the elemental lead which contained precious metals would stayed at the bottom of the mould and any unwanted materials called slag would floated on top and removed by hammering, a "lead button" is formed.

(d)

The lead button was then put back in the furnace onto a preheated cupel for a second stage of separation, at 1650 F, the lead button became liquefied and absorbed by the cupel, but gold and silver which had higher melting points would stayed on top of the cupel.

(e)

After 45 minutes of cupellation, the cupel was then taken out and cooled, the dore bead which contained precious metals was then transferred into a test tube and dissolved in hot Aqua Regia solution heated by a hot water bath.

(f)

The gold in solution is determined with an Atomic Absorption spectrometer. The gold value, in parts-per-billion, or grams-per-tonne is calculated by comparison with a set of known gold standards.

QUALITY CONTROL

Every fusion of 24 pots contains 22 samples, one internal standard or blank, and a random reweigh of one of the samples. Samples with anomalous gold values greater than 1000 ppb are automatically checked by Fire Assay/AA methods. Samples with gold values greater than 10000 ppb are automatically checked by Fire Assay/Gravimetric methods.

APPENDIX D

QA/QC Pre-2000 (from the 2000 Prefeasibility Study)

***From 2000 Pre-feasibility Report (by MRDI for Cumberland Resources)**

Evaluation of QA/QC Results

Results for the pulp check assays, coarse rejects and SRMs are evaluated in the following sections. These results indicate that coarse gold particles are present in the samples. The effect of coarse gold on the evaluations is discussed, and it is concluded the assay results are adequate for the resource estimations made as part of this study. Recommendations for dealing with the coarse gold in the sampling and assaying are given in other documents previously delivered to CRL.

Pulp Check Assay Results Prior to 1998

There were 42 check assays run on pulp material from drilling conducted prior to 1998. Comparison of the original and check values using the relative difference formula defined above had only 52% of the relative differences within 10% (Figure 2.9). There were 83% of the differences within 20%. This lack of correspondence in the preliminary results produced concerns about the presence of coarse gold in the samples. (Appendix B - fax from M. Sedore to G. Dickson). Discussions at this time, also, raised the possibility of conducting an audit of the primary laboratory. At this point, there was too little information to know if the differences in check assays were the result of coarse gold or a possible laboratory problem. Subsequent check assay work indicated that coarse gold was the most likely cause of the differences.

Figure 2.9: Percentage of Check Assays vs. the Relative Difference (pre-1998)

Pulp Check Assay Results from 1998

The results from the pulp duplicates, as shown in Figure 2.10 and Figure 2.11, show there are not as strong a correspondence between the IPL assays and Chemex checks than is usually desirable. Only 53% of the duplicate pulp samples display a relative difference of less than 10%, and just 80% fall within 20%. However, Figure 2.11 shows the results tend to scatter on both sides of the x=y line indicating no bias in the results. The discrepancies in these data are similar to the differences identified in the checks run on the drilling prior to 1998. Again, there is no clear indication what causes the assays to be erratically different.

The pattern of differences prompted a program of blindly resubmitting samples to the same lab. This program was conducted after similar results appeared in the 1999 check assays. The resubmission work indicated erratic differences occurred in reassays from both primary and check laboratories, and it was unlikely laboratory procedure caused the differences.

Figure 2.10: Precentage of Check Assays vs. the Absolute Relative Difference (1998)

Figure 2.11: Scatter of Original (IPL) and Check (Chemex) Assay Results (1998)

Pulp Check Assaying for 1999

The results from the pulp duplicates, as shown in Figure 2.12, show the correspondence between the IPL assays and Chemex checks is about the same as it is for 1998. About 80% fall within 20%. Again, the results tend to scatter on both sides of the relative difference = 0 line, indicating no bias in the results. The discrepancies in these data are similar to the differences identified in all prior check results.

Figure 2.12: Percentage of Check Assays vs. the Relative Difference (1999)

Coarse Reject Check Assaying for 1998

The results from the assaying of the coarse reject duplicates by IPL are shown in Figure 2.13. These results show a higher discrepancy rate than what is usually deemed acceptable (see previous descriptions). Approximately 85% of the duplicate assays are within 30% relative difference.

Figure 2.13: Percentage of Coarse Reject vs. the Absolute Difference (1998)

Coarse Reject Check Assaying for 1999

The results from the assaying of the coarse reject duplicates by IPL are shown in Figure 2.14. The results are similar to 1998. Approximately 85% of the duplicate assays are within 30% relative difference.

Figure 2.14 Percentage of Coarse Reject Difference vs. the Relative Difference (1999)

Standard Reference Material Results

SRMs used by CRL were purchased from CANMET (Natural Resources Canada). The html page describing the two SRMs is included in Appendix B. Table 2.4 summarizes the values and confidence intervals for these SRMs used.

