30229

MAGNETOMETER SURVEY REPORT,

RICHMAN 1 CLAIM, SOUTH-CENTRAL BRITISH COLUMBIA

NTS Map Sheet 92 O/7

Latitude 51° 18′ N; Longitude 122° 38′ W

Clinton Mining Division

Tenure Holder: Christopher Sebert

By: A.J. Boronowski, P.Geo. and C. Sebert, P. Eng.

September 19, 2008

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SUMMARY

A magnetometer survey consisting of 13.7 line kilometers utilizing a GeoMetrics Model G816 Portable Proton Magnetometer was conducted over the eastern portion of the Richman 1 Claim, lying to the southwest of Blackdome Mountain in the Clinton Mining Division. The survey was designed with the following objectives in mind:

1) to determine whether the clay (argillic) alteration zones, which represent hydrothermally altered structural trends with potential for hosting economic auriferous quartz veins at depth could be recognized as magnetic lows;
2) to determine whether large and small scale shears and faults are magnetically distinct from adjacent host rocks;
3) to test if underlying bedrock lithologies could be separated using measurements of magnetic field intensity.

The magnetometer survey has demonstrated that the area of interest located to the east of the old Bobcat baseline, in the area between lines L7+00S to L15+00S contains subtle magnetic lows which trend NNE to NE. These magnetic occur above the fault controlled clay (argillic) alteration zones originally cut by trenches dug by Lexington Resources Ltd. Similar trends control most of the economically important gold-silver mineralization and quartz veins at the Blackdome Mine (refer to the highlighted text in section: Summary of Geology for more detail). However, the variation of the magnetic field intensity is low - on the order of 10 gammas. Therefore, it is questionable whether a magnetometer survey would be able to provide the confidence to interpret such slight magnetic anomalies as potential Au-Ag-vein locations without other complementary geological information.

Two large northeast-striking faults, one parallel to the Bobcat baseline and the other trending across the eastern claim boundary also appear to prompt changes in the magnetic field intensity. The magnetic response is between 10 and 30 gammas immediately near their surface traces, and up to 70 gammas across ~200 m of traverse over the more western of the two parallel to the baseline. The general decline of magnetic intensity over the western of the two

structures may possibly be linked to changes in thickness of certain more magnetic rock types across the fault. The slightly lower magnetic intensity above the surface trace of the eastern structure may be due to clay alteration along it and magnetite destruction.

The Miocene-age basalt flow rocks give a very strong magnetic response. These younger mafic rocks cap older Eocene volcanic rocks in portions of the Richman claim block and the surrounding area. The Eocene volcanic rocks are the hosts of the epithermal gold-silver mineralization at the Blackdome mine and considered to be the more prospective target.

The magnetometer survey may be a useful exploration tool in the search for epithermal Au-Ag- veins as a complement to mapping and geochemical surveys. It is relatively quick and cheap to conduct and would likely help to better define areas covered by younger, Miocene-aged basaltic rocks where outcrop is scarce. It also appears to have some potential to pick out larger fault structures. However, more area needs to be covered than that done in this programme. A more extensive magnetometer survey would serve to better confirm the results and conclusions given above, and provide coverage over the whole of the Richman 1 claim block to help better define larger clay-altered faults and areas covered by Miocene basalt flow rocks.

INTRODUCTION AND OUTLINE OF PROGRAMME

A magnetometer survey consisting of a total of approximately 13.7 kilometres was conducted over the area of economic interest underlying the eastern portion of the Richman 1 Claim. The Richman 1 Claim lies about 5 kilometres to the southwest of the peak of Blackdome Mountain, in the Clinton Mining Division.

Location and Access

Access to the Richman claims is provided by an all-weather gravel road, which leaves Highway 97 about 17 km north of Clinton, B.C. The road leads westward and crosses the Fraser River via the Gang Ranch Bridge. The road then heads southward towards Empire Valley. Just south of Brown Lake the Blackdome Mine road turns off. This road is about 32 km long and is drivable by normal 2 wheel drive vehicles under dry conditions to Blackdome Mountain. From there access through the Blackdome Mine property is restricted via a gate across the mine road. For this programme the authors traversed the last 6 km to the claims on foot and on bicycles as motorized-vehicle access across the Blackdome property had not been previously approved by the owners.

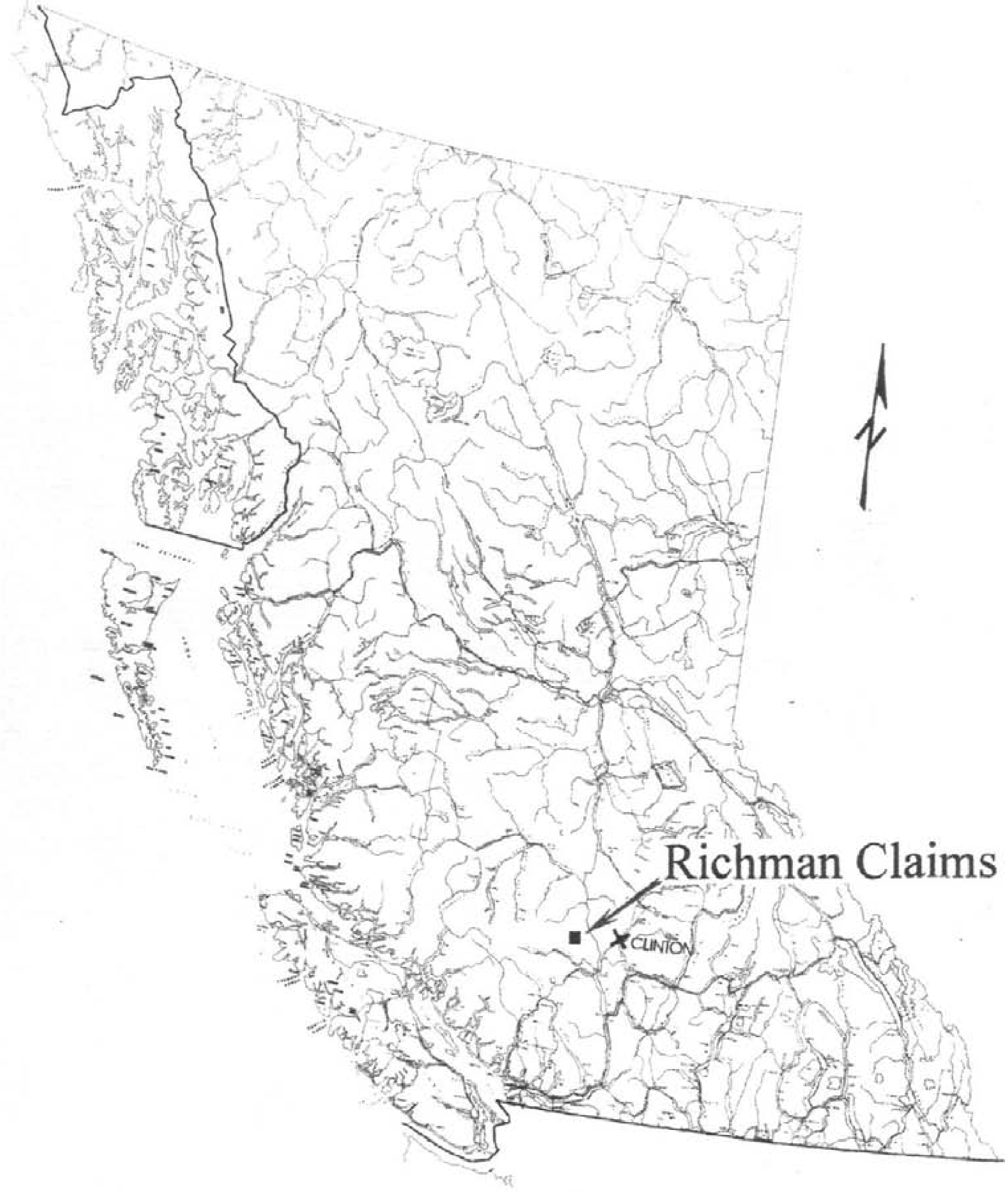
Claim Tenure Information

Table 1 outlines the claim tenure information for the Richman 1 and 3 Claims. Figure 2 shows their location relative to Blackdome Mountain and other mineral titles.

Table 1: Tenure Information: Richman Claims, Clinton Mining Division, B.C.

Claim	Units	Tenure No.	Owner	Client No.	Staking Date
Richman 1	20 units	378915	C.F. Sebert	124204	2000/07/12
Richman 3	4 units	378917	C.F. Sebert	124204	2000/07/12

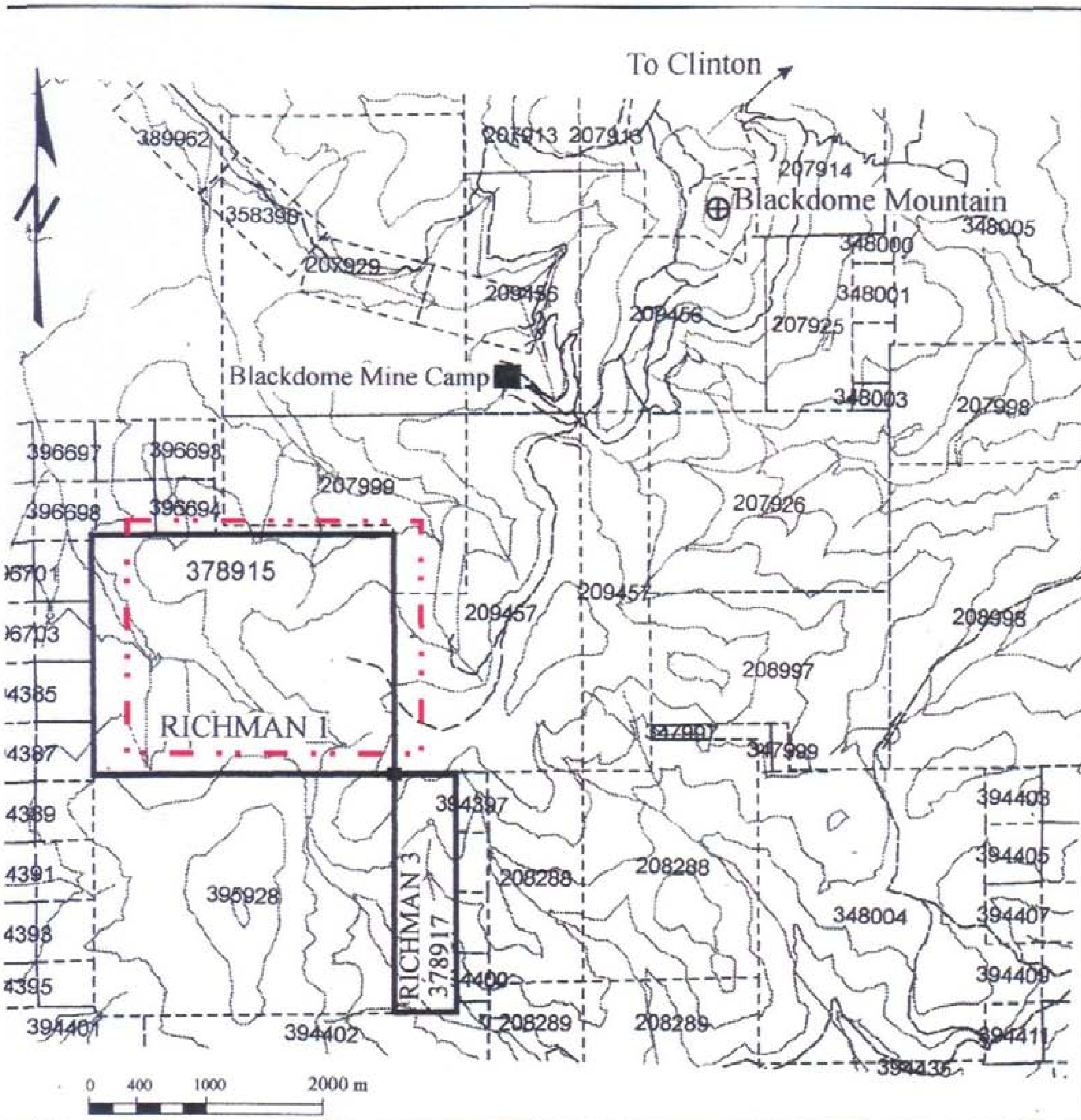
Based on this year's filing of assessment work: the Richman 1 Claim is in good standing until July 12, 2012; the Richman 3 Claim until July 12, 2012.



Property Location Map

RICHMAN 1 and 3 CLAIMS

Figure 1	Sept. 19, 2008



2008 Geophysical Survey Area

TENURE MAP
RICHMAN 1 & 3 CLAIMS

Figure 2	Sept. 19, 2008

Summary of Geology

Blackdome Mountain lies just 5 km to the northeast of the Richman Claims. It is an Eocene-aged calc-alkaline volcanic centre (Vivian, 1988) and is composed of shallow-dipping layer-cake stratigraphy made-up of alternating beds of andesitic, dacitic, and rhyolitic flows, breccias, tuffs and volcanic-derived sediments. The Eocene volcanic rocks form a regional formation and overlie older Lower Cretaceous-aged conglomeratic rocks of the Jackass Mountain Group, which are exposed to the south of the area explored. Dark Miocene-aged basalt flows and breccias of the Chilcotin Group cap the Eocene volcanic rocks and are often prominently exposed on topographic high points. Glacial drift, which includes till and fluvial deposits, forms an extensive blanket that covers the country rocks at lower elevations.

Gold-silver mineralization occurs at the Blackdome Mine and is contained in epithermal-type veins lying in prominent north to northeast trending fault zones. The faults and veins generally dip steeply to the west and tend to be strongly argillically altered and stained by iron and manganese oxides. Propylitic alteration also occurs peripherally to the veins and may form an outer envelope to the argillic alteration. Green porphyritic andesite dykes intrude the vein-bearing faults locally.

The epithermal Au-Ag mineralization at the Blackdome Mine occurs in low-sulphidation-type quartz-rich veins, which display characteristic open-space filling textures. The veins are composed of several phases of, amorphous and fine-grained to coarse-grained sub-to euhedral crustiform and cockscomb quartz. The quartz is accompanied by significant adularia, calcite and clay minerals including Ca-K montmorillonite, illite, mixed illite/smectite and minor kaolinite (Vivian, 1988). Sulphides are sparse in the Blackdome veins and are generally fine-grained; these include pyrite, Ag-sulphosalts, acanthite-aguilarite (Ag_2S – Ag_2Se), chalcopyrite, galena, sphalerite and marcasite. Gold occurs in native form and more commonly as electrum (Vivian, 1988). Particle size of the gold and electrum vary from microscopic (1 micron) to several millimetres. The gold is found associated with fine-grained pyrite but primarily within acanthite-aguilarite grains. Electrum is found between quartz-adularia grains, in tiny veinlets cutting pyrite and chalcopyrite and commonly within acanthite-aguilarite grains. Vivian (1988) states that it is common to see electrum replacing silver sulphosalts. Therefore he suggests that electrum and gold deposition probably closely followed the start of deposition of Ag sulphides and sulphosalts, chalcopyrite, galena and sphalerite.

