

TECHNICAL REPORT OF ACTIVITIES  
ON THE  
GRIZZLY DIAMOND DRILLING PROJECT

ATLIN MINING DIVISION  
NTS: 104K  
LONG: 132° 17' W LAT: 58° 13' N

Owned & Operated By:

**North American Metals Corp.**  
1500-700 West Pender Street  
Vancouver, B.C., V6C 1G8

**EXPLORE B.C. PROGRAM**  
Grant I.D. #95/96 A-118

Andrew P. Hamilton, B.Sc.

January 1995



25369  
PART 1 of 3

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**GEOLOGICAL SURVEY BRANCH  
ASSESSMENT REPORT**

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## EXECUTIVE SUMMARY

The Grizzly Zone is an area of gold mineralization located on the Golden Bear Mine property in the Tatsamenie gold camp. It lies down dip from, and on the same structure as, the Bear Main deposit, which sustained mining operations on the property until exhausted in 1994. From late 1994 until mid-August 1995, North American Metals Corp has carried out a diamond drilling program consisting of 33 NQ diameter drill holes totalling 5606.72 metres (18,441 feet) in an effort to outline the extent and nature of gold mineralization.

The results of this diamond drilling program have allowed a preliminary polygonal mineral inventory to be calculated. Based on 50 metre east-west sections and a 12 gram per tonne cutoff the Grizzly Zone is estimated to contain a mineral inventory of 152,945 tonnes grading 23.39 grams per tonne gold.

There is good potential to significantly increase the mineral inventory of the Grizzly zone through additional diamond drilling on known mineralized zones. Drilling should be continued as fans of holes on 50 metre sections. This will require that the decline be advanced minimum of 150 metres. In addition, several widely spaced holes that have been drilled in the Grizzly carbonate lens suggest gold mineralization is widespread and that potential for locating other zones of significant gold mineralization is high. Such zones could be tested for by drilling additional, widely spaced drill holes in areas of the Grizzly carbonate lens where drill coverage is sparse or lacking.

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## **1.0 INTRODUCTION**

The Grizzly Zone is an area of gold mineralization that occurs on the Golden Bear Mine property in northwestern British Columbia. It lies 400 metres below, and on the same structure as, the Bear Main deposit, which sustained mining operations at the site from 1989 until exhaustion in 1994, during which 6,781,807 grams (218,040 oz.) of gold were produced from 535,277 tonnes of ore. The property is 100% owned by North American Metals Corp.(NAMC), an 81.4% owned subsidiary of Wheaton River Minerals Ltd. From January 1995 to August 1995 an exploration program of diamond drilling from underground stations on the Grizzly decline was carried out on the zone. Completed fieldwork consists of 33 diamond drill holes totalling 5606.72 metres (18,441 feet). This work has defined a preliminary, drill indicated resource of 152,945 tonnes grading 23.39 grams per tonnes gold, uncut.

### **1.1 SCOPE OF REPORT**

This report serves to present the results of the diamond drilling program conducted from January 1995 to August 1995, to assess the Grizzly Zone for economic gold mineralization. Much of the introductory section of this report has been summarized from previous authors. Geological and geochemical data from the 1995 program is shown together with data from earlier surface diamond drilling programs.

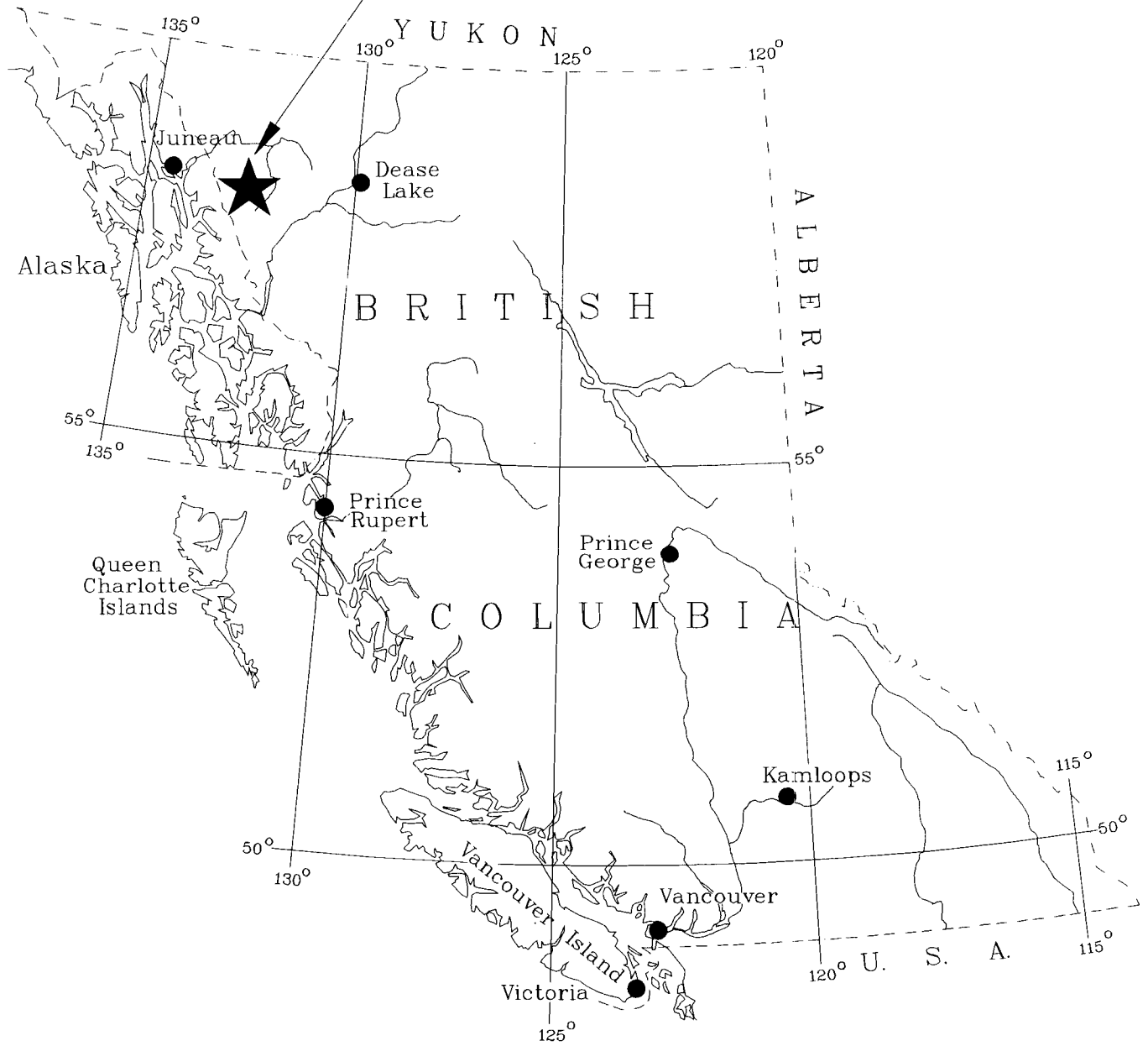
### **1.2 LOCATION, PHYSIOGRAPHY AND ACCESS**

The Grizzly Zone project area is located on the Golden Bear Mine property in the Atlin Mining Division near 132°17' west longitude and 58°13' north latitude. The project area occurs on the Tulsequah (104K) and Bearskin Lake (104K/1W) mapsheets. The town of Dease Lake lies 140 kilometres to the east, and Juneau, Alaska is 100 kilometres to the west (see Figure 1).

The mine property lies within moderately rugged terrain on the east side of the Chichidla Range of the Coast Mountains, where elevations range from 600 to 2200 metres. Treeline is at roughly 1100 metres elevation and slopes are primarily talus covered, with soil development only below treeline. Little or no vegetation other than grass occurs above treeline, lower slopes are forested with dense spruce, pine and poplar. Glaciers and permanent snow are not abundant, however snow melts slowly on western and northern slopes, where surface exploration can only be effectively conducted between July and mid-September.