Table 2.4: CANMET Standard Reference Material

SRM	Certified Value	95% Confidence Interval
MA-3a	8.56 g/t	0.09 g/t
CH-3	1.40 g/t	0.03 g/t

Assaying of SRM produced results that lead to the recommendations for an audit of the IPL laboratory. Assays of the lower grade SRM, CH-3, showed approximately 8% of the assays fall outside the 95% confidence limits (Figure 2.15). Ideally, only 5% of the results should fall outside of the confidence limits, but the discrepancy may be attributed to the small number of assays. For the higher grade SRM, MA-3a, approximately 36% of the assays fell outside the 95% confidence limits (Figure 2.16). Clearly, this failure was not the result of a small sampling. MRDI recommends re-assaying those batches where the SRM result fell outside of the confidence limits.

Figure 2.15: Meadowbank SRM Control Chart for Cnmet SRM: CH-3 (1998)

Figure 2.16: Meadowbank SRM Control Chart for Canmet SRM: MA-3A (1998)

Standard Reference Material Results for 1999

Results from the assays of SRM in 1999 are quite good. No assays fell outside of the control or confidence limits for either standard (Figures 2.17 and 2.18).

Figure 2.17: Meadowbank SRM Control Chart for Canmet SRM: CH-3 (1999)

Figure 2.18: Meadowbank SRM Control Chart for Canmet SRM: MA-3A (1999)

Final Laboratory Check Program

To verify that coarse gold and not a laboratory caused the lack of correspondence in the check assays, seventy (including blanks and SRM) previously assayed pulp samples were resubmitted blind to both IPL and Chemex. The results from this program indicate that erratic results are probably not the result of lab problems. Samples resubmitted to either lab return results that show the same type of correspondence as the check assays of the pulps. The re-submission results suggest coarse or liberated gold is the most likely cause of the erratic but unbiased check assays.

APPENDIX E

QA/QC 2000-2003 Charts for Check and Duplicate Assays

APPENDIX F

Specific Gravity Data

APPENDIX G

List of Drill Holes Checked

HOLE-ID	Deposit
VLT00-008	Vault
VLT00-024	Vault
VLT01-045	Vault
VLT02-061	Vault
VLT02-094	Vault
VLT03-115	Vault
VLT03-127	Vault
VLT03-144	Vault
VLT03-162	Vault
VLT03-183	Vault
VLT03-198	Vault
91053	Goose Island
G95-070	Goose Island
G96-111	Goose Island
G99-325	Goose Island
G03-440	Goose Island
90027	Portage
91044	Portage
91047	Portage
NP02-401	Portage
NP02-405	Portage
NP02-413	Portage
NP03-480	Portage
NP96-140	Portage
NP96-159	Portage
TP95-096	Portage
TP97-194	Portage
TP97-203	Portage
TP97-209	Portage
TP97-216	Portage
TP98-236	Portage
TP98-261	Portage
TP99-344	Portage
TP99-364	Portage
TP99-382	Portage

APPENDIX H

List of Drill Hole Locations and Mineralized Intervals

Hole-ID	East (m)	North (m)	Elev (m)	Length (m)
91050	-508.00	-1100.00	137.55	167.00
91051	125.00	-1100.00	136.25	179.00
91052	162.60	-969.21	136.41	176.00
91053	146.00	-1400.00	134.75	248.00
91064	150.00	-1200.00	134.95	200.00
G03-437	-75.81	-1224.97	132.95	45.00
G03-438	82.01	-1250.06	133.63	56.00
G03-439	85.50	-1275.23	133.82	63.00
G03-440	84.61	-1300.24	134.10	65.00
G03-441	70.02	-1225.12	133.96	50.00
G95-065	80.60	-1049.95	135.05	62.00
G95-066	20.92	-1050.05	134.34	116.00
G95-067	34.46	-1149.98	134.38	74.00
G95-068	-23.55	-1150.06	134.14	197.00
G95-069	-2.42	-1199.85	134.05	113.00
G95-070	-30.64	-1249.54	134.04	158.00
G95-071	-79.36	-1149.95	134.13	248.00
G96-097	35.30	-1250.30	134.35	98.00
G96-098	-74.20	-1250.20	134.35	224.00
G96-099	29.50	-1300.60	134.35	113.00
G96-100	-76.40	-1200.00	134.35	227.00
G96-101	48.10	-1200.40	134.35	53.00
G96-102	-28.60	-1300.40	134.35	182.00