Sampling and analysis of ore mineralization at the Blackdome mine determined that there was a close correlation between Au, Ag, As, Sb, Cu, Pb and Mo (Rennie, 1988). However, exploration conducted by Blackdome Mining Corp. revealed that most of these elements were not useful pathfinders for the epithermal mineralization in soils (Rennie, 1988).

Previous workers in the area have also noted that economic Au mineralization at Blackdome is confined largely between the 1870 and 1960 m elevation and the veins at this level are generally better formed and the wall rocks are less clay altered. At higher levels the veins become more discontinuous and occur as multiple stringers, and the wall rock tends to be clay altered. The Au content of the veins at upper levels is generally lower and with only local, sporadic higher Au grades. These characteristics of the Blackdome veins may be related to a primary topographic control in the hydrothermal system. Also interesting is that all known economic mineralization at Blackdome Mountain appears to occur within several kilometres of the peak and this suggests that the Au mineralization in the area was deposited close to volcanic centers.

Summary of Previous Exploration Work

Several parties have previously explored the area covered by the Richman Claims.

In 1981 Mr. R. Dunn obtained anomalous Au values from heavy mineral samples from creeks draining the area, which had been staked as the Pony Claims at that time. Unfortunately, the location of these samples is unknown. Other samples from altered and silicified float reportedly contained up to 2010 ppb Au; these samples were found on line with the southwestern projection of the Blackdome vein system (Heine, 1988 a & b).

In 1982, 23 soil samples were collected along a contour-parallel traverse (Fipke and Capell, 1983); of these three were very anomalous in Au (ranging from 1180 to 2555 ppb). The traverse was conducted near the top of a prominent west-northwest trending ridge and the sample locations were about 200 m to the west-northwest of the old Lexington Camp (Figure 3).

In 1986 the Pony claims were re-staked as the Bobcat claims and then subsequently sold to Lexington Resources Ltd. More exploration was done by Ashworth Explorations Ltd. for Lexington Resources Ltd. in the late 1980's. A program of geological mapping, soil sampling and trenching was followed by diamond drilling (Heine, 1988 a & b). This program identified several argillically altered fault zones of similar attitude as those found at Blackdome Mountain. Some of these structures contained quartz stringers and quartz sealed breccias with open-space filling textures; some contained significant sulphides. However, assay values of samples taken in trenches and core did not return any significant Au values. A "high" Au value of 120 ppb was obtained from a blocky-brecciated clay-rich zone with quartz veinlets in one drill hole. The same interval contained mercury values up to 6100 ppb. Lower Au values (generally below 70 ppb) were returned from other similar clay-rich silicified zones. Instead, a few of these altered zones contain sporadic high Hg values exceeding 5000ppb. However, Lexington Resources Ltd. decided not to pursue further exploration of the ground and the claims were allowed to lapse.

Past exploration on the Richman Claims indicates that the bedrock geology is very similar to that found at Blackdome Mountain. The core from the dozen holes drilled by Lexington Resources Ltd. was re-organized and re-piled in 2000 by Alex Boronowski and the Chris Sebert. The rocks in the core consisted primarily of medium to green-grey (+/-) pyroxene-feldspar-porphyritic dacite to andesite flows. Occasional beds of autoclastic volcanic breccia, ash layers, heterogeneous volcanic blockstone, and fine to coarse-grained volcanic sandstone occur in the stratigraphy. The volcanic blockstones contain a mixture of porphyritic dacite and andesite blocks up to a magnitude of 10 centimetres across; pale rhyolite fragments were noted in places. Generally these blockstones are unbedded and probably were locally derived. Some sandstone layers are well bedded. Grain size of the sandstones varies from fine to coarse and flattened pumice fragments were noted sporadically. Minor laminated mudstone and fine-grained ash beds are contained in the sandstone layers. Like the volcanic blockstones the sandstones were largely derived from andesitic and dacitic volcanic rocks but are more reworked, likely in an aqueous setting.

Geological mapping of the Richman 1 Claim was started in June 2004 at 1:2000 scale. This work sought to cover the topographically-higher, eastern half of the claim block, which contains the anomalous, clay altered structures that were targeted by Lexington Resources Ltd. in trenches and drill holes. The mapping effort was accompanied by whole rock analyses of volcanic rocks in outcrop and drill core (Boronowski and Sebert, 2004) and by examining air photos to trace lineaments corresponding to bedding and faulting. However, impediments to detailed mapping were encountered in the form of sparse outcrop, even in this elevated section of the claim block; also the reclamation of earlier trenching has distributed angular, fresh float dug from bedrock over a wide area. Therefore geological mapping must be accompanied by judicious examination of available sub crop and float concentrations.

In general, the geology of eastern part of the Richman 1 claim is dominated by grey to green pyroxene-feldspar dacitic flows representing several effusions of lava. Minor discontinuous beds of rhyolitic tuff are located within dacitic volcanic rocks just to the west of the old Bobcat baseline on the higher portion of the west-northwest-trending ridge within the Richman 1 Claim. Darker green andesitic and basaltic feldspar-pyroxene porphyritic flow rocks lie below the dacitic volcanic rocks towards the west-northwest. Pale, bleached to rusty rhyolitic tuffs sub crop at lower elevations to the west of the Bobcat baseline in the north-westward flowing creek draining the central portion of the Richman 1 Claim, and in a prominent gulley cutting the ridge axis in the northern section of the claim at about 0531750 E (UTM).A layer of volcanic-derived sediments, including volcanic sandstone and conglomerate, separate the overlying porphyritic andesitic and basaltic rocks from the rhyolitic tuffaceous rocks below.

Islands of dark brown-purplish, Miocene-age basaltic flow rocks are located on the southern flank of the east-northeast ridge forming the high ground on the Richman 1 Claim between 0533000E (UTM) and 0531600E (UTM). Other bodies of younger mafic flow rocks occur in the southern section of the claim block, south of 5682400N (UTM), on the southern bank of the northwestward-flowing creek draining the Richman 1 Claim.

The layering and bedding in the volcanic rocks and sediments tends to dip gently southeast to northeastward. The volcanic stratigraphy is cut by several sub-parallel northeast-trending faults. These dip steeply southwest or northeast, and produce right-hand and left-hand displacement of bedding contacts up to ~100 metres, with a collective down drop of stratigraphy in the west with respect to the east. This suggests that these structures were block faults with a normal slip component. Other northwest-striking and east-northeast faults were also noted.

However, to date, the Richman Claims have only been partially mapped. The exploration program conducted for Lexington Resources Ltd. was mainly focused on delineating and mapping alteration and structures on the upper elevations of the Richman 1 Claim. The detailed stratigraphic and structural relations between lithologies remain to be determined. Also, the soil geochemical programs conducted on these claims so far have been localized efforts.

Never the less, the previous exploration efforts on the ground covered by the Richman 1 Claim suggest that there is good potential for epithermal Au-bearing veins. Of particular interest is that several of the drill holes intersected quartz-sealed breccia zones, which were contained in argillically altered faults. Present data suggests that they trend north to northeast, a similar orientation as those at the Blackdome Mine. Also they are mineralogically and texturally somewhat similar to those found at Blackdome.

Heine (1988b) postulated that the clay-rich nature of the faulted zones, the lack of well-formed vein structures and low Au content may be due to the samples being taken at too

high an elevation in the hydrothermal system. He suggested that Au grades may increase at depth. To date the areas sampled by drilling and trenching lie at elevations from above 1950 down to about 1800 m. While this covers the productive elevation range for Au at the Blackdome Mine this exploration has occurred on only a restricted portion of the property. Also, the mineralization in the Richman area may conceivably be related to a different hydrothermal cell and therefore there is potential of finding higher Au grades at lower elevations than at the Blackdome Mine.

Another clay-sericite altered fault zone is exposed on the north end of the Richman 3 Claim. This zone was uncovered and examined originally by Ballatar Explorations Ltd. (Hardy and van Wermeskerken, 1989) in 1988 and named the Geo Zone. It is made-up of several limonite and clay rich sheared intervals containing quartz veinlets and pyrite. Sampling revealed only very low Au contents (up to 19 ppb) but elevated As (up to 250 ppm) and Hg (up to 11000 ppb).

Objectives and Methodology of the Magnetometer Survey

The magnetometer survey was designed with the following objectives in mind:

1) to determine whether the clay (argillic) alteration zones, which represent hydrothermally altered structural trends with potential for hosting economic auriferous quartz veins at depth could be recognized as magnetic lows;

2) to determine whether large and small scale shears and faults are magnetically distinct from adjacent host rocks.

3) to test if underlying bedrock lithologies could be separated using measurements of magnetic field intensity.

A Geometrics Model G816 Portable Proton Magnetometer was rented from S.J. Geophysical Ltd. A copy of the manual for this instrument is contained in Appendix 2. The survey was conducted by Alex Boronowski between July 6th and 10th, 2008. A Garmin GPSmap 60CSx was utilized for ground control and navigating along older lines established by Lexington

Resources Ltd. in 1988. The compass mode was utilized in the GPS until it was determined that the readings were wandering due to magnetic effects.

Magnetometer readings were collected at 50 metre intervals and at 100 metre line spacing. The readings (in gammas) for total magnetic field intensity were corrected for diurnal changes. A total of 13.7 line kilometers were covered in the survey. These results were plotted on an Excel spreadsheet and are presented in Appendix 1. A contour map of magnetic field intensity at 1:5000 scale based on the corrected magnetometer readings is presented in Figure 3 (in pocket).

Along with the magnetometer survey, additional geological mapping was performed by Chris Sebert to the west of the old Bobcat baseline to augment geological mapping started in 2004. The geological information obtained in 2008 was combined with the 2004 geological work and integrated with the geological information collected in trenches by Lexington Resources Ltd. (Heine, 1988a). A 1:5000 geological summary map was plotted (Figure 4, in pocket), which displays the major rock-types and faults located in the area of the geophysical survey. This map has the same coverage window as the magnetic contour map and was used to relate magnetic field intensity measurements to fault structures, alteration, and bedrock lithology. A third map Figure 5 (in pocket) superimposes the contour map of magnetic intensity on the geology as mapped.

Figures 3 to 5 are based on 1:20,000 government TRIM maps. All GPS locations are measured in NAD83.

RESULTS AND DISCUSSION

Only a portion of the area of interest covered by the 1 5000 map sheets was covered by the geophysical survey because of time and weather constraints. Nine lines (L7+00S to L15+00S) were surveyed from the Bobcat baseline to the eastern border of the claim. Two lines (L14+00S and L15+00S) were completed to ~12+00W. The Bobcat baseline was traversed from 00+00S to 27+50S, beyond the present geological mapping coverage.

The area lying east of the Bobcat baseline between L7+00S to L15+00S and 3+50E to 8+00E is underlain by a relatively low area of magnetic response with magnetic lows (<56100 Gammas) appearing to trend NNE to NE (Figure 3). However, there is only a relative variation of 10 to 20 gammas across most of this area. Values of magnetic field intensity tend to rise to > 56100 gammas to the southwest approaching L14+00S and L15+00S.

This part of the Richman 1 claim block contains strongly clay-altered structures, which were originally exposed in trenching performed by Lexington Resources Ltd. in 1988 (Figure 4). The older trench mapping performed by Lexington geologists, and geological mapping and air photo lineament interpretation done by the authors in 2004 and 2008 confirm a NNE to NE trend for clay-altered fault structures in this area. The slightly lower magnetic responses obtained may be due to magnetite destruction in the volcanic rocks by hydrothermal alteration. The general rise in magnetic field intensity southwestward may reflect a change in rock-type from dacitic to more andesitic rocks (Figure 5).

A large northeast-striking, east-dipping fault paralleling the Bobcat baseline was identified by examination of aerial photo lineaments and geologic mapping by the authors in 2004 and 2008 (Figure 4). Two lines of the magnetometer survey crossed this structure (14+00S and 15+00S). Magnetic field density declines by ~15 to 20 gammas from east to west across the recessive lineament marking the structure; however, a larger decline of > 30 to 70 gammas is present over a distance of ~200 on these same two lines (Figure 3 and Figure 5). This change in readings may be a result of juxtaposition of thicker layers of more magnetic andesitic volcanic rock in the east against a thinner layer in the west across this fault. Or there are thicker sedimentary, conglomeritic and tuffaceous layers in the western section of the stratigraphy.

Another large northeast-striking, west-dipping fault cuts the eastern boundary of the Richman 1 claim (Figure 4). A variation of 30 gammas occurs on L11+00 between 600E and 700E, with a relatively low reading between 650E and 700E marking the fault trace (Figure 5). More subtle variation of ~ 10 gamma lows in the same general easting location was noted on L12+00 and L13+00 across this same structure. Trenches cut across this structure by

Lexington Resources Ltd. revealed strong clay alteration and this likely has caused magnetite destruction.

Miocene basaltic flows, which have been observed to be strongly magnetic in the sparse available outcrop in the survey area, are co-incident with strong magnetic highs on line 15+00 at station 650W and on the extreme southwestern part of the Bobcat baseline between stations 24+50S and 26+00S. Portions of the andesitic volcanic rocks mapped below the dacitic volcanic rocks and between 19+00S and 21+50S on the baseline are also associated with higher magnetic field intensity readings (Figure 5).

However, there was no consistently recognizable variation in magnetic field intensity measurements taken above most of the volcanic rock-types present in the survey area that coincide with mapped and interpreted contacts. The magnetic susceptibility of the majority of the dacitic and andesitic rock units is likely not sufficiently large to produce sharp changes in the magnetic intensity and to allow more accurate definition of contacts between them. Rather the change from dacitic to andesitic rocks may express itself in a broad, gentle increase in magnetic intensity.

CONCLUSIONS AND RECOMMENDATIONS

The magnetometer survey has demonstrated that the area of interest located to the east of the old Bobcat baseline, in the area between lines L7+00S to L15+00S contains subtle magnetic lows which trend NNE to NE. These magnetic occur above fault controlled clay (argillic) alteration zones originally cut by trenches dug by Lexington Resources Ltd. Similar trends control most of the economically important gold-silver mineralization and quartz veins at the Blackdome Mine (refer to the highlighted text in section: Summary of Geology for more detail). However, the variation of the magnetic field intensity is low, on the order of 10 gammas. Therefore, it is questionable whether a magnetometer survey would be able to provide the confidence to interpret such slight anomalies as potential Au-Ag-vein locations without other complementary geological information.

The two large northeast-striking faults also appear to prompt changes in the magnetic field intensity, which are slightly larger: between 10 and 30 gammas immediately near their surface traces, and up to 70 gammas across ~200 m of geophysical traverse over the more western of the two, parallel to the baseline. The general decline of magnetic intensity over the western of the two faults may possibly be linked to changes in thickness of certain more magnetic rock types across the fault. The slightly lower magnetic intensity above the surface trace of the eastern structure may be due to clay alteration along it and magnetite destruction.

The Miocene-age basalt flow rocks give a very strong magnetic response. These younger mafic rocks cap older Eocene volcanic rocks in portions of the Richman claim block and the surrounding area. The Eocene volcanic rocks are the hosts of the epithermal gold-silver mineralization at the Blackdome mine.

The magnetometer survey may be a useful exploration tool in the search for epithermal Au-Ag- veins as a complement to mapping and geochemical surveys. It is relatively quick and cheap to conduct and would likely help to better define areas covered by younger, Miocene-aged basaltic rocks where outcrop is scarce. It also appears to have some potential to pick out larger fault structures. However, more area needs to be covered than that done in this programme. A more extensive magnetometer survey would serve to better confirm the results and conclusions given above, and provide coverage over the whole of the Richman 1 claim block to help better define larger clay-altered faults and areas covered by Miocene basalt flow rocks.