Access to the Golden Bear Mine property can be gained by two-wheel drive road, fixed-wing aircraft, or helicopter. Access by road is gained by public road 80 kilometres west from Dease Lake and then by an all weather private access road extending 155 kilometres northwest from Telegraph Creek. A 1500 metre gravel airstrip is present at the minesite to accommodate small fixed wing aircraft. Contract helicopter service is available based out of Dease Lake. For safety reasons use of both the mine access road and the airstrip is restricted. From the camp the Grizzly project area is accessed by a short (< 1 kilometre)

# GRIZZLY PROJECT



NORTH AMERICAN METALS CORP.

GRIZZLY PROJECT

LOCATION MAP

N.T.S.: 104 K

Figure 1



all weather gravel road.

### **1.3 PROPERTY DEFINITION AND STATUS**

The Grizzly Zone is covered by Mining Lease #40 (Tenure # 203776), which totals 1462.1 hectares and is comprised of Lots 7043 to 7047 (see Figure 2). Converted from previously existing mineral claims on October 30, 1989, the lease has a primary term of 30 years and is subject to an annual rental fee.

### **1.4 EXPLORATION HISTORY**

Exploration was first carried out on the Grizzly Zone in 1989 when the projections of consulting structural geologists (Lehrman and Caddey, 1989) indicated that a carbonate lens similar to the one that hosts the Bear Main deposit, appeared at depth on the same fault structure. During 1990 and 1991 NAMC drilled the area from surface and defined the upper portion of the Grizzly carbonate lens. Mineralization was encountered in the footwall of the lens and graded less than 8.0 g/t gold over narrow widths.

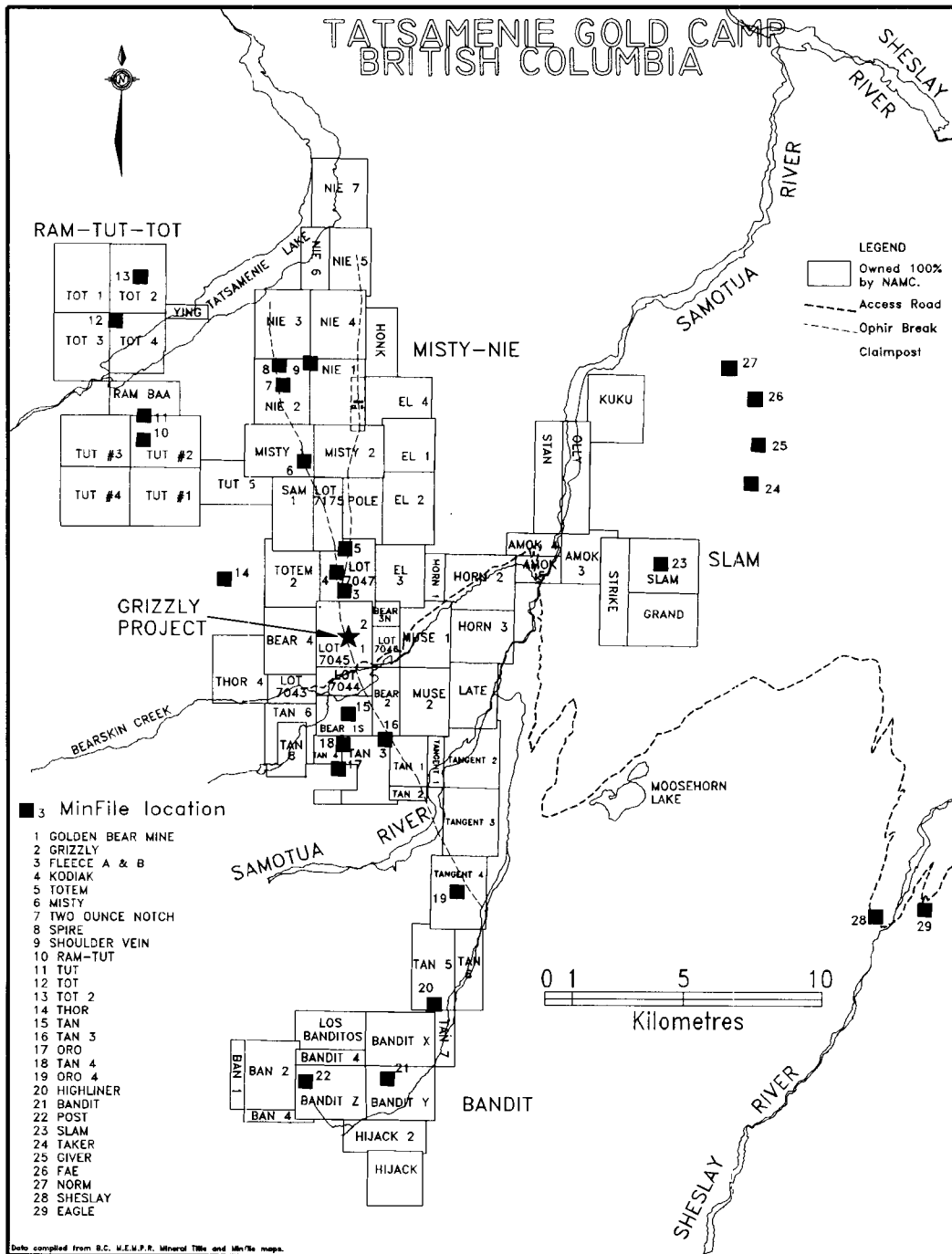
In 1992 drilling was continued at greater depths and further to the north, returning results of 11.3 and 14.4 g/t gold over 1.8 metres, and suggesting that mineralization was increasing in strength to the north and following a gentle, northerly plunge. After Wheaton River Minerals Ltd. assumed control of NAMC in 1993, this idea was pursued with three diamond drill holes. Two holes intersected low grade mineralization while the third, B94DH194, intersected the Grizzly carbonate lens two hundred metres north of the others and returned 14.38 g/t gold over 15.54 metres with an estimated true width of 7.0 metres.

Due to the extreme difficulty of drilling this zone from surface, and the associated expense, it was decided to assess its economic potential by drilling from underground stations. The Grizzly portal was collared in December 1993 and ramp construction began in January 1994 with a total of 823.1 metres of primary advance on the ramp and 191.8 metres of secondary advance (remucks, sumps and diamond drill stations) being completed by Christmas, 1994. During this period geologic mapping and chip sampling of the decline and cutouts was completed, and 9 Bazooka drill holes totalling 104.24 metres were drilled on four sections from 23575N to 23650N, inclusive. The drilling attempted to trace a zone of ore grade mineralization which was unexpectedly encountered in the face and walls of remuck #5. Difficulty was experienced in positioning the drill in the decline during the program and the zone was not adequately tested.

### **1.5 1995 WORK PROGRAM**

The following work was completed on the Grizzly project between December, 1995 and August 11, 1995:

Mining: during April and May, 1995, the decline was rehabilitated and additional mining consisting of 26.6 metres of primary advance and 37.6 metres of



■ 3 MinFile location

- 1 GOLDEN BEAR MINE
- 2 GRIZZLY
- 3 FLEECE A & B
- 4 KODIAK
- 5 TOTEM
- 6 MISTY
- 7 TWO OUNCE NOTCH
- 8 SPIRE
- 9 SHOULDER VEIN
- 10 RAM-TUT
- 11 TUT
- 12 TOT
- 13 TOT 2
- 14 THOR
- 15 TAN
- 16 TAN 3
- 17 ORO
- 18 TAN 4
- 19 ORO 4
- 20 HIGHLINER
- 21 BANDIT
- 22 POST
- 23 SLAM
- 24 TAKER
- 25 GIVER
- 26 FAE
- 27 NORM
- 28 SHESLAY
- 29 EAGLE

Data compiled from B.C. M.E.W.P.R. Mineral Title and MinFile maps.

NORTH AMERICAN METALS CORP.

GRIZZLY PROJECT

CLAIM MAP

N.T.S.: 104 K

Figure 2

secondary advance was completed. Most of this development focussed on better water collection and pumping facilities.

Diamond Drilling: diamond drilling was carried out in two phases. From late December 1994 to late February 1995, 17 drill holes totalling 2611.22 metres were completed, and from May 31, 1995 to August 11, 1995, 16 holes totalling 2995.50 metres were completed.