G96-103	-58.70	-1300.00	134.35	209.00
G96-104	48.60	-1149.60	133.80	59.00
G96-105	-55.90	-1150.40	134.35	218.00
G96-106	45.40	-1350.20	134.35	140.00
G96-107	-16.80	-1350.40	134.35	170.00
G96-108	-56.10	-1099.10	134.35	216.36
G96-109	-53.10	-1350.30	134.35	233.00
G96-110	45.90	-1100.20	134.35	71.00
G96-111	-56.00	-1050.10	134.35	206.00
G96-112	-56.10	-976.00	134.35	203.00
G96-113	19.50	-975.90	134.35	116.00
G96-114	53.30	-899.90	134.35	140.00
G96-115	-13.00	-1399.80	134.35	209.00
G96-116	-6.80	-900.10	134.35	156.00
G96-117	49.30	-749.80	134.35	131.00
G96-118	-8.70	-750.20	134.35	92.00
G96-127	-96.80	-1000.70	134.35	233.00
G96-128	42.20	-1499.60	134.35	134.00
G96-129	28.40	-1599.10	134.35	121.50
G96-130	-60.60	-1400.40	134.35	273.50
G96-131	-88.60	-1300.50	134.35	275.00
G96-132	-15.40	-1600.80	134.35	227.00
G96-133	-14.50	-1500.00	134.35	230.00
G96-134	-114.30	-1200.00	134.35	275.00
G96-138	-104.40	-1100.00	134.35	257.00
G97-160	-141.00	-1299.00	134.15	473.60
G97-161	-210.60	-1199.90	134.15	543.00
G97-163	-149.30	-1400.10	134.25	571.00
G97-165	-64.10	-1599.80	134.45	551.00
G97-172	-25.20	-1748.50	134.35	469.00
G97-182	1.10	-1100.10	134.45	168.00
G98-225	-94.02	-1200.16	133.22	377.00
G98-226	-114.38	-1300.15	133.25	536.00
G98-227	-27.49	-1200.03	133.21	230.00
G98-228	-104.56	-1400.23	133.28	552.00
G98-229	5.56	-1150.10	133.19	180.00
G98-231	10.37	-1250.05	133.36	158.00
G98-232	-74.36	-1500.14	133.27	510.00
G98-238	-134.47	-1499.90	133.02	661.00
G99-323	20.80	-1174.24	134.08	96.00
G99-324	-15.15	-1174.21	133.91	175.00

G99-325	-63.68	-1174.25	133.86	231.00
G99-329	28.18	-1224.91	133.59	98.00
G99-331	-6.28	-1224.89	133.51	144.00
G99-332	-44.30	-1224.91	134.01	201.00
G99-333	-78.25	-1224.96	133.48	246.00
Hole-ID	**East (m)**	**North (m)**	**Elev (m)**	**Length (m)**
89001	-83.22	92.61	141.64	131.00
89002	-83.30	92.54	141.38	56.00
89002	-83.30	92.54	141.38	119.00
89003	-109.63	167.62	142.02	113.00
89004	-110.39	166.97	142.08	136.00
89005	-102.37	129.37	141.98	119.00
89006	-105.13	127.55	141.41	89.00
89007	-195.10	222.04	139.79	110.00
89008	-130.26	151.59	140.88	106.00
89009	-162.50	183.34	138.99	113.00
89010	-200.84	333.02	139.26	113.00
89011	-81.07	-448.69	134.81	80.00
89012	-84.85	54.47	139.54	137.00
89013	40.39	-4.41	141.63	107.00
90014	-4.05	-39.72	140.48	116.70
90015	-221.27	361.63	137.45	65.00
90016	-35.67	44.47	141.19	122.00
90017	-35.30	0.02	140.11	140.00
90018	-36.17	-0.92	140.19	137.00
90019	7.80	0.00	141.26	101.00
90020	-208.55	196.20	136.08	101.00
90021	-211.40	242.78	137.82	95.00
90022	-221.70	283.28	137.72	62.00
90023	-223.80	323.68	138.33	62.00
90024	-44.29	60.84	141.56	118.00
90025	-23.58	30.96	141.16	122.00
90026	51.27	-79.66	141.55	110.00
90027	27.68	19.12	141.68	77.35
90028	-64.69	125.59	142.70	95.00
90029	-254.90	263.38	133.59	80.00
90030	-250.10	303.88	133.38	65.00
90031	-197.30	323.48	139.51	50.00
90032	-242.10	323.78	135.91	59.00
90033	-6.51	19.84	141.27	119.00
90034	11.59	32.52	141.89	92.00

