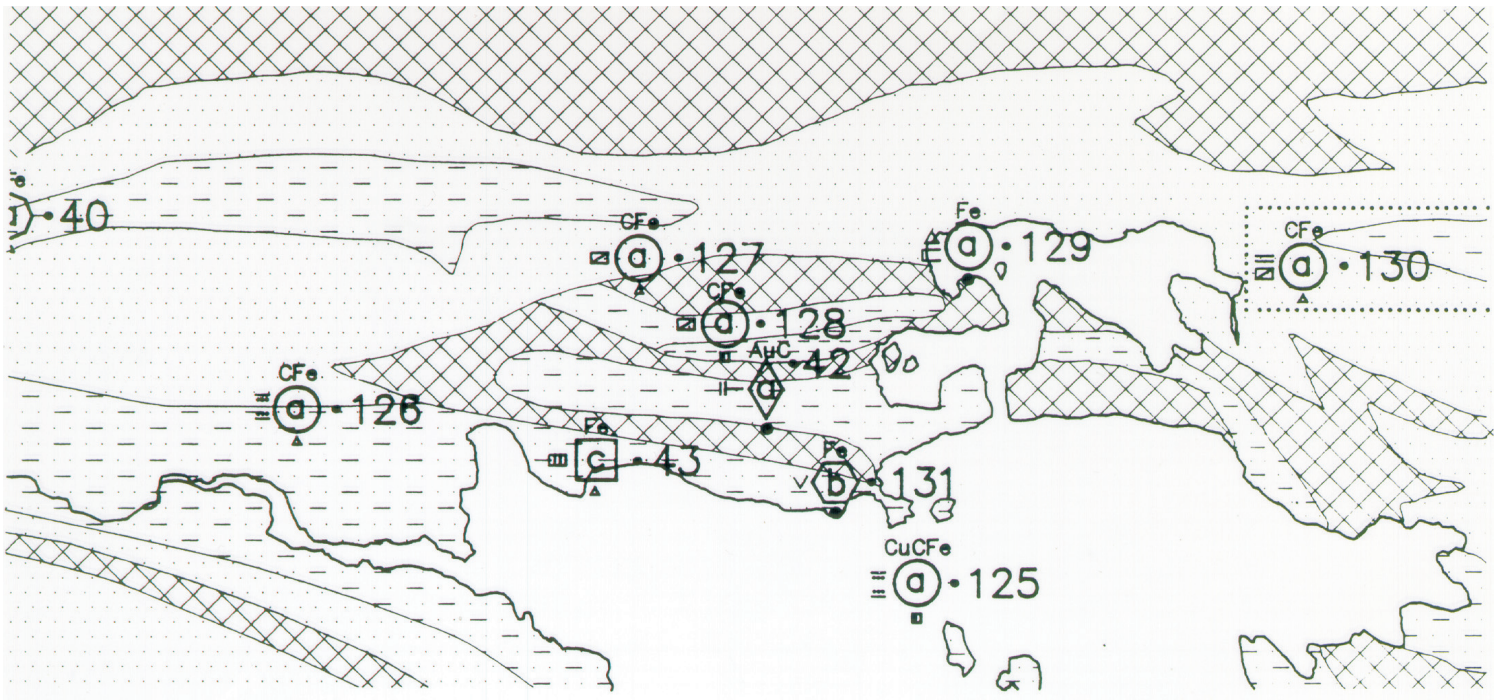
Mineral Deposit Series Report No. 30



Mineral Deposits and Occurrences in the Elbow Lake Area, Manitoba, NTS 63K15

by T.H. Heine

2003

Manitoba

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Mineral Deposits and Occurrences in the Elbow Lake Area, Manitoba, NTS 63K15

by T. H. Heine, Regional Geologist
Flin Flon, Manitoba, 2003

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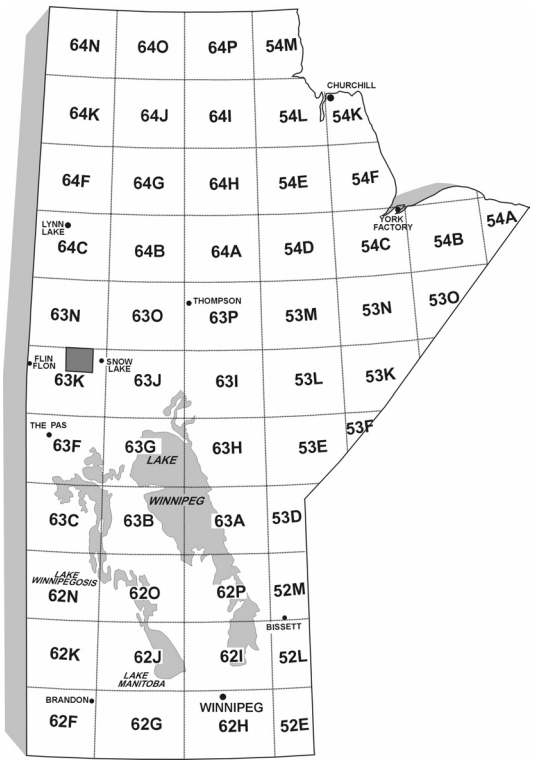

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INTRODUCTION

This report and accompanying maps are part of a Mineral Deposit Series presenting a uniformly organized and up-to-date collation and analysis of information on mineral occurrences in the Province of Manitoba. The series is intended: (1) to provide explorationists with a geoscientific database that can be used in mineral exploration; and (2) to provide a technical database for government use in resource evaluations, formulation of mineral and land use policies and the initiation of regional development programs.

Methodology

The documentation program was initiated in the main mining districts of the province under the 1984-1989 Canada-Manitoba Mineral Development Agreement. Under this project, mineral deposit geologists of the Manitoba Geological Survey have attempted to inspect and evaluate each known mineral occurrence. These site visits ranged from a preliminary half-day or less search of an area for old workings, to extensive geological mapping of selected occurrences for a week or more. In addition, for each occurrence the geologists have attempted to synthesize available data from published and unpublished sources. The Manitoba Mineral Inventory Card Index and the cancelled assessment files have been used extensively in the preparation of this report. Mineral occurrence documentations representing only cancelled assessment file compilations are identified as such under the heading 'Name'. Information for all other occurrences was acquired primarily by field examination supplemented by cancelled assessment file compilations.

The locations of all mineral deposits and occurrences are presented in Figure 1.

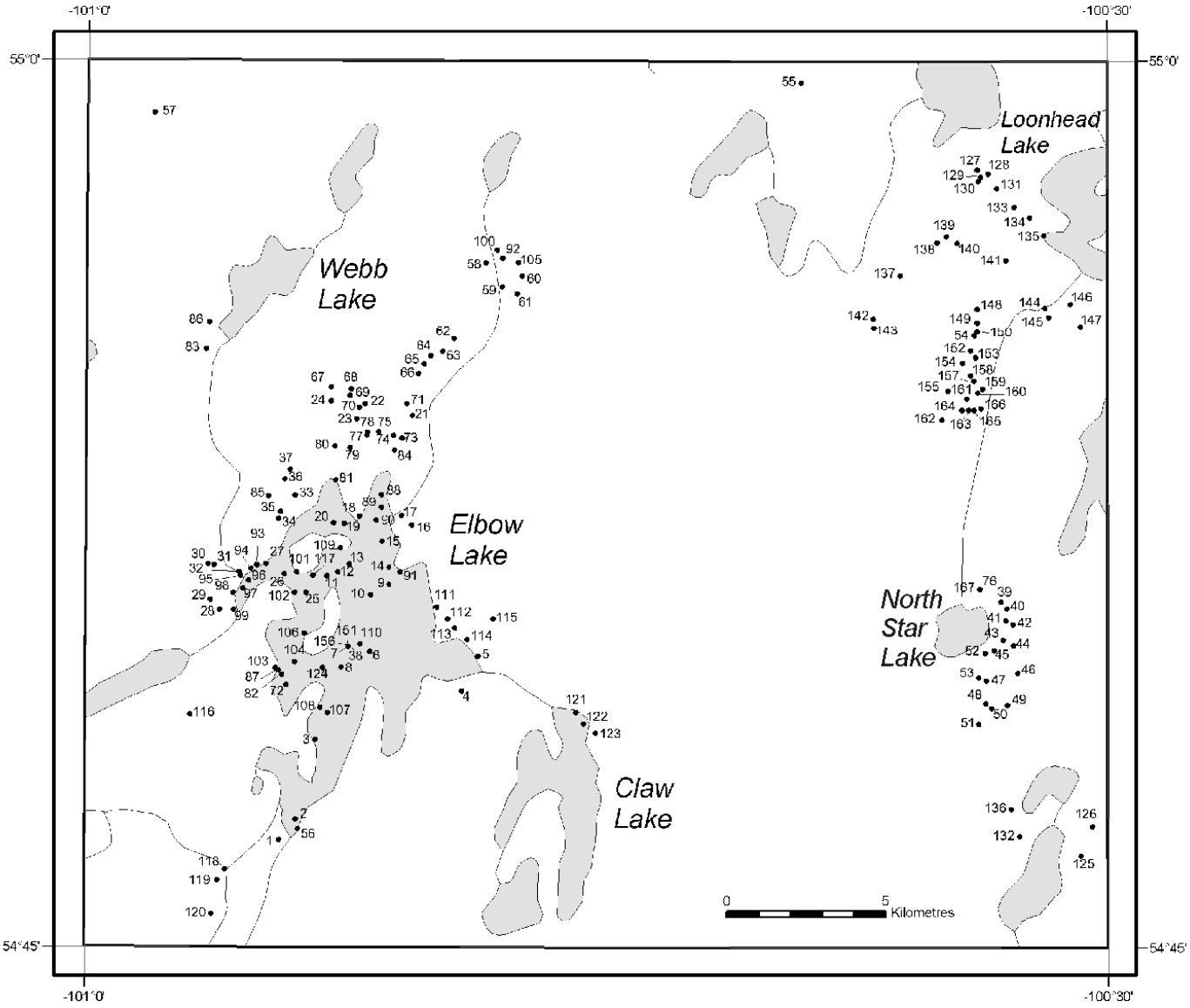

Figure 1: Location of mineral deposits and occurrences (63K/15).

Deposit versus occurrence

Throughout this report mineralization is referred to as a deposit if tonnage and grade figures are known; all other mineralization is referred to as an occurrence.

Massive sulphide versus solid sulphide

The use of 'massive sulphide' in the geological literature is confusing in that it is not always clear whether the authors are referring to a 'massive sulphide deposit' (cf. Sangster, 1972) or a section of sulphide-rich rock. In this publication 'massive sulphide' will be used in reference to a deposit type, i.e., a volcanogenic massive sulphide deposit type, rather than the nature of the mineralization. A volcanogenic or sedimentogenic massive sulphide deposit can contain a sulphide lens that locally contains as little as 10% sulphide minerals by volume. The alteration zones that are an integral part of many massive sulphide deposits rarely contain more than 50% sulphide minerals. Consequently, the use of 'solid sulphide' for 75% to 100% and 'near solid sulphide' for 50% to 75% sulphide minerals is adopted in place of the commonly used term 'massive' to describe the quantitative aspects of the sulphide mineralization.

Format of Mineral Deposit Maps

Location

One of the incentives spurring mineral deposit documentation was the absence of accurate location maps for known mineral occurrences. Inaccurate land bases have previously resulted in failure to find old workings, surveys conducted in wrong areas, and even cancellation of intended surveys by explorationists. Consequently, considerable field time has been spent in establishing occurrence locations and attempts have been made to display exact locations to within approximately 10 metres both on the maps and in the report.

The location number on the map is a unique reference number that will be used both in the report and the geologists' unpublished database. Where the volume of occurrence/deposit data within a 1:50 000 NTS map sheet is large enough to be more efficiently presented by dividing the map sheet in half or into quadrants (cf. Map MDS87-1, NTS 63K13 SE), reference numbers will be consecutive only within the individual map sheet. Where the density of data warrants the publication of a 1:10 000 map sheet, location numbers are consecutive within each 1:50 000 area.

Deposit types

In order to maintain a mineral deposit classification, which will be useful to both explorationists and metallogeneticists, a simplified descriptive classification was selected. This classification is based on the use of common deposit types for the classification of both deposits and occurrences. The classification of mineralization is based on the premise that the mineral explorationist requires information on metals and types of mineralization in an area as well as on the economic deposits (past and present producers).

All deposits and occurrences are classified according to the deposit type classification in Table 1.

The deposit type displayed on the map represents mineralization with the greatest economic potential, e.g., a disseminated narrow chalcopyrite layer is emphasized over a much thicker solid pyrite-graphite layer.

Mineralization

A symbol is used to denote the percentage and/or type of mineralization present. At some localities more than one type of mineralization is present. The type of mineralization displayed in the symbol represents the mineralization with the greatest economic potential as indicated by the deposit type symbol. It should be noted that, in the context of this report, a "sulphide facies iron formation" is equivalent to a "sulphide stratum". For a discussion of sulphide stratum the reader is referred to Gale et al. (1980).

Some occurrences have a significant strike extent or occur as an area of mineralization. An example of the former case would be a sulphide layer that is the cause of an EM conductor. In these cases the location of the occurrence is indicated in the central part of the conductive response. Separate conductive responses, where they have been proven to be associated with sulphide mineralization, are indicated as separate occurrences.

TABLE 1: MINERAL DEPOSIT TYPES

STRATABOUND MASSIVE SULPHIDE TYPE DEPOSITS
- a) Volcanic rock associated
- b) Sedimentary rock associated
- c) Alteration zone associated with a or b

CHEMICAL SEDIMENT-TYPE DEPOSITS
- a) Sulphide facies iron formation
- b) Oxide facies iron formation
- c) Carbonate facies iron formation
- d) Silicate facies iron formation
- e) Other chemical sediments

VEIN-TYPE DEPOSITS
- a) Single vein
- b) Multiple veins or lenses
- c) Stockwork

MAGMATOGENIC-TYPE DEPOSITS ASSOCIATED WITH MAFIC/ULTRAMAFIC ROCKS
- a) Disseminated
- b) Layered
- c) Net textured
- d) Podiform

DEPOSITS WITH PORPHYRY AFFINITIES

PEGMATITE-TYPE DEPOSITS

CLASTIC SEDIMENT-TYPE DEPOSITS

REPLACEMENT-TYPE DEPOSIT

DISSEMINATED MINERALIZATION - NOT CLASSIFIED

Host rocks

In general, this description refers to the immediately underlying and overlying rock types. When a number of rock types are present in an extensive zone of mineralization, the most common rock types are indicated.

Elements

This description allows for a maximum of three metals present in increasing order of abundance by volume. The precious and base metals are indicated in preference to elements such as iron and carbon.

Format of Mineral Deposit Reports

Location

Each deposit or occurrence description will contain the unique reference number, deposit or claim name where applicable, UTM coordinates (NAD83, zone 14), general area description, the reference number of the airphoto on which the deposit can be located and a brief description of method(s) of access.

Exploration summary

This section provides a summary of the extent of exploration and was compiled from Mineral Inventory Cards, cancelled assessment files, and maps and files from the Mining Recording Office.

Geological setting

In this section the general geology of a deposit or occurrence is described. The information levels of the descriptions vary considerably and depend largely upon the extent of geological mapping during the documentation project. For further details the reader should consult the references cited.

In this report, volcanic and sedimentary rock names are used rather than metamorphic equivalents in order to simplify and clarify the descriptions of the occurrence rock types. All supracrustal units have been metamorphosed to at least greenschist grade.

Mineralization

A detailed description of the mineralization provides readers with the opportunity to make their own evaluation of the significance of a mineral occurrence or deposit.