## 2.0 REGIONAL GEOLOGY

The regional geology and structure of the area was first described by Souther (1971) and more recently by Oliver (1993, 1995) and Bradford and Brown (1993a, 1993b). Property geology and economic mineralization for selected mineral occurrences have been reported by Shroeter (1985, 1986, 1987). The work of these authors has been summarized by Pigage (1994) and the following description is largely drawn from his report.

The Golden Bear property lies within the Stikine Terrane, where the lowermost stratigraphic sequence exposed consists of the Stikine Assemblage. The lowermost unit in the Stikine Assemblage is an unfossiliferous, presumed Carboniferous, recrystallized limestone. This limestone is conformably overlain by a much more extensively exposed sequence of foliated, chloritic metavolcanic rocks dominated by andesitic ash to lapilli tuff, feldspar and augite phyric tuffs and flows, massive andesite flows and rare pillow basalts. Minor grey limestone interbeds up to 25 metres thick occur throughout the sequence. Argillite and conglomerate also occur as interbeds. The age of the Stikine Assemblage is poorly constrained: recent zircon dates by Oliver and Gabites (1993) of felsic volcanics within the Assemblage indicates ages as old as Pennsylvanian (316 Ma).

A thick, fossiliferous Permian limestone unit forms a distinctive marker within the Stikine Assemblage. The unit ranges from massive to thin bedded, includes calcitic and dolomitic end members, and has been estimated to have a thickness in excess of 200 metres (McBean and Reddy, 1993). Poorly preserved fusulinids and rugosan corals confirm an early Permian date for the unit (Souther, 1971; Bradford and Brown 1993b).

Unconformably overlying the Stikine assemblage is a thick package of volcanic and sedimentary rocks comprising the Upper Triassic Stuhini Group. A continuous section near the Bandit claims (see Figure 2) has a thickness of near 2000 metres. This group consists mainly of plagioclase and augite bearing volcanoclastic rocks with lesser pillow basalts and epiclastic rocks. The Stuhini group rocks are typically much less deformed than those of the Stikine Assemblage with a pervasive chloritic foliation only locally developed adjacent to major shear zones.

The Stuhini Group is unconformably overlain by columnar jointed olivine basalts of the Miocene Level Mountain Group (Souther, 1971). Basaltic dykes of the same group are minor in extent but intrude all units including mineralized ones, commonly along fault structures.

Most of the intrusive rocks in the immediate Golden Bear area consist of compositionally heterogeneous, variably foliated, hornblende diorite to quartz monzodiorite. These rocks, dated to Late Triassic, intrude both Stikine assemblage and Stuhini Group rocks. The voluminous Eocene intrusions comprising the Coast Belt occur west of the Project area.

Structural interpretation of the Golden Bear area is difficult due to the lack of stratigraphic control in the Stikine Assemblage rocks. The extensive foliation in the Stikine Assemblage volcanics is consistent with at least one and perhaps two pre-Late Triassic phases of folding followed by an erosional interval before deposition of Stuhini Group rocks. D1 folds are tight to isoclinal and trend dominantly north-south. D2 folds trend either northeast or northwest. Unequivocal D2 folds were not observed by Bradford and Brown (1993) in Stuhini Group rocks. Folding interpreted as occurring during D3 and D4 deformational events are considered to be latest Triassic to Middle Jurassic and Middle Jurassic events, respectively.

Faulting in the area is dominated by north to northwest trending, high angle, strike slip faults. The Ophir Break is an economically important fault zone which extends for at least 20 kilometres (Smith et al, 1991), and provides the structural control for the Bear Main gold deposit. It is comprised of several anastomosing fault strands across a width of 50 to 100 metres. K-Ar dates of sericite alteration within the Ophir Break indicate a broadly Middle Jurassic date for alteration and faulting. Movement on the structure is not well constrained and although measured fault grooves and slickensides having mainly shallow plunges suggest predominantly strike slip movement, there is evidence to suggest that significant normal (Oliver, 1995) and reverse (Lehrman and Caddey, 1989) displacements have occurred.

### **3.0 PROPERTY GEOLOGY**

The geology of the property in the Grizzly project area is shown on Figure 3 and descriptions of rock codes are given in Appendix IV. It is predominantly underlain by the chloritic volcanic and Permian carbonate units of the Stikine Assemblage, which have been placed in fault contact with one another. To the west and northwest of the Grizzly project, a large block a Permian carbonate opens up in a wedge to the north, bounded to the west by the Limestone Creek Fault and to the east by the West Wall Fault. In the northern portion of the map area the West Wall Fault coalesces with the Fleece and Black Faults, which in this area of the property comprise the Ophir Break. Further south the Ophir Break is dominated by the Bear Fault, which occurs entirely within the volcanics and hosts at least two large fault blocks of Permian carbonate, the southernmost of which contains the Bear Main deposit. The Grizzly carbonate lens lies downdip of the Bear Main carbonate lens.

The volcanics are dominated by well bedded mafic ash tuffs and crystal tuffs (MFAS), and very finely bedded epiclastic sediments (MFEP) with lesser coarse pyroclastics (MFLP) and flow rocks (MFFL). Thin bedded argillites (ARGI) and minor bedded chert (CHRT) form interbeds up to 10-15 metres thick, particularly in association with epiclastic rocks and fine tuffs.

The Permian carbonate rocks are dominated by variably bedded limestones (LMST), dolomite (DOLO), and chert. An widespread variety of dolomite (DOCH) contains abundant amorphous gray to black chert nodules. Fusilinids, crinoids and corals indicate a shallow marine environment. A number of breccias and brecciation textures have been observed in the carbonates including intraformational breccias, karst breccias, crackle breccias in area of tight folding, and perhaps most importantly, tectonic breccias related to mineralization (DOSB, CHSB, DOXB, CHXB).

Massive, medium grained Jurassic gabbro intrudes the volcanics to the north of the Grizzly area.

### **3.1 ALTERATION**

The alteration associated with mineralization is developed in both carbonate and volcanic rocks along the Ophir Break and related structures, and distinct alteration suites are associated with each major rock type.

The volcanic rocks have been strongly carbonatized (MFCA) around fault structures of all sizes, with alteration envelopes ranging from a few tens of centimetres thick around small scale faults, to tens of metres thick around the fault structures of the Ophir Break. The rocks have been altered to a light green to creamy-tan color and are dominated by a sericite, calcite, ankerite, pyrite and green mica alteration mineral assemblage. Calcite occurs mainly as coarse grained veinlets to 0.5 centimetres as does ankerite, pyrite as medium to coarse grained, euhedral disseminations and veinlets. Sulphide content in altered rocks is commonly 3-5 %. Fine bedding and pyroclastic textures are most often preserved.

Alteration in the carbonate rocks, which in the Bear Main and Grizzly zones consist of fault bound lenses, occurs in areas of tectonic brecciation. In such areas breccia fragments are pervasively silicified and are hosted in a siliceous breccia matrix.

### **3.2 MINERALIZATION**

Gold mineralization in the Bear and Grizzly zones occurs in structurally controlled dilatancy zones developed along the Ophir Break. Gold values are most strongly associated with extremely fine, dark grey to black sulphides, primarily pyrite. In the carbonate rocks this occurs as disseminations in the silicious matrix of tectonic breccias, or as fine coatings on crackle surfaces (a very commonly observed texture). In the volcanics, these fine sulphides occur in dark grey, fine to medium grained very strongly altered tuffs (PYTF) and in dark grey to black fault gouge (PGTF). Total pyrite content can vary from 1 % up to approximately 10% Both rock types can host economic gold grades. This pyrite mineralization is distinct from that in the carbonatized volcanics, which is medium to coarse grained, brassy in colour, and generally carries only slightly geochemically anomalous gold values. SEM and microprobe analyses of pyrite from ore grade Bear Main mineralization indicates that the gold occurs in euhedral, arsenian pyrite overgrowths on earlier euhedral pyrite, with gold values in the arsenian pyrite rims as high as 200 grams per tonne (J. Oliver, personal communication).