STATEMENT OF EXPENDITURES

Table 4: Statement of Expenditures

<u>Alex Boronowski</u>	
Wages – July 4-11, 2008	
8 days x 10 hrs x $100/hr.	$8000.00
Truck – July 4-11, 2008	
1,673 km. x $0.75/km	$1254.75
Camp Supplies and Equipment	
5 days x $100/day	$500.00
Communications	$20.00
<u>Chris Sebert</u>	
Wages – July 4-11, 2008	
8 days x 10 hrs x $100/hr.	$8000.00
Truck – July 4-11, 2008	
1,400 km. x $0.75/km	$1050.00
Camp Supplies and Equipment	
5 days x $100/day	$500.00
Assistant for 1 day	$60.00
Magnetometer Rental	
Invoice ER08634 July 4, 2008 (deposit)	$157.50
Invoice ER08634 July 14, 2008 (final settlement)	$94.50

Food (2 men)	$479.01
Fuel (2 vehicles)	$466.24
Report Writing and Drafting (Alex Boronowski and Chris Sebert)	$5000.00
Total Programme Cost	**$25,582.00**

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Vivian, G.J., 1988. The Geology of the Blackdome Epithermal Deposit. Unpublished Master's Thesis, University of Alberta.

Appendix 1: Richman 1 Magnetometer Survey Data

STATION	GPS STN.	UTM EASTING NAD 83	UTM NORTHING NAD 83	Elevation	SAMPLE TIME	START TIME	DIFF TIME	DIFF MIN	CORRECT PER MIN.	CORRECT	GAMMAS	CORRECTION GAMMAS	NOTES -NAD 83 Datum
BL 13+50S	3	532418	5683086	1948 m	14:34:00	14:40:00	0:06:00	-6.00	-0.102	0.61	56073	56073.61	
BL 13+00S	4	532445	5683128	1950 m	14:40:00	14:40:00	0:00:00	0.00	-0.102	0.00	56125	56125.00	subtract 0.102 gammas per min. to reduce end result to be equal to starting point
BL 12+50S	5	532475	5683166	1947 m	14:46:00	14:40:00	0:06:00	6.00	-0.102	-0.61	56099	56098.39	
BL 12+00S	6	532507	5683202	1946 m	14:48:00	14:40:00	0:08:00	8.00	-0.102	-0.82	56093	56092.18	
BL 11+50S	7	532537	5683241	1942 m	14:51:00	14:40:00	0:11:00	11.00	-0.102	-1.12	56108	56106.88	
BL 11+00S	8	532562	5683276	1938 m	14:56:00	14:40:00	0:16:00	16.00	-0.102	-1.63	56090	56088.37	
BL 10+50S	9	532605	5683324	1931 m	14:57:00	14:40:00	0:17:00	17.00	-0.102	-1.73	56113	56111.27	
BL 10+00S	10	532632	5683359	1924 m	14:59:00	14:40:00	0:19:00	19.00	-0.102	-1.94	56107	56105.06	
BL 9+50S	11	532662	5683400	1917 m	15:02:00	14:40:00	0:22:00	22.00	-0.102	-2.24	56081	56078.76	
BL 9+00S	12	532681	5683428	1913 m	15:06:00	14:40:00	0:26:00	26.00	-0.102	-2.65	56091	56088.35	
BL 8+50S	13	532717	5683467	1906 m	15:08:00	14:40:00	0:28:00	28.00	-0.102	-2.86	56097	56094.14	SURVEY PIN
BL8+00S	14	532755	5683515	1903 m	15:12:00	14:40:00	0:32:00	32.00	-0.102	-3.26	56117	56113.74	
BL 7+50S	15	532784	5683556	1898 m	15:16:00	14:40:00	0:36:00	36.00	-0.102	-3.67	56065	56061.33	
BL 7+00S	16	532816	5683595	1893 m	15:19:00	14:40:00	0:39:00	39.00	-0.102	-3.98	56084	56080.02	
BL 6+50S	17	532848	5683633	1892 m	15:22:00	14:40:00	0:42:00	42.00	-0.102	-4.28	56053	56048.72	
BL 6+00S	18	532879	5683672	1890 m	15:24:00	14:40:00	0:44:00	44.00	-0.102	-4.49	56073	56068.51	
BL 5+50S	19	532910	5683710	1889 m	15:34:00	14:40:00	0:54:00	54.00	-0.102	-5.51	56040	56034.49	
BL 5+00S	20	532934	5683746	1888 m	15:37:00	14:40:00	0:57:00	57.00	-0.102	-5.81	56023	56017.19	
BL 4+50S	21	532969	5683788	1887 m	15:39:00	14:40:00	0:59:00	59.00	-0.102	-6.02	56045	56038.98	
BL 4+00S	22	532995	5683818	1885 m	15:42:00	14:40:00	1:02:00	62.00	-0.102	-6.32	56050	56043.68	QUARTZ FLOAT
BL 3+50S	23	533032	5683869	1878 m	15:45:00	14:40:00	1:05:00	65.00	-0.102	-6.63	56021	56014.37	
BL3+00S	24	533061	5683906	1867 m	15:48:00	14:40:00	1:08:00	68.00	-0.102	-6.94	55998	55991.06	RECCE LINE WP50 253DEGREES FOR 22OM.
BL 2+50S	25	533093	5683945	1858 m	15:52:00	14:40:00	1:12:00	72.00	-0.102	-7.34	56035	56027.66	
BL2+00S	26	533125	5683984	1844 m	15:55:00	14:40:00	1:15:00	75.00	-0.102	-7.65	56025	56017.35	
BL 1+50S	27	533155	5684022	1832 m	15:58:00	14:40:00	1:18:00	78.00	-0.102	-7.96	56054	56046.04	
BL 1+00S	28	533185	5684059	1817 m	16:01:00	14:40:00	1:21:00	81.00	-0.102	-8.26	56054	56045.74	
BL +50S	30	533217	5684102	1809 m	16:12:00	14:40:00	1:32:00	92.00	-0.102	-9.38	56115	56105.62	
BL 0+00S	29	533248	5684139	1802 m	16:07:00	14:40:00	1:27:00	87.00	-0.102	-8.87	56077	56068.13	BOBCATII 51N41E
BL13+00S	4				16:48:00	14:40:00	2:08:00	128.00	-0.102	-13.06	56138	56124.94	
BL9+00S	31	532695	5683443	1907 m	8:49:00	8:49:00	0:00:00	0.00	0.207	0.00	56094	56094.00	Add 0.207 gammas per min. to increase end result to be equal to starting point
8S+50E	32	532763	5683470	1917 m	9:09:00	8:49:00	0:20:00	20.00	0.207	4.14	56081	56085.14	
8S+100E	33	532809	5683434	1931 m	9:11:00	8:49:00	0:22:00	22.00	0.207	4.55	56077	56081.55	
8S+150E	34	532838	5683393	1949 m	9:14:00	8:49:00	0:25:00	25.00	0.207	5.18	56086	56091.18	
8S+200E	35	532865	5683358	1960 m	9:16:00	8:49:00	0:27:00	27.00	0.207	5.59	56078	56083.59	
8S+250E	36	532894	5683319	1972 m	9:19:00	8:49:00	0:30:00	30.00	0.207	6.21	56079	56085.21	
8S+300E	37	532919	5683276	1980 m	9:21:00	8:49:00	0:32:00	32.00	0.207	6.62	56075	56081.62	
8S+350E	38	532943	5683235	1984 m	9:23:00	8:49:00	0:34:00	34.00	0.207	7.04	56075	56082.04	
8S+400E	39	532969	5683183	1978 m	9:26:00	8:49:00	0:37:00	37.00	0.207	7.66	56085	56092.66	

Richman Magnetometer Survey

Tabulated Locations, Readings and Corrections

STATION	GPS STN.	UTM EASTING NAD 83	UTM NORTHING NAD 83	Elevation	SAMPLE TIME	START TIME	DIFF TIME	DIFF MIN	CORRECT PER MIN.	CORRECT	GAMMAS	CORRECTION GAMMAS	NOTES -NAD 83 Datum
8S+450E	40	532984	5683149	1975 m	9:27:00	8:49:00	0:38:00	38.00	0.207	7.87	56075	56082.87	
8S+500E	41	533006	5683107	1974 m	9:28:00	8:49:00	0:39:00	39.00	0.207	8.07	56073	56081.07	
8S+550E	42	533033	5683066	1976 m	9:31:00	8:49:00	0:42:00	42.00	0.207	8.69	56085	56093.69	
9S+600E	43	532999	5682922	1979 m	9:46:00	8:49:00	0:57:00	57.00	0.207	11.80	56094	56105.80	
9S+550E	44	532970	5682961	1980 m	9:47:00	8:49:00	0:58:00	58.00	0.207	12.01	56082	56094.01	
9S+500E	45	532942	5682998	1981 m	9:49:00	8:49:00	1:00:00	60.00	0.207	12.42	56097	56109.42	
9S+450E	46	532915	5683037	1984 m	9:51:00	8:49:00	1:02:00	62.00	0.207	12.83	56080	56092.83	
9S+400E	47	532891	5683077	1991 m	9:52:00	8:49:00	1:03:00	63.00	0.207	13.04	56091	56104.04	
9S+350E	48	532865	5683118	1990 m	9:54:00	8:49:00	1:05:00	65.00	0.207	13.46	56086	56099.46	
9S+300E	49	532833	5683151	1990 m	9:56:00	8:49:00	1:07:00	67.00	0.207	13.87	56088	56101.87	
9S+250E	50	532798	5683181	1983 m	9:58:00	8:49:00	1:09:00	69.00	0.207	14.28	56092	56106.28	
9S+200E	51	532761	5683214	1974 m	9:59:00	8:49:00	1:10:00	70.00	0.207	14.49	56091	56105.49	
9S+150E	52	532728	5683242	1962 m	10:02:00	8:49:00	1:13:00	73.00	0.207	15.11	56102	56117.11	
9S+100E	53	532696	5683275	1950 m	10:03:00	8:49:00	1:14:00	74.00	0.207	15.32	56085	56100.32	
9S+50E	54	532659	5683308	1940 m	10:05:00	8:49:00	1:16:00	76.00	0.207	15.73	56077	56092.73	
BL10+25S	55	532617	5683342	1924 m	10:08:00	8:49:00	1:19:00	79.00	0.207	16.35	56080	56096.35	
BL9+00S	31				10:11:00	8:49:00	1:22:00	82.00	0.207	16.97	56077	56093.97	
BL10+00S	10				10:43:00	10:43:00	0:00:00	0.00	0.128	0.00	56111	56111.00	Add 0.128 gammas per min. to increase end result to be equal to starting point
10S+50E	56	532677	5683318	1941 m	10:48:00	10:43:00	0:05:00	5.00	0.128	0.64	56082	56082.64	
10S+100E	57	532711	5683287	1952 m	10:51:00	10:43:00	0:08:00	8.00	0.128	1.02	56090	56091.02	
10S+150E	58	532755	5683258	1964 m	10:54:00	10:43:00	0:11:00	11.00	0.128	1.41	56094	56095.41	
10S+200E	59	532790	5683226	1976 m	10:57:00	10:43:00	0:14:00	14.00	0.128	1.79	56089	56090.79	
10S+250E	60	532833	5683200	1985 m	11:01:00	10:43:00	0:18:00	18.00	0.128	2.30	56096	56098.30	
10S+300E	61	532850	5683160	1990 m	11:03:00	10:43:00	0:20:00	20.00	0.128	2.56	56082	56084.56	
10S+350E	62	532888	5683124	1988 m	11:06:00	10:43:00	0:23:00	23.00	0.128	2.94	56073	56075.94	
10S+400E	63	532929	5683084	1982 m	11:09:00	10:43:00	0:26:00	26.00	0.128	3.33	56082	56085.33	
10S+450E	64	532967	5683052	1979 m	11:10:00	10:43:00	0:27:00	27.00	0.128	3.46	56082	56085.46	
10S+500E	65	533000	5683011	1980 m	11:13:00	10:43:00	0:30:00	30.00	0.128	3.84	56092	56095.84	
10S+550E	66	533024	5682987	1980 m	11:15:00	10:43:00	0:32:00	32.00	0.128	4.10	56082	56086.10	
10S+600E	67	533061	5682955	1981 m	11:17:00	10:43:00	0:34:00	34.00	0.128	4.35	56088	56092.35	
10S+650E	68	533103	5682923	1982 m	11:19:00	10:43:00	0:36:00	36.00	0.128	4.61	56082	56086.61	
10S+700E	69	533134	5682890	1986 m	11:21:00	10:43:00	0:38:00	38.00	0.128	4.86	56086	56090.86	
11S+750E	70	533136	5682769	1999 m	11:27:00	10:43:00	0:44:00	44.00	0.128	5.63	56115	56120.63	
11S+700E	71	533098	5682802	1991 m	11:35:00	10:43:00	0:52:00	52.00	0.128	6.66	56100	56106.66	
11S+650E	72	533063	5682835	1986 m	11:37:00	10:43:00	0:54:00	54.00	0.128	6.91	56082	56088.91	
11S+600E	73	533016	5682874	1981 m	11:40:00	10:43:00	0:57:00	57.00	0.128	7.30	56089	56096.30	
11S+550E	74	532983	5682904	1978 m	11:41:00	10:43:00	0:58:00	58.00	0.128	7.42	56090	56097.42	
11S+500E	75	532960	5682924	1979 m	11:43:00	10:43:00	1:00:00	60.00	0.128	7.68	56091	56098.68	
11S+450E	76	532925	5682952	1980 m	11:44:00	10:43:00	1:01:00	61.00	0.128	7.81	56090	56097.81	
11S+400E	77	532882	5682980	1984 m	11:46:00	10:43:00	1:03:00	63.00	0.128	8.06	56089	56097.06	