90035	-116.09	-45.78	136.01	176.00
90036	-64.27	28.23	139.79	131.00
90037	29.84	44.81	142.23	65.00
90038	-138.66	196.37	141.80	86.00
90039	-199.60	281.87	139.31	62.00
90040	-531.46	1120.34	135.82	116.00
91041	49.22	-41.12	141.29	74.00
91042	-0.12	-79.65	140.24	128.00
91043	42.71	-199.85	138.63	146.00
91044	-18.48	-199.98	135.30	146.00
91045	-21.55	-200.07	135.15	86.00
91046	-320.09	-199.84	134.92	200.00
91047	-337.40	65.60	138.98	203.00
91048	-400.00	400.00	143.10	158.00
91049	-698.63	-200.81	147.84	230.00
91056	-84.39	-448.40	134.75	209.00
91057	-160.97	461.74	135.18	161.00
91058	-161.88	461.88	135.16	71.00
91059	-72.00	322.00	147.30	122.00
91060	-211.99	460.96	134.20	71.00
91061	-210.27	461.60	134.24	74.00
G96-122	2.10	-600.00	134.35	149.00
G97-169	-100.50	-600.10	134.25	233.00
G98-259	-250.15	-600.44	133.56	393.00
GNP02-01	-428.72	1024.50	138.87	111.00
GNP02-02	-535.71	1124.49	136.87	109.50
GNP02-03	-458.39	1224.83	146.84	111.00
GTP02-01	-227.97	263.66	137.59	110.00
GTP02-02	-68.40	-92.60	138.01	149.00
NP02-385	-234.92	600.07	132.73	80.00
NP02-386	-320.13	750.05	132.70	164.00
NP02-387	-394.71	825.26	132.50	191.00
NP02-390	-259.77	650.25	132.43	101.00
NP02-391	-313.93	650.33	132.31	104.00
NP02-392	-363.44	650.15	132.41	179.00
NP02-393	-321.76	600.27	132.43	110.00
NP02-397	-405.00	865.00	133.30	152.00
NP02-398	-455.00	865.00	133.30	170.00
NP02-399	-344.40	825.22	133.14	107.00
NP02-400	-390.74	940.23	132.88	116.00
NP02-401	-454.55	940.73	132.91	158.00

NP02-404	-210.62	600.16	133.26	75.00
NP02-405	-184.81	600.11	133.24	102.00
NP02-406	-354.72	865.00	133.33	87.00
NP02-407	-304.53	865.40	134.24	72.00
NP02-408	-320.02	825.20	133.27	84.57
NP02-409	-295.21	825.41	132.78	78.00
NP02-410	-292.96	700.85	132.81	108.00
NP02-411	-267.01	700.75	132.77	80.00
NP02-412	-241.88	700.50	133.24	69.00
NP02-413	-370.23	790.24	133.43	105.00
NP02-414	-320.66	790.12	133.39	90.00
NP02-415	-234.34	650.26	133.10	83.00
NP02-416	-538.79	1077.40	133.65	123.00
NP02-417	-498.10	981.08	133.55	102.00
NP02-418	-268.20	825.08	132.93	80.00
NP02-419	-254.46	865.08	132.99	63.00
NP02-420	-321.83	900.37	133.62	75.00
NP02-421	-353.59	979.73	136.24	71.00
NP02-422	-402.68	1000.25	137.24	80.00
NP02-423	-387.57	1075.10	143.12	89.00
NP02-424	-438.42	1075.76	141.31	92.00
NP02-425	-473.95	1075.34	137.55	110.00
NP02-426	-471.30	1100.51	139.82	101.00
NP02-427	-505.42	1100.49	136.97	104.00
NP02-428	-494.98	1150.55	141.08	104.00
NP02-429	-546.12	1150.51	137.90	122.00
NP02-430	-451.65	1175.46	145.17	80.00
NP02-431	-475.02	1275.69	147.30	98.00
NP02-432	-624.78	1276.14	140.30	161.00
NP02-433	-600.71	1315.17	144.96	155.00
NP02-434	-549.60	1314.78	146.40	131.00
NP03-445	-334.55	700.05	132.63	110.00
NP03-446	-380.00	700.00	133.23	136.00
NP03-447	-451.68	700.79	133.24	169.00
NP03-454	-280.71	750.19	133.23	92.00
NP03-458	-280.55	789.94	133.27	77.00
NP03-460	-420.25	790.34	133.00	119.00
NP03-461	-505.00	940.00	133.00	47.00
NP03-480	-550.03	1400.26	150.68	108.00
NP03-481	-599.33	1400.26	147.80	159.00
NP03-482	-649.97	1399.93	144.37	160.00