## **4.0 1995 DIAMOND DRILLING WORK PROGRAM**

The work program on the Grizzly diamond drilling project was carried out between the dates of November 26, 1995 and August 11, 1995, and consisted of 33 NQ diamond drill holes totalling 5606.72 metres (18,441 feet). The purpose of the program was to test the Grizzly carbonate lens for gold mineralization by drilling fans of holes on 50 metre east-west sections from stations on the Grizzly decline (see Figure 4). Drilling extended from sections 23550N to 24050N. Drilling was difficult with several broken zones containing high water pressures ranging up to 250 psi.

The collar location and orientation of each drill hole was surveyed using mine grid coordinates. Depth down the drill hole is measured from the top of casing. Down hole deviations were measured using a single-shot Sperry Sun instrument.

The drill core was logged for lithology, structure, assay, and geotechnical information at the exploration trailer at the minesite camp using custom field logging forms. All core was photographed prior to being split. The core is stored at the airstrip immediately west of the minesite camp. Requested intervals were split and assayed at the minesite assay lab for gold (see Appendix III for analytical procedures).

Appendix V contains the logging codes and conventions used for logging core on the Grizzly project, diamond drill logs for all 1995 holes, and their assay sheets. Vertical cross sections showing 1995 drill holes and all earlier drill holes are presented in Figures 7 - 17. Mineralized intersections are summarized in Table 1 and shown on long section in Figure 5.

## **5.0 RESULTS**

### **5.1 GEOLOGY**

The vertical sections indicate that the Grizzly carbonate lens consists of a number of fault blocks and slices that form a package up to 70 metres thick. The lens dips steeply to the east and generally appears to narrow at depth, particularly on the southernmost sections. The largest and strongest structural feature is the very planar, steeply easterly dipping Footwall Fault. It forms the western contact of the carbonate lens with the volcanics and consists of a 1 to 10 metre wide gouge zone of predominantly volcanic origin with lesser carbonate material, mainly as milled pebbles or cobbles.

Within the lens itself, fault blocks of both carbonate and volcanic rocks are present in an anastomosing system of faults and shears. Volumetrically the carbonate rocks are dominant. The margins of fault blocks are typically sheared and gougy in the case of volcanic rocks and brecciated and crackled in the case of carbonate rocks. The cores of fault blocks generally show little or no sign of shearing or brecciation.

Three primary carbonate lithologies are present: dolomite with chert nodules (DOCH), bedded, silty limestones (LMST), and chert (CHRT). DOCH is the most abundant rock

type and forms the largest most competent blocks. LMST has been encountered less often and typically at greater depths. The cherts are volumetrically the least abundant rocks of the carbonate package, are most often located at the hangingwall of the lens, and tend to be extensively brecciated. Whether or not the relative positions of these rock types represents stratigraphy or is the result of faulting is uncertain.

Similarly, the nature of the hangingwall contact of the carbonate lens is uncertain. Smith et al (1991) state that the transition from limestones and dolomites to chert to mafic volcanics is considered conformable on a regional scale. The results of drilling are inconclusive. Some drill holes encountered strong, gougy fault zones at this contact, others encountered very strongly altered but competent rocks. The author's opinion is that contact is a faulted one as the volcanics in the hanging wall are known from Grizzly ramp geology to be dipping shallowly to the east (Hamilton, 1994), which is not consistent with the steeply dipping hangingwall contact.

Intrusive rocks are present within the Grizzly carbonate lens in the form of basalt dykes of the Level Mountain Group, occurring singularly or as swarms along fault structures.

## **5.2 MINERALIZATION**

The Grizzly diamond drilling program indicates that anomalous to low grade gold mineralization is present in pyritic and gougy volcanic tuffs and tectonic carbonate breccias along most, if not all, fault structures in the Grizzly carbonate lens. Significant gold values however have mainly been intersected in two mineralized zones. These can be seen on the grade times thickness long section of the Grizzly Zone (Figure 6).

The first forms a thin sliver extending between sections 23600N and 23700N at an elevation of 1000 metres. The zone is located on the eastern edge of an internal sliver of altered volcanics and has returned gold values of up to 18.48 grams/tonne over a true width of 2.45 metres. To date it has only been intersected in one drill hole one each section. The zone is closed off by drilling on section 23550N and appears to be of limited vertical extent on sections 23600N and 23650N. The zone remains open and untested to the north of section 23700N and down dip from hole B92DH166 on section 23700N. Because of its narrow width and limited vertical extent the zone has small tonnage potential where tested to date. There is potential for expansion of the zone to the north.

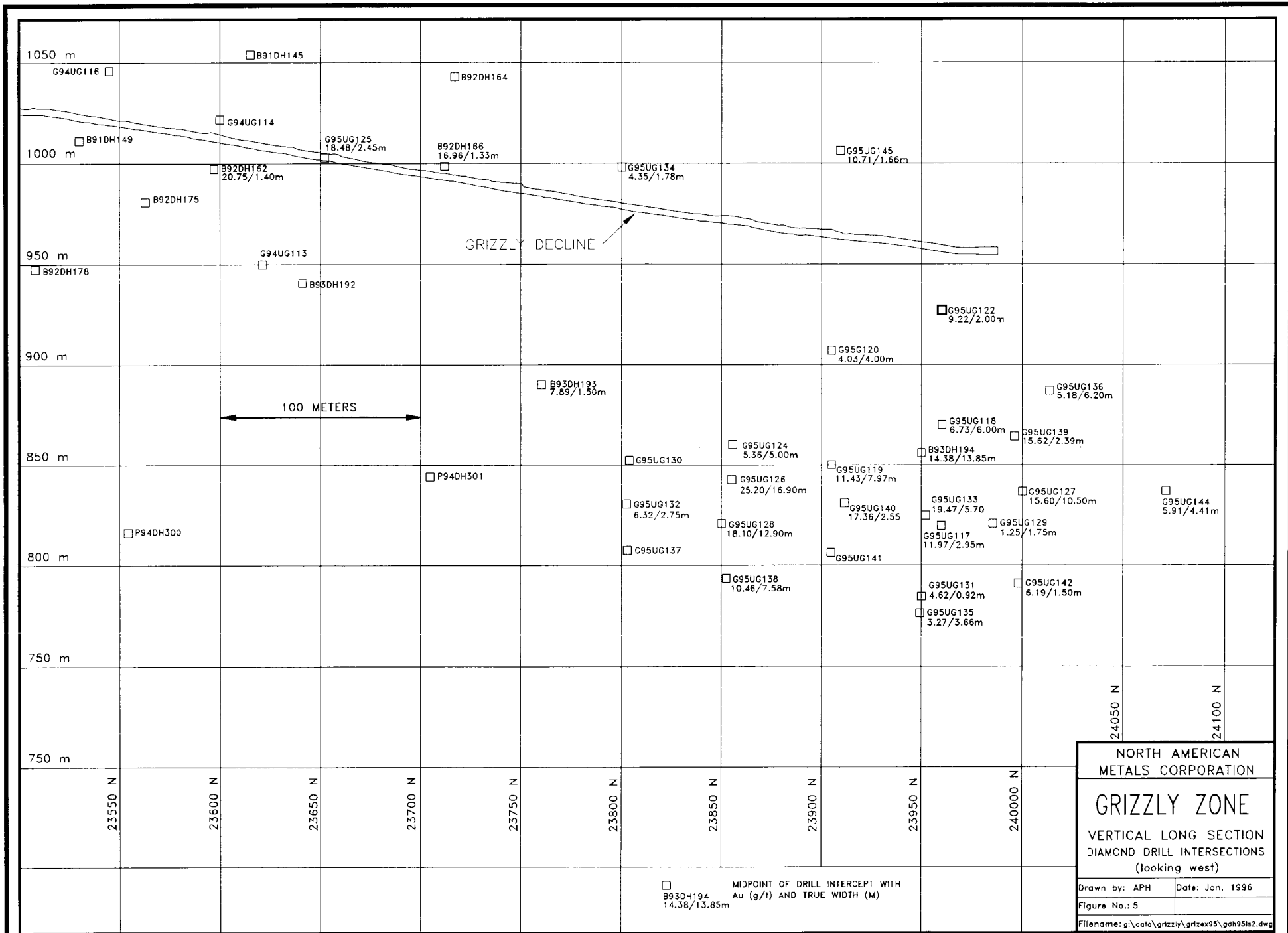
The second zone extends between sections 23850N and 24000N, near 850 metres elevation (see Figure 6). This zone contains the Grizzly Zone discovery hole, B93DH194, and contains the bulk of the mineralization outlined to date (see section 6.0). It occurs in extensively brecciated and silicified carbonate rocks in the immediate hangingwall of the Footwall Fault over true widths ranging from 2.5 to 16.9 metres. Mineralization has been closed off by drilling to the south and up and down dip, but remains open to the north. Further exploration drilling is required to test the extent of mineralization to the north.