STATION	GPS	UTM	UTM	Elevation	SAMPLE	START	DIFF	DIFF	CORRECT	CORRECT	GAMMAS	CORRECTION	NOTES -NAD 83 Datum
	STN.	EASTING	NORTHING		TIME	TIME	TIME	MIN	PER MIN.			GAMMAS	
		NAD 83	NAD 83										
11S+350E	78	532849	5683004	1987 m	11:48:00	10:43:00	1:05:00	65.00	0.128	8.32	56082	56090.32	
11S+300E	79	532812	5683035	1992 m	11:50:00	10:43:00	1:07:00	67.00	0.128	8.58	56083	56091.58	
11S+250E	80	532775	5683066	1997 m	11:52:00	10:43:00	1:09:00	69.00	0.128	8.83	56099	56107.83	
11S+200E	81	532731	5683095	1993 m	11:54:00	10:43:00	1:11:00	71.00	0.128	9.09	56096	56105.09	
11S+150E	82	532695	5683130	1991 m	11:57:00	10:43:00	1:14:00	74.00	0.128	9.47	56102	56111.47	
11S+100E	83	532654	5683154	1981 m	11:59:00	10:43:00	1:16:00	76.00	0.128	9.73	56099	56108.73	
11S+50E	84	532617	5683183	1972 m	12:02:00	10:43:00	1:19:00	79.00	0.128	10.11	56100	56110.11	
BL11+50S						10:43:00							OUT BY 50METERS
BL10+00S	10				12:09:00	10:43:00	1:26:00	86.00	0.128	11.01	56100	56111.01	
BL12+00S					13:06:00	13:06:00	0:00:00	0.00	0.048	0.00	56086	56086.00	Add 0.048 gammas per min. to increase end result to be equal to starting point
12S+50E	85	532539	5683185	1951 m	13:10:00	13:06:00	0:04:00	4.00	0.048	0.19	56120	56120.19	
12S+100E	86	532570	5683165	1963 m	13:13:00	13:06:00	0:07:00	7.00	0.048	0.34	56082	56082.34	
12S+150E	87	532610	5683129	1976 m	13:23:00	13:06:00	0:17:00	17.00	0.048	0.82	56091	56091.82	
12S+200E	88	532637	5683105	1985 m	13:25:00	13:06:00	0:19:00	19.00	0.048	0.91	56094	56094.91	
12S+250E	89	532669	5683075	1990 m	13:27:00	13:06:00	0:21:00	21.00	0.048	1.01	56102	56103.01	
12S+300E	90	532703	5683047	1986 m	13:30:00	13:06:00	0:24:00	24.00	0.048	1.15	56078	56079.15	
12S+350E	91	532742	5683017	1988 m	13:32:00	13:06:00	0:26:00	26.00	0.048	1.25	56114	56115.25	really 300e
12S+400E	92	532780	5682984	1980 m	13:35:00	13:06:00	0:29:00	29.00	0.048	1.39	56090	56091.39	
12S+450E	93	532818	5682955	1976 m	13:37:00	13:06:00	0:31:00	31.00	0.048	1.49	56089	56090.49	
12S+500E	94	532854	5682922	1972 m	13:38:00	13:06:00	0:32:00	32.00	0.048	1.54	56082	56083.54	
12S+550E	95	532891	5682888	1971 m	13:40:00	13:06:00	0:34:00	34.00	0.048	1.63	56086	56087.63	
12S+600E	96	532926	5682862	1971 m	13:42:00	13:06:00	0:36:00	36.00	0.048	1.73	56118	56119.73	
12S+650E	97	532961	5682828	1974 m	13:46:00	13:06:00	0:40:00	40.00	0.048	1.92	56096	56097.92	
12S+700E	98	532994	5682793	1978 m	13:48:00	13:06:00	0:42:00	42.00	0.048	2.02	56086	56088.02	
12S+750E	99	533025	5682751	1985 m	13:51:00	13:06:00	0:45:00	45.00	0.048	2.16	56089	56091.16	
12S+800E	100	533060	5682722	1991 m	13:53:00	13:06:00	0:47:00	47.00	0.048	2.26	56076	56078.26	
12S+850E	101	533094	5682690	1993 m	13:56:00	13:06:00	0:50:00	50.00	0.048	2.40	56085	56087.40	
12S+900E	102	533133	5682663	2000 m	13:58:00	13:06:00	0:52:00	52.00	0.048	2.50	56114	56116.50	
13S+950E	103	533125	5682517	1974 m	14:06:00	13:06:00	1:00:00	60.00	0.048	2.88	56101	56103.88	
13S+900E	104	533085	5682544	1965 m	14:10:00	13:06:00	1:04:00	64.00	0.048	3.07	56119	56122.07	
13S+850E	105	533054	5682569	1967 m	14:12:00	13:06:00	1:06:00	66.00	0.048	3.17	56095	56098.17	
13S+800E	106	533016	5682604	1973 m	14:21:00	13:06:00	1:15:00	75.00	0.048	3.60	56094	56097.60	
13S+750E	107	532979	5682641	1978 m	14:26:00	13:06:00	1:20:00	80.00	0.048	3.84	56100	56103.84	
13S+700E	108	532954	5682657	1977 m	14:29:00	13:06:00	1:23:00	83.00	0.048	3.98	56104	56107.98	
13S+650E	109	532926	5682678	1971 m	14:31:00	13:06:00	1:25:00	85.00	0.048	4.08	56094	56098.08	
13S+600E	110	532897	5682740	1968 m	14:37:00	13:06:00	1:31:00	91.00	0.048	4.37	56098	56102.37	
13S+550E	111	532873	5682787	1967 m	14:41:00	13:06:00	1:35:00	95.00	0.048	4.56	56097	56101.56	
13S+500E	112	532845	5682829	1960 m	14:43:00	13:06:00	1:37:00	97.00	0.048	4.66	56099	56103.66	
13S+450E	113	532803	5682855	1964 m	14:46:00	13:06:00	1:40:00	100.00	0.048	4.80	56085	56089.80	
13S+400E	114	532755	5682879	1968 m	14:50:00	13:06:00	1:44:00	104.00	0.048	4.99	56083	56087.99	

STATION	GPS STN.	UTM EASTING NAD 83	UTM NORTHING NAD 83	Elevation	SAMPLE TIME	START TIME	DIFF TIME	DIFF MIN	CORRECT PER MIN.	CORRECT	GAMMAS	CORRECTION GAMMAS	NOTES -NAD 83 Datum
13S+350E	115	532717	5682909	1972 m	14:52:00	13:06:00	1:46:00	106.00	0.048	5.09	56083	56088.09	
13S+300E	116	532684	5682949	1982 m	14:55:00	13:06:00	1:49:00	109.00	0.048	5.23	56083	56088.23	
13S+250E	117	532647	5682986	1993 m	14:58:00	13:06:00	1:52:00	112.00	0.048	5.38	56078	56083.38	
13S+200E	118	532611	5683017	1990 m	15:00:00	13:06:00	1:54:00	114.00	0.048	5.47	56078	56083.47	
13S+150E	119	532565	5683040	1981 m	15:02:00	13:06:00	1:56:00	116.00	0.048	5.57	56081	56086.57	
13S+100E	120	532524	5683072	1967 m	15:04:00	13:06:00	1:58:00	118.00	0.048	5.66	56093	56098.66	
13S+50E	121	532486	5683111	1952 m	15:06:00	13:06:00	2:00:00	120.00	0.048	5.76	56090	56095.76	
BL12+00S					15:11:00	13:06:00	2:05:00	125.00	0.048	6.00	56080	56086.00	
BL14+00S	122	532380	5683044	1943 m	8:48:00	8:48:00	0:00:00	0.00	0.075	0.00	56101	56101.00	Add 0.075 gammas per min. to increase end result to be equal to starting point
BL14+50S	123	532350	5683002	1941 m	8:53:00	8:48:00	0:05:00	5.00	0.075	0.38	56115	56115.38	
BL15+00S	124	532318	5682966	1939 m	8:56:00	8:48:00	0:08:00	8.00	0.075	0.60	56149	56149.60	
BL15+50S	125	532287	5682930	1934 m	9:01:00	8:48:00	0:13:00	13.00	0.075	0.98	56111	56111.98	
BL16+00S	126	532259	5682887	1927 m	9:12:00	8:48:00	0:24:00	24.00	0.075	1.80	56119	56120.80	
BL16+50S	127	532226	5682851	1912 m	9:17:00	8:48:00	0:29:00	29.00	0.075	2.18	56132	56134.18	
BL17+00S	128	532196	5682819	1896 m	9:19:00	8:48:00	0:31:00	31.00	0.075	2.33	56120	56122.33	
BL17+50S	129	532162	5682778	1870 m	9:26:00	8:48:00	0:38:00	38.00	0.075	2.85	56177	56179.85	
BL18+00S	130	532124	5682736	1849 m	9:31:00	8:48:00	0:43:00	43.00	0.075	3.23	56115	56118.23	
BL18+50S	131	532097	5682704	1826 m	9:36:00	8:48:00	0:48:00	48.00	0.075	3.60	56127	56130.60	
BL19+00S	132	532054	5682660	1801 m	9:44:00	8:48:00	0:56:00	56.00	0.075	4.20	56197	56201.20	CREEK
BL19+50S	133	532019	5682622	1813 m	9:50:00	8:48:00	1:02:00	62.00	0.075	4.65	56154	56158.65	
BL20+00S	134	531979	5682586	1819 m	9:54:00	8:48:00	1:06:00	66.00	0.075	4.95	56173	56177.95	
BL20+50S	135	531934	5682542	1824 m	10:00:00	8:48:00	1:12:00	72.00	0.075	5.40	56256	56261.40	END OF CUT LINE
BL21+00S	136	531910	5682506	1830 m	10:09:00	8:48:00	1:21:00	81.00	0.075	6.08	56298	56304.08	
BL21+50S	137	531877	5682466	1843 m	10:13:00	8:48:00	1:25:00	85.00	0.075	6.38	56329	56335.38	
BL22+00S	138	531845	5682423	1860 m	10:19:00	8:48:00	1:31:00	91.00	0.075	6.83	55602	55608.83	BATTERY SIGNAL
BL22+50S	139	531814	5682391	1871 m	10:26:00	8:48:00	1:38:00	98.00	0.075	7.35	55646	55653.35	BATTERY SIGNAL
BL23+00S	140	531783	5682363	1874 m	10:30:00	8:48:00	1:42:00	102.00	0.075	7.65	55232	55239.65	BATTERY SIGNAL
BL23+50S	141	531749	5682314	1870 m	10:38:00	8:48:00	1:50:00	110.00	0.075	8.25	55288	55296.25	
BL24+00S	142	531723	5682264	1870 m	10:43:00	8:48:00	1:55:00	115.00	0.075	8.63	55596	55604.63	OLD FLAGGED LINE
BL24+50S	143	531697	5682229	1869 m	10:50:00	8:48:00	2:02:00	122.00	0.075	9.15	56498	56507.15	
BL25+00S	144	531674	5682204	1870 m	10:54:00	8:48:00	2:06:00	126.00	0.075	9.45	56322	56331.45	
BL25+50S	145	531640	5682171	1868 m	10:59:00	8:48:00	2:11:00	131.00	0.075	9.83	56337	56346.83	
BL26+00S	146	531613	5682137	1868 m	11:01:00	8:48:00	2:13:00	133.00	0.075	9.98	56283	56292.98	
BL26+50S	147	531578	5682095	1869 m	11:06:00	8:48:00	2:18:00	138.00	0.075	10.35	56198	56208.35	
BL27+00S	148	531531	5682063	1873 m	11:11:00	8:48:00	2:23:00	143.00	0.075	10.73	56114	56124.73	
BL27+50S	149	531501	5682024	1878 m	11:14:00	8:48:00	2:26:00	146.00	0.075	10.95	56082	56092.95	
BL14+00S					12:08:00	8:48:00	3:20:00	200.00	0.075	15.00	56086	56101.00	
BL8+00S					13:35:00	13:35:00	0:00:00	0.00	-0.028	0.00	56110	56110.00	subtract 0.028 gammas per min. to reduce end result to be equal to starting point

Richman Magnetometer Survey

Tabulated Locations, Readings and Corrections

STATION	GPS STN.	UTM EASTING NAD 83	UTM NORTHING NAD 83	Elevation	SAMPLE TIME	START TIME	DIFF TIME	DIFF MIN	CORRECT PER MIN.	CORRECT	GAMMAS	CORRECTION GAMMAS	NOTES -NAD 83 Datum
8+50E	150	532793	5683484	1912 m	13:38:00	13:35:00	0:03:00	3.00	-0.028	-0.08	56062	56061.92	AT OLD PICKET SITE
8+100E	151	532832	5683448	1929 m	13:41:00	13:35:00	0:06:00	6.00	-0.028	-0.17	56085	56084.83	AT OLD PICKET SITE
8+150E	152	532878	5683414	1948 m	13:44:00	13:35:00	0:09:00	9.00	-0.028	-0.25	56069	56068.75	
8+200E	153	532906	5683389	1961 m	13:48:00	13:35:00	0:13:00	13.00	-0.028	-0.36	56083	56082.64	AT OLD PICKET SITE
8+250E	154	532945	5683337	1966 m	13:51:00	13:35:00	0:16:00	16.00	-0.028	-0.45	56072	56071.55	
8+300E	155	532981	5683299	1972 m	13:53:00	13:35:00	0:18:00	18.00	-0.028	-0.50	56071	56070.50	
8+350E	156	533018	5683254	1966 m	13:55:00	13:35:00	0:20:00	20.00	-0.028	-0.56	56066	56065.44	
8+400E	157	533052	5683213	1962 m	13:58:00	13:35:00	0:23:00	23.00	-0.028	-0.64	56067	56066.36	
8+450E	158	533102	5683188	1960 m	14:01:00	13:35:00	0:26:00	26.00	-0.028	-0.73	56115	56114.27	DRAW WITHOUT TREES BETWEEN 400E AND 450E, MAYBE VEIN LOC?
8+500E	159	533149	5683202	1949 m	14:05:00	13:35:00	0:30:00	30.00	-0.028	-0.84	56068	56067.16	
7+434E	160	533161	5683327	1923 m	14:22:00	13:35:00	0:47:00	47.00	-0.028	-1.32	56067	56065.68	CUT LINE
7+400E	161	533115	5683348	1931 m	14:25:00	13:35:00	0:50:00	50.00	-0.028	-1.40	56065	56063.60	
7+350E	162	533089	5683374	1934 m	14:27:00	13:35:00	0:52:00	52.00	-0.028	-1.46	56053	56051.54	
7+300E	163	533055	5683415	1940 m	14:29:00	13:35:00	0:54:00	54.00	-0.028	-1.51	56077	56075.49	
7+250E	164	533017	5683442	1945 m	14:32:00	13:35:00	0:57:00	57.00	-0.028	-1.60	56058	56056.40	
7+200E	165	532977	5683476	1947 m	14:34:00	13:35:00	0:59:00	59.00	-0.028	-1.65	56056	56054.35	
7+150E	166	532927	5683499	1933 m	14:36:00	13:35:00	1:01:00	61.00	-0.028	-1.71	56073	56071.29	
7+100E	167	532893	5683529	1926 m	14:38:00	13:35:00	1:03:00	63.00	-0.028	-1.76	56068	56066.24	
7+50E	168	532856	5683555	1909 m	14:41:00	13:35:00	1:06:00	66.00	-0.028	-1.85	56065	56063.15	
BL8+00S					14:46:00	13:35:00	1:11:00	71.00	-0.028	-1.99	56112	56110.01	
9+50E	169	532729	5683399	1927 m	15:09:00						56094	56094	
9+100E	170	532760	5683357	1941 m	15:11:00						56088	56088	
9+150E	171	532793	5683319	1957 m	15:14:00						56096	56096	
9+200E	172	532833	5683291	1969 m	15:16:00						56072	56072	
9+250E	173	532869	5683253	1983 m	15:18:00						56074	56074	
9+300E	174	532905	5683219	1988 m	15:20:00						56093	56093	
9+350E	175	532946	5683187	1984 m	15:22:00						56073	56073	
9+400E	176	532981	5683149	1978 m	15:24:00						56076	56076	
9+450E	177	533025	5683122	1976 m	15:25:00						56096	56096	
9+500E	178	533064	5683094	1977 m	15:27:00						56089	56089	
9+550E	179	533106	5683067	1974 m	15:29:00						56099	56099	
9+600E	180	533149	5683043	1972 m	15:31:00						56105	56105	
BL14+00S					8:52:00	8:52:00	0:00:00	0.00	0.149	0.00	56112	56112.00	NO BASE STATION VALUE
14+50E	181	532431	5682991	1941 m	8:55:00	8:52:00	0:03:00	3.00	0.149	0.45	56097	56097.45	Add 0.149 gammas per min. to increase end result to be equal to starting point
14+100E	182	532472	5682953	1946 m	8:58:00	8:52:00	0:06:00	6.00	0.149	0.89	56112	56112.89	
14+150E	183	532509	5682935	1957 m	9:00:00	8:52:00	0:08:00	8.00	0.149	1.19	56130	56131.19	
14+200E	184	532560	5682912	1960 m	9:03:00	8:52:00	0:11:00	11.00	0.149	1.64	56114	56115.64	