Geochemical data

Most geochemical data included in this report are summarized from assays listed in drill logs submitted to fulfill assessment requirements. In addition, samples collected for geochemical analysis from site visits are described in this section.

Classification

In this section the geologist may indicate the reasons for the classification appearing on the mineral deposit maps. For those localities containing more than one deposit type, the deposit types not shown on the maps are documented here.

References

These include both published and unpublished sources. For published and assessment report information the reader should obtain the desired material directly from the source. The mineral deposit geologists will endeavor to supply copies of unpublished material on a deposit by deposit basis.

References listed at the end of each occurrence description may also include sources of additional information not directly cited in the text.

Abbreviations

The following abbreviations are used throughout the occurrence descriptions:

AEM	airborne electromagnetic
A.F.	assessment file(s)
AFMAG	audiofrequency magnetic
AMAG	airborne magnetic
apy	arsenopyrite
Ag	silver
Au	gold
bn	bornite
cm	centimetre
c	carbonatized
Cd	cadmium
Co	cobalt
conc	concentration
cp	chalcopyrite
Cu	copper
DDH	diamond-drill hole(s)
EM	electromagnetic
fsh	fuchsite
g/t	grams per tonne
hem	hematite
HLEM	horizontal loop electromagnetic
if	iron formation
m	metre
MAG	magnetic
MDS	Mineral Deposit Series
mb	molybdenite
Mo	molybdenum
Ni	nickel
ns	near solid
oz./ton	ounces per ton
Pb	lead
ppb	parts per billion
ppm	parts per million
po	pyrrhotite
py	pyrite
qtz	quartz
shr	sheared
sl	slightly mineralized
to	tourmaline
tr	trace
VL-EM	vertical loop electromagnetic
VLF-EM	very low frequency electromagnetic
wm	well mineralized
Zn	zinc

Acknowledgments

Several students provided assistance during the summer field investigations of the occurrences. Rolf Pippert did some of the initial mapping of the North Star Lake gold occurrences. Kyla Arden, Christine Poschadel, Zerai Andegeorgs, and Rebecca Jacksteit provided valuable assistance during the quest for old workings. Rebecca Jacksteit also digitized some of the data included in the cancelled assessment files. David Prouse assisted in the documentation of several occurrences in the Elbow Lake area during the 1992 field season. The manuscript was reviewed by George Gale, Al Bailes and Mark Fedikow who provided valuable comments to improve the text. Bonnie Lenton and Tony Franceschet drafted the final figures for this report. Craig Steffano and Kelly Proutt did the desktop publishing.

NOTE:

This mineral deposit report and the accompanying maps are intended to be active documents that can be updated as new information becomes available. Although revisions of the publication are anticipated, any additional unpublished information may be obtained by contacting the author or the Director, Manitoba Geological Survey.

GEOLOGY OF NTS 63K15

Introduction

Initial investigations in NTS area 63K15 were undertaken by Bruce (1918) with subsequent studies of the geology and mineral deposits by Alcock (1920), Armstrong (1923), Wright (1931), Stockwell (1935), Robertson (1950) and McGlynn (1959). A reconnaissance investigation of the Elbow Lake–Webb Lake area was undertaken by Syme (1978). Galley *et al.* (1987a, b) investigated the metallogeny of the Elbow Lake gold occurrences and published the results in a summary paper (Galley *et al.*, 1989). Nielsen (1992), Ryan and Williams (1993, 1994), Syme (1990, 1991a, b, 1992, 1993), Whalen (1991, 1992, 1993a, b) and Whalen and Hunt (1994) undertook investigations in the Elbow Lake area after a major forest fire in 1989. The till, supracrustal sequence, mineral occurrences and some of the diatremes within the North Star Lake supracrustal assemblage have been investigated by Ayed and Halden (1993), Heine (1993), Heine and Prouse (1992), Prouse and Gale (1993), Nielsen (1992), Norquay *et al.* (1991a, b, c, 1992, 1993a, b, 1994a, b, c), Norquay and Halden (1992), Ostry (1985), Richardson and Ostry (1996) and Trembath *et al.* (1990). The geology of the Webb Lake area has been described by Schledewitz (1990, 1991, 1992, 1993), and Zwanzig (1995, 1996) completed investigations in the Dow Lake–Martell Lake area WNW of Loonhead Lake. The geologic base for the location index map (MDS Map No. 30-1, in pocket) is derived from the 1:100 000 NATMAP Shield Margin Project compilation map of the Flin Flon Belt (NATMAP Shield Margin Working Group, 1998). The NATMAP lithologic classification scheme is used in this report.

Regional setting

Supracrustal rocks of the Elbow Lake area belong to the 1920 to 1880 Ma Amisk collage (Syme *et al.*, 1995; Lucas *et al.*, 1996), formerly termed the Amisk Group. This is a continuation of the sequence that occurs in the Iskwasum Lake area to the south (NTS 63K10) and the Cranberry lakes area to the southwest (NTS 63K11). A second area of supracrustal rocks occurs in the eastern part of this NTS area (63K15), extending northwards from Reed Lake (63K10), through North Star Lake and continuing into the Dow Lake area. Metamorphic grade in the Elbow Lake map area ranges from lower to middle greenschist, to upper amphibolite facies, and generally increases to the north.

Supracrustal rocks

The volcanic rocks of the Elbow Lake area were deposited in three tectonic environments (Syme, 1991a, 1992):

- Ocean floor assemblage basalts (McDougalls Point basalt, Claw Bay basalt and derived tectonite) that were erupted in an immature oceanic rift setting. These rocks dominate the supracrustal assemblage in the Elbow Lake area;
- Arc assemblage (Webb Lake and Tee Lake basalts) similar to the rocks that host the main volcanogenic massive sulphide deposits in Flin Flon;
- Ocean island basalt assemblage (basalt clasts in Long Bay conglomerate) derived by partial melting of mantle in an intra-plate mantle plume setting.

Ocean floor assemblage

The McDougalls Point basalt (unit F1a) extends from the Cranberry lakes NE along the Grass River into Elbow Lake. Primary features such as pillows, flow contacts, amygdules and amoeboid pillow breccia are common, but are destroyed within approximately 300 m of the Elbow Lake shear zone (units W6 and W6c). This basalt displays geochemical characteristics of a normal mid-ocean ridge basalt (N-MORB) with a small crustal component. It was most likely erupted in an ensimatic back arc basin (Syme, 1994; Stern *et al.*, 1995a).

The Claw Bay basalt (unit F1b) and derived Centre Lake mafic tectonite (unit W6c) occur in the Claw Bay area SE of Elbow Lake and extend south into NTS 63K10 east of the Elbow Lake shear zone. This basalt also displays N-MORB geochemical characteristics, but is lithologically and geochemically distinct from the McDougalls Point basalt (Syme, 1992, 1994; Stern *et al.*, 1995b).

Arc assemblage

The Tee Lake basalt (unit J1a) appears to represent the lowest stratigraphic unit in the area north of Elbow Lake. This 900 m thick unit consists of NW-trending plagioclase- and pyroxene-phyric basalt flows and flow breccia. It appears to be conformably overlain by the Tee Lake rhyolite.

East of Moen Bay the metavolcanic assemblage consists of plagioclase-phyric and aphyric pillowed basalt, plagioclase-pyroxene-phyric pillowed flows and plagioclase-phyric breccia (unit F1c), the Moen Bay basalt. They are intruded by diabase, plagioclase-phyric diabase, and younger gabbros and ultramafic rocks (units P2a, P2f, P10b). The macroscopic character of these porphyritic basalts are similar to the Tee Lake basalts. This sequence is broken up by a series of NE-trending splays from the Elbow Lake shear zone.

Felsic volcanic rocks form only a small proportion of the supracrustal rocks of the Elbow Lake area and generally have limited areal extent. The Tee Lake rhyolite (unit J4a) is the largest felsic complex in the area. It is approximately 600 m thick north of Webb Island, and extends from west of Moen Bay to Tee Lake in the west. It may extend into the Webb Lake area to the north. The complex is dominated by structureless, massive, aphyric, quartz-phyric and plagioclase-phyric felsic rocks. Iron-oxide stained areas are common in some parts of this sequence, particularly east of Tee Lake. Patches of dark green chlorite (?Mg-chlorite) are a ubiquitous

feature.

The Webb Island felsic breccia (unit J7a) is up to 580 m thick on Webb Island and at least 100 m thick west of Long Bay. It is dominated by subangular to subrounded white, sparsely quartz-phyric rhyolite and buff aphyric dacite clasts. Aphyric (?)andesite is a minor component. This sequence represents a subaqueous, possibly reworked, pyroclastic deposit. Its discordance relative to stratification in the underlying Webb Island succession suggests an unconformity between the two units. No structural modification of the contact is evident.

The Century rhyolite (unit J4a) is a 150 m thick, northwest-topping, massive, aphyric flow exposed on the central and eastern part of Webb Island. Contorted flow banding, lobes, hyaloclastite and breccia are locally present.

Tuff, breccia, and dykes form a complex of intermediate to felsic volcaniclastic rocks (units J1a, J4a, J6a) extensively intruded by synvolcanic rhyolite, andesite, basalt and diabase dykes (units P2a, P2f, P10a, J13a) in the bay immediately north of Webb Island. This suite of rocks is generally in fault or intrusive contact with bounding units, but it may overlie the Tee Lake rhyolite. The tuff and breccia intervals contain a variety of intermediate and felsic angular to subangular fragments.

Webb Island basalt (unit J1a) is exposed mainly along the north side of Webb Island, and consists mainly of NE-trending, NW-topping, foliated and commonly strongly flattened aphyric basalt, amoeboid pillow breccia and thin intercalated pillowed flows. Sporadic rafts and enclaves of hornfelsed, black pillowed basalt are tentatively correlated with the Webb Island basalt, and occur as a minor component within the Tee Lake dyke complex (unit J13d) SW of Tee Lake.

No geochemical work has been completed on the volcanic rocks in the Webb Lake area north of Tee Lake, but Schledewitz (1991) indicates that parts of this sequence belong to the Tee Lake complex (Syme, 1991a). If this interpretation is correct, these rocks are part of the arc assemblage (Syme, 1991a, 1992).

Ocean island basalt assemblage

The Long Bay picrite conglomerate (unit F3c) is a coarse clastic assemblage of volcanic conglomerate, pebbly conglomerate and sandstone deposited from subaqueous debris flows (Syme, 1991a). The large clast size and thickness of beds suggests that these represent proximal accumulations (Syme, 1992), although the source of these sediments remains unknown.

Supracrustal rocks of uncertain affinity

The eastern part of NTS 63K15 is underlain by the northerly-trending North Star Lake volcanosedimentary assemblage. The supracrustal sequence in the North Star Lake area has been divided into Western, Central and Eastern zones (Norquay *et al.*, 1993a; 1994a). The geochemical characteristics of this sequence remain to be determined.

The Eastern zone (unit J1d) consists predominantly of massive, pillowed and brecciated basaltic flows and fine- to medium-grained synvolcanic mafic intrusions. A variety of younger intrusions, mainly dykes, form a minor component of this assemblage (Norquay *et al.*, 1993a, b). This volcanic sequence appears to be part of the Fourmile Island assemblage (Syme *et al.*, 1995), deposited in an arc-type tectonic setting. It hosts the Reed Lake (NTS 63K9), Fourmile Island (NTS 63K10) and Dickstone (NTS 63K16) volcanogenic massive sulphide deposits.

The Central zone, which has been described by Norquay *et al.* (1993a, b) as consisting of interlayered amphibolite, quartz-rich amphibolite, psammitic and psammopelitic rocks, layered rhyolitic tuff, lapilli tuff and tuff breccia, mafic flows and chemical sedimentary rocks, is regionally part of a tectonite zone (unit W6b) termed the West Reed–North Star shear zone by the NATMAP Shield Margin Working Group (1998). Primary textures have generally been obliterated in the Central zone due to this strong tectonic overprint, but they remain well preserved within the hinge areas of several folds north of North Star Lake. In the area east and north of North Star Lake, the contact between the Central and Eastern zones is marked by a late brittle structure, Zaks Fault (Norquay *et al.*, 1993a, b).

The Western zone consists of felsic and mafic volcanic and volcaniclastic rocks, felsic intrusions, and diatremes associated with mafic intrusions (units J1d, J1e, J4b). This assemblage has been intruded by younger granodioritic bodies (units P6d, P6f), and is bounded to the west by the Gants Lake batholith (units P7c, P7e).

Intrusive rocks

Intervening intrusive rocks to the supracrustal part of the Flin Flon collage consist of 1876 to 1845 Ma granitoid plutons that form >60% of the belt (Morrison and Whalen, 1995). The major intrusions in NTS 63K15 are shown on MDS Map No. 30-1, -2, and their features summarized in Table 2.

The Gants Lake batholith (units P5a, P6d, P6f, P7a, P7b, P11a) occupies the boundary zone between the Claw Bay basalt ocean floor volcanic assemblage to the west and the Fourmile Island arc-type assemblage to the east. The Loucks Lake shear zone which occurs dominantly within the batholith, may represent the trace of the contact zone between these two diverse supracrustal assemblages.

Structural geology

Structural elements of the Elbow Lake area are summarized in Table 3. The NNE-trending Elbow Lake shear zone (Syme, 1991a, 1992) is the main structural feature in the Elbow Lake area. This up to 3 km wide zone in central Elbow Lake extends NNE along the creek at the head of Moen Bay and SSW along the Grass River outflow from Elbow Lake into Iskwasum Lake (Syme, 1994). The shear splays to the SE in the east central part of Elbow Lake, forming the Claw Bay shear zone, and is

TABLE 2. MAJOR INTRUSIONS OF NTS 63K15 (ELBOW LAKE).

Name	**Age** (Whalen, 1993a; Whalen and Hunt, 1994)	**Petrography** (Bailes, 1980; Syme, 1992; Whalen, 1993a; Morrison and Whalen, 1995; Zwanzig, 1995)
Little Swan Lake pluton	1826±5 Ma	coarse-grained, hornblende-biotite granodiorite, quartz diorite, diorite, gabbro
Big Rat Lake pluton	1845±3 Ma	fine- to medium-grained biotite granite to granodiorite and medium - to coarse-grained, biotite granite to granodiorite
Norris Lake pluton	1845 Ma	diorite, quartz diorite, granodiorite, minor granite
Gauthier Lake pluton	1845 Ma	monzodiorite or quartz monzonite, granodiorite, granite
Echo Lake pluton	1847 Ma	feldspar-amphibole porphyritic and coarse-grained hornblende-biotite granodiorite, melagabbro, diorite, quartz diorite
Elbow Lake tonalite	1864+5/-3 Ma	quartz-biotite porphyritic, biotite±hornblende tonalite
East Elbow Lake tonalite	1864±3Ma	quartz megacrystic tonalite
Gants Lake batholith	1876+7/-6 Ma	plagioclase porphyritic, hornblende-biotite granodiorite; other comagmatic phases coexist
Rail Lake pluton	1860 Ma	mainly tonalitic, quartz and biotite megacrystic, quartz-phyric phases
Claw Lake gabbro complex	1901 Ma	layered series (gabbro, leucogabbro, anorthosite and subordinate pyroxenite, peridotite); younger gabbro series (gabbro, minor peridotite, poikilitic peridotite, pyroxenite)
Webb Lake plutonic complex		mainly tonalitic, texturally diverse, quartz- and biotite-phyric, hydrothermally altered
North Star Lake pluton		medium- to coarse-grained quartz-plagioclase-phyric biotite granodiorite to tonalite, fine-grained biotite felsic aplite
Josland Lake gabbro		layered series (gabbro, ferrogabbro, quartz diorite, tonalite; melanocratic to mesocratic plagioclase-hornblende orthogneiss

NOTE: Units in this table are not in chronological order.