TABLE 1: 1995 GRIZZLY DRILLING PROGRAM SUMMARY

DRILLHOLE	SECTION	DIP	MINERALIZED ZONES				DRILL INTERSECTION (m)	TRUE WIDTH (m)	Au g/t UNCUT	Au g/t CUT
			HOLE DEPTH (m)	HOLE DEPTH (ft)	FROM (m)	TO (m)				
UG113	23600N	-43	112.17	368.00			N/A			
UG114	23600N	5	103.02	338.00	73	76	3.00	3.00	2.45	2.45
UG115	23550N	-78	39.93	131.00	HOLE LOST BEFORE ZONE					
UG116	23550N	16	116.43	382.00	60.30	64.30	4.00	3.76	2.88	2.88
UG117	23950N	-52	203.61	668.00	168.55	171.60	3.05	2.95	11.97	11.97
UG118	23950N	-28	195.99	643.00	160.93	167.03	6.10	6.00	6.73	6.73
UG119	23900N	-45	177.70	583.00	150.74	158.89	8.15	7.97	11.43	11.43
UG120	23900N	-22	177.69	583.00	135.35	139.35	4.00	4.00	4.03	4.03
UG121	23900N	-8	58.83	193.00	HOLE LOST BEFORE ZONE					
UG122	23950N	-10	180.75	593.00	162.82	164.82	2.00	2.00	9.22	9.22
UG123	23900N	-38	119.48	392.00	HOLE LOST BEFORE ZONE					
UG124	23850N	-47	180.74	593.00	138.5	143.82	5.32	5.00	5.36	5.36
UG125	23650N	-2	118.26	388.00	86.50	88.96	2.46	2.46	18.48	18.48
UG126	23850N	-59	189.89	623.00	137.03	156.60	19.57	16.90	25.22	17.31
					141.03	148.87	7.84	6.77	51.95	32.19
UG127	24000N	-39	211.23	693.00	170.96	183.80	12.84	10.47	15.62	15.62
					177.13	183.13	6.00	4.90	23.24	23.24
UG128	23850N	-68	215.8	708.00	154.32	169.17	14.85	12.90	18.14	15.65
UG129	24000N	-47	209.7	688.00	178.96	180.83	1.87	1.75	1.25	1.25
UG130	23800N	-59	174.65	573.00			N/A			
UG131	23950N	-63	232.25	762.00	189.59	190.59	1.00	0.92	4.62	4.62
UG132	23800N	-69	186.07	610.50	157.00	160.90	3.90	2.75	6.32	6.32
UG133	23950N	-46	195.67	642.00	167.97	174.04	6.07	5.70	19.47	15.51
UG134	23800N	+13	166.41	546.00	87.64	89.42	1.78	1.78	4.35	4.35
UG135	23950N	-72	231.04	758.00	185.31	189.89	4.58	3.66	3.27	3.27
UG136	24000N	-23	207.56	681.00	171.75	178.00	6.25	6.20	5.18	5.18
					163.37	178.00	14.63	14.52	3.37	3.37
UG137	23800N	-77	205.12	673.00			N/A			
UG138	23850N	-78	207.86	681.00	154.24	164.77	10.53	8.73	3.43	3.43
					174.96	176.48	1.52	1.26	15.11	15.11
					181.04	184.10	3.06	2.54	15.31	15.31
					174.96	184.10	9.14	7.58	10.46	10.46
					154.24	186.37	32.13	26.64	5.26	5.26
UG139	24000N	-33	197.20	647.00	171.45	173.11	1.66	1.66	20.57	20.57
					171.45	173.84	2.39	2.39	15.62	15.62
					170.74	175.84	5.10	5.10	8.35	8.35
UG140	23900N	-57	201.16	660.00	150.26	151.61	1.35	1.13	31.68	29.57
					150.26	153.31	3.05	2.55	17.36	16.43
					150.26	154.45	4.19	3.51	13.85	13.17
					147.02	171.59	24.57	20.61	4.44	4.33
UG141	23900N	-66	195.67	642			N/A			
UG142	24000N	-55	215.79	708.00	195.51	197.53	2.02	1.50	6.19	6.19
					194.45	197.53	3.08	2.29	4.74	4.74
UG143	23900N	-75	13.01	40.00	HOLE SHUT DOWN BEFORE ZONE					
UG144	24050N	-36	228.89	751.00	187.23	201.63	14.4	12.5	4.33	4.33
					193.85	201.63	7.78	6.77	5.29	5.29
					196.56	201.63	5.07	4.41	5.91	5.91
					205.24	207.68	2.44	2.12	5.48	5.48
UG145	23900N	16	137.15	500.00	155.34	155.00	1.66	1.66	10.71	10.71

TOTAL FOOTAGE HOLES 113-145      5606.72      18441.5





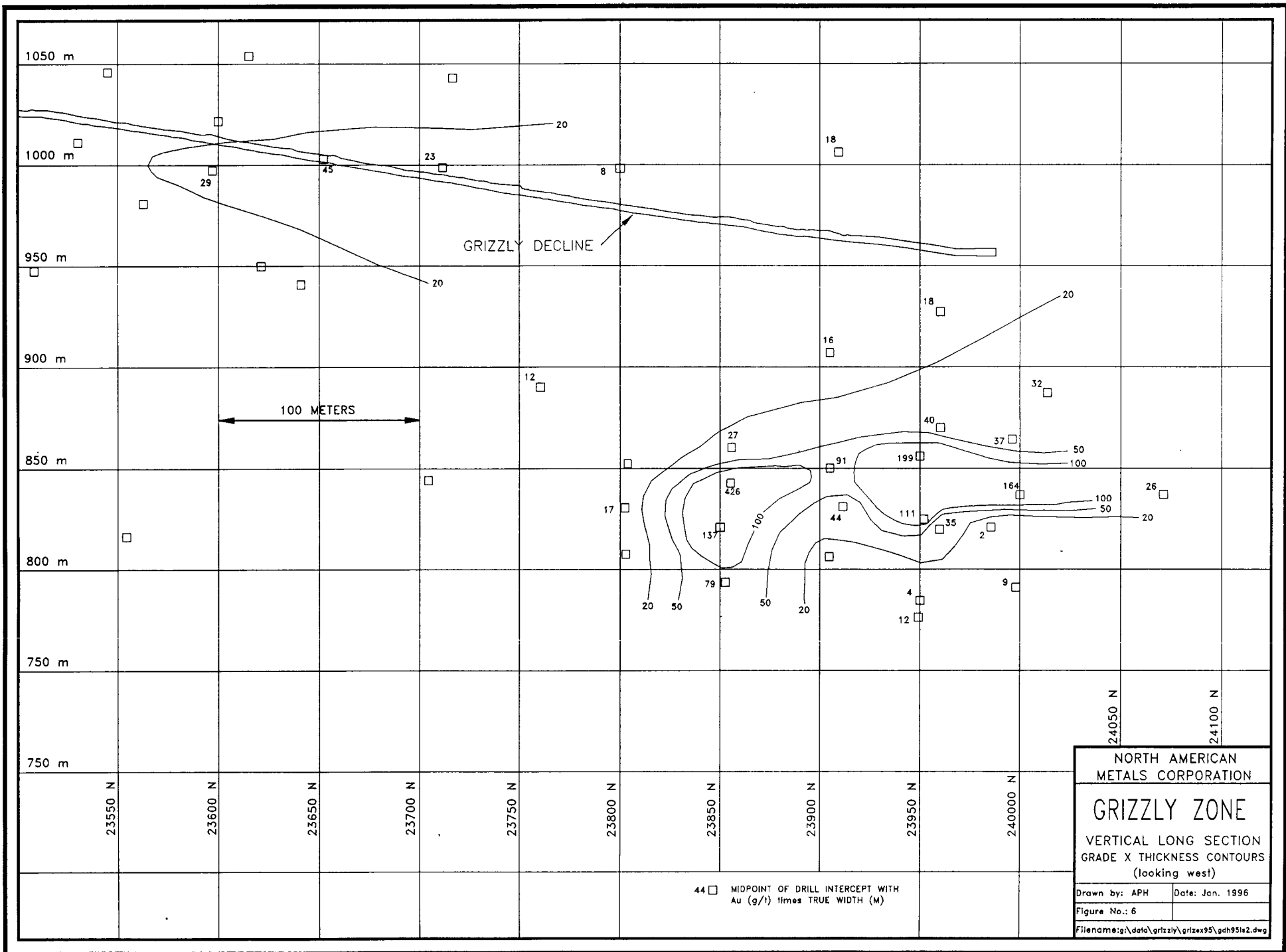
NORTH AMERICAN  
METALS CORPORATION

## GRIZZLY ZONE

VERTICAL LONG SECTION  
DIAMOND DRILL INTERSECTIONS  
(looking west)