NP03-483	-699.56	1400.00	139.78	230.00
NP03-484	-652.35	1315.24	141.28	197.00
NP03-485	-675.69	1275.41	137.90	230.00
NP96-139	-569.72	1125.30	134.30	224.00
NP96-140	-481.48	1125.19	139.81	164.00
NP96-141	-505.06	1350.53	150.32	119.00
NP96-142	-564.66	1350.15	147.63	149.00
NP96-147	-524.80	1176.10	140.65	119.00
NP96-148	-575.70	1175.00	137.27	143.52
NP96-149	-533.20	1225.90	142.47	125.00
NP96-150	-563.10	1225.90	141.07	132.00
NP96-158	-620.70	1175.40	134.87	176.00
NP96-159	-607.80	1226.00	138.47	188.00
NP97-173	-408.80	750.10	132.57	284.00
NP97-174	-646.20	1126.40	132.57	212.00
NP97-175	-484.40	1025.10	132.27	110.00
NP97-176	-541.50	1024.90	132.47	167.00
NP97-177	-611.10	1025.20	132.00	227.00
NP97-192	-724.80	1448.90	137.98	290.00
NP98-241	-360.16	749.41	132.88	179.00
NP98-244	-458.79	749.19	132.66	239.00
NP98-247	-420.56	899.68	133.04	179.00
NP98-249	-470.14	899.29	132.94	236.00
NP98-252	-370.06	899.71	133.10	113.00
NP98-254	-426.72	824.85	132.69	227.00
NP98-257	-476.51	824.35	133.03	224.00
NP98-260	-475.47	599.48	134.60	209.00
NP98-262	-376.48	599.48	132.55	179.00
NP98-264	-272.85	599.86	132.83	110.00
NP98-273	-657.25	1225.19	135.71	217.00
NP98-274	-611.99	1350.28	144.87	204.00
NP98-275	-664.48	1350.46	141.26	120.00
NP98-276	-664.48	1350.46	141.26	258.00
NP98-295	-673.39	1449.80	141.65	167.00
NP98-297	-622.98	1450.07	145.84	152.00
NP98-300	-573.50	1449.98	150.22	114.00
NP98-304	-431.55	1124.82	143.54	90.00
NP98-306	-377.36	1125.38	144.58	81.00
NP98-307	-481.71	1225.12	144.66	89.00
NP98-308	-334.67	1125.78	143.51	90.00
NP98-309	-433.81	1225.59	146.32	92.00

NP98-310	-434.70	1024.99	137.88	87.00
NP98-311	-384.26	1224.73	146.89	77.00
NP98-318	-384.55	1025.25	139.04	78.00
NP98-319	-335.11	1025.31	138.98	75.00
NP98-320	-298.48	1126.01	142.04	75.00
NP98-321	-575.15	1274.83	143.03	137.00
NP98-322	-524.24	1275.08	145.31	111.00
TP02-388	-260.32	550.21	132.51	80.00
TP02-389	-346.70	550.10	132.47	110.00
TP02-394	-231.05	499.95	133.04	62.00
TP02-395	-280.23	499.81	132.66	110.00
TP02-396	-332.29	499.98	132.09	110.00
TP02-402	-180.85	499.74	133.45	70.00
TP02-403	-209.95	550.27	133.10	99.00
TP03-435	-166.62	-325.03	136.62	190.00
TP03-436	-170.50	-275.09	134.15	185.00
TP03-442	-17.92	-225.25	133.60	200.00
TP03-443	-54.69	-225.15	133.60	167.00
TP03-444	-98.72	-224.72	133.60	167.00
TP03-448	-274.18	209.37	133.39	80.00
TP03-449	-68.36	-274.89	134.12	152.00
TP03-450	-53.72	-299.87	133.99	156.00
TP03-451	-59.78	-325.14	132.07	173.00
TP03-452	-239.18	119.75	134.14	119.00
TP03-453	-209.21	149.74	134.28	96.00
TP03-455	-28.79	-275.09	134.03	149.00
TP03-456	5.37	-274.70	133.92	130.00
TP03-457	-312.00	350.00	133.00	20.54
TP03-459	-19.94	-324.90	131.54	152.00
TP03-462	-161.77	150.06	139.02	104.00
TP03-463	-159.13	95.06	137.62	113.00
TP03-464	-127.36	95.18	139.17	119.00
TP03-465	-149.95	34.32	135.78	146.00
TP03-466	-149.50	35.35	135.81	134.00
TP03-467	-63.70	163.36	145.59	80.00
TP03-468	-84.01	148.89	143.25	98.00
TP03-469	-44.24	176.74	147.89	55.00
TP03-470	-56.04	187.01	147.72	47.00
TP03-471	-72.66	175.46	145.83	71.00
TP03-472	-86.42	165.73	143.87	95.00
TP03-473	-100.63	155.90	142.20	107.00