TABLE 3. SUMMARY OF STRUCTURAL ELEMENTS OF THE ELBOW LAKE AREA (from Syme, 1992).

Generation	**Trend**	**Structures, fabrics**
P_1	E	rare refolded, isoclinal F_1 folds, lacking axial planar cleavage, in Long Bay conglomerate
P_2	NW	S_2 foliation in Centre Lake domain (E of Elbow Lake) and Long Bay domain (W of Elbow Lake)
P_3	NNE	S_3 foliation through centre of Elbow Lake, isoclinal upright F3 folds, well developed S3 axial planar foliation, foliation associated with the Elbow Lake shear zone
P_4	NE	open F_4 minor folds refolding S_2 and tectonic lamination in the southern Centre Lake domain, S_4 axial planar foliation, fracture cleavage, quartz-carbonate filled fractures
P_5	NE, NW, N	conjugate late brittle faults

truncated by a brittle fault just SE of Claw Bay (Syme, 1992). It is dominated by mafic phyllonites derived from basalt, but felsic phyllonites are also present. Strain intensity is highly variable within the Elbow Lake shear zone; lens shaped domains of less deformed rock ranging in size from a few centimetres to less than 2 km long are common. The deformation history along this structure is complex (Ryan and Williams, 1993, 1994), but on a broad scale it is a sinistral, transpressive structure. Deformation within the Elbow Lake shear zone has juxtaposed terranes that formed in different tectonic environments. Most of the gold occurrences in the Elbow Lake area are closely associated with this structure.

The Grass River fault is a NE-trending structure up to 230 m wide that parallels the Elbow Lake shear zone in the Grass River inlet area. It may be part of the Cranberry shear zone to the southwest, but continuity between the two faults has not been established; they have been offset approximately 1500 m by a west-trending dextral splay off the Elbow Lake shear zone. The Grass River fault is characterized by felsic mylonites and associated brittle deformation structures such as lens shaped tectonic fragments and open space filling carbonate.

The north-trending, linear Centre Lake fault has been traced for more than 18 km, and cuts both the Elbow Lake tonalite (unit P6a) and the Gants Lake batholith (units P7b, P9b, P9d). In the north it forms a sharp, thin topographic lineament, and in the Claw Lake–Little Claw

Lake area it is a shear zone up to 20 m thick. Kinematic indicators suggest sinistral shear with east side up.

Several NNE-trending faults and shear zones occur in the Claw Lake area. The main one is the Claw Lake shear zone (unit W6c). It is a narrow feature to the north and south, but widens to at least 200 m on central Claw Lake. It cuts the Elbow Lake tonalite in the south, where it is accompanied by intense ductile deformation in the hangingwall (east side). The character of the shear zone is similar to the Elbow Lake shear zone in that it is dominated by mafic phyllonites with abundant intrafolial quartz and carbonate.

The Webb Creek fault is a north-trending curvilinear structure that follows Webb Creek. It truncates the western margin of the Webb Creek tonalite, cuts the Tee Lake dyke complex, and offsets the Webb Island felsic breccia/Long Bay conglomerate contact. Kinematic indicators confirm the sinistral offset along this structure.

The structural features of the North Star Lake area are summarized in Table 4. The sheared Central zone (Norquay *et al.*, 1993a; 1994a) in the North Star Lake area (more or less correlative with the West Reed–North Star shear zone in NTS 63K10 (Syme *et al.*, 1995) and Reed–North Star high strain zone in the NE corner of NTS 63K15 (Zwanzig, 1995, 1996)) is a major structural feature affecting the supracrustal assemblage. This high strain zone displays a strongly attenuated primary stratigraphy, although well preserved primary rock textures have been locally identified within fold hinge areas and a stratigraphic sequence delineated (Norquay *et al.*, 1991a; 1992; 1993a; 1994a).

The north-trending Zaks Fault approximates the eastern boundary of the Central zone to the east and north of North Star Lake. This north-trending, up to 50 m thick, semi-brittle to brittle structure contains fault gouge, crush breccia and rare pseudotachylite. It strikes at a shallow angle to stratigraphy in the Central zone, and progressively truncates successive lithologic units to the north. To the south of North Star Lake, Zaks Fault is hosted by rocks of the Eastern zone. Poorly delineated high strain zones occur for a considerable distance to the east of Zaks Fault. Most of the gold occurrences in the area are located in Eastern zone rocks within 500 m of this break.

The contact between the Flin Flon and Kisseynew belts is exposed in the NE corner of the NTS map area, extending NW from the north side of Loonhead Lake to the north side of Dow Lake in NTS 63N2 (Zwanzig, 1995, 1996). The ENE-dipping Loonhead Lake thrust fault separates rocks of the Amisk Collage from the younger metasedimentary rocks of the Kisseynew belt (Burntwood and Missi suites).

Economic geology

Early interest in mineral deposit potential of the area was sparked by the discovery of lode-type gold occurrences in the Elbow Lake area. Some of the early reports indicated the presence of high gold grades, and shafts were sunk on several prospects, including the Gunwor (occurrence 31), Sherlock (occurrence 32), Webb-Garbutt (occurrence 19), Murray (occurrence 2), Mack (occurrence 17), Hanna (occurrence 9), North Star No. 1 and 2 (occurrence 45), Jupiter No. 2 and 3 (occurrence 49), and Winnipeg-Jupiter No. 7 (occurrence 50). Only the Webb-Garbutt occurrence (Century mine) delineated ore reserves and achieved very limited production. Most of the occurrences are near major shear zones. In the Elbow Lake area, gold prospects occur within and proximal to the Elbow Lake shear zone. The quartz veins also commonly show a close spatial association with chert and cherty iron formation. At North Star Lake, most of the gold occurrences are within approximately 500 m of the West Reed–North Star shear zone.

Subsequent mineral exploration activity focused on the base metal potential of the area. Elbow Lake and surrounding areas were covered by ground EM surveys and many of the conductive responses drill tested. Overall, most of the mineralized intersections proved to be disappointing, consisting of barren sulphides and graphite; however, several significant occurrences that warrant additional work were found.

Significant copper mineralization was intersected in one drillhole along the NE side of Claw Bay at occurrence 114. This mineralization is hosted by ocean floor assemblage Claw Bay basalt (unit F1b), and is proximal to the Claw Bay shear zone.

The Tee Lake area contains arc-related rhyolites and other volcanic rocks. This assemblage forms the largest felsic complex in the Elbow Lake area. The rhyolites east of Tee Lake show extensive chloritic alteration. It remains

TABLE 4. SUMMARY OF STRUCTURAL ELEMENTS OF THE NORTH STAR LAKE AREA (from Norquay et al., 1993a).

Generation	Trend	Structures, fabrics
S_0	N	primary layering in volcaniclastic rocks, volcanic flow contacts
D_1, F_1, S_1		tight to isoclinal, intrafolial folds with well developed axial planar schistosity or spaced cleavage
D_2, F_2, L_2	N	open to tight folds in S_1 with associated S_2 axial planar fracture cleavage on limbs of F_2 structures, S_1 is coplanar with S_2
D_3, F_3, S_3		minor tight shear folds with axial planes similar to F_2, but moderate to steep south plunge
D_4, F_4, S_4		flexure folds with new fabric (S_4) locally developed in micaceous rocks
D_5, F_5	N, NE	semi-brittle shear folds (S-asymmetry) and semi-brittle to brittle faults (eg. Zaks Fault)

unclear if this is related to a sulphide-generating hydrothermal event. Their geochemical similarity to rocks of the Flin Flon area would appear to make them particularly favourable for hosting volcanogenic massive sulphide mineralization (cf. Syme and Bailes, 1993).

Recent work in the Claw Lake area has lead to the discovery of several volcanogenic massive sulphide type base metal occurrences (occurrences 166, 167). Although many of the rock types intersected in the drillholes remain problematic, fragmental rhyolites have been documented that were unexpected in an area mapped as dominantly ocean floor assemblage basalts (Syme and Whalen, 1992).

The Lon zone (occurrence 54) north of North Star Lake is a small copper-zinc deposit hosted by volcanic rocks to the west of the West Reed–North Star shear zone. It has been modified by deformation and its structural characteristics remain to be determined. Fine-grained gahnite ($ZnAl_2O_4$) is widespread within this stratigraphic sequence north of North Star Lake (pers. comm., Don Dudek, 2001), indicating that there was sufficient zinc available in this assemblage to form this spinel group mineral. Gahnite is also present in some of the metamorphosed zinc-copper deposits of the Snow Lake area, particularily those in the Chisel Lake area.

Several mafic/ultramafic intrusions are present in this NTS map-area. The Claw Lake layered gabbro complex is exposed along the west side of Claw Lake, and is intruded to the west by a younger homogeneous gabbro. It consists of modally layered mafic cumulates including gabbro, pyroxenite, peridotite, and anorthosite. Neither the top nor the bottom of the layered series is exposed (Syme, 1992). No investigations to evaluate this differentiated intrusion for its platinum group element (PGE) potential have been undertaken.

Little detail is known about the gabbro SW of Loonhead Lake. Conductive units, most of which contain sulphides, wrap around this intrusion. Neither the sulphide intersections proximal to the gabbro nor the gabbro itself have been evaluated for their PGE potential.

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LOCATION: 1

NAME: Wire
UTM: 377450E, 6072015N
AREA: west side of Grass River near south end of Elbow Lake
ACCESS: via bush aircraft, or by boat through the Cranberry Lakes from Cranberry Portage
AIRPHOTO: MB90025-133

EXPLORATION SUMMARY

The occurrence was originally staked in 1933 by Mr Thomas R. Webb. In 1934 an area with quartz veins in schist was uncovered and a number of pits excavated (Stockwell, 1935). In 1973 Falconbridge Nickel Mines Limited had an airborne EM and magnetometer survey flown in the area (A.F. 91564).

Quartz veins are exposed in several trenches and stripped areas.

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 1-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). The area is underlain by schist (units W6 and W6a) of the Elbow Lake shear zone (Galley *et al.*, 1987, 1989; Syme, 1990, 1991, 1992). The shear zone is bounded to the east by the Elbow Lake tonalite (P6A) and to the west by a series of dykes and/or dyke complex (unit P10).

The rocks exposed in outcrop in the vicinity of the trenches are strongly deformed and consist of fine-grained interbanded dark green and light grey weathering schist (Fig. 1-2). The foliation trends 020-035^{o} and has a vertical dip.

MINERALIZATION

The schist contains grey quartz stringers averaging 1 to 2 cm thick and 10 to 20 cm long. Larger irregular discontinuous lenses of milky quartz are exposed in some of the stripped areas. These lenses are generally parallel to the foliation of the schist.

The quartz stringers contain up to 1% euhedral pyrite as crystalline aggregates; some of these are open space fillings. Stockwell (1935) noted the presence of minor galena and chalcopyrite.

GEOCHEMICAL DATA

Stockwell (1935) indicated that the quartz contained gold, but values were not specified.

CLASSIFICATION

Vein type deposit; multiple veins or lenses. The veins have been affected by deformation within the Elbow Lake shear zone: some are folded and boudinaged, and have limited strike length.

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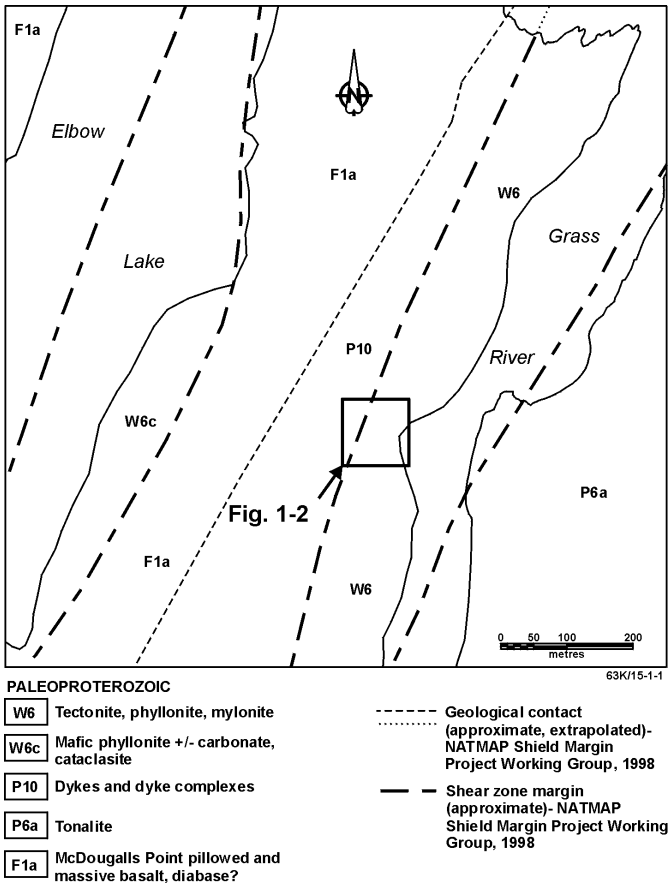

Figure 1-1: Geological setting of Wire occurrence.

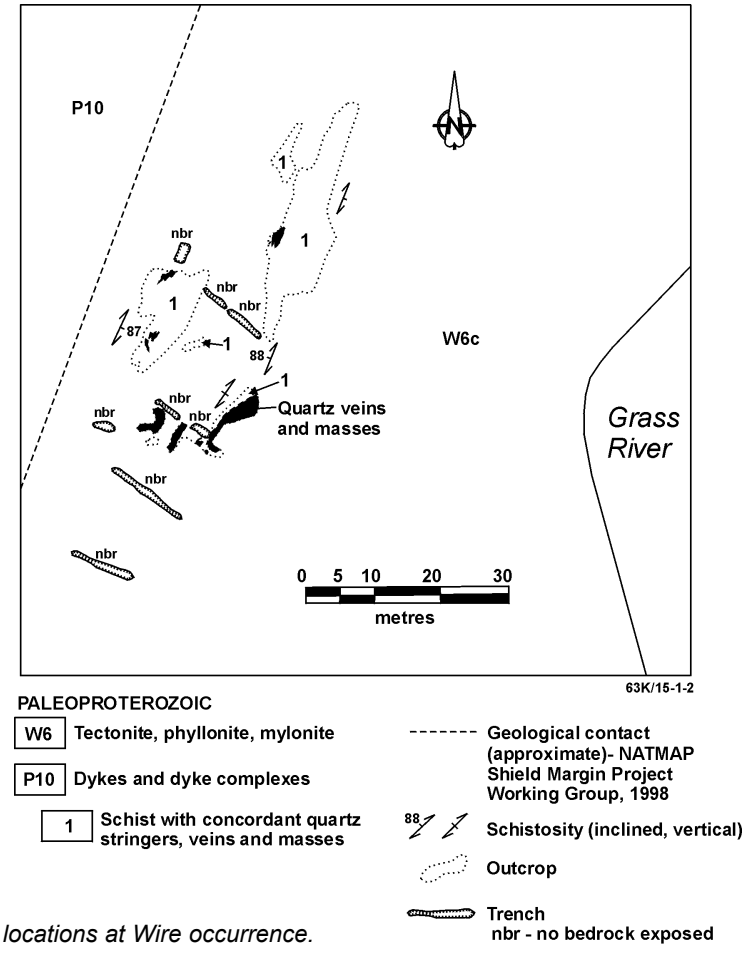

Figure 1-2: Geology and trench locations at Wire occurrence.