STATION	GPS STN.	UTM EASTING NAD 83	UTM NORTHING NAD 83	Elevation	SAMPLE TIME	START TIME	DIFF TIME	DIFF MIN	CORRECT PER MIN.	CORRECT	GAMMAS	CORRECTION GAMMAS	NOTES -NAD 83 Datum
14+250E	185	532604	5682894	1965 m	9:04:00	8:52:00	0:12:00	12.00	0.149	1.79	56104	56105.79	
14+300E	186	532657	5682871	1965 m	9:06:00	8:52:00	0:14:00	14.00	0.149	2.09	56123	56125.09	
14+350E	187	532689	5682835	1960 m	9:08:00	8:52:00	0:16:00	16.00	0.149	2.38	56084	56086.38	
14+400E	188	532731	5682809	1955 m	9:11:00	8:52:00	0:19:00	19.00	0.149	2.83	56117	56119.83	
14+450E	189	532777	5682784	1950 m	9:13:00	8:52:00	0:21:00	21.00	0.149	3.13	56145	56148.13	
14+500E	190	532817	5682751	1951 m	9:15:00	8:52:00	0:23:00	23.00	0.149	3.43	56116	56119.43	
14+550E	191	532855	5682723	1962 m	9:17:00	8:52:00	0:25:00	25.00	0.149	3.73	56134	56137.73	
14+600E	192	532900	5682697	1967 m	9:20:00	8:52:00	0:28:00	28.00	0.149	4.17	56117	56121.17	
14+650E	193	532942	5682668	1974 m	9:22:00	8:52:00	0:30:00	30.00	0.149	4.47	56112	56116.47	
14+700E	194	532980	5682633	1979 m	9:24:00	8:52:00	0:32:00	32.00	0.149	4.77	56128	56132.77	
14+750E	195	533021	5682603	1977 m	9:26:00	8:52:00	0:34:00	34.00	0.149	5.07	56152	56157.07	
14+800E	196	533066	5682574	1971 m	9:28:00	8:52:00	0:36:00	36.00	0.149	5.36	56110	56115.36	
14+850E	197	533105	5682536	1973 m	9:31:00	8:52:00	0:39:00	39.00	0.149	5.81	56136	56141.81	
14+900E	198	533135	5682499	1983 m	9:34:00	8:52:00	0:42:00	42.00	0.149	6.26	56105	56111.26	
14+950E	199	533151	5682450	1993 m	9:39:00	8:52:00	0:47:00	47.00	0.149	7.00	56138	56145.00	
15+1030E	200	533146	5682299	2008 m	10:02:00	8:52:00	1:10:00	70.00	0.149	10.43	56212	56222.43	
15+1000E	201	533090	5682331	1988 m	10:06:00	8:52:00	1:14:00	74.00	0.149	11.03	56137	56148.03	
15+950E	202	533037	5682341	1967 m	10:09:00	8:52:00	1:17:00	77.00	0.149	11.47	56129	56140.47	
15+900E	203	532985	5682357	1947 m	10:12:00	8:52:00	1:20:00	80.00	0.149	11.92	56107	56118.92	
15+850E	204	532926	5682368	1923 m	10:14:00	8:52:00	1:22:00	82.00	0.149	12.22	56115	56127.22	
15+800E	205	532870	5682385	1918 m	10:17:00	8:52:00	1:25:00	85.00	0.149	12.67	56134	56146.67	
15+750E	206	532825	5682413	1926 m	10:20:00	8:52:00	1:28:00	88.00	0.149	13.11	56131	56144.11	
15+700E	207	532785	5682445	1926 m	10:22:00	8:52:00	1:30:00	90.00	0.149	13.41	56126	56139.41	
15+650E	208	532728	5682475	1923 m	10:30:00	8:52:00	1:38:00	98.00	0.149	14.60	56122	56136.60	
15+600E	209	532712	5682513	1924 m	10:32:00	8:52:00	1:40:00	100.00	0.149	14.90	56120	56134.90	
15+550E	210	532690	5682563	1919 m	10:34:00	8:52:00	1:42:00	102.00	0.149	15.20	56111	56126.20	
15+500E	211	532668	5682607	1915 m	10:36:00	8:52:00	1:44:00	104.00	0.149	15.50	56112	56127.50	
15+450E	212	532634	5682648	1917 m	10:39:00	8:52:00	1:47:00	107.00	0.149	15.94	56107	56122.94	
15+400E	213	532610	5682696	1929 m	10:42:00	8:52:00	1:50:00	110.00	0.149	16.39	56125	56141.39	
15+350E	214	532576	5682733	1933 m	10:44:00	8:52:00	1:52:00	112.00	0.149	16.69	56109	56125.69	
15+300E	215	532548	5682772	1938 m	10:46:00	8:52:00	1:54:00	114.00	0.149	16.99	56087	56103.99	
15+250E	216	532523	5682823	1947 m	10:49:00	8:52:00	1:57:00	117.00	0.149	17.43	56135	56152.43	
15+200E	217	532491	5682867	1946 m	10:53:00	8:52:00	2:01:00	121.00	0.149	18.03	56088	56106.03	
15+150E	218	532459	5682910	1947 m	10:56:00	8:52:00	2:04:00	124.00	0.149	18.48	56086	56104.48	
15+100E	219	532412	5682931	1945 m	10:58:00	8:52:00	2:06:00	126.00	0.149	18.77	56129	56147.77	
15+50E	220	532367	5682957	1944 m	11:00:00	8:52:00	2:08:00	128.00	0.149	19.07	56083	56102.07	
BL14+00S					11:06:00	8:52:00	2:14:00	134.00	0.149	19.97	56092	56111.97	
BL14+00S					12:31:00	12:31:00	0:00:00	0.00	-0.050	0.00	56087	56087.00	subtract 0.050 gammas per min. to reduce end result to be equal to starting point
14+50W	221	532348	5683081	1952 m	12:33:00	12:31:00	0:02:00	2.00	-0.050	-0.10	56093	56092.90	

STATION	GPS STN.	UTM EASTING NAD 83	UTM NORTHING NAD 83	Elevation	SAMPLE TIME	START TIME	DIFF TIME	DIFF MIN	CORRECT PER MIN.	CORRECT	GAMMAS	CORRECTION GAMMAS	NOTES -NAD 83 Datum
14+100W	222	532313	5683118	1950 m	12:35:00	12:31:00	0:04:00	4.00	-0.050	-0.20	56103	56102.80	
14+150W	223	532271	5683149	1946 m	12:37:00	12:31:00	0:06:00	6.00	-0.050	-0.30	56077	56076.70	
14+200W	224	532241	5683186	1942 m	12:39:00	12:31:00	0:08:00	8.00	-0.050	-0.40	56078	56077.60	
14+250W	225	532202	5683225	1941 m	12:41:00	12:31:00	0:10:00	10.00	-0.050	-0.50	56073	56072.50	
14+300W	226	532166	5683259	1940 m	12:43:00	12:31:00	0:12:00	12.00	-0.050	-0.60	56062	56061.40	
14+350W	227	532132	5683295	1931 m	12:46:00	12:31:00	0:15:00	15.00	-0.050	-0.75	56059	56058.25	
14+400W	228	532090	5683324	1923 m	12:48:00	12:31:00	0:17:00	17.00	-0.050	-0.85	56083	56082.15	
14+450W	229	532055	5683356	1914 m	12:55:00	12:31:00	0:24:00	24.00	-0.050	-1.20	56091	56089.80	
14+500W	230	532018	5683397	1908 m	12:57:00	12:31:00	0:26:00	26.00	-0.050	-1.30	56081	56079.70	
14+550W	231	531974	5683417	1899 m	12:58:00	12:31:00	0:27:00	27.00	-0.050	-1.35	56074	56072.65	
14+600W	232	531929	5683444	1886 m	13:00:00	12:31:00	0:29:00	29.00	-0.050	-1.45	56084	56082.55	
14+650W	233	531881	5683462	1876 m	13:03:00	12:31:00	0:32:00	32.00	-0.050	-1.60	56082	56080.40	
14+700W	234	531836	5683485	1861 m	13:05:00	12:31:00	0:34:00	34.00	-0.050	-1.70	56037	56035.30	
14+750W	235	531788	5683506	1844 m	13:08:00	12:31:00	0:37:00	37.00	-0.050	-1.85	56081	56079.15	
14+800W	236	531746	5683530	1828 m	13:10:00	12:31:00	0:39:00	39.00	-0.050	-1.95	56067	56065.05	
14+850W	237	531693	5683550	1815 m	13:13:00	12:31:00	0:42:00	42.00	-0.050	-2.10	56038	56035.90	
14+900W	238	531647	5683578	1807 m	13:15:00	12:31:00	0:44:00	44.00	-0.050	-2.20	56043	56040.80	
14+950W	239	531621	5683617	1803 m	13:17:00	12:31:00	0:46:00	46.00	-0.050	-2.30	56090	56087.70	
14+1000W	240	531589	5683656	1811 m	13:19:00	12:31:00	0:48:00	48.00	-0.050	-2.40	56053	56050.60	
14+1050W	241	531549	5683687	1824 m	13:22:00	12:31:00	0:51:00	51.00	-0.050	-2.55	56060	56057.45	
14+1100W	242	531510	5683717	1831 m	13:24:00	12:31:00	0:53:00	53.00	-0.050	-2.65	56089	56086.35	
14+1150W	243	531477	5683755	1836 m	13:26:00	12:31:00	0:55:00	55.00	-0.050	-2.75	56112	56109.25	
14+1200W	244	531436	5683785	1836 m	13:28:00	12:31:00	0:57:00	57.00	-0.050	-2.85	56141	56138.15	
14+1250W	245	531400	5683819	1834 m	13:30:00	12:31:00	0:59:00	59.00	-0.050	-2.95	56145	56142.05	
15+1160W	246	531402	5683686	1824 m	13:34:00	12:31:00	1:03:00	63.00	-0.050	-3.15	56118	56114.85	
15+1100W	247	531452	5683649	1822 m	13:42:00	12:31:00	1:11:00	71.00	-0.050	-3.55	56073	56069.45	
15+1050W	248	531497	5683623	1813 m	13:43:00	12:31:00	1:12:00	72.00	-0.050	-3.60	56052	56048.40	
15+1000W	249	531531	5683584	1796 m	13:46:00	12:31:00	1:15:00	75.00	-0.050	-3.75	56040	56036.25	
15+950W	250	531567	5683549	1797 m	13:48:00	12:31:00	1:17:00	77.00	-0.050	-3.85	56058	56054.15	
15+900W	251	531600	5683509	1802 m	13:50:00	12:31:00	1:19:00	79.00	-0.050	-3.95	56093	56089.05	
15+850W	252	531631	5683466	1808 m	13:52:00	12:31:00	1:21:00	81.00	-0.050	-4.05	56088	56083.95	
15+800W	253	531664	5683424	1813 m	13:55:00	12:31:00	1:24:00	84.00	-0.050	-4.20	56054	56049.80	
15+750W	254	531709	5683401	1827 m	13:57:00	12:31:00	1:26:00	86.00	-0.050	-4.30	56064	56059.70	
15+700W	255	531750	5683377	1843 m	14:01:00	12:31:00	1:30:00	90.00	-0.050	-4.50	56107	56102.50	
15+650W	256	531787	5683339	1859 m	14:12:00	12:31:00	1:41:00	101.00	-0.050	-5.05	56240	56234.95	
15+600W	257	531824	5683303	1873 m	14:15:00	12:31:00	1:44:00	104.00	-0.050	-5.20	56143	56137.80	
15+550W	258	531866	5683274	1890 m	14:18:00	12:31:00	1:47:00	107.00	-0.050	-5.35	56124	56118.65	
15+500W	259	531898	5683237	1900 m	14:20:00	12:31:00	1:49:00	109.00	-0.050	-5.45	55997	55991.55	
15+450W	260	531942	5683211	1902 m	14:24:00	12:31:00	1:53:00	113.00	-0.050	-5.65	56056	56050.35	
15+400W	261	531993	5683194	1910 m	14:26:00	12:31:00	1:55:00	115.00	-0.050	-5.75	56084	56078.25	
15+350W	262	532032	5683165	1916 m	14:28:00	12:31:00	1:57:00	117.00	-0.050	-5.85	56080	56074.15	

Richman Magnetometer Survey

Tabulated Locations, Readings and Corrections

STATION	GPS STN.	UTM EASTING NAD 83	UTM NORTHING NAD 83	Elevation	SAMPLE TIME	START TIME	DIFF TIME	DIFF MIN	CORRECT PER MIN.	CORRECT	GAMMAS	CORRECTION GAMMAS	NOTES -NAD 83 Datum
15+300W	263	532072	5683136	1923 m	14:31:00	12:31:00	2:00:00	120.00	-0.050	-6.00	56086	56080.00	
15+250W	264	532111	5683104	1931 m	14:34:00	12:31:00	2:03:00	123.00	-0.050	-6.15	56080	56073.85	
15+200W	265	532146	5683074	1935 m	14:35:00	12:31:00	2:04:00	124.00	-0.050	-6.20	56091	56084.80	
15+150W	266	532187	5683041	1941 m	14:38:00	12:31:00	2:07:00	127.00	-0.050	-6.35	56098	56091.65	
15+100W	267	532232	5683013	1945 m	14:45:00	12:31:00	2:14:00	134.00	-0.050	-6.70	56087	56080.30	
15+50W	268	532276	5682991	1949 m	14:46:00	12:31:00	2:15:00	135.00	-0.050	-6.75	56095	56088.25	
BL15+00S					14:51:00	12:31:00	2:20:00	140.00	-0.050	-7.00	56094	56087.00	

Appendix 2: Manual – Geometrics Model G 816 Portable Proton Magnetometer

TYPE: MAG

MAN - MR001

geoMetrics

MODEL G 816
PORTABLE PROTON MAGNETOMETER

914

S.J.V CONSULTANTS LTD.
S J GEOPHYSICAL LTD.
SYD J. VISSER, P. Geo.