Drawn by: APH	Date: Jan. 1996
Figure No.: 5	
Filename: g:\data\grizzly\grizex95\goh95ta2.dwg	

□ MIDPOINT OF DRILL INTERCEPT WITH  
B93DH194 Au (g/t) AND TRUE WIDTH (M)  
14.38/13.85m



NORTH AMERICAN  
METALS CORPORATION

**GRIZZLY ZONE**

VERTICAL LONG SECTION  
GRADE X THICKNESS CONTOURS  
(looking west)

Drawn by: APH      Date: Jan. 1996

Figure No.: 6

Filename: g:\data\grizzly\grizex95\gdh951s2.dwg

44 □ MIDPOINT OF DRILL INTERCEPT WITH  
Au (g/l) times TRUE WIDTH (M)

Included in the Grizzly drilling program were two widely spaced drill holes, G95UG134 and G95UG145, that were drilled to test portions of the Grizzly carbonate lens that had no previous drilling coverage. The holes returned 4.35 g/t gold over 1.78 metre and 10.71 g/t gold over 1.66 metre true widths, respectively. While these results are not of economic grade and thickness they suggest that other zones of significant gold mineralization may be present within the Grizzly Carbonate lens. Further widely spaced drill holes are required to test this possibility.

## **6.0 RESERVES**

A preliminary mineral inventory for the Grizzly Zone has been prepared by Pigage (1995). A polygonal sectional method was used based on 50 metre sections approximately perpendicular to the strike of the mineralized zone. A twelve gram per tonne cutoff was used for ore polygon construction. Polygons were manually prepared and in most cases correspond to a single drillhole intersection with polygon boundaries drawn halfway between holes. Polygons were extended halfway to adjoining sections for a total thickness of 50 metres. A uniform specific gravity of 2.50 was used for all volume to tonnage calculations.

Based on these criteria the mineral inventory for the Grizzly Zone was calculated to be 152,945 tonnes grading 23.39 grams per tonne gold, uncut. Of this total 8,394 tonnes grading 23.54 grams per tonne gold are contained in the narrower upper zone, and 144,551 tonnes grading 23.38 grams per tonne gold are contained in the main, lower zone.

## **7.0 METALLURGY**

Metallurgical testing was performed on Grizzly Zone composites from drill holes G95UG126 and G95UG127 by McClelland Laboratories Inc. in Sparks, Nevada. Bottle roll tests were conducted at 80 % minus 75 $\mu$ m (-200 mesh) feed size to determine amenability to milling/cyanidation treatment. Neither composite was amenable to direct agitated cyanidation treatment at the 75 $\mu$ m size. Gold recoveries of only 6.9 and 2.5 % were achieved from composite G95UG126 and 127, respectively, in 96 hours of leaching. Detailed results for both composites are presented in Appendix IV.

## 8.0 SUMMARY

The Grizzly Zone is an area of gold mineralization located in the Tatsamenie gold camp in northwestern British Columbia, 140 kilometres west of the town of Dease Lake. It lies down dip from and on the same structure as the Bear Main deposit, which sustained mining operations on the Golden Bear property until exhausted in 1994. From late 1994 until mid-August 1995, North American Metals Corp. has carried out a diamond drilling program consisting of 33 NQ diameter drill holes totalling 5606.72 metres (18,441 feet) in an effort to outline the extent and nature of gold mineralization.

The property is predominantly underlain by a package of mafic volcanic tuffs, flows, epiclastic sediments, and Permian carbonate rocks of the Stikine Assemblage. Structurally the property is dominated by the Ophir Break, a regional scale, north to northwest trending, steeply dipping, anastomosing fault system. Alteration on the property consists of carbonatization of the mafic volcanic rocks in envelopes around fault structures and silicification of tectonic breccia zones in the carbonate rocks. Gold mineralization is strongly associated with very fine dark grey sulphides, primarily pyrite, that occurs in very strongly altered and often gougy volcanic rocks, in silicious breccia matrix and on crackle surface in the carbonate rocks.

Diamond drilling has identified two significant mineralized zones in the Grizzly carbonate lens; a fault bound, steeply easterly dipping package of predominantly carbonate fault blocks up to 70 metres thick. The first occurs as a thin zone between 23600N and 23700N, immediately adjacent to an internal fault sliver of mafic volcanic rocks. The zone as defined is of limited tonnage and vertical extent but there is potential for expansion of the zone to the north. The second zone has been defined from 23850N to 24000N near 850 metres elevation and contains the bulk of the mineralization outlined to date. It occurs in strongly brecciated and silicified carbonate rocks in the immediate hanging wall to the western bounding fault of the Grizzly carbonate lens, and ranges from 2.5 to 16.9 metres in thickness. Drilling has closed off the zone to the south, updip and downdip, but it remains open to the north.

The results of this diamond drilling program have allowed a preliminary polygonal mineral inventory to be calculated. Based on 50 metre east-west sections and a 12 gram per tonne cutoff the Grizzly Zone is estimated to contain a mineral inventory of 152,945 tonnes grading 23.39 grams per tonne gold, uncut. The bulk of this is contained in the lower zone.

Metallurgical testing of composite from two mineralized Grizzly Zone diamond drill holes indicates that the mineralization is not amenable to direct agitated cyanidation treatment.

There is good potential to significantly increase the mineral inventory of the Grizzly zone through additional diamond drilling on both mineralized zones, particularly in the larger, lower zone. Drilling should be continued on this zone as fans, on 50 metre sections to the north. This will require that the decline be advanced minimum of 150 metres. In addition, several widely spaced holes that have been drilled in the Grizzly carbonate lens suggest gold mineralization is widespread

and that potential for locating other zones of significant gold mineralization is high. Such zones could be tested for by drilling additional, widely spaced drill holes in area of the Grizzly carbonate lens where drill coverage is sparse or lacking.

## 9.0 BIBLIOGRAPHY AND SELECTED REFERENCES

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**APPENDIX I**

**Statement of Qualifications**




### Statement of Qualifications

I, Andrew P. Hamilton, with a residence address of #201-2166 West 8th Avenue, Vancouver, BC, do hereby certify that:

1. I am a graduate of the University of British Columbia at Vancouver, BC, with a Bachelor of Science Degree in Geological Sciences.
2. I have practiced my profession as a Geologist in the Northwest Territories and British Columbia since 1991.
3. I am registered with the Association of Professional Engineers and Geoscientists of British Columbia.
4. I am presently employed full time as a geologist with North American Metals Corp. of #1500-700 West Pender Street, Vancouver, BC.
5. The work described in this report is based on fieldwork conducted from November 26, 1994 to August 11, 1995, in which I supervised.
6. I have no direct or indirect financial interest in any company known by me to have an interest in the mineral properties described in this report, nor do I expect to receive any such interest.
7. I am the author of this report.