LOCATION: 2

NAME: Murray
UTM: 377990E, 6072645N
AREA: east side of Grass River near south end of Elbow Lake
ACCESS: via bush aircraft, or by boat through the Cranberry Lakes from Cranberry Portage
AIRPHOTO: MB90025-123

EXPLORATION SUMMARY

The Murray claim was first recorded in 1921 by Gordon C. Murray. A number of trenches had been excavated by 1922 (Wright, 1930). Two shafts approximately 8 m (25 feet) and 18 m (60 feet) deep and a 15 m (50 feet) adit were subsequently excavated, and a diamond drilling programme was reported to have commenced in 1934 (Stockwell, 1935). In 1973 Falconbridge Nickel Mines Limited had an airborne EM and magnetometer survey flown in the area (A.F. 91564). In 1976 Espina Copper Developments Ltd. optioned the property and carried out a 25 hole drill programme (Mineral Inventory File 781). The results of these drill programmes are not available.

The trenches at this occurrence are largely overgrown and caved and the rock sequence is poorly exposed. The muck piles around the east shaft are mostly overgrown.

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 2-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). The area is underlain by schists (unit W6) of the Elbow Lake shear zone and mafic volcanic rocks of the McDougalls Point basalt (unit F1a). These units are bounded to the NNE by fine- to medium-grained diabase, and to the SE by the Elbow Lake tonalite (unit P6a) and South Elbow layered gabbro complex (unit F6a) (Galley *et al.*, 1987, 1989; Syme, 1990, 1991, 1992).

The mineralization is hosted by fine-grained mafic volcanic rocks that are intruded by an 80 m thick fine- to medium-grained quartz porphyritic tonalite dyke (Fig. 2-2). This dyke can be traced for about 100 m along a low ridge. The tonalite is weakly foliated and contains elongate, strongly foliated mafic xenoliths. The wallrock adjacent to the tonalite is strongly foliated at 225^{o} with a steep NW dip, parallel to the fabric in the rocks of the Elbow Lake shear zone.

MINERALIZATION

Several irregular quartz stringers occur in the trenches. The waste piles around the west shaft (Fig. 2-2) contain abundant quartz with up to 5% disseminated pyrite. Galley (field notes, 1987) reported that abundant coarse gold could be found in quartz-rich fly rock around the trenches. Native gold in white quartz was found just south of the adit during the 1993 inspection of the property. The quartz around the west shaft contains minor feldspar, bright green chlorite, carbonate, sericite and tourmaline. Widely spaced quartz-pyrite filled joints are common throughout the area.

GEOCHEMICAL DATA

None.

CLASSIFICATION

Vein type deposit; multiple veins or lenses.

REFERENCES

A.F. 91564; Cancelled Assessment File, Manitoba Industry, Trade and Mines, Minerals Division.

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Mineral Inventory File No. 781

Manitoba Energy and Mines, Minerals Division

NATMAP Shield Margin Project Working Group

1998: Geology, NATMAP Shield Margin Project Area (Flin Flon Belt), Manitoba-Saskatchewan; Geological Survey of Canada 1968A; Manitoba Energy and Mines Map A-98-2, Sheets 1 to 7; Saskatchewan Energy and Mines Map 258A-2, scale 1:100 000.

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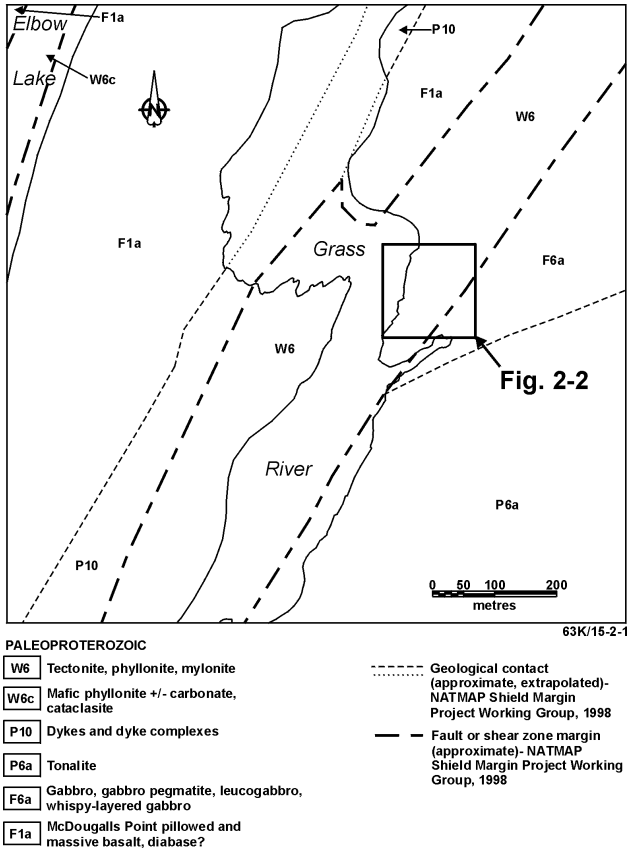

Figure 2-1: Geological setting of Murray occurrence.

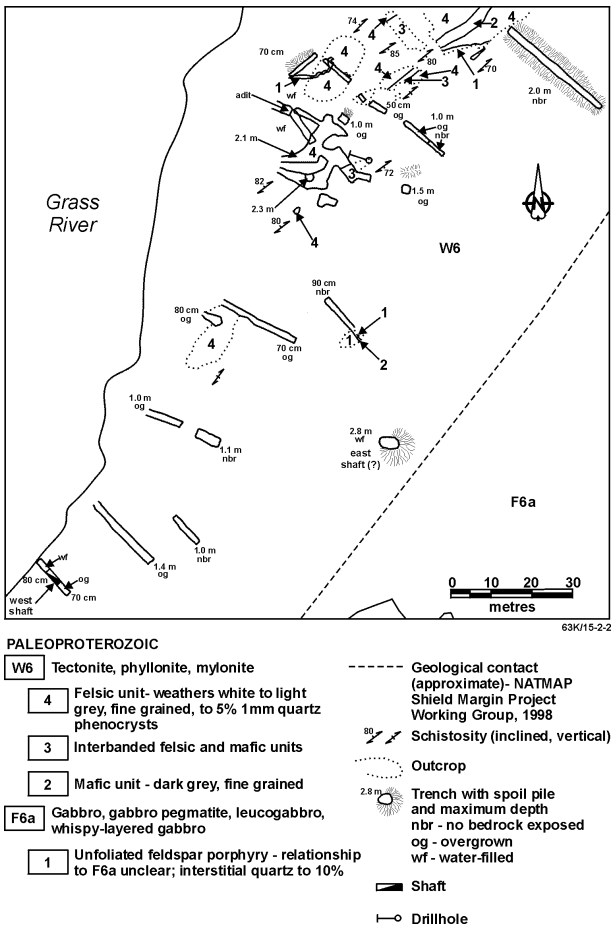

Figure 2-2: Geology and workings at Murray occurrence.

LOCATION: 3

NAME: Hanson
UTM: 378680E, 6075125N
AREA: small bay on east side of McDougalls Point, south end of Elbow Lake.
ACCESS: via bush aircraft, or by boat through the Cranberry Lakes from Cranberry Portage
AIRPHOTO: MB90025-122

EXPLORATION SUMMARY

This occurrence was staked in 1933 by Mr J. McDougall. A trench was excavated in an area of chlorite and sericite schist (Stockwell, 1935). Several additional trenches have been excavated, apparently subsequent to Stockwell's 1934 visit to the area. In 1973 Falconbridge Nickel Mines Limited had an airborne EM and magnetometer survey flown in the area (A.F. 91564). Homestake Mining and Development drilled the property in 1987 (Mineral Inventory File 774), but results have not been released.

The remains of a stamp mill and roasting kiln are still present at the occurrence. The trenches are mostly caved and/or overgrown and flooded.

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 3-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). The area is underlain by schists (units W6c and P11b) of the Elbow Lake shear zone (Galley *et al.*, 1987, 1989; Syme, 1990, 1991, 1992), derived in part from pillowed mafic volcanic rocks. The shear zone is bounded to the east by a quartz diorite intrusion (unit P10a) and to the west by the pillowed and massive aphyric McDougalls Point basalt (unit F1a) (Fig. 3-1).

Galley (field notes, 1987) indicates that the mineralization occurs within an assemblage of mixed felsic and mafic schists, quartz-phyric and aphanitic rhyolite and rhyolite breccia, and mafic lapilli and heterolithic breccia. These rocks are intruded by felsic dykes up to 4 m thick.

The trenches at the occurrence were cut in sericitic and chloritic schists that are part of the Elbow Lake shear zone (Fig. 3-2 and -3). Primary volcanic and depositional textures have been obliterated. Approximately 15 m west of the western series of trenches, pillow selvages are recognizable and outcrop comprises moderately sheared pillowed feldspar-phyric basalt alternating with intensely schistose intervals. The schistosity trends 020^{o} to 025^{o} and dips steeply to the east.

MINERALIZATION

Rocks exposed in the western trenches are weathered and rusty, and much of the schist is calcareous. Narrow (2-4 cm) discontinuous white quartz veins parallel the foliation in the schist. The attenuated, discontinuous character of these veins is related to deformation within the Elbow Lake shear zone. Trace amounts of sphalerite occur within the quartz. Stockwell (1935) indicates that the quartz is mixed with carbonate, feldspar and a bright green phyllosilicate.

GEOCHEMICAL DATA

Grab samples of the quartz and schist are reported by the original owner to have carried from 3.8 to 5.0 g Au/t (0.12 to 0.16 oz. Au/ton) (Stockwell, 1935).

CLASSIFICATION

Vein type deposit; multiple veins or lenses. Mineralization occurs within schists of the Elbow Lake shear zone and proximal to fine-grained felsic dykes.

REFERENCES

A.F. 91564; Cancelled Assessment File, Manitoba Industry, Trade and Mines, Minerals Division.

Galley, A.G., Ames, D.E. and Franklin, J.M.

1987: Geological setting of gold mineralization in the Elbow Lake region, Manitoba; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1987, pp.175-177.

1989: Results of studies on the gold metallogeny of the Flin Flon belt; in Investigations by the Geological Survey of Canada in Manitoba and Saskatchewan during the 1984-1989 Mineral Development Agreements, Geological Survey of Canada, Open File 2133, pp.25-32.

Mineral Inventory File No. 774
Manitoba Energy and Mines, Minerals Division

NATMAP Shield Margin Project Working Group

1998: Geology, NATMAP Shield Margin Project Area (Flin Flon Belt), Manitoba-Saskatchewan; Geological Survey of Canada 1968A; Manitoba Energy and Mines Map A-98-2, Sheets 1 to 7; Saskatchewan Energy and Mines Map 258A-2, scale 1:100 000.

Stockwell, C.H.

1935: Gold Deposits of the Elbow-Morton Area, Northern Manitoba; Geological Survey of Canada, Memoir 186, 74pp.

Syme, E.C.

1990: Elbow Lake project (part of NTS 63K/15W); in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1990, pp.49-57.

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1992: Elbow Lake Project - Part A: Supracrustal rocks; in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1992, pp.32-46.

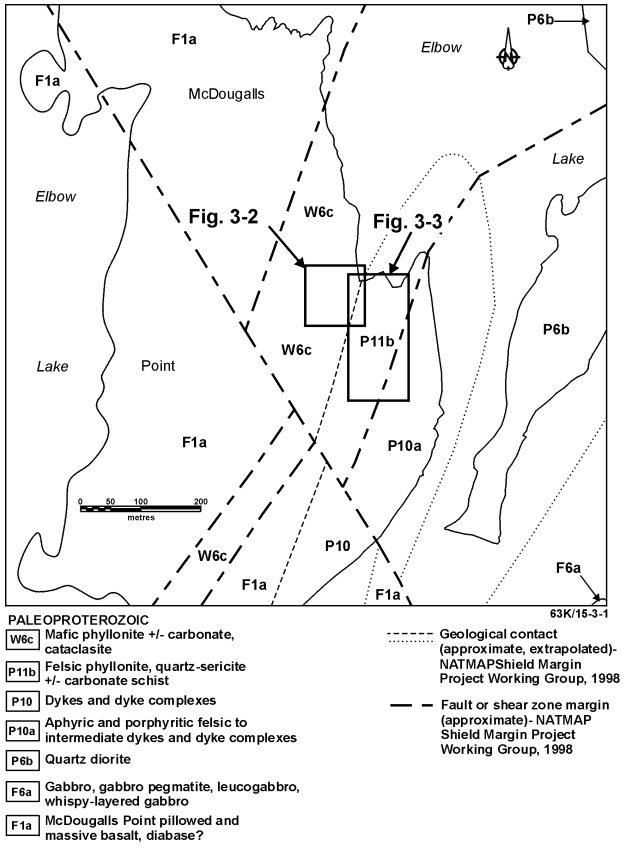


Figure 3-1: Geological setting of Hanson occurrence.

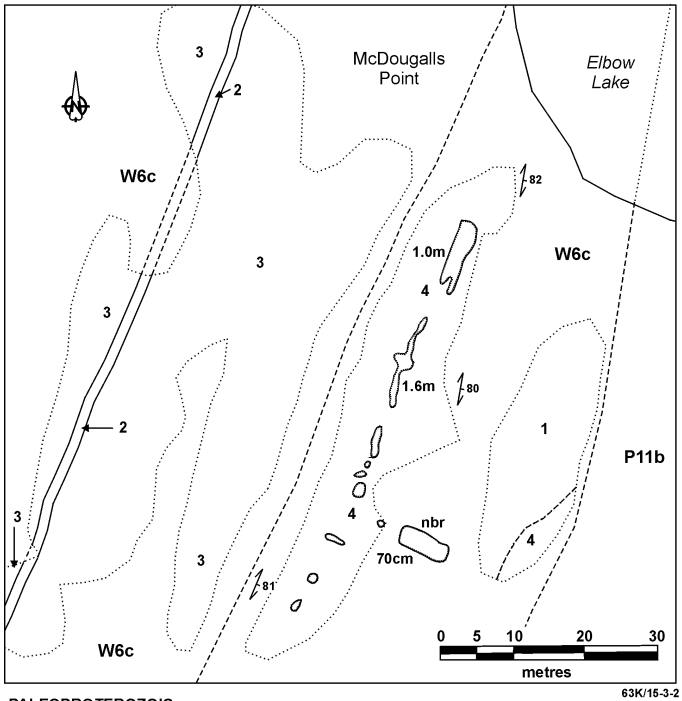
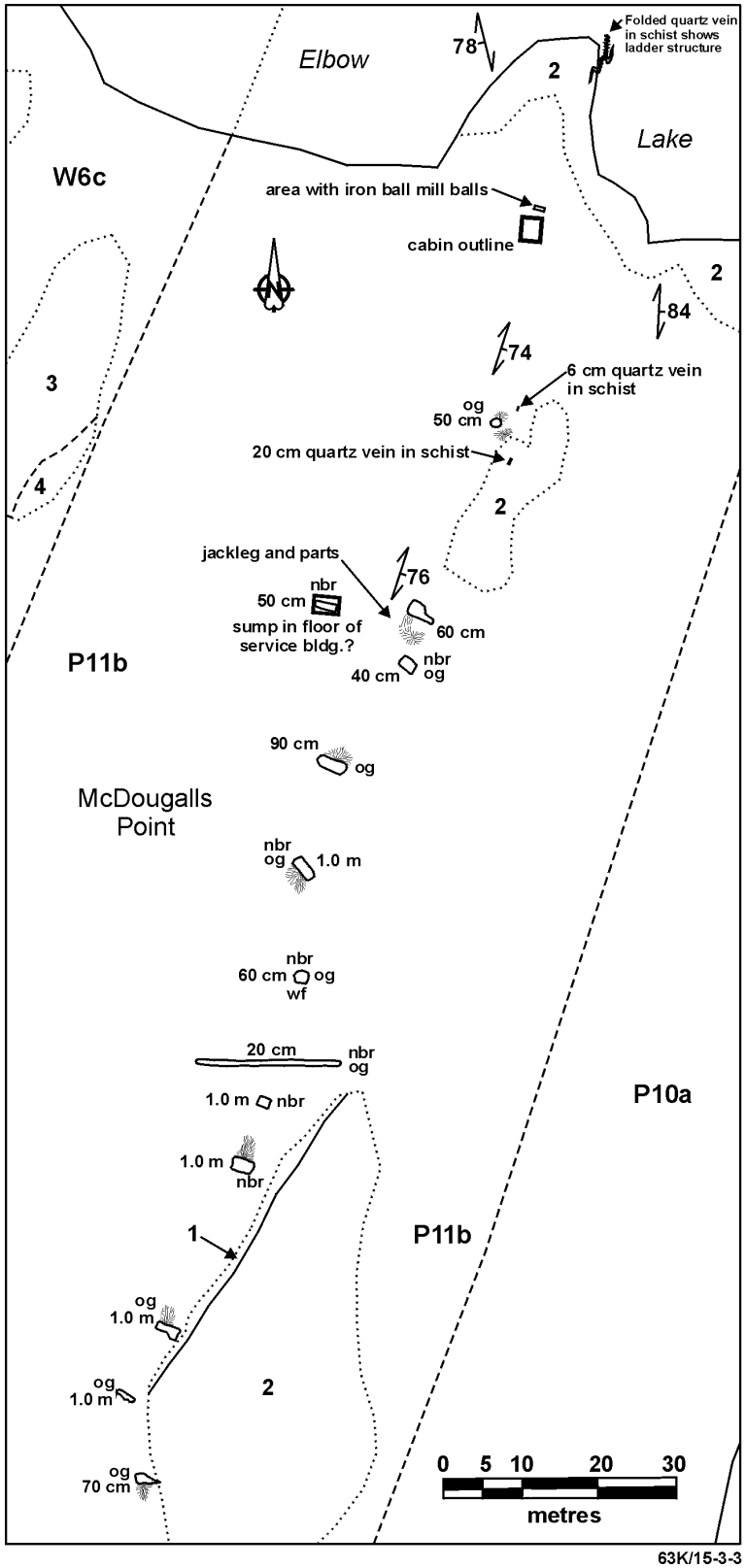