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914 Industrial Avenue
Palo Alto, California 94303
(415) 321-7610

Property of Kerr Addison Mines Limited
703 - 1112 W. Pender St.
Vancouver, B.C. V6E 2S1
Phone 682-7401

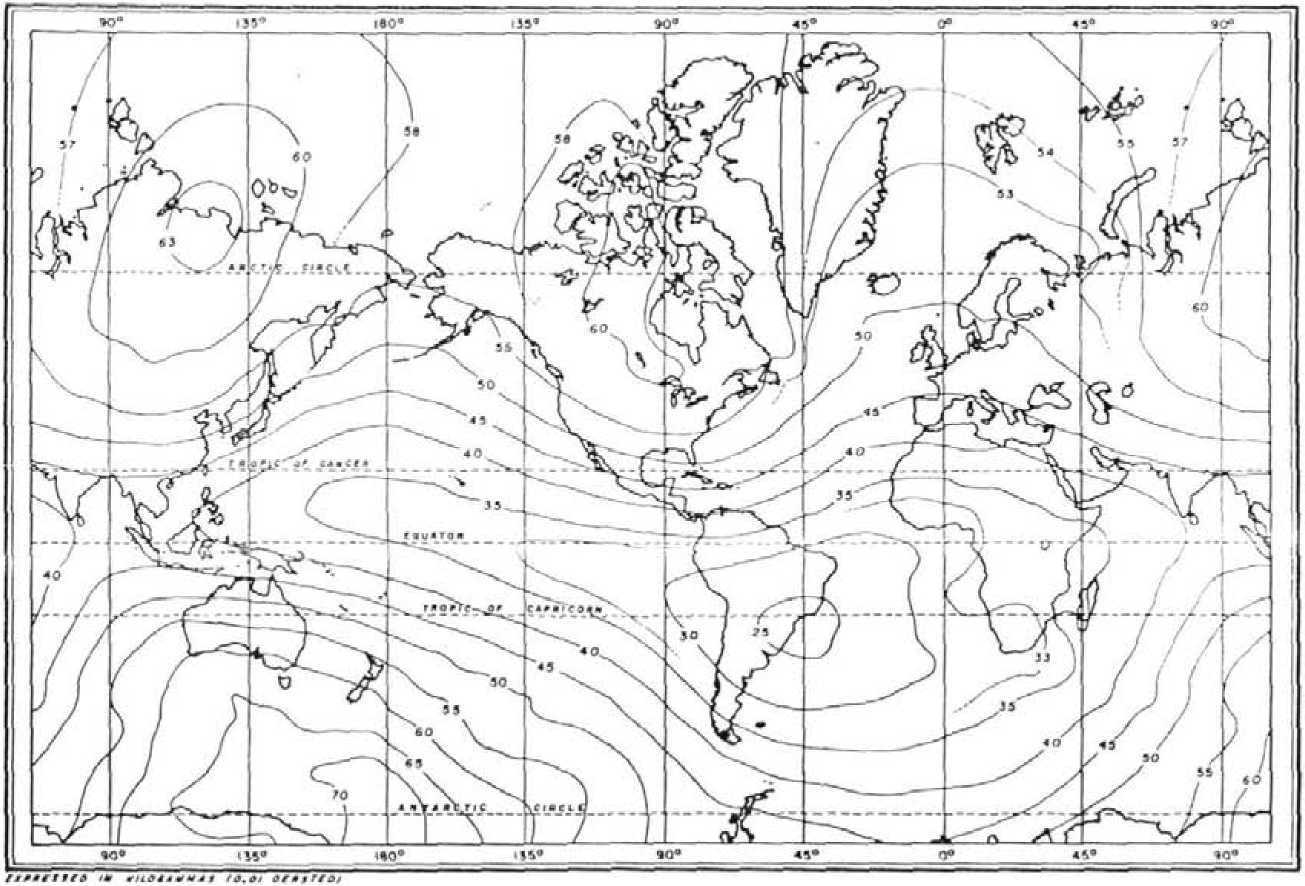
WARRANTY

GeoMetrics guarantees this instrument to be in perfect operating condition, fully tested, and complete as described for one full year beginning with the date of receipt but not to exceed fifteen months from the shipping date.

GeoMetrics guarantees that all magnetometers, digital recording systems, and associated parts offered for sale are free from defects in materials and workmanship, carefully tested, and in first class operating condition. In the event of malfunction, GeoMetrics, at its own expenses, will repair or replace any materials, equipment, work, or parts which prove defective or deficient under normal operating conditions. Unless altered by contract, the warranty period shall extend for one calendar year beginning with the date of acceptance, but will not exceed 15 months from the date of shipment.

GeoMetrics reserves the right to perform warranty services FOB Palo Alto or at the customer's installation site. Since time may be of the essence, customers are encouraged to make minor repairs or adjustments as may be required and to consult the factory regarding all phases of operation. GeoMetrics is not responsible for delays or defects in the quality of results from misuse, mishandling, unauthorized modifications, installation, or other operation conditions outside its control.

The information contained within this operating manual is proprietary to GeoMetrics, and is provided for the private use of GeoMetrics' customers only, and no part of this manual may be reproduced without the express, written consent of GeoMetrics, California.



The Total Intensity of the Earth's Magnetic Field

TABLE OF CONTENTS

LIST OF FIGURES

1.0 GENERAL INFORMATION

1.1 INTRODUCTION

The Model G-816 Portable Proton Magnetometer is a complete system designed for all man-carry field applications requiring simple operation and stable measurements of the total intensity of the earth's magnetic field. The G-816 is accurate and stable to within ±1 gamma over a range from 20,000 to 90,000 gammas. Since the instruments measures total field intensity, the accuracy of each measurement is independent of sensor leveling. Furthermore, the measurement is based upon an atomic constant* and is independent of temperature, humidity, and battery conditions. The inherent simplicity of the G-816 proton magnetometer allows rapid, accurate measurements to be obtained from a rugged, compact field instrument. This is a precision instrument and reasonable attention must be given to handling, battery condition, and magnetic environment.

1.2 MAGNETIC ENVIRONMENT

It is important that the earth's magnetic field is not disturbed by allowing magnetic objects to come close to the sensor. Such articles include rings, keys, watches, belt buckles, pocket knives, metal pencils, zippers, some hats, etc. When the sensor is used on the staff, 1 gamma surveys are easily performed provided the sensor is kept at a distance of 3 feet from the operator. When the sensor is used in the backpack, certain articles of clothing and some types of batteries within the console will cause a 5 to 10 gamma shift in readings. The G-816, however, still provides 1 gamma sensitivity and repeatability despite the presence of a base line shift. The backpack feature is recommended for use in difficult terrain where "hands free" operation is required.

Prior to survey use, articles that are suspected to be magnetic may be checked in the following manner:

1. Attach sensor to <u>staff</u> and connect coiled signal cable to console. Sensor should not be moved or turned during the test, and the suspected article should be far away initially.

*Proton Gyromagnetic Ratio: $(2.67513 \pm 0.00002) \times 10^{4}$ Radians/Gauss second.

2. Cycle the magnetometer a few times by depressing the READ button--releasing--and waiting for a reading each cycle.

3. Observe measurement readings. Each reading should repeat to ±1 gamma. (A slow shift may occur over several minutes due to a diurnal change in the earth's field.)

4. Place the suspected article at the distance from the sensor expected during actual survey operation.

5. Cycle magnetometer several times and note the readings.

6. Remove the article and repeat steps 2 and 3 to check for diurnal shifts in the earth's field. If a diurnal shift is present, repeat entire test.

7. If the readings obtained in step 5 differ by more than ±1 gamma (±one count) from those obtained in steps 3 and 6, then the article is magnetic.

IF THE ARTICLE IS HIGHLY MAGNETIC, OR IF THE SENSOR IS INSIDE OR NEAR A BUILDING OR VEHICLE, THE PROTON PRECESSION SIGNAL WILL BE LOST, GIVING COMPLETELY ERRATIC READINGS AND LOSS OF ±1 COUNT REPEATABILITY.

The magnetometer should not be operated in areas that are known as sources of radio frequency energy, power line noise (transformers), in buildings or near highly magnetic objects. The sensor should always be placed on the staff above the ground, or in the "backpack". The sensor will NOT operate properly when placed directly on the ground.

1.3 SPECIFICATIONS

Sensitivity:	±1 gamma throughout range
Range:	20,000 to 90,000 gammas (worldwide)
Tuning:	Multi-position switch with signal amplitude indicator light on display
Gradient Tolerance:	Exceeds 150 gammas/ft
Sampling Rate:	Manual push-button, one reading each 6 seconds.

Output:	5 digit numeric display with readout directly in gammas
Power Requirements:	Twelve self-contained 1.5 volt "D" cell, universally available flashlight-type batteries. Charge state or replacement signified by flashing indicator light on display.
Temperature Range:	Console and sensor: -40° to $+85^{\circ}$ C Battery Pack: 0° to $+50^{\circ}$ C (limited use to -15° C; lower temperature operation--optional)
Accuracy (Total Field):	±1 gamma through 0° to 50° C temperature range
Sensor:	High signal, noise cancelling, interchangeably mounted on separate staff or attached to backpack
Size:	Console: 3.5 × 7 × 10.5 inches (9 × 18 × 27 cm) Sensor: 4.5 × 6 inches (11 × 15 cm) Staff: 1 inch diameter × 8 ft. length (3 cm × 2.44 cm)

Weight:		Lbs.	Kgs.
	Console (w/batteries):	5.5	2.5
	Sensor and signal cable:	4	1.8
	Aluminum staff	2	0.9
		11.5	5.2

1.1 INVENTORY INSPECTION

When received from the manufacturer, the G-816 magnetometer should include the following items:

1.	G-816 magnetometer console	1 each
2.	Sensor	1 each
3.	Collapsible sensor staff	1 each
4.	Signal cable-staff (long)	1 each
5.	Signal cable-backpack (short)	1 each
6.	Adjustable carrying harness	1 each

7.	Batteries: Type D alkaline (w/console)	12 each
8.	Batteries: Type D Carbon Zinc with cardboard sleeve	12 each
9.	Shipping/carrying case	1 each
10.	Manual	1 each

2.0 FIELD OPERATION

2.1 INTRODUCTION

The G-816 comes complete and ready for field survey operation. A few simple procedures should be observed to obtain optimum results, and it is recommended that the operator follow each step as outlined to initially become familiar with the various controls and survey considerations.

2.2 TURN ON PROCEDURE

PRELIMINARY CONSIDERATIONS: BEFORE OPERATING THE G-816, CHECK FOR:

a. Presence of sensor fluid:

Shake sensor and listen for "sloshing" sound. If it is necessary to add or replace the sensor fluid, remove blue "cap plug" and fill with STRAINED kerosene or white gasoline to within 1½ inches of top. (Fluid should be strained several times through paper filters, i.e. paper towels, coffee filters, etc.)

b. Batteries in place and fully charged:

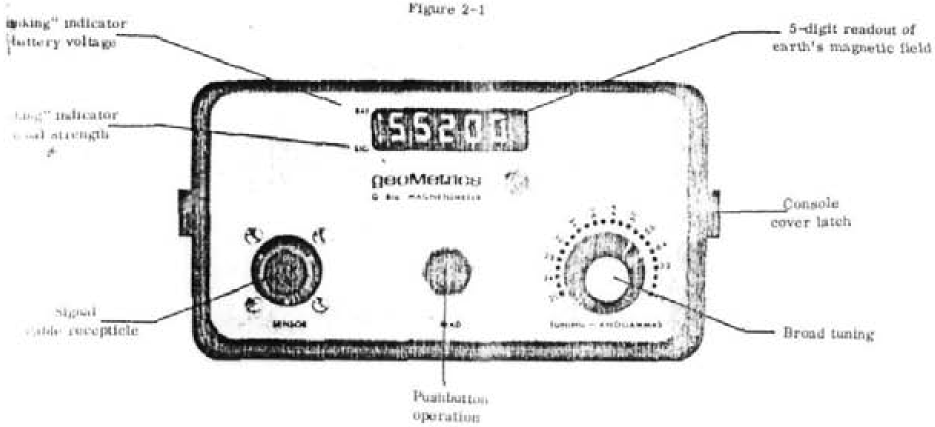
Remove cover, check battery polarity, and insure that batteries are held firmly in place by retaining straps. (See Figure 2-1) Check battery charge by pressing push button and counting the blinks of the BAT charge indicator light. (See Section 3.2)

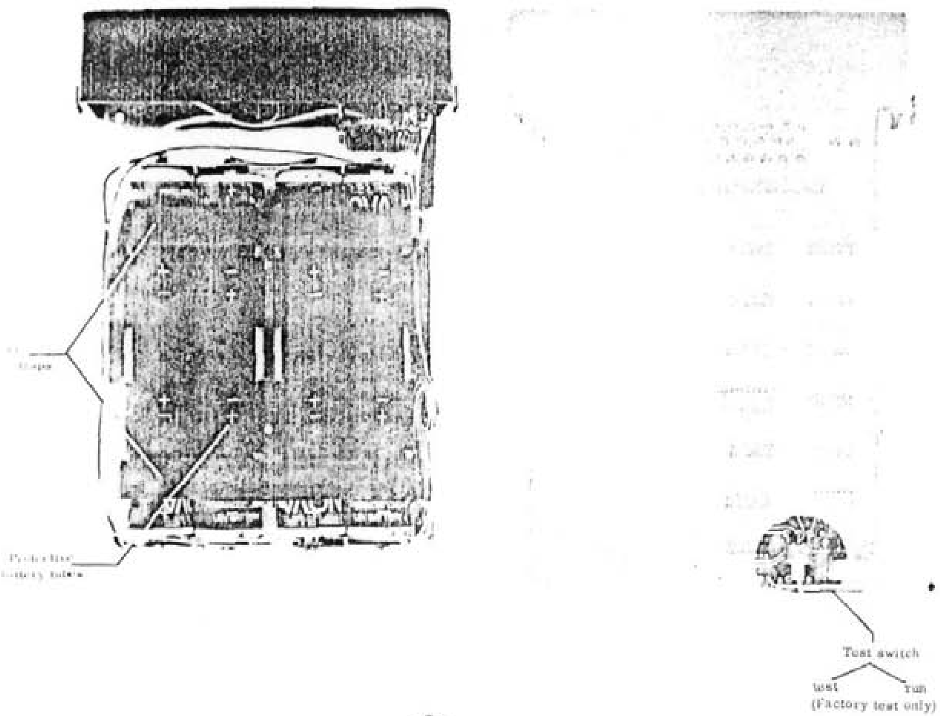
THE FOLLOWING STEPS SHOULD BE PERFORMED TO CORRECTLY TUNE AND TURN ON THE MAGNETOMETER

1. Attach signal cable to sensor. There are two (2) cables provided: a long coiled cable for staff use and a shorter cable for use with the "backpack".

CONTROLS AND INDICATORS

Figure 2-1





2. Attach sensor to staff and assemble sections or place sensor in "backpack" pouch attached to carrying harness.

3. Place G-816 console in harness, attach to shoulder harness, and adjust for snug fit on operator's person.

4. Connect sensor signal cable to console. The console WILL NOT OPERATE with the sensor cable disconnected.

THE INSTRUMENT IS NOW READY FOR TUNING--BE SURE THE FOLLOWING IS PERFORMED IN A CLEAN MAGNETIC ENVIRONMENT (Section 1.2) THEN PROCEED:

5. Adjust TUNING-KILOGAMMAS switch to a position that produces maximum signal. To save time, start with a setting near the known field. The field value at any location can be estimated using the world map in the beginning of this manual. (A map is also located under the console cover.)

6. Depress the READ button momentarily and release.

7. The battery indicator lamp (BAT) will light immediately and blink throughout the 3 second polarize interval. (See Section 3.2)

8. Shortly after the polarize interval, the magnetometer will display the total intensity of the earth's magnetic field directly in gammas.