Dated at Vancouver, BC, this 9<sup>TH</sup> day of JANUARY, 1996

Respectfully submitted

  
Andrew P. Hamilton

**APPENDIX II**  
**Statement of Costs**

## STATEMENT OF COSTS

(for eligible exploration expenses: July 10 - August 11, 1995)

### Wages:

Geologists - project supervision, drill supervision, core logging	
J. Baril (10 days)	3,321.60
A. Hamilton (5 days)	1,660.50
G. McDougall (16 days)	4,320.00
C. McPhee (6.5)	1,842.75
L. Pigage (2 days)	810.00
R. Smallwood (5 days)	1,660.50
C. Tucker (11.5 days)	2,716.75
Surveyors/Assistants - survey drill sites, geotechnical logging	
P. Henry (10 days)	2,835.00
B. Pullman (3 days)	708.75
Assistants - core splitting, geotechnical logging	
C. Dennis (9 days)	1,822.50
B. Louie (9 days)	2,004.75
A. Nole (17 days)	3,442.50
J. Nole (9 days)	1,822.50
M. Nole (4 days)	810.00
C. Tashoots (13 days)	2,895.75
Room and Board - Namc crew (130 days @ \$35.00/day)	4,550.00
Drilling crew (297 days @ \$35.00/day)	10,395.00
Travel - Namc crew rotation off property	3,898.00
Diamond Drilling - July 10 to August 11, 1996	
1666 metres @ \$166.47/metre (Advanced Drilling, Langley)	277,339.02
Note - cost per metre based on all direct drilling costs for a 2858.35 metre phase of diamond drilling carried out between May 31 and August 11, 1996.	
Equipment Rental - 2 Sperry Sun single shot instruments for 1 month (Sperry Sun, Calgary)	3,890.00
Equipment Rental - survey instrument for 1 month (Butler Survey, Vancouver)	1,145.00
Laboratory Analyses - 772 samples @\$7.00/sample (minesite assay lab)	5,404.00
Field Supplies	292.00
Office Supplies	167.00
	<hr/>
<b>TOTAL</b>	<b><u>\$339,753.87</u></b>

**APPENDIX III**

**Golden Bear Mine Lab Fire Assay Procedures**

## GOLDEN BEAR MINE ASSAY LAB - ANALYTICAL PROCEDURES

All rock and core samples assayed at the minesite assay lab were assayed for gold using standard fire assay techniques:

- samples are dried, crushed, and ring milled to 85% -200 mesh,
- one assay ton is fused at 1980°C and the resulting lead button is cupelled at 1760°,
- dore bead is then parted in 20 % HNO<sub>3</sub>,
- parted bead is washed dried, and annealed,
- final weight is recorded, multiplied by 34.286, and reported as grams per tonne.

Assays are not considered accurate if they are below 0.17 grams per tonne.

**APPENDIX IV**

**Metallurgical Results**

**Table 4. - Overall Metallurgical Results, Bottle Roll Tests,  
Grizzly Zone Core Composites, 80 Percent Minus 75 $\mu$ m (200M) Feeds**

Metallurgical Results	Composite	
	G95DH126	G95DH127
Extraction: pct of Au		
in 2 hours	5.8	2.0
in 6 hours	6.8	2.3
in 24 hours	6.9	2.4
in 48 hours	6.9	2.5
in 72 hours	6.9	2.5
in 96 hours	6.9	2.5
Extracted, gAu/mt ore	1.68	0.31
Tail Assay, gAu/mt*	22.70	11.86
Calculated Head, gAu/mt ore	24.38	12.17
Assayed Head, gAu/mt ore*	22.70	15.44
Cyanide Consumed, kg/mt ore	0.22	0.30
Lime Added, kg/mt ore	1.9	1.5
Final Solution pH	11.1	10.9
Natural pH (40% solids)	7.7	8.4
Ag Recovery, percent	31.3	32.0
Extracted, gAg/mt ore	2.1	1.6
Tail Assay, gAg/mt ore*	4.6	3.4
Calculated, gAg/mt ore	6.7	5.0
Assayed Head, gAg/mt ore*	5.8	4.3

\* Average of triplicate direct assay.

McCLELLAND LABORATORIES, INC.

Figure 3. - Gold Leach Rate Profiles,  
Bottle Roll Tests, Grizzley Zone Core Composites, 80% - 75um (200M) Feeds

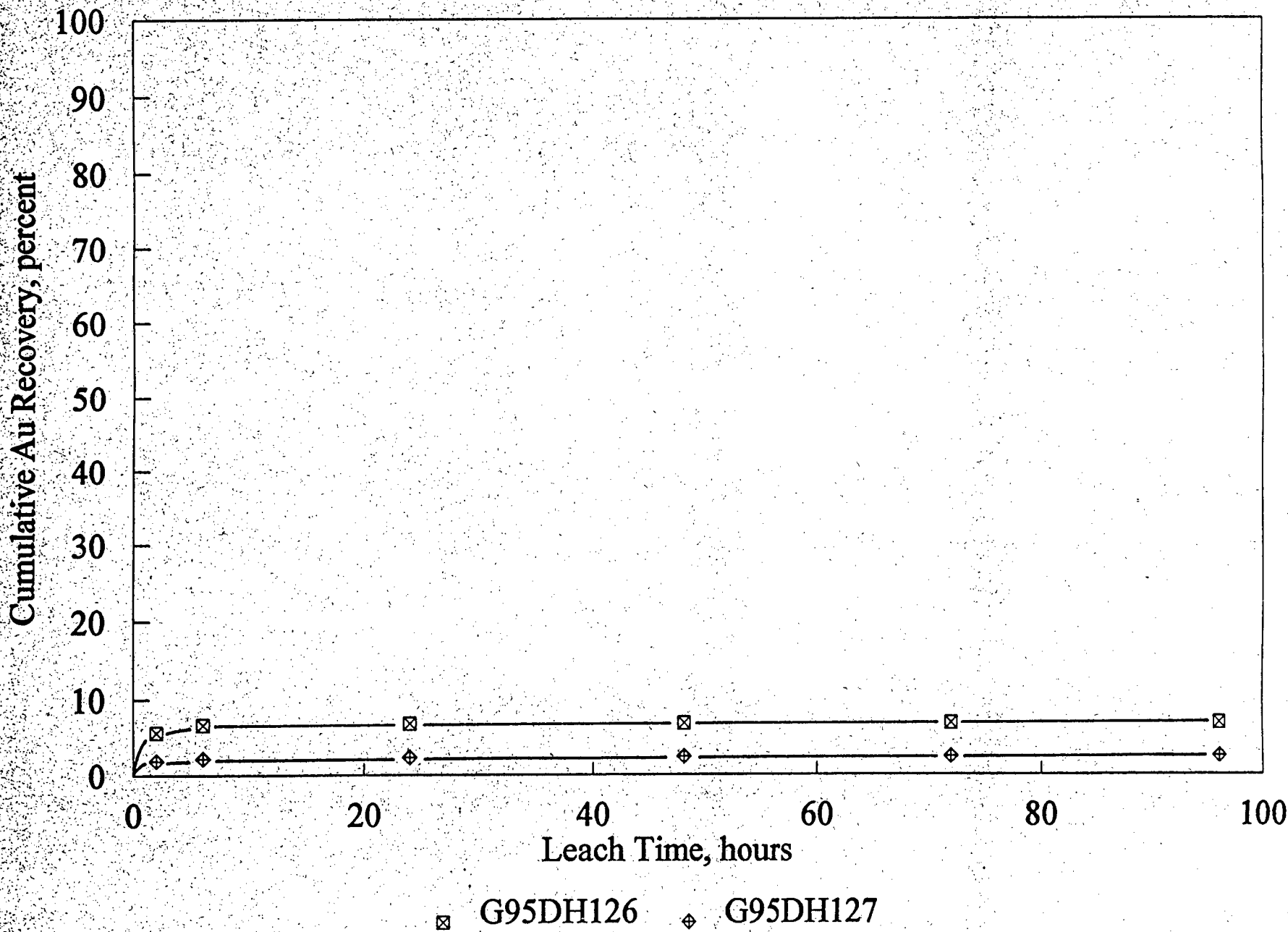




Table A11. - Composite Make-Up Information  
Grizzly Zone Hole G95DH126 Core Composite