Figure 3-2: Geology and trench locations at Hanson occurrence.



PALEOPROTEROZOIC

- **W6c** — Mafic phyllonite +/- carbonate, cataclasite
  - **4** — Sericite and chlorite schist
  - **3** — Mafic heterolithic breccia
- **P11b** — Felsic phyllonite, quartz-sericite +/- carbonate schist
  - **2** — Sericite schist with minor quartz grains; calcareous
  - **1** — Gabbro
- **P10a** — Aphyric and porphyritic felsic to intermediate dykes and dyke complexes

Geological contact (observed, approximate, extrapolated)- NATMAP Shield Margin Project Working Group, 1998

81 — Schistosity (inclined)

Outcrop

40 cm — Trench with spoil pile and maximum depth
nbr- no bedrock exposed
wf - water-filled
og - overgrown

Figure 3-3: Geology and trench locations at Hanson occurrence.

LOCATION: 4

NAME: Pato
UTM: 383320E, 6076525N
AREA: approximately 1000 m SSE of Claw Bay, Elbow Lake
ACCESS: via bush aircraft, or by boat through the Cranberry Lakes from Cranberry Portage, then traverse
AIRPHOTO: MB90025-34

EXPLORATION SUMMARY

The claim was staked in 1933 by Mr Albert McBrearthy. Some trenching was done on one of the areas containing quartz veins (Stockwell, 1935). No work has been reported for this occurrence since that time.

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 4-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). This occurrence is located in schistose, fine-grained mafic volcanic rocks that are part of the Claw Bay basalt (unit F1b). The schistosity trends 270^{o} and dips 76^{o}S. The contact with the Elbow Lake tonalite (unit P6a) lies approximately 30 metres to the south of the occurrence. Narrow tonalite dykes are common in the volcanic rocks marginal to the intrusion.

MINERALIZATION

A single overgrown trench along the side of a hill was located during this investigation (Fig. 4-2). The trench trends 265^{o} and is 3.5 m long, 1 to 1.5 m wide and averages 20 cm deep. Along its north side, a milky quartz vein 15 cm thick and parallel to the foliation at 268^{o}/76^{o} is exposed. The vein is crenulated. Minor disseminated pyrite occurs in the quartz. A few metres to the north of the trench, along the north side of the hill, a milky quartz vein with epidote and chloritic wallrock inclusions and <1% disseminated pyrite trends approximately 270^{o}. This vein is discontinuous and ranges in thickness from 40 to 110 cm. The tonalite to the south contains common irregular quartz masses and segregations to 4 cm with no obvious structural control. Sparse chalcopyrite and galena have been noted at this occurrence, and it was reported that free gold is also present (Stockwell, 1935).

GEOCHEMICAL DATA

None.

CLASSIFICATION

Vein type deposit; multiple veins or lenses. Associated with a shear zone in mafic volcanic rocks proximal to a tonalite intrusion.

REFERENCES

NATMAP Shield Margin Project Working Group

1998: Geology, NATMAP Shield Margin Project Area (Flin Flon Belt), Manitoba-Saskatchewan; Geological Survey of Canada 1968A; Manitoba Energy and Mines Map A-98-2, Sheets 1 to 7; Saskatchewan Energy and Mines Map 258A-2, scale 1:100 000.

Stockwell, C.H.

1935: Gold Deposits of the Elbow-Morton Area, Northern Manitoba; Geological Survey of Canada, Memoir 186, 74pp.

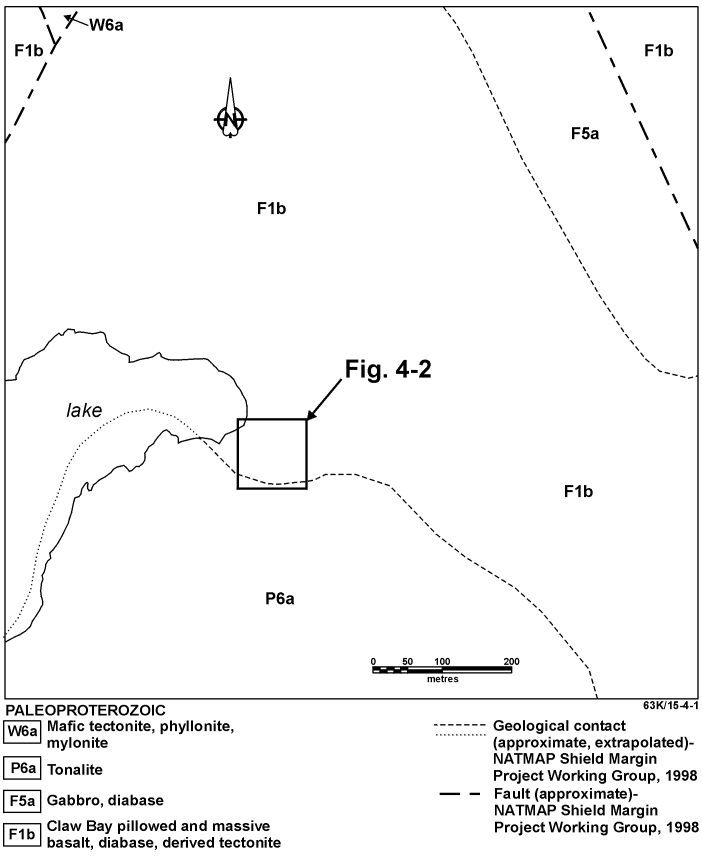


Figure 4-1: Geological setting of Pato occurrence.

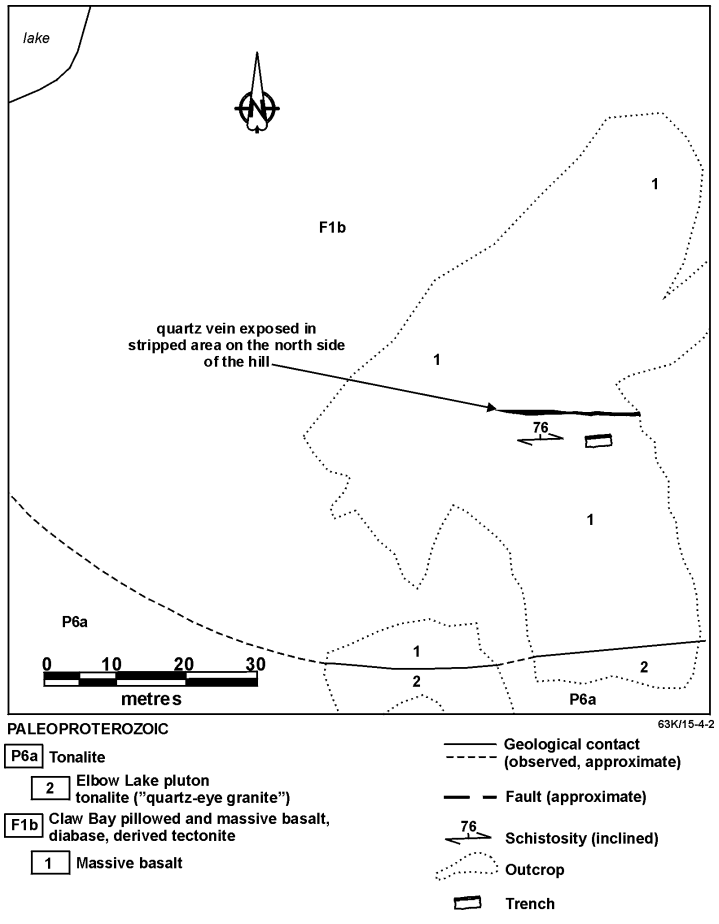


Figure 4-2: Geology and trench location at Pato occurrence.

LOCATION: 5

NAME: Big Dome No. 6
UTM: 383850E, 6077625N
AREA: east side of Elbow Lake, north of creek between Claw Bay and Centre Lake
ACCESS: via bush aircraft, or by boat through the Cranberry Lakes from Cranberry Portage, then traverse
AIRPHOTO: MB90025-34

EXPLORATION SUMMARY

The claim was staked in 1933 by Mr Harvey LeBlanc (Stockwell, 1935). In 1969 a ground HLEM (Ronka) and magnetometer survey was performed over the area for Guggenheim Exploration Company, Inc. (A.F. 92261). No further work is recorded for this property.

The main occurrence has been explored by a number of trenches and shallow pits. Approximately 100 m SE of the main group of excavations, several additional (more recent?) trenches have been excavated.

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 5-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). The area is underlain by pillowed and massive aphyric flows of the Claw Bay-Moen Bay basalt (unit F1b). It is bounded to the NE and SW by fine- to medium-grained equigranular diabase and gabbro (unit F5a).

The occurrence is hosted by one or more massive, weakly foliated, fine- to medium-grained felsic dykes (Fig. 5-2 and -3) emplaced into fine-grained mafic rocks of probable volcanic origin. Quartz phenocrysts can make up more than 20% of the intrusion. Wallrock inclusions are common, especially at the dyke margins. Banding in the mafic rock is irregular and shows open crenulations and folds. Stretched pillows and (flow?) breccia textures are present. An irregular 0.5 m thick granitic dyke cuts the mafic rocks in the northern part of the occurrence area.

MINERALIZATION

The trenches expose a series of irregular milky quartz veins, stringer networks and masses within the felsic intrusions and at the contacts with the enclosing mafic rocks. Only the larger quartz bodies are shown on the accompanying maps. The quartz contains up to 5% disseminated pyrite and trace amounts of chalcopyrite.

GEOCHEMICAL DATA

None.

CLASSIFICATION

Vein type deposit; multiple veins and lenses. Associated with one or more felsic dykes emplaced into tectonically banded mafic volcanic rocks.

REFERENCES

A.F. 92261; Cancelled Assessment File, Manitoba Industry, Trade and Mines, Minerals Division.

NATMAP Shield Margin Project Working Group

1998: Geology, NATMAP Shield Margin Project Area (Flin Flon Belt), Manitoba-Saskatchewan; Geological Survey of Canada 1968A; Manitoba Energy and Mines Map A-98-2, Sheets 1 to 7; Saskatchewan Energy and Mines Map 258A-2, scale 1:100 000.

Stockwell, C.H.

1935: Gold Deposits of the Elbow-Morton Area, Northern Manitoba; Geological Survey of Canada, Memoir 186, 74pp.

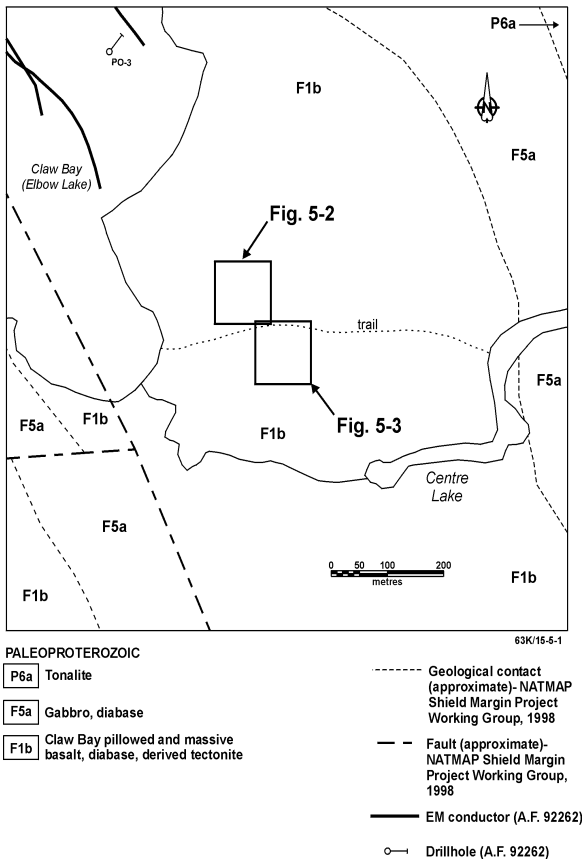


Figure 5-1: Geological setting of Big Dome occurrence.