TP03-474	-109.95	148.91	142.06	107.00
TP03-475	-75.31	118.50	142.46	101.30
TP03-476	-74.92	118.76	142.40	110.00
TP03-477	-72.30	138.99	143.30	113.00
TP03-478	-51.18	153.99	146.07	74.00
TP03-479	-48.75	137.58	145.65	74.00
TP03-486	-499.16	380.45	146.01	380.00
TP03-487	-448.18	95.82	141.32	401.00
TP03-488	-178.94	191.87	138.27	107.00
TP03-489	-164.11	201.97	139.65	101.00
TP03-490	-40.83	104.41	142.56	101.00
TP03-491	-21.55	119.51	144.94	91.24
TP95-082	-10.01	-157.83	139.52	140.00
TP95-083	51.14	-156.47	142.15	77.00
TP95-084	-9.66	-119.79	140.04	131.00
TP95-085	51.71	-120.19	142.95	83.00
TP95-086	0.54	69.27	143.17	94.00
TP95-087	-90.69	7.53	137.89	137.00
TP95-088	-40.63	89.20	142.25	116.00
TP95-089	-106.24	38.09	138.45	140.00
TP95-090	-82.28	113.37	141.89	101.00
TP95-091	-177.50	176.70	138.21	113.00
TP95-092	-195.96	168.06	136.75	98.00
TP95-093	-226.97	377.14	136.03	65.00
TP95-094	-196.67	376.75	138.77	59.00
TP95-095	-223.33	416.03	136.28	56.00
TP95-096	-191.92	416.38	137.26	50.00
TP96-119	-273.80	325.50	133.20	59.00
TP96-120	-267.90	379.80	133.20	62.00
TP96-121	-262.60	468.30	133.20	74.00
TP96-123	2.80	-349.60	133.80	167.00
TP96-125	-292.40	466.30	133.20	86.00
TP96-126	-297.10	325.60	133.20	71.00
TP96-135	-39.40	-349.90	133.80	176.00
TP96-136	9.10	-299.90	133.80	122.00
TP96-137	-49.20	-299.80	133.80	185.00
TP96-151	-92.60	220.93	145.19	88.00
TP96-152	-147.66	136.66	139.67	119.00
TP96-153	-72.03	194.01	145.87	53.00
TP96-154	-56.49	148.91	145.30	78.50
TP96-155	-153.47	281.86	141.27	77.00

TP96-156	-28.82	-38.70	139.59	134.00
TP96-157	-340.62	246.72	134.10	152.00
TP97-166	-25.30	-249.30	133.38	173.00
TP97-167	-84.30	-249.80	133.08	200.00
TP97-168	-131.60	-196.40	133.28	212.00
TP97-170	-201.90	-195.10	133.38	269.00
TP97-178	-257.10	-162.90	133.28	257.00
TP97-179	-188.40	-163.50	132.48	209.00
TP97-180	-224.10	-128.50	133.28	206.00
TP97-181	-289.00	-128.30	133.28	269.00
TP97-183	-239.80	-194.10	133.38	230.00
TP97-185	-20.68	-157.74	139.00	191.00
TP97-187	-21.11	-157.80	138.82	179.00
TP97-189	-29.84	-119.89	139.56	188.00
TP97-191	-39.03	-158.57	136.82	176.00
TP97-193	-21.33	-79.97	139.76	170.00
TP97-194	-66.12	-39.88	137.97	158.00
TP97-195	-44.82	-80.01	138.57	136.00
TP97-196	-130.65	-250.17	137.32	200.00
TP97-197	-66.44	-39.88	137.93	140.00
TP97-198	-75.13	-79.85	136.96	179.00
TP97-199	-130.08	-250.11	137.34	170.00
TP97-200	-19.11	-119.65	139.31	149.00
TP97-201	-131.54	-250.43	137.27	215.00
TP97-202	-19.63	-119.61	139.31	140.00
TP97-203	-109.18	-349.91	138.24	215.00
TP97-204	91.88	-120.18	141.25	41.00
TP97-205	-54.41	111.08	142.15	116.00
TP97-206	-114.28	-299.89	137.33	179.00
TP97-207	-149.60	65.82	136.26	122.00
TP97-208	-130.30	-299.89	136.42	217.00
TP97-209	-130.14	119.74	140.03	122.00
TP97-210	-175.80	119.62	135.52	143.00
TP97-211	-94.70	-399.79	137.26	203.00
TP97-212	-164.56	65.56	135.53	140.00
TP97-213	-110.23	0.49	136.92	160.00
TP97-214	-132.82	-324.60	136.88	116.00
TP97-215	-158.04	0.15	134.38	173.00
TP97-216	-138.70	-275.00	136.04	119.00
TP97-217	-130.79	-349.90	136.02	128.00
TP97-218	-124.49	-374.69	136.47	131.00