9. Simultaneously, the signal lamp (SIG) will light and blink to give a relative indication of signal strength. COUNT THE NUMBER OF BLINKS.

10. Switch the TUNING-KILOGAMMAS switch to an adjacent position in either direction, repeat step 6, and count the number of SIG blinks.

11. Repeat step 10 until a tuning position giving the most blinks is found. A properly tuned signal should provide approximately 7 or more blinks on the SIG indicator.

THE INSTRUMENT IS NOW READY FOR FIELD SURVEY OPERATION.

Note that a true and repeatably correct reading is obtained in 3 or 4 tuning positions surrounding the estimated local magnetic fields, i.e. the tuning is quite broad and non-critical in most cases. Better operation is obtained in problem areas or high gradient areas if the instrument is properly tuned initially. Unless high field changes on the order of 4 or 5 thousand gammas occur during operation, it will not be necessary to retune.

2.3 SENSOR ORIENTATION

To insure optimum results, the sensor is marked with an arrow and the letter "N". The arrow should be roughly pointed north or south. This procedure will allow the sensor axis to be placed perpendicular to the earth's field and produce optimum signal. However, proper operation will be obtained in fields about 40,000 gammas with the arrow pointed in any direction.

In low magnetic latitudes (where the field dips less than 40° or below 40,000 gammas), such as near the magnetic equator where the field is horizontal, the sensor arrow MUST be pointed north or south.

2.4 SURVEY OPERATION

During survey operation and after the instrument is tuned to the local field intensity (Section 2.2), the operator need only depress the READ button and note the reading in a log. If a reading is in question, i.e. a sudden shift of several hundred gammas, another reading should be taken.

THE ONE COUNT REPEATABILITY AND SENSITIVITY OF THE G-816 CAN ALWAYS BE VERIFIED BY REPEATING A MEASUREMENT WITH THE SENSOR IN THE EXACT SAME LOCATION.

The G-816 will operate accurately in areas where the magnetic gradient is as high as 175 gammas per foot. The only precaution is that the sensor be held very still. With the sensor mounted on the staff, surveys with ±1 gamma sensitivity and repeatability are easily achieved.

The sensor may also be mounted in the backpack for surveys requiring lower mapping accuracy and rapid operation through rugged terrain. Because of the magnetic properties of most "D" cell batteries, however,

only the cardboard or plastic jacketed batteries should be used in the console for this application. (See Section 3.1) A spare set of "Burgess-1200" cardboard jacketed batteries are supplied for backpack operation, and additional sets are available from GeoMetrics.

2.5 LOW TEMPERATURE OPERATION

At temperatures below 0° C, battery life decreases rapidly to only a hundred readings per set of batteries at -20° C. During surveys at these low temperatures, the console should be held close to the operator's person, under a coat or warm clothing or placed in an insulated bag sufficient to maintain the battery temperature at 0° C or above. Lower temperature operation (to -40° C) will not effect the circuit components or the sensor, but operation is limited by the decrease in battery life.

2.6 INSTRUMENT STORAGE

After use, all of the components should be stored in the carrying case to prevent damage, loss, or possible contact with magnetic particles that could be imbedded in the sensor. The sensor signal cable must be DISCONNECTED from the console to prevent constant battery drainage. If long term storage is anticipated, the batteries should be removed from the console to prevent any damage from electrolitic leakage or corrosion of contacts. After long storage, always inspect the batteries.

2.7 POSSIBLE SURVEY DIFFICULTIES

The following is a list of possible survey difficulties, probable causes, and recommended corrective action.

Survey Difficulty	Probable Cause	Corrective Action
No reading on display	1. Poor battery contact	1. Check for loose batteries and retainer straps. Battery contact points should be free from corrosion.
	2. Dead batteries	2. Replace batteries
	3. Test switch in "test" position	3. Flip switch to "run" position as shown in Figure 2-1.
	4. Readout display board unplugged	4. Check readout display board for tight fit in socket

Survey Difficulty	Probable Cause	Corrective Action
Console will not tune	1. Loose tuning knob	1. Tighten set screw
	2. Broken wire between tuning switch and circuit board.	2. Replace wire
	3. High noise area	3. Move to different location
Partial numeric blackout	Segments not illuminating	Depress READ button and hold down until all number 8's appear - check each segment. If any segments are missing, notify and return the readout board (P/N 16021) to GeoMetrics immediately.
Slow blinking BAT light	Low battery voltage	Replace batteries
Erratic Readout	1. Sensor located in high noise area	1. Move sensor away from generators, power lines, buildings, highways, etc.
	2. Highly magnetic environment	2. Check for magnetic articles (hats, knives, belts, eye glass straps, pencils, etc.) that are close to or imbedded in sensor (steel chips, magnetic dirt, etc.). Do not make readings inside buildings. (See Section 1.2)
	3. No fluid in sensor	3. Shake sensor and listen for fluid. Fill as required.(See Section 2.2)
	4. Sensor not connected	4. Check Bendix connector and sensor signal cable for proper connections or damage. Repair as required.

Survey Difficulty	Probable Cause	Corrective Action
Erratic Readout (cont.)	5. No polarize power	5. Weak or "dead" batteries - replace
	6. Intermittent battery contact	6. Check battery contacts for corrosion and tighten retaining straps
	7. Sensor not properly oriented	7. Point sensor arrow to north or south (See Section 2.3)
	8. Some segment(s) in display not lighting	8. Depress READ button, hold down, and check segments
	9. Diurnal shift or magnetic storm	9. Wait for several hours - repeat readings when field is stable

2.8 SIGNAL/NOISE RATIO

To INSURE optimum system performance, the operator should occasionally verify the signal level by counting the SIG blinks with the sensor held close to a known magnetic object (keys, knife, etc.). By comparing the number of SIG blinks with a noise source present to those during normal operation (magnetic object removed), a signal-to-noise ratio may be determined.

The following example demonstrates the use of the handy conversion factor table shown in Figure 2-2.

1. A reading is made with the sensor close to a magnetic object and the SIG blinks counted:

    Example: 3 blinks (no precession signal - amplified noise only)

2. During the normal survey operation (away from the magnetic object), the number of SIG blinks are observed:

    Example: 10 blinks of signal

3. The signal-to-noise ratio is found using the table below (Figure 2-2.)

3 blinks noise = 0.4 signal amplitude
10 blinks signal= 3.0

$$S/N = \frac{Signal}{Noise} = \frac{3.0}{0.4} = 7.5{:}1$$

The G-816 will provide true 1 gamma data with a signal to noise ratio of approximately 2:1. Operation with a lower S/N ratio may cause "data scatter".

SIGNAL-TO-NOISE
CONVERSION FACTOR TABLE

SIG BLINKS		SIGNAL AMPLITUDE
15		5
12		4
10		3
7		2
5		1
4		0.5
3	normal noise	0.4

Figure 2-2

(Remember this test must be made outdoors away from power lines and magnetic objects.)

3.0 BATTERY REPLACEMENT

3.1 INTRODUCTION

When the magnetometer is used with the sensor mounted on the staff, readily available standard "D" cell batteries will work satisfactorily. The following chart compares the expected number of readings possible for different battery types. Because most standard batteries use a steel jacket, when the sensor is used in the "backpack" only cardboard or plastic jacket batteries should be used. If standard carbon zinc or alkaline batteries (steel jacketed) are used in the console during "backpack" operation, a shift of several gammas will occur and will bias the measurement.

The G-816 will still provide 1 gamma sensitivity, but actual readings will be several gammas higher or lower than the "real" value.

Battery Type	Brand Name	Readings at 25° C	Readings at 0° C	Jacket Type
Alkaline	Burgess, Eveready Ray-O-Vac	10,000	8,000	Steel
Standard Carbon-Zinc (flashlight)	Burgess, Eveready Ray-O-Vac	1,700	1,000	Steel
Premium Carbon-Zinc *(see note)	1. Burgess type 1200 2. Novo type	4,100	3,000	1. Card-board 2. Plastic

Figure 3-1

*1. Available from GeoMetrics
2. Available from RADIO SHACK (located in major cities throughout the world).

The above table is based upon one reading every 30 seconds. Faster sampling rates will yield fewer readings, especially at lower temperatures. Photoflash and "Energizers" are not designed for this type of application, but may be used until proper batteries are available. It should be noted that battery capacity decreases rapidly below 0° C to only a few hundred readings at -20° C. The battery types above will recover, however, when warmed above 0° C.

3.2 BATTERY VOLTAGE INDICATOR

Before starting, and occasionally during a survey, the battery voltage indicator lamp (BAT) should be observed with the sensor connected, and the number of blinks counted. Fully charged batteries will cause about ten (10) rapid blinks. As battery voltage decreases, the number of blinks will also gradually decrease until the BAT lamp remains illuminated for approximately 3 seconds. At this time, the batteries MUST be replaced, as the voltage available is below that required for adequate operation.

When new batteries are installed, the number of (BAT) blinks should be noted. As the battery life decreases, the remaining battery life can easily be estimated.

3.3 BATTERY REPLACEMENT

The following steps should be followed for correct replacement of batteries:

1. Unsnap and remove instrument cover.

2. Loosen battery retaining straps.

3. Replace batteries. See Figure 2-1 for correct polarity. The positive contact has a Teflon tip.

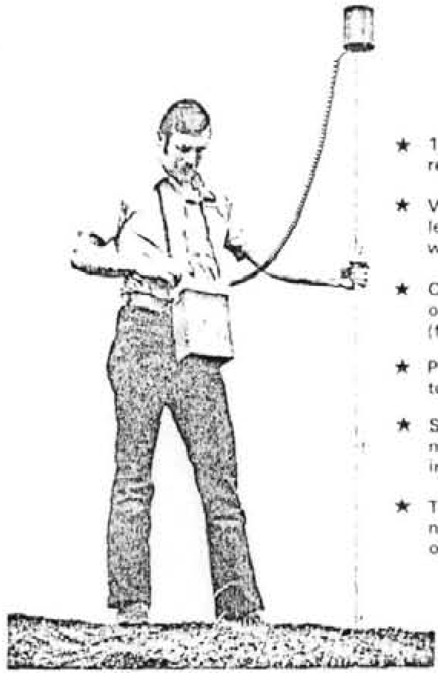
4. Tighten battery retaining straps.

5. Replace instrument cover.

geoMetrics

PORTABLE PROTON MAGNETOMETER
MODEL G-816

March 1972



★ 1 gamma sensitivity and repeatability

★ Very small size and weight: less than 12 lbs complete with battery and sensor

★ Over 10,000 readings per set of alkaline "D" cell (flashlight) batteries

★ Provision to attach sensor to carrying harness

★ Simplified operation—numeric display directly in gammas

★ Total field measurements—no calibration—independent of orientation

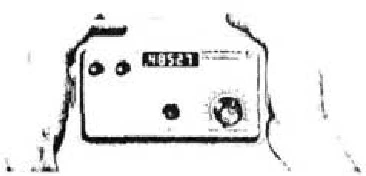
The Model G-816 is a complete portable magnetometer for all man-carry field applications. As an accurate yet simple to operate instrument, it features an outstanding combination of one gamma sensitivity and repeatability, compact size and weight, operation on standard universally available flashlight batteries, ruggedized packaging and very low price.

The G-816 magnetometer allows precise mapping of very small or large amplitude anomalies for ground geophysical surveys, or for detail follow-up to aeromagnetic reconnaissance surveys. It is a rugged, lightweight, and versatile instrument, equally well suited for field studies in geophysics, research programs or other magnetic mapping application where low cost, dependable operation and accurate measurements are required.

For marine, airborne or ground recording systems consider GeoMetrics Models G-801., G-803, and G-806.

"Hands-free" Back Pack Sensor

Based upon the principle of nuclear precession (proton) the G-816 offers absolute drift-free measurements of the total field directly in gammas. (The proton precession method is the officially recognized standard for measurement of the earth's magnetic field.) Operation is worldwide with one gamma sensitivity and repeatability maintained throughout the range. There is no temperature drift, no set-up or leveling required, and no adjustment for orientation, field polarity, or arbitrary reference levels. Operation is very simple with no prior training required. Only 6 seconds are required to obtain a measurement which is always correct to one gamma, regardless of operator experience. Only the Proton Magnetometer offers such repeatability—an important consideration even for 10 gamma survey resolution.



Complete Field Portable System

The Model G-816 comes complete, ready for portable field operation and consists of:

1. Electronics console with internally mounted and easily replaced "D" cell battery pack.
2. Proton sensor and signal cable for attachment to carrying harness or staff.
3. Adjustable carrying harness.
4. 8 foot collapsible staff.
5. Instruction manual, complete set of spare batteries, reusable shipping container.

All magnetometers and parts are covered by a one year warranty beginning with the date of receipt but not to exceed fifteen months from the shipping date.

SPECIFICATIONS

Sensitivity:	±1 gamma throughout range
Range:	20,000 to 90,000 gammas (worldwide)
Tuning:	Multi-position switch with signal amplitude indicator light on display
Gradient Tolerance:	Exceeds 150 gammas/ft
Sampling Rate:	Manual push-button, one reading each 6 seconds
Output:	5 digit numeric display with readout directly in gammas
Power Requirements:	Twelve self-contained 1.5 volt "D" cell, universally available flashlight-type batteries. Charge state or replacement signified by flashing indicator light on display

Battery Type		Number of Readings
Alkaline	over	10,000
Premium Carbon Zinc	over	4,000
Standard Flashlight	over	1,500

NOTE: Battery life decreases with temperature

Temperature Range:	Console and sensor: -40° to +85°C Battery Pack: 0° to +50°C (limited use to -15°C; lower temperature operation—optional)
Accuracy (Total Field):	±1 gamma through 0° to 50°C temperature range
Sensor:	High signal, noise cancelling, interchangeably mounted on separate staff or attached to carrying harness
Size:	Console: 3.5 x 7 x 10.5 inches (9 x 18 x 27 cm) Sensor: 4.5 x 6 inches (11 x 15 cm) Staff: 1 inch diameter x 8 ft length (3 cm x 2.44 m)

Weight:

	Lbs.	Kgs.
Console (w/batteries):	5.5	2.4
Sensor & signal cable:	4	1.8
Aluminum staff:	2	0.9
	11.5	5.1

Appendix 3: Statement of Qualifications

Statement of Qualification of the Author

I, Alexander J. Boronowski, residing at 3741 St. Andrews Avenue, North Vancouver, in the province of British Columbia, do certify that:

1) I am a graduate of the Faculty of Science, University of British Columbia 1970, with a B.Sc. degree in Geology.

2) I am registered with the Association of Engineers and Geoscientists of British Columbia and I am a Fellow of the Geological Association of Canada.

3) I have worked in the mining industry as an exploration and mine geologist for 38 years.