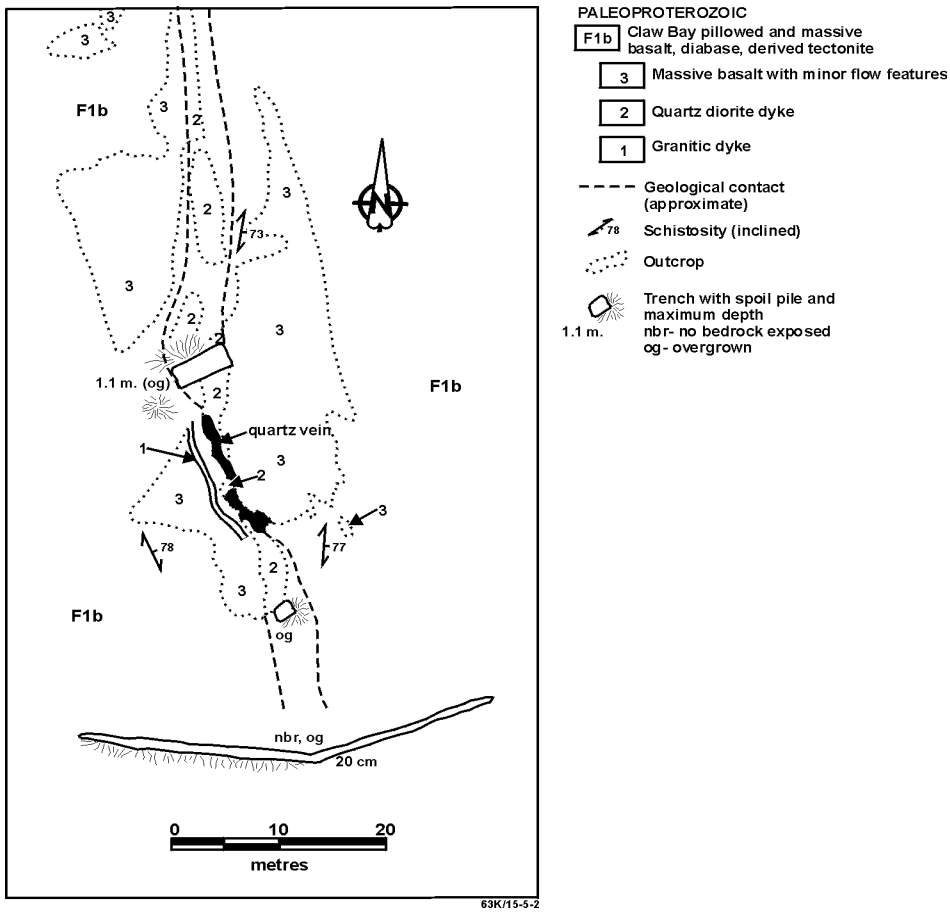


Figure 5-2: Geology and trench locations at Big Dome occurrence.

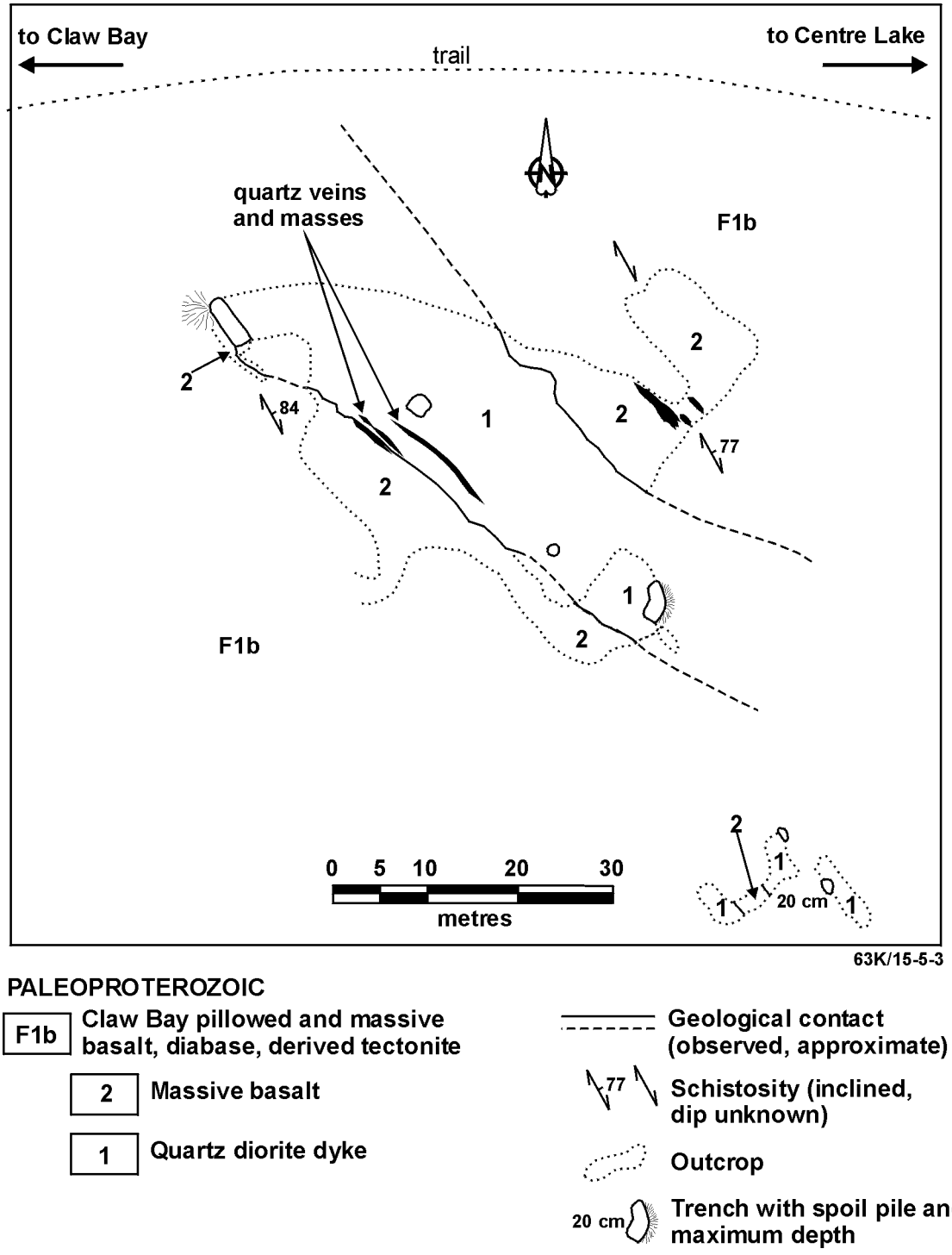


Figure 5-3: Geology and trench locations at Big Dome occurrence.

LOCATION: 6

NAME: Hanna (Wright, 1930)
Gold Pan (Stockwell, 1935)
Ding How (McGlynn, 1959)
UTM: 380450E, 6077845N
AREA: along west side of Chinaman Island, Elbow Lake
ACCESS: via bush aircraft, or by boat through the Cranberry Lakes from Cranberry Portage
AIRPHOTO: MB90025-120

EXPLORATION SUMMARY

This claim was first staked in 1921 by Mr Thomas Hanna and re-staked by him in 1926 (Stockwell, 1935). By the end of June 1930 a shaft approximately 6 m (20 feet) deep had been put down on the No. 1 vein (Wright, 1930). At about the same time a number of trenches had been excavated to the north northeast of the shaft along the strike extension of the No. 2 vein. Stockwell (1935) indicates that the shaft was eventually put down to a depth of approximately 14 m (45 feet). Narrow quartz veins were also trenched along the northwest side of the island. Between 1936 and 1938, 104 m of diamond drilling was completed in the area (Mineral Inventory File 773). About 1944 a building with a small mill was erected on the south shore of the island. In 1976 Espina Copper Developments Ltd. completed 11 diamond drill holes around the island. Hole 5 returned values of 3.43 and 5.49 g/tonne over 1.54 m (The Northern Miner, April 8, 1976).

The geological setting is shown in Fig. 6-1, and the workings at this occurrence are shown in Fig 6-2 and –3. The trenches in the northwest part of the island (Fig. 6-3) are almost completely overgrown.

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 6-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). Chinamans Island is located along the eastern margin of the Elbow Lake shear zone (unit W6c) (Galley *et al.*, 1987, 1989; Syme, 1990, 1991, 1992). The NE part of the island contains an E-W striking sequence of massive to pillowed basalt with volcaniclastic interlayers (grouped under unit F1b) (Galley, field notes, 1987; Syme, 1991; Syme and Whalen, 1992). A 1 m thick layer of jasper-magnetite iron formation occurs near the centre of the island. This sequence is crosscut by north striking feldspar porphyry dykes to 2 m thick.

The remainder of the island consists of a NNE-trending mafic mylonite with transposed bounding lithologies. Movement indicators suggest dextral displacement along this shear zone, with a considerable dip-slip component (Galley, field notes, 1987; Syme, 1991). All of the auriferous quartz veins occur within the mylonite.

MINERALIZATION

The shaft was sunk on a set of quartz-ankerite veins outlined over an area 2-3 m wide and 10 m long and extending intermittently approximately 130 m to the north side of the island. The veins average 30 cm thick but widen to >1 m where they intersect iron formation (Galley, field notes, 1987). The quartz veins consist of coarse-grained clear to white varieties and finer-grained grey quartz, and contain patches of pink feldspar, ankerite, dark green chlorite and emerald green phyllosilicate. Fractures in the quartz carry minor pyrite, chalcopyrite, sphalerite, galena and native gold. The quartz and quartz-ankerite veins have been folded and boudinaged. Near the shaft, deformed tourmaline-ankerite veinlets are present. Visible gold was found in quartz during the 1992 examination of the property. Minor (<1%) pyrite and chalcopyrite are ubiquitous constituents in wallrock fractures.

GEOCHEMICAL DATA

Stockwell (1935) reports that the owners obtained the following assays:

86.56 to 268.75 g Au/t (2.77 to 8.6 oz. Au/ton) across approximately 40 to 60 cm (16 to 24 inches) in the shaft

50.0 g Au/t (1.60 oz. Au/ton) across approximately 40 cm (24 inches) in the Number 2 vein northeast of the shaft

Galley (field notes, 1987) obtained the following results:

23 ppm Au -grab sample of quartz vein from dump

92 ppb Au, 7 ppm W -chlorite-rich wallrock

<1 ppb Au, 11 ppm W -green phyllosilicate-rich rock from dump

CLASSIFICATION

Vein type deposit; multiple veins and lenses. Associated with the Elbow Lake shear zone and proximal to jasper-magnetite iron formation.

REFERENCES

A.F. 92654; Cancelled Assessment File, Manitoba Industry, Trade and Mines, Minerals Division.

Galley, A.G., Ames, D.E. and Franklin, J.M.

1987: Geological setting of gold mineralization in the Elbow Lake region, Manitoba; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1987, pp.175-177.

1989: Results of studies on the gold metallogeny of the Flin Flon belt; in Investigations by the Geological Survey of Canada in Manitoba and Saskatchewan during the 1984-1989 Mineral Development Agreements, Geological Survey of Canada, Open File 2133, pp.25-32.

McGlynn, J.C.

1959: Elbow-Heming Lakes Area, Manitoba; Geological Survey of Canada, Memoir 305, 72 pp.

Mineral Inventory File No. 773

Manitoba Energy and Mines, Minerals Division

NATMAP Shield Margin Project Working Group

1998: Geology, NATMAP Shield Margin Project Area (Flin Flon Belt), Manitoba-Saskatchewan; Geological Survey of Canada 1968A; Manitoba Energy and Mines Map A-98-2, Sheets 1 to 7; Saskatchewan Energy and Mines Map 258A-2, scale 1:100 000.

Stockwell, C.H.

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Syme, E.C.

1990: Elbow Lake project (part of NTS 63K/15W); in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1990, pp.49-57.

1991: Elbow Lake project - Part A: supracrustal rocks and structural setting; in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1991, pp.14-27.

1992: Elbow Lake Project - Part A: Supracrustal rocks; in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1992, pp.32-46.

Syme, E.C. and Whalen, J.B.

1992: Geology, Elbow Lake, Manitoba; Preliminary 1:20 000 map, Shield-Margin Project, File ELBOW92.PS.

Wright, J.F.

1930: Geology and mineral deposits of part of northwest Manitoba; in Geological Survey of Canada, Summary Report, 1930, Part C, pp.1-124.

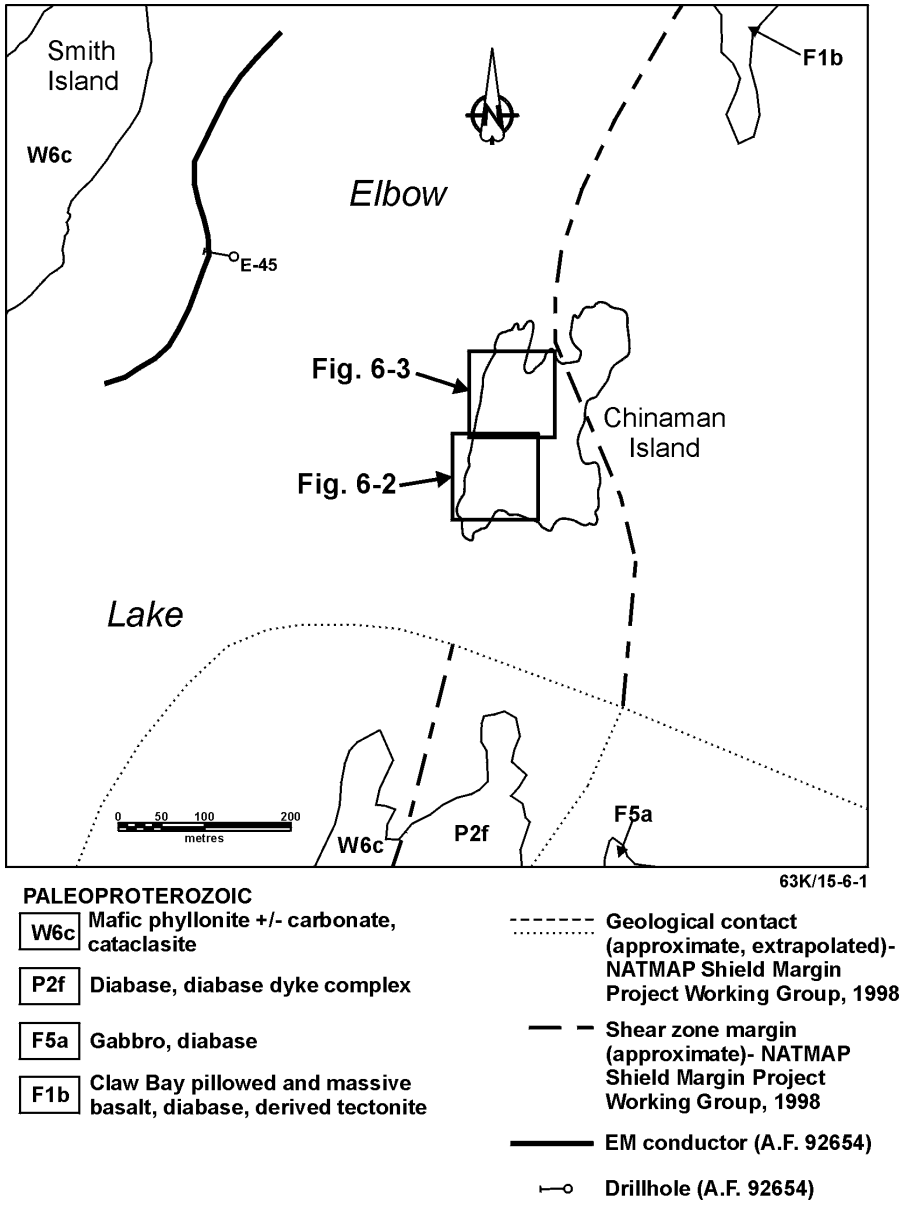

Figure 6-1: Geological setting of Hanna (Gold Pan; Ding How) occurrence.