Interval Meters	Weight to Composite		Assays		Au contribution to composite percent
	kgs	percent	gAu/mt ore		
137.03-138.03	0.50	4.76	4.05		0.7
138.03-139.03	0.51	4.85	6.27		1.1
139.03-140.03	0.50	4.79	8.47		1.5
140.03-141.03	0.50	4.77	10.39		1.8
141.03-142.03	0.51	4.83	38.26		6.8
142.03-143.03	0.50	4.74	20.78		3.6
143.03-144.03	0.50	4.74	37.41		6.5
144.03-145.03	0.51	4.87	31.85		5.7
145.03-146.03	0.50	4.74	36.45		6.3
146.03-146.62	0.58	5.52	77.55		15.7
146.62-147.5	0.49	4.68	134.74		23.1
147.5-148.37	0.51	4.81	70.73		12.5
148.37-148.87	0.38	3.63	33.29		4.4
148.87-149.87	0.50	4.74	9.29		1.6
149.87-150.87	0.51	4.82	7.20		1.3
150.87-151.87	0.50	4.76	8.61		1.5
151.87-152.87	0.50	4.80	12.82		2.3
152.87-153.87	0.51	4.84	5.69		1.0
153.87-154.87	0.50	4.75	3.12		0.5
154.87-155.87	0.49	4.69	5.49		0.9
155.87-156.6	0.51	4.85	6.79		1.2
Composite	10.50	99.98	27.30		100.0

Table A12. - Composite Make-Up Information  
Grizzly Zone Hole G95DH127 Core Composite

Interval Meters	Weight to Composite		Assays		Au contribution to composite percent
	kgs	percent	gAu/mt ore	gAg/mt ore	
170.96-171.96	0.23	2.28	11.45		1.7
171.96-172.96	0.79	7.85	6.48		3.3
172.96-173.96	0.91	8.96	5.93		3.5
173.96-174.96	0.73	7.22	11.42		5.4
174.96-175.96	0.72	7.15	12.99		6.1
175.96-177.13	1.28	12.64	6.10		5.1
177.13-178.13	0.75	7.37	15.05		7.3
178.13-179.13	0.93	9.24	22.08		13.4
179.13-180.13	0.98	9.68	15.98		10.1
180.13-181.13	0.82	8.07	29.42		15.6
181.13-182.13	0.65	6.47	32.78		13.9
182.13-183.13	0.73	7.19	24.10		11.4
183.13-183.8	0.59	5.88	8.54		3.3
Composite	10.11	100.00	15.25		100.1

# Bottle Roll Test

Job No: 2188 co#1  
 Test No: CY-07  
 Sample: Kodiak Grizzly Zone Core Composite G95DH126  
 Feed Size: 80 Percent Minus 75µm (200M) Feed

Ore Charge: grams 1066.80 metric tons 0.001

Solution Vol.: mls 1600.20 metric tons 0.0016

Solids Density: Weight % 40.0

Natural pH: stu 7.7

Cyanide Concentration Maintained at: 1.0 grams/liter solution

### Raw Data

Leach Time, hours	Reagents Applied		Volume mls	Solution Withdrawn and Solution Analysis			Removed From Pulp		
	lime	NaCN		NaCN Conc. lb/ton sol	pH	Au PPM	Ag PPM	Au mg	Ag mg
Initial	1.85	1.60							
2			100	1.9	11.3	0.95	1.28	0.095	0.128
6	0.00	0.17	100	1.9	11.3	1.05	1.27	0.105	0.127
24	0.00	0.17	100	2.0	11.3	0.99	1.20	0.099	0.120
48	0.00	0.10	100	2.0	11.0	0.93	1.16	0.093	0.116
72	0.00	0.10	100	2.0	10.8	0.87	1.08	0.087	0.108
96	0.20	0.10		1.9	11.1	0.82	1.03	0.000	0.000

### Metallurgical Results

Leach Time, hours	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements	
	mg	g/mt ore	percent of total	mg	g/mt ore	percent of total	Cyanide Consumed	Lime Added
Initial								1.7
2	1.520	1.4250	5.8	2.048	1.9200	28.6	0.07	1.7
6	1.775	1.6641	6.8	2.160	2.0250	30.2	0.15	1.7
24	1.784	1.6725	6.9	2.175	2.0390	30.4	0.14	1.7
48	1.787	1.6753	6.9	2.231	2.0915	31.2	0.14	1.7
72	1.784	1.6725	6.9	2.219	2.0803	31.0	0.14	1.9
96	1.791	1.6790	6.9	2.247	2.1065	31.4	0.22	1.9

Extracted, g/mt ore	<u>Au</u> 1.68	<u>% of total</u> 6.9	<u>Ag</u> 2.1	<u>% of total</u> 31.4
Tail assay, g/mt ore	22.70		4.6	
Calculated Head, g/mt ore	24.38		6.7	
Cyanide Consumed, kg/mt ore	0.22			
Lime Added, kg/mt ore	1.9			

### Leached Residue

Final Residue Weight, grams 1068.46

Tail Assay	gAu/mt	gAg/mt
Initial	22.53	4.6
Duplicate	21.39	4.6
Triplicate	24.17	4.5
Average	22.70	4.6

Head Assay	gAu/mt	gAg/mt
Initial	25.54	5.5
Duplicate	25.58	5.6
Triplicate	27.33	6.3
Average	26.15	5.8

# Bottle Roll Test

Job No: 2188 co#1  
 Test No: CY-08  
 Sample: Kodiak Grizzly Zone Core Composite G95DH127  
 Feed Size: 80 Percent Minus 75µm (200M) Feed

Ore Charge:  $\frac{\text{grams}}{1039.40}$   $\frac{\text{metric tons}}{0.001}$

Solution Vol.:  $\frac{\text{mls}}{1559.10}$   $\frac{\text{metric tons}}{0.0016}$

Solids Density:  $\frac{\text{Weight \%}}{40.0}$

Natural pH:  $\frac{\text{stu}}{8.4}$

Cyanide Concentration Maintained at: 1.0 grams/liter solution

### Raw Data

Leach Time, hours	Reagents Applied		Volume mls	Solution Withdrawn and Solution Analysis			Removed From Pulp		
	lime	NaCN		NaCN Conc. lb/ton sol	pH	Au PPM	Ag PPM	Au mg	Ag mg
Initial	1.56	1.56							
2			100	1.9	11.5	0.16	0.93	0.016	0.093
6	0.00	0.17	100	2.0	11.5	0.18	0.95	0.018	0.095
24	0.00	0.10	100	1.9	11.5	0.17	0.93	0.017	0.093
48	0.00	0.17	100	2.0	11.2	0.17	0.89	0.017	0.089
72	0.00	0.10	100	2.0	11.0	0.16	0.84	0.016	0.084
96	0.00	0.10		1.8	10.9	0.15	0.80	0.000	0.000

### Metallurgical Results

Leach Time, hours	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt ore	
	mg	g/mt ore	percent of total	mg	g/mt ore	percent of total	Cyanide Consumed	Lime Added
Initial								1.5
2	0.249	0.2400	2.0	1.450	1.3950	27.9	0.08	1.5
6	0.297	0.2854	2.3	1.574	1.5145	30.3	0.07	1.5
24	0.299	0.2877	2.4	1.638	1.5759	31.5	0.15	1.5
48	0.316	0.3041	2.5	1.669	1.6	32.0	0.15	1.5
72	0.317	0.3054	2.5	1.680	1.6	32.0	0.15	1.5
96	0.318	0.31	2.5	1.701	1.6	32.0	0.30	1.5

Extracted, g/mt ore	$\frac{\text{Au}}{0.31}$	$\frac{\% \text{ of total}}{2.5}$	$\frac{\text{Ag}}{1.6}$	$\frac{\% \text{ of total}}{32.0}$
Tail assay, g/mt ore	11.86		3.4	
Calculated Head, g/mt ore	12.17		5.0	

Cyanide Consumed, kg/mt ore 0.30

Lime Added, kg/mt ore 1.5

### Leached Residue

Final Residue Weight, grams 1026.60

Tail Assay	gAu/mt	gAg/mt
Initial	11.73	3.4
Duplicate	11.86	3.3
Triplicate	12.00	3.4
Average	11.86	3.4

Head Assay	gAu/mt	gAg/mt
Initial	14.57	4.2
Duplicate	16.08	4.4
Triplicate	15.67	4.4
Average	15.44	4.3