Alexander Boronowski

Statement of Qualification of the Author

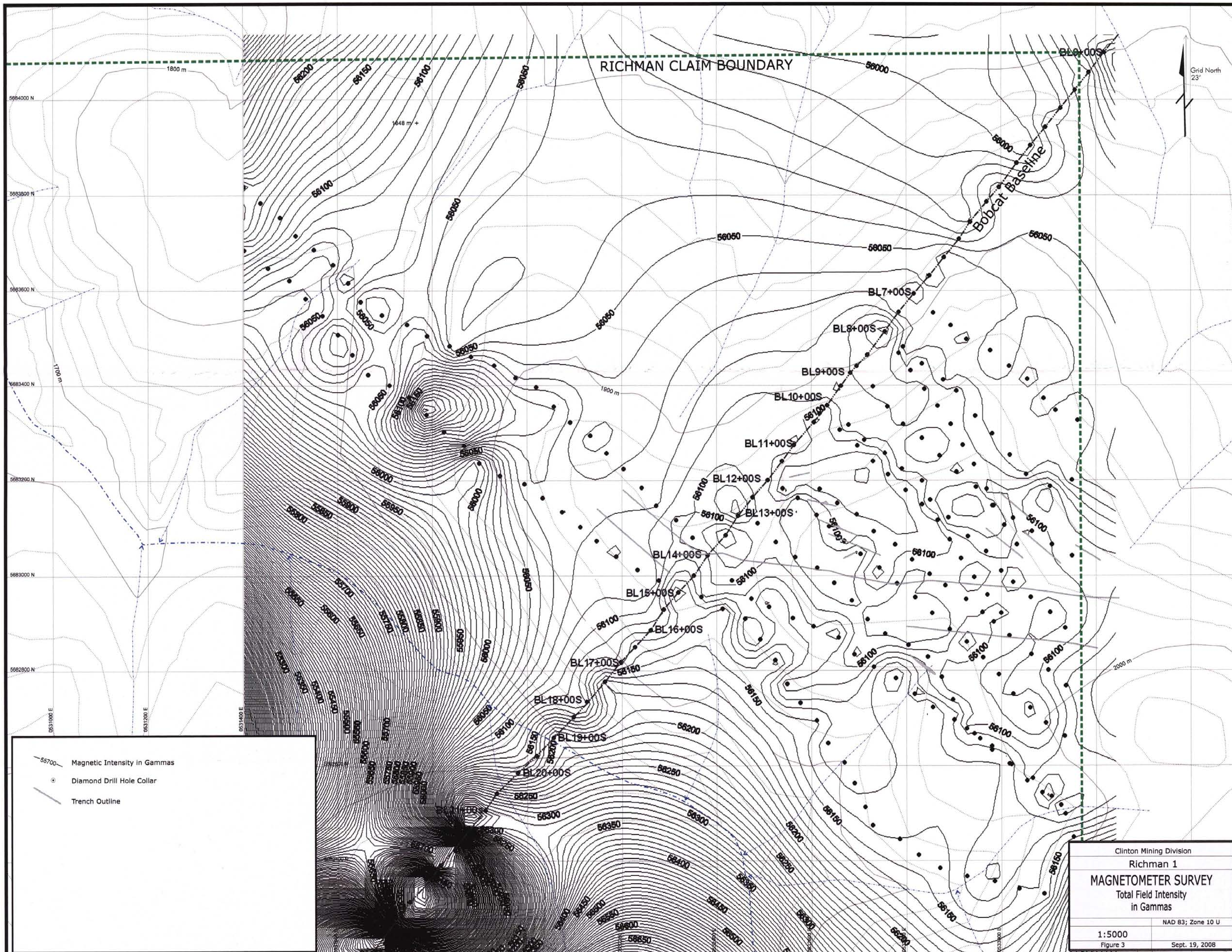
I, Christopher Sebert, residing at 19616-80th Ave, Langley, British Columbia declare:

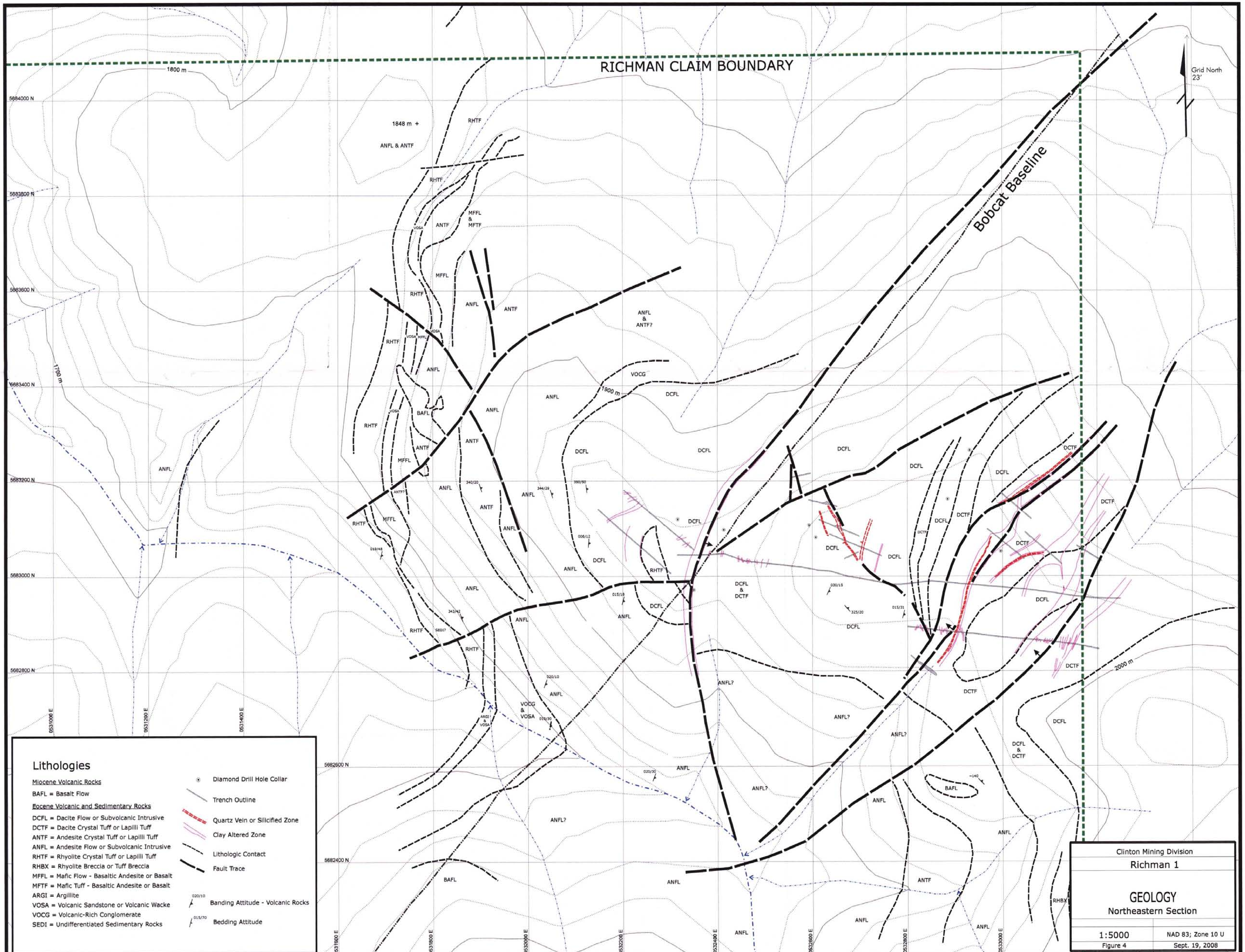
1) I am a registered Geological Engineer in the province of British Columbia.

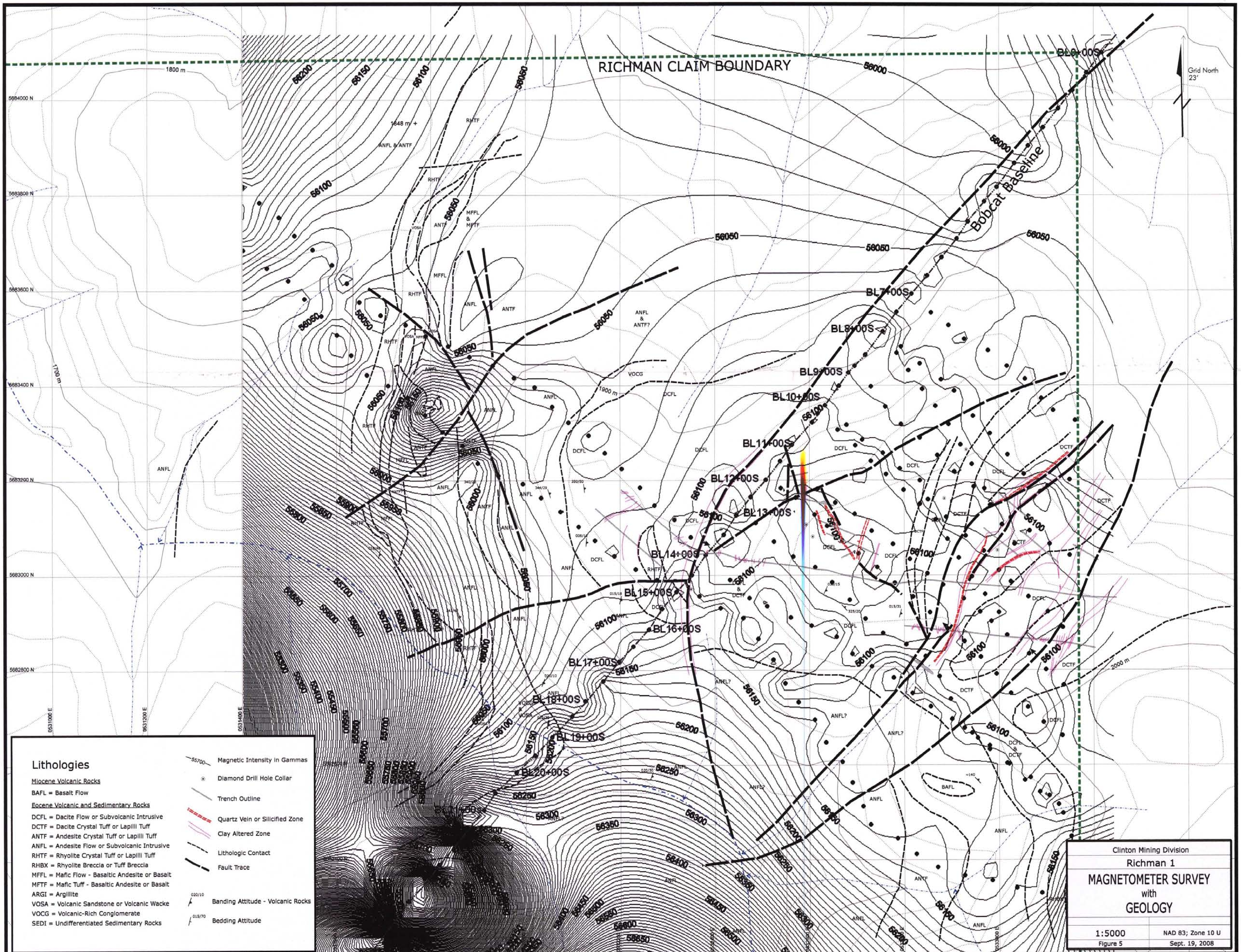
2) I hold a Bachelors and Masters degree in Geological Engineerng obtained at the University of British Columbia in 1987 and 1998 respectively.

3) I have worked in the mining industry as an exploration and mine geologist for 21 years.

Christopher Sebert


RICHMAN CLAIM BOUNDARY
Bobcat Baseline
Grid North
23'
BL0+00S
BL7+00S
BL8+00S
BL9+00S
BL10+00S
BL11+00S
BL12+00S
BL13+00S
BL14+00S
BL15+00S
BL16+00S
BL17+00S
BL18+00S
BL19+00S
BL20+00S
1800 m
1900 m
2000 m
1700 m
5684000 N
5683800 N
5683600 N
5683400 N
5683200 N
5683000 N
5682800 N
0531000 E
0531200 E
0531400 E
Magnetic Intensity in Gammas
Diamond Drill Hole Collar
Trench Outline
Clinton Mining Division
Richman 1
MAGNETOMETER SURVEY
Total Field Intensity
in Gammas
NAD 83; Zone 10 U
1:5000
Figure 3
Sept. 19, 2008


RICHMAN CLAIM BOUNDARY
Bobcat Baseline
Grid North 23'
1800 m
1848 m +
1700 m
1900 m
2000 m
Lithologies
Miocene Volcanic Rocks
BAFL = Basalt Flow
Eocene Volcanic and Sedimentary Rocks
DCFL = Dacite Flow or Subvolcanic Intrusive
DCTF = Dacite Crystal Tuff or Lapilli Tuff
ANTF = Andesite Crystal Tuff or Lapilli Tuff
ANFL = Andesite Flow or Subvolcanic Intrusive
RHTF = Rhyolite Crystal Tuff or Lapilli Tuff
RHBX = Rhyolite Breccia or Tuff Breccia
MFFL = Mafic Flow - Basaltic Andesite or Basalt
MFTF = Mafic Tuff - Basaltic Andesite or Basalt
ARGI = Argillite
VOSA = Volcanic Sandstone or Volcanic Wacke
VOCG = Volcanic-Rich Conglomerate
SEDI = Undifferentiated Sedimentary Rocks
Diamond Drill Hole Collar
Trench Outline
Quartz Vein or Silicified Zone
Clay Altered Zone
Lithologic Contact
Fault Trace
Banding Attitude - Volcanic Rocks
Bedding Attitude
Clinton Mining Division
Richman 1
GEOLOGY
Northeastern Section
1:5000
NAD 83; Zone 10 U
Figure 4
Sept. 19, 2008


RICHMAN CLAIM BOUNDARY
Grid North
23'
Bobcat Baseline
BL6+00S
BL7+00S
BL8+00S
BL9+00S
BL10+00S
BL11+00S
BL12+00S
BL13+00S
BL14+00S
BL15+00S
BL16+00S
BL17+00S
BL18+00S
BL19+00S
BL20+00S
1800 m
1700 m
1900 m
2000 m
5684000 N
5683800 N
5683600 N
5683400 N
5683200 N
5683000 N
5682800 N
0531000 E
0531200 E
0531400 E
Lithologies
Miocene Volcanic Rocks
BAFL = Basalt Flow
Eocene Volcanic and Sedimentary Rocks
DCFL = Dacite Flow or Subvolcanic Intrusive
DCTF = Dacite Crystal Tuff or Lapilli Tuff
ANTF = Andesite Crystal Tuff or Lapilli Tuff
ANFL = Andesite Flow or Subvolcanic Intrusive
RHTF = Rhyolite Crystal Tuff or Lapilli Tuff
RHBX = Rhyolite Breccia or Tuff Breccia
MFFL = Mafic Flow - Basaltic Andesite or Basalt
MFTF = Mafic Tuff - Basaltic Andesite or Basalt
ARGI = Argillite
VOSA = Volcanic Sandstone or Volcanic Wacke
VOCG = Volcanic-Rich Conglomerate
SEDI = Undifferentiated Sedimentary Rocks
55700
Magnetic Intensity in Gammas
Diamond Drill Hole Collar
Trench Outline
Quartz Vein or Silicified Zone
Clay Altered Zone
Lithologic Contact
Fault Trace
020/10
Banding Attitude - Volcanic Rocks
015/70
Bedding Attitude
Clinton Mining Division
Richman 1
MAGNETOMETER SURVEY
with
GEOLOGY
1:5000
NAD 83; Zone 10 U
Figure 5
Sept. 19, 2008