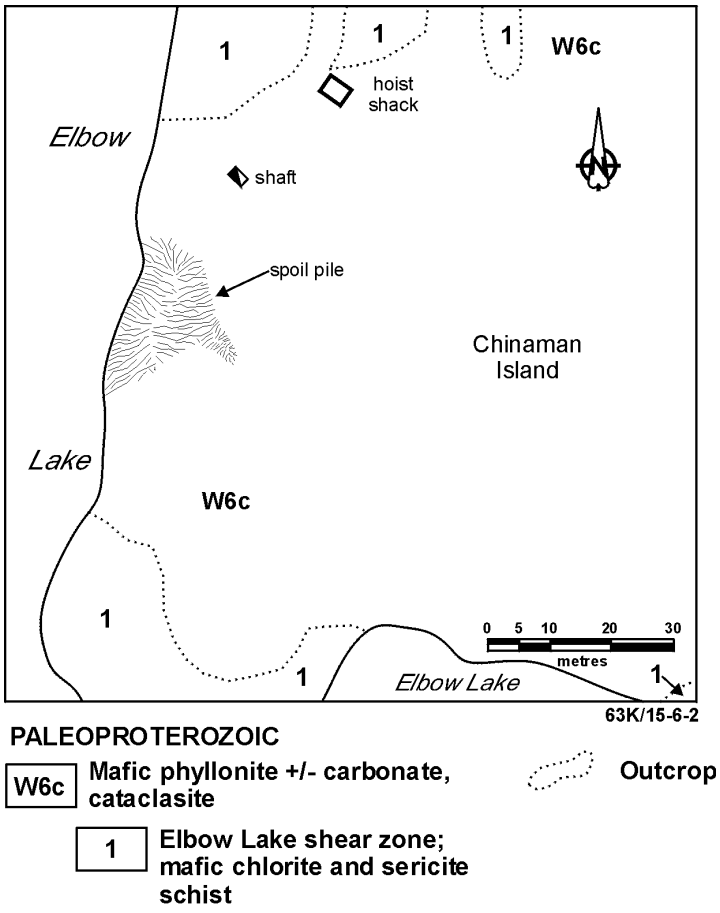

Figure 6-2: Geology and workings at Hanna (Gold Pan; Ding How) occurrence.

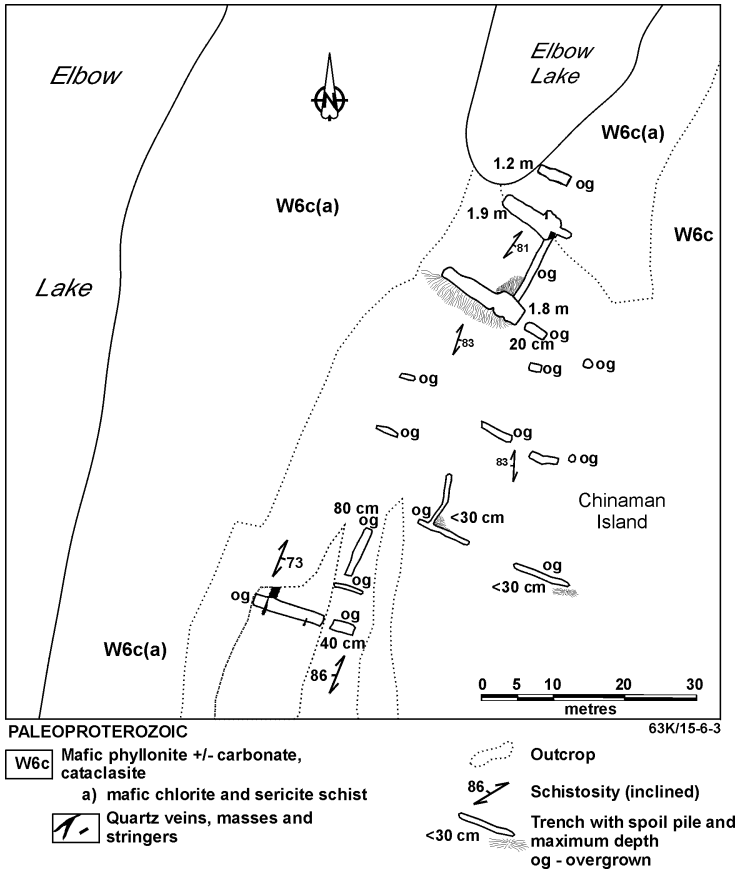

Figure 6-3: Geology and trench locations at Hanna (Gold Pan; Ding How) occurrence.

LOCATION: 7

NAME: Smith Island No. 1
UTM: 379785E, 6078230N
AREA: Smith Island, Elbow Lake
ACCESS: via bush aircraft, or by boat through the Cranberry Lakes from Cranberry Portage
AIRPHOTO: MB90025-120

EXPLORATION SUMMARY

This occurrence was staked in 1933 by Mr James A. Smith (Stockwell, 1935). Several pits were excavated, but no work has been recorded since that time.

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 7-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). The area is underlain by schists (unit W6c) of the Elbow Lake shear zone (Galley *et al*., 1987, 1989; Syme, 1990, 1991, 1992). The structure is approximately 1500 m thick in this area. Relatively unsheared basalt (unit F1a) occurs as blocks within the shear zone.

The rocks on Smith Island consist of chlorite and carbonate schists of the Elbow Lake shear zone. The shear zone is crosscut by NNE-trending quartz and/or feldspar-phyric dykes (Fig. 7-2). Several dioritic dykes are also present. The rocks show a strong pervasive penetrative foliation that trends 025^{o} and dips 85^{o}SE. Dyke margins are schistose and some of the thinner feldspar porphyry dykes have been boudinaged. Several areas of carbonate alteration host deformed quartz-carbonate veins.

MINERALIZATION

Stockwell (1935) indicates that quartz veins occur in a quartz porphyry dyke that has been exposed at intervals for approximately 140 m (450 feet) from the north shore of the island. The porphyry is sparsely mineralized with disseminated arsenopyrite and pyrite. Quartz stringers within the porphyry carry minor sphalerite. Galley (field notes, 1987) indicates that the mineralization is associated with strongly hematitic alteration halos around a series of quartz-feldspar veins. The host schist to the porphyry contains deformed quartz veins and disseminated pyrite.

GEOCHEMICAL DATA

None.

CLASSIFICATION

Vein type deposit; multiple veins or lenses. Associated with quartz porphyry dyke hosted by schists of the Elbow Lake shear zone.

REFERENCES

A.F. 92654; Cancelled Assessment File, Manitoba Industry, Trade and Mines, Minerals Division.

Galley, A.G., Ames, D.E. and Franklin, J.M.

1987: Geological setting of gold mineralization in the Elbow Lake region, Manitoba; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1987, pp.175-177.

1989: Results of studies on the gold metallogeny of the Flin Flon belt; in Investigations by the Geological Survey of Canada in Manitoba and Saskatchewan during the 1984-1989 Mineral Development Agreements, Geological Survey of Canada, Open File 2133, pp.25-32.

NATMAP Shield Margin Project Working Group

1998: Geology, NATMAP Shield Margin Project Area (Flin Flon Belt), Manitoba-Saskatchewan; Geological Survey of Canada 1968A; Manitoba Energy and Mines Map A-98-2, Sheets 1 to 7; Saskatchewan Energy and Mines Map 258A-2, scale 1:100 000.

Stockwell, C.H.

1935: Gold Deposits of the Elbow-Morton Area, Northern Manitoba; Geological Survey of Canada, Memoir 186, 74pp.

Syme, E.C.

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1991: Elbow Lake project - Part A: supracrustal rocks and structural setting; in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1991, pp.14-27.

1992: Elbow Lake Project - Part A: Supracrustal rocks; in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1992, pp.32-46.

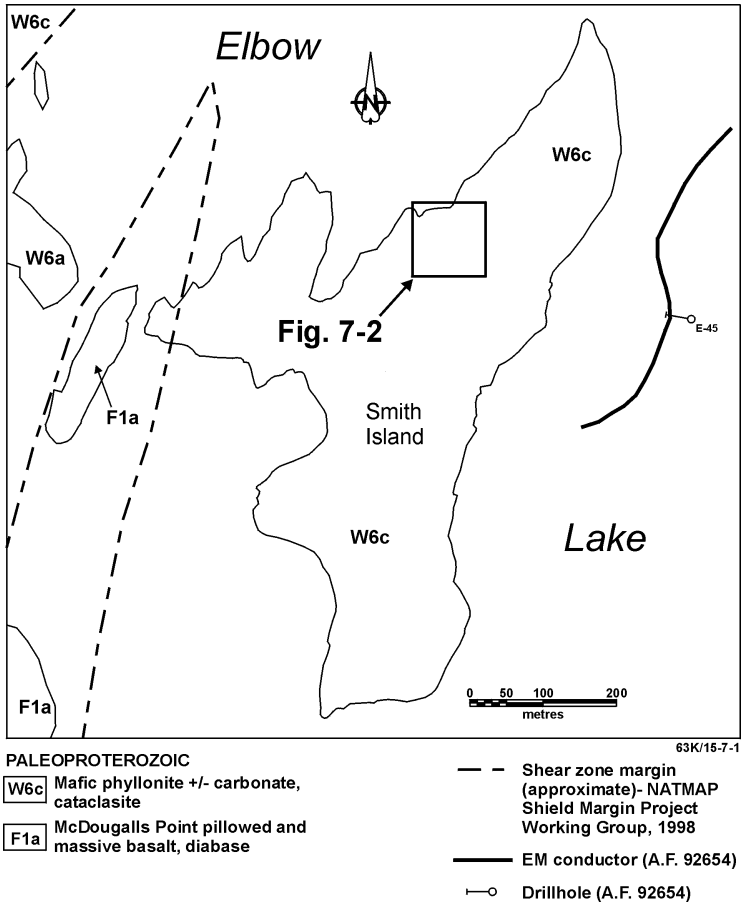

Figure 7-1: Geological setting of Smith Island No. 1 occurrence.

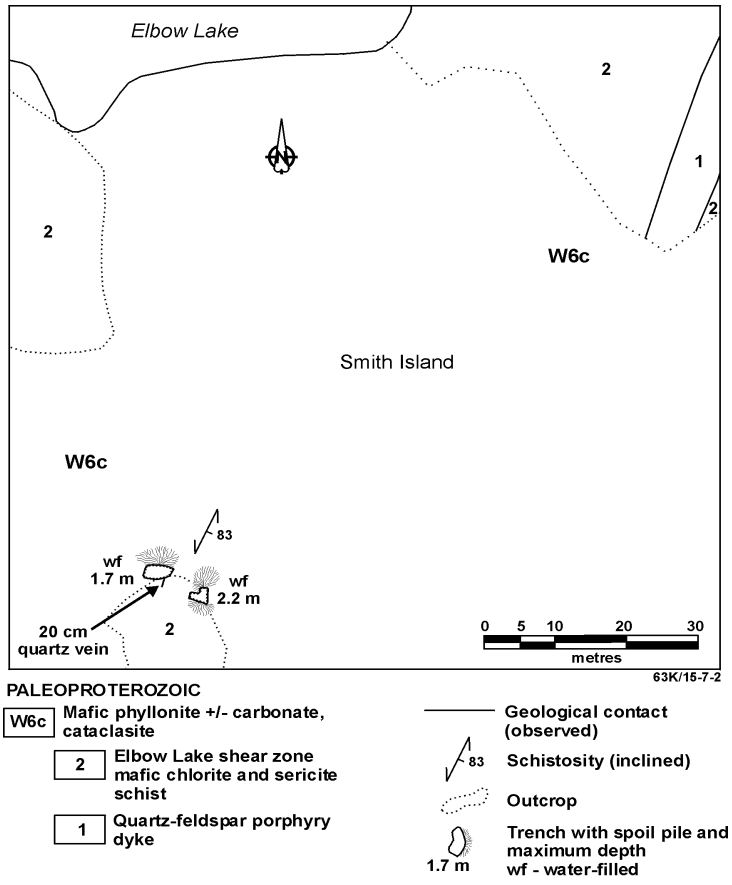

Figure 7-2: Geology and trench locations at Smith Island No. 1 occurrence.

LOCATION: 8

NAME: Smith Island No.2
UTM: 379550E, 6077385N
AREA: island immediately SSW of south end of Smith Island, Elbow Lake
ACCESS: via bush aircraft, or by boat through the Cranberry Lakes from Cranberry Portage
AIRPHOTO: MB90025-120

EXPLORATION SUMMARY

The claim was staked in 1933 by Mr James A. Smith (Stockwell, 1935). A trench was subsequently excavated on a mineralized area approximately 45 m (150 feet) from the north shore of the island. Additional trenches are located approximately 35 m NW of the main trench and along the shoreline on the small bay at the NW end of the island (Fig. 8.1). No work has been recorded since Stockwell's visit.

Several trenches were located at the north end of the island. One was dry and provided good bedrock exposure.

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 8-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). The area is underlain by schists (unit W6c) of the Elbow Lake shear zone (Galley *et al*., 1987, 1989; Syme, 1990, 1991, 1992), which is approximately 900 m thick in this area. Relatively unsheared basalt (unit F1a) occurs as blocks within the shear zone.

The rocks at the occurrence consist of chloritic and calcareous schists. The dominant foliation trends 016^{o} and is subvertical. The schists are crosscut by NNE-trending quartz and/or feldspar-phyric dykes. At the main trench, a fine-grained medium to light olive green dyke intrudes the fine-grained dark grey schist. The main dyke is approximately 110 cm thick and trends 185^{o}/83^{o}W. It is sericitic and shows occasional slickensided surfaces.

MINERALIZATION

The felsic dyke contains randomly oriented quartz veinlets 5-10 mm thick. No sulphides were noted in the quartz. Minor thin quartz veinlets occur in the mafic schist. Euhedral pyrite grains are common in close proximity to the veinlets, but don't occur within the veinlets.

GEOCHEMICAL DATA

None.

CLASSIFICATION

Vein type deposit; multiple veins or lenses. Associated with quartz porphyry dyke hosted by schist of the Elbow Lake shear zone.

REFERENCES

Galley, A.G., Ames, D.E. and Franklin, J.M.

1987: Geological setting of gold mineralization in the Elbow Lake region, Manitoba; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1987, pp.175-177.

1989: Results of studies on the gold metallogeny of the Flin Flon belt; in Investigations by the Geological Survey of Canada in Manitoba and Saskatchewan during the 1984-1989 Mineral Development Agreements, Geological Survey of Canada, Open File 2133, pp.25-32.

NATMAP Shield Margin Project Working Group

1998: Geology, NATMAP Shield Margin Project Area (Flin Flon Belt), Manitoba-Saskatchewan; Geological Survey of Canada 1968A; Manitoba Energy and Mines Map A-98-2, Sheets 1 to 7; Saskatchewan Energy and Mines Map 258A-2, scale 1:100 000.

Stockwell, C.H.

1935: Gold Deposits of the Elbow-Morton Area, Northern Manitoba; Geological Survey of Canada, Memoir 186, 74pp.

Syme, E.C.

1990: Elbow Lake project (part of NTS 63K/15W); in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1990, pp.49-57.

1991: Elbow Lake project - Part A: supracrustal rocks and structural setting; in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1991, pp.14-27.

1992: Elbow Lake Project - Part A: Supracrustal rocks; in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1992, pp.32-46.