TP97-219	-399.09	64.70	139.71	243.00
TP97-220	-374.20	-198.84	140.77	272.00
TP98-230	-170.34	-324.84	133.77	248.00
TP98-233	-185.25	-39.35	133.72	218.00
TP98-234	-75.82	-159.97	133.77	56.00
TP98-235	-125.28	-79.70	134.36	161.00
TP98-236	-129.06	-159.73	133.48	74.00
TP98-237	-230.01	-375.56	133.43	347.00
TP98-239	-82.09	-119.70	135.12	83.00
TP98-240	-210.14	-0.02	133.66	209.00
TP98-242	-259.74	-0.02	133.58	194.00
TP98-243	-231.85	-326.51	133.29	456.00
TP98-245	-310.00	-0.02	133.56	203.00
TP98-246	-225.44	-79.09	133.44	254.00
TP98-248	-324.04	-79.03	133.57	206.00
TP98-250	-287.26	-39.49	133.40	170.00
TP98-251	-173.93	-375.42	133.30	252.00
TP98-253	-199.91	-275.11	133.67	245.00
TP98-255	-249.58	-275.28	133.43	224.00
TP98-256	-199.19	-449.41	133.41	351.00
TP98-258	-175.90	-120.69	133.50	173.00
TP98-261	-294.63	179.81	134.79	152.00
TP98-263	-248.98	-449.47	133.45	354.00
TP98-265	-173.27	-160.05	133.41	101.00
TP98-266	-274.81	-79.24	133.36	239.00
TP98-267	-148.72	-448.05	133.65	291.00
TP98-268	-174.28	-79.30	133.36	110.00
TP98-269	-218.87	-225.40	133.65	275.00
TP98-270	-223.25	-300.04	133.42	351.00
TP98-271	-266.55	-225.65	133.61	257.00
TP98-272	-174.54	-500.12	133.37	338.00
TP98-277	-344.28	179.72	136.22	198.00
TP98-278	-449.43	66.16	139.35	198.00
TP98-279	-98.75	464.81	136.11	116.00
TP98-280	-398.98	-80.72	134.36	207.00
TP98-281	-189.23	350.10	139.38	62.00
TP98-282	-163.37	325.48	141.23	62.00
TP98-283	-199.32	304.13	139.44	71.00
TP98-284	-320.19	-273.93	137.85	255.00
TP98-285	-149.62	304.34	141.32	59.00
TP98-286	-34.39	171.25	147.28	56.00

TP98-287	-31.52	148.71	146.22	83.00
TP98-288	-299.24	119.90	135.32	210.00
TP98-289	-5.26	118.42	145.18	77.00
TP98-290	-393.74	180.18	137.83	216.00
TP98-291	-9.24	90.83	143.48	101.00
TP98-292	-349.03	119.75	137.75	189.00
TP98-293	-163.62	420.61	137.32	140.00
TP98-294	-159.46	350.20	140.29	47.00
TP98-296	-399.69	0.17	135.42	195.00
TP98-312	-169.36	380.51	139.01	93.00
TP98-313	5.12	51.60	142.07	102.00
TP98-314	-128.57	261.89	143.48	39.00
TP98-315	-39.57	89.63	141.84	117.00
TP98-316	-119.45	303.18	143.69	84.00
TP98-317	-131.38	325.12	142.52	51.00
TP99-326	-148.25	-180.01	133.82	62.00
TP99-327	-172.26	-180.10	133.91	92.00
TP99-328	-195.27	-180.25	133.78	110.00
TP99-330	-217.23	-180.19	133.65	134.00
TP99-334	-209.86	-159.73	133.78	125.00
TP99-335	-157.87	-199.76	134.39	98.00
TP99-336	-231.86	-159.80	133.56	142.00
TP99-337	-284.12	304.06	133.15	66.00
TP99-338	-182.62	-199.60	133.87	107.00
TP99-339	-264.20	303.92	133.23	69.00
TP99-340	-259.28	350.23	133.76	60.00
TP99-341	-240.23	-180.20	133.76	149.00
TP99-342	-249.55	379.90	133.38	57.00
TP99-343	-192.67	-224.73	133.72	230.00
TP99-344	-257.37	325.45	134.71	60.00
TP99-345	-243.33	284.38	134.54	57.00
TP99-346	-176.27	-226.16	133.90	177.00
TP99-347	-263.28	284.30	133.80	54.00
TP99-348	-300.14	263.66	133.20	69.00
TP99-349	-274.57	263.52	133.34	57.00
TP99-350	-277.31	241.61	133.39	72.00
TP99-351	-156.84	-225.31	135.22	119.00
TP99-352	-244.38	242.20	133.94	75.00
TP99-353	-261.73	419.78	132.73	66.00
TP99-354	-295.87	419.61	132.87	75.00
TP99-355	-150.41	-139.91	133.74	32.00

TP99-356	-244.95	-39.86	133.97	93.00
TP99-357	-191.42	-138.44	133.97	119.00
TP99-358	-232.82	-60.10	133.83	132.60
TP99-359	-170.35	-138.73	133.76	101.00
TP99-360	-216.57	-138.19	133.78	137.00
TP99-361	-190.01	-59.94	134.04	75.00
TP99-362	-200.08	-79.99	134.15	90.00
TP99-363	-159.31	-79.92	133.95	57.00
TP99-364	-153.19	-119.58	133.66	57.00
TP99-365	-186.01	-249.51	133.71	75.00
TP99-369	-313.11	549.84	132.75	117.00
TP99-370	-21.37	-15.07	140.49	147.00
TP99-371	-45.57	17.21	140.59	117.00
TP99-372	-85.25	38.03	139.12	135.00
TP99-373	26.41	18.57	141.75	30.00
TP99-374	67.14	47.09	144.40	69.00
TP99-375	47.07	57.39	144.77	60.00
TP99-376	34.50	73.19	145.12	60.00
TP99-377	-0.70	48.34	142.09	30.00
TP99-378	12.17	81.71	144.26	57.00
TP99-379	15.71	108.48	146.42	72.00
TP99-380	-13.51	88.53	143.51	51.00
TP99-381	-153.75	234.35	141.51	72.00
TP99-382	-227.93	263.50	137.22	72.00
TP99-383	-205.03	261.80	138.26	81.00
TP99-384	-174.87	263.31	140.94	75.00
TPMET02-01	-53.77	187.27	147.49	60.25
TPMET02-02	80.21	20.16	143.31	66.00
TPMET02-03	-114.06	224.95	145.20	60.00
Hole-ID	**East (m)**	**North (m)**	**Elev (m)**	**Length (m)**
GTVLT02-01	-4799.77	4574.49	146.04	120.00
GTVLT02-02	-4884.53	4859.91	142.33	93.00
GTVLT02-03	-4870.22	4739.52	144.66	93.00
GTVLT03-04	-4603.87	4928.27	141.05	200.00
VLT00-001	-4923.80	4949.95	143.45	107.00
VLT00-002	-4959.81	4950.18	143.33	53.00
VLT00-003	-4899.79	4675.07	148.12	101.00
VLT00-004	-4950.00	5100.00	142.55	92.00
VLT00-005	-4800.00	4925.00	142.55	95.00
VLT00-006	-4890.30	4949.67	142.71	74.00
VLT00-007	-4849.93	4925.64	142.05	92.00

VLT00-008	-4949.22	4675.01	148.16	101.00
VLT00-009	-4651.36	4926.87	143.06	113.00
VLT00-010	-4873.27	4499.92	151.06	110.00
VLT00-011	-4782.28	4499.46	149.21	122.00
VLT00-012	-4725.57	4350.28	142.07	134.00
VLT00-013	-4834.78	4350.53	144.47	116.00
VLT00-014	-4875.01	4350.04	145.32	83.00
VLT00-015	-4824.82	4674.32	146.01	104.00
VLT00-016	-4750.33	4674.13	143.03	122.00
VLT00-017	-4900.71	4574.69	151.69	77.00
VLT00-018	-4824.30	4575.78	149.45	101.00
VLT00-019	-4900.73	4424.48	151.96	80.00
VLT00-020	-4826.92	4425.15	147.82	101.00
VLT00-021	-4753.46	4572.48	142.55	134.00
VLT00-022	-4924.88	4800.19	148.87	80.00
VLT00-023	-4830.92	4800.62	145.96	101.00
VLT00-024	-4749.71	5100.01	142.55	134.00
VLT00-025	-5132.56	4674.80	142.55	80.00
VLT00-026	-4698.47	5100.14	142.55	164.00
VLT00-027	-4849.56	5749.63	142.55	182.00
VLT01-028	-4651.52	4574.81	142.35	198.00
VLT01-029	-4599.46	4800.61	144.31	228.00
VLT01-030	-4623.19	5100.33	142.11	225.00
VLT01-031	-4775.00	5300.00	142.55	207.00
VLT01-032	-4575.00	5300.00	142.55	270.00
VLT01-033	-4574.42	4926.93	142.87	198.00
VLT01-034	-4516.18	4914.76	142.55	288.00
VLT01-035	-4375.00	4925.00	142.55	339.00
VLT01-036	-4475.00	4800.00	142.55	306.00
VLT01-037	-4553.00	4575.00	142.55	201.00
VLT01-038	-4625.00	4500.00	142.55	207.00
VLT01-039	-4661.76	4673.93	142.36	174.00
VLT01-040	-4735.00	4800.00	142.55	156.00
VLT01-041	-4725.00	4925.00	142.55	186.00
VLT01-042	-4573.59	4673.60	142.08	213.00
VLT01-043	-4625.00	5200.00	142.55	294.00
VLT01-044	-4775.31	5025.30	144.30	129.00
VLT01-045	-4843.33	5025.13	143.12	105.00