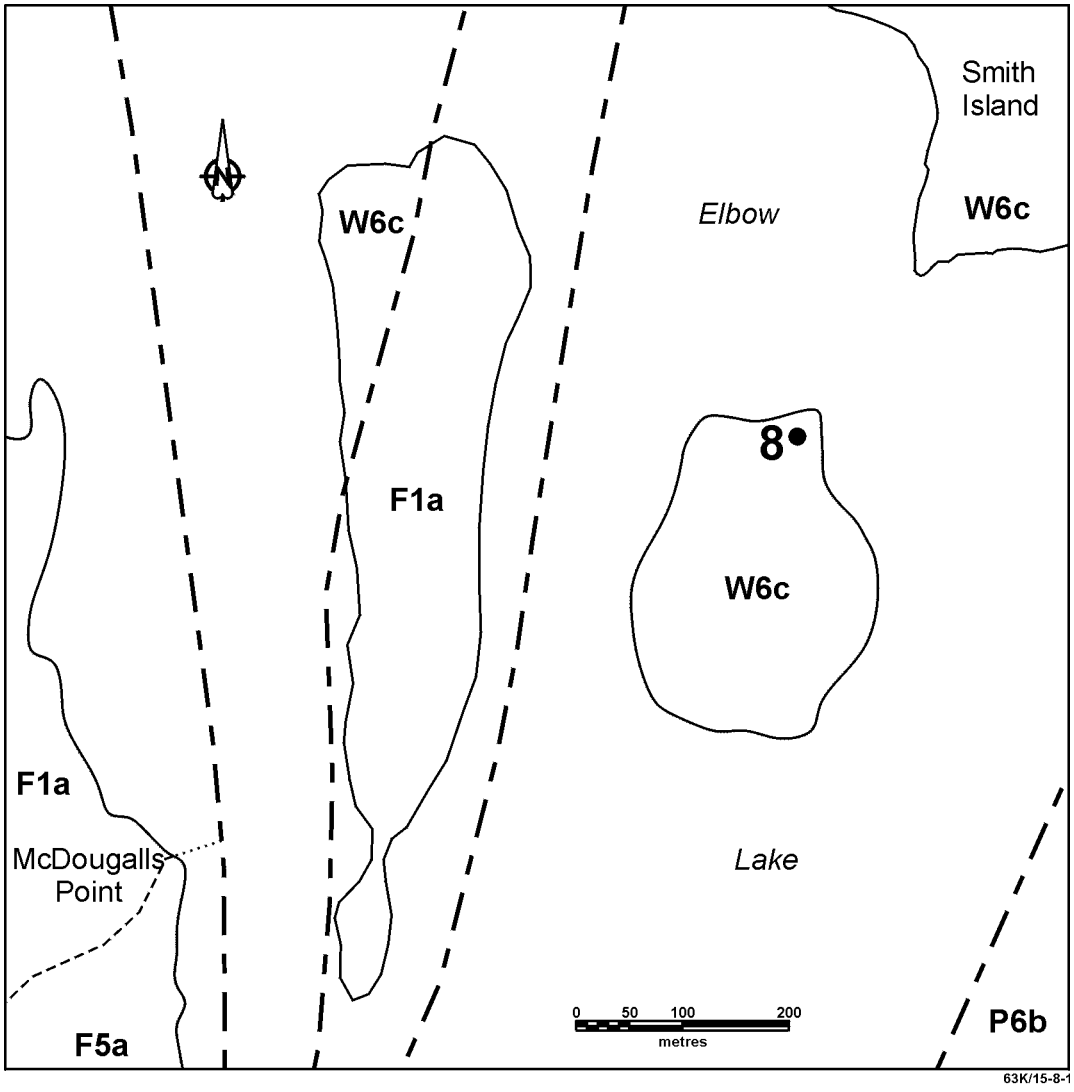

Figure 8-1: Geological setting of Smith Island No. 2 occurrence.

LOCATION: 9

NAME: Hanna
UTM: 381110E, 6079935N
AREA: island in east central Elbow Lake (informally known as Leaping Moose Island)
ACCESS: via bush aircraft, or by boat through the Cranberry Lakes from Cranberry Portage
AIRPHOTO: MB90025-54

EXPLORATION SUMMARY

This prospect was staked in 1921 by Mr Tom Hanna. By 1934 six trenches had been excavated in an area south of the small bay on the north side of the island (Stockwell, 1935). In 1976 Espina Copper Developments Ltd. optioned the property and carried out a 22 hole drill programme in the area (Mineral Inventory File 778).

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 9-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). The area is underlain by schists (unit W6c) of the Elbow Lake shear zone near its junction with the Claw Bay shear zone (Galley *et al*., 1987, 1989; Syme, 1990, 1991, 1992). In this area the shear zone is approximately 2700 m thick (Syme and Whalen, 1992).

The lithologic sequence on the island consists of heterolithic tuff breccia, lapilli tuff and tuff, and jasper-magnetite iron formation. The tuff breccia contains a large number of felsic volcanic clasts. The sequence has been intruded by gabbro dykes and sills, and quartz-feldspar porphyry dykes to 2 m thick. The sequence on the eastern part of the island is strongly foliated at 020^{o} to 350^{o}/90^{o}, with stretching ratios typically 10:1. To the west the rocks become increasingly schistose and are sheared, mylonitized and altered, as part of the Elbow Lake shear zone. Felsic dykes become increasingly segmented and the jasper-magnetite iron formation has been transposed into the shear foliation.

MINERALIZATION

The occurrence consists of two zones (east and west) of quartz-carbonate altered rock separated by a 40 m thick interval of quartz veined rock (Fig. 9-2). The carbonate-rich areas are up to 20 and 60 m thick, respectively, and contain quartz lenses up to 60 cm thick and 1.5 m long with Fe-carbonate lenses to 2 m long. The host rocks are strongly carbonatized and chloritized and the felsic dykes are altered to sericite, carbonate and quartz. The west zone can be traced along the west side of the island for approximately 200 m and the east zone for 180 m.

Gold mineralization appears to be limited to the eastern alteration zone. A folded and boudinaged Fe-carbonate-quartz vein system, trending 015^{o} and containing accessory bright green phyllosilicate, pyrite and trace quantities of magnetite and hematite, occurs in this area. The host rocks are pervasively carbonatized. Late planar tourmaline-quartz veins trending 350-000^{o} cut the earlier carbonate-quartz veins and the host rocks.

GEOCHEMICAL DATA

Stockwell (1935) indicates that the veins and schist are reported to carry up to 7.8 g Au/t (0.25 oz. Au/ton).

CLASSIFICATION

Vein type deposit; multiple quartz and/or quartz-carbonate veins. This occurrence is located within schist of the Elbow Lake shear zone, associated with jasper-magnetite iron formation and quartz-feldspar porphyry dykes.

REFERENCES

Galley, A.G., Ames, D.E. and Franklin, J.M.

1987: Geological setting of gold mineralization in the Elbow Lake region, Manitoba; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1987, pp.175-177.

1989: Results of studies on the gold metallogeny of the Flin Flon belt; in Investigations by the Geological Survey of Canada in Manitoba and Saskatchewan during the 1984-1989 Mineral Development Agreements, Geological Survey of Canada, Open File 2133, pp.25-32.

Mineral Inventory File No. 778

Manitoba Energy and Mines, Minerals Division

NATMAP Shield Margin Project Working Group

1998: Geology, NATMAP Shield Margin Project Area (Flin Flon Belt), Manitoba-Saskatchewan; Geological Survey of Canada 1968A; Manitoba Energy and Mines Map A-98-2, Sheets 1 to 7; Saskatchewan Energy and Mines Map 258A-2, scale 1:100 000.

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1992: Elbow Lake Project - Part A: Supracrustal rocks; in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1992, pp.32-46.

Syme, E.C. and Whalen, J.B.

1992: Geology, Elbow Lake, Manitoba; Preliminary 1:20 000 map, Shield-Margin Project, File ELBOW92.PS.

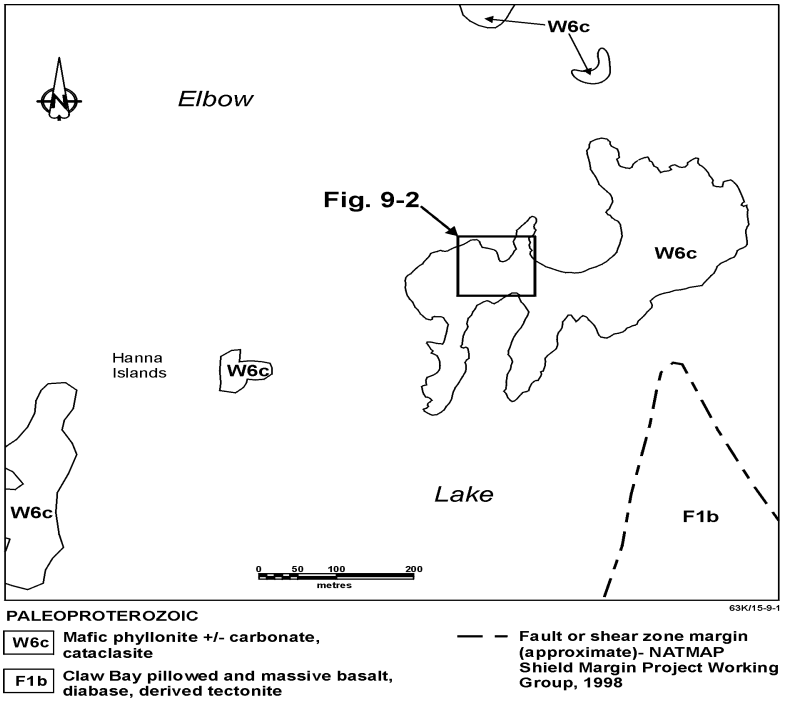

Figure 9-1: Geological setting of Hanna occurrence.

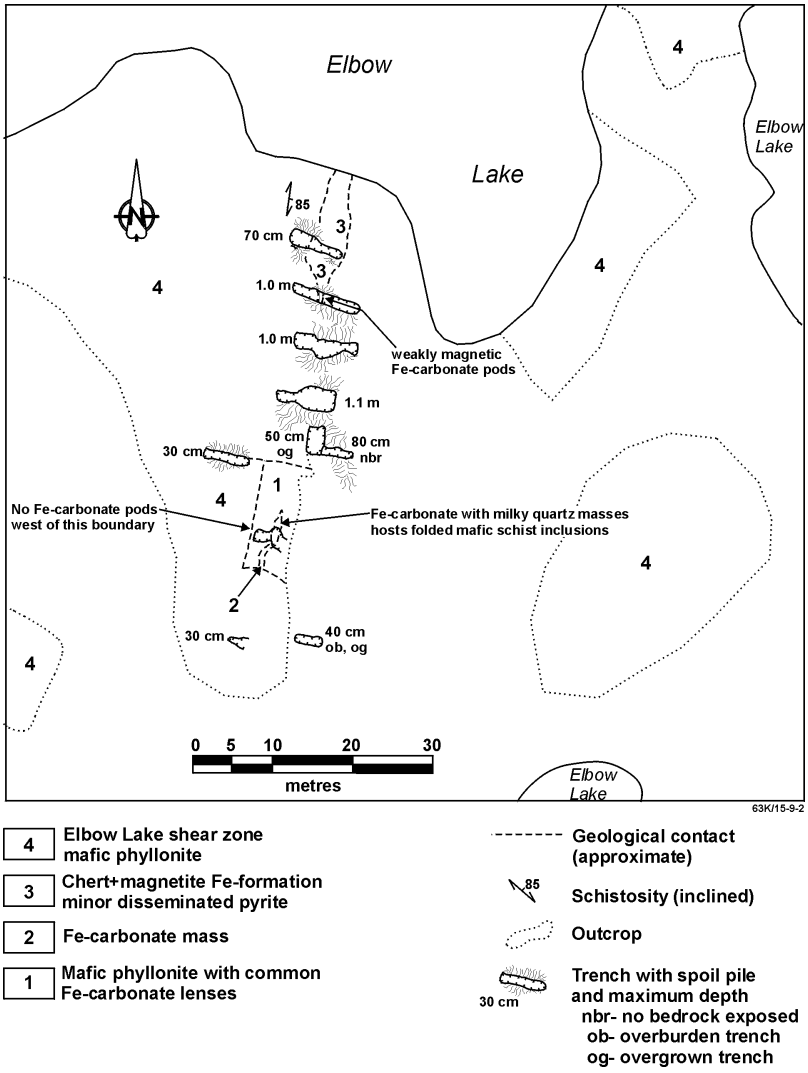

Figure 9-2: Geology and trench locations at Hanna occurrence.

LOCATION: 10

NAME: Harbour
UTM: 380530E, 6079635N
AREA: on largest of the Hanna Islands in central part of Elbow Lake, east of Big Poplar Island
ACCESS: via bush aircraft, or by boat through the Cranberry Lakes from Cranberry Portage
AIRPHOTO: MB90025-118

EXPLORATION SUMMARY

The property was staked in 1921 by Mr Thomas Hanna. By 1934 three trenches had been excavated (Stockwell, 1935). In 1976 Espina Copper Developments Ltd. optioned the property and carried out a 22 hole drill programme in the area (Mineral Inventory File 780).

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 10-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). The area is underlain by schists (unit W6c) of the Elbow Lake shear zone (Galley *et al*., 1987, 1989; Syme, 1990, 1991, 1992). The structure is approximately 1600 m thick in this area, and the occurrence is situated in its central part (Syme and Whalen, 1992).

Galley (field notes, 1987) examined the property and this description is taken in part from his observations. All of the rock units have a strong 195°/80°W schistosity, but pre-shear lithologies can be recognized. These consist of coarse fragmental amygdaloidal mafic units, jasper-magnetite iron formation, diorite and quartz-feldspar porphyry. The quartz-feldspar porphyry appears to be a dyke, and now lies as a boudin 10x50 m in size that strikes 020°, within the shear zone. The jasper-magnetite iron formation trends 180°/80°W, is up to 3 m thick, and thins and forms two separate layers to the south that can be traced for approximately 35 m (Fig. 10-2). Within the iron formation, 5 cm thick chert bands are separated by 2 cm magnetite-hematite-chlorite bands. Southwards, along the strike extension of the iron formation, chlorite-carbonate schist contains 5-10% magnetite blebs up to 1 cm; some of these have pyrite cores.

The iron formation is strongly fractured and contains abundant deformed quartz-carbonate veins that trend 195° and are parallel to the schistosity. The area of quartz-carbonate veins extends beyond the iron formation up to 10 m into the enclosing schist.

MINERALIZATION

Pyrite occurs as stringers and veins up to 2 cm thick in the iron formation. The strongly sheared margins of the quartz-feldspar porphyry adjacent to the trenches contain 2-3% disseminated pyrite.

GEOCHEMICAL DATA

Stockwell (1935) indicates that the owner of the property reported assays of 7.8 g Au/t (0.25 oz. Au/ton) over approximately 2.3 m (8 ft.).

Galley (field notes, 1987) obtained the following results:

60 ppb Au -average of 3 pyrite-rich grab samples of iron formation

3 ppb Au -average of 2 grab samples from carbonate-sericite schist wallrock

320 ppb Au -grab sample from pyrite-rich quartz-feldspar dyke margin

CLASSIFICATION

Chemical sediment type deposit; silicate-oxide facies iron formation. This mineralization, quartz-feldspar porphyry dyke(s) and minor quartz-carbonate veins are spatially associated with the Elbow Lake shear zone, but it is unclear what the relationship is between the dykes and the gold mineralization.

REFERENCES

Galley, A.G., Ames, D.E. and Franklin, J.M.

1987: Geological setting of gold mineralization in the Elbow Lake region, Manitoba; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1987, pp.175-177.

1989: Results of studies on the gold metallogeny of the Flin Flon belt; in Investigations by the Geological Survey of Canada in Manitoba and Saskatchewan during the 1984-1989 Mineral Development Agreements, Geological Survey of Canada, Open File 2133, pp.25-32.

Mineral Inventory File No. 780

Manitoba Energy and Mines, Minerals Division

NATMAP Shield Margin Project Working Group

1998: Geology, NATMAP Shield Margin Project Area (Flin Flon Belt), Manitoba-Saskatchewan; Geological Survey of Canada 1968A; Manitoba Energy and Mines Map A-98-2, Sheets 1 to 7; Saskatchewan Energy and Mines Map 258A-2, scale 1:100 000.

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1992: Elbow Lake Project - Part A: Supracrustal rocks; in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1992, pp.32-46.

Syme, E.C. and Whalen, J.B.

1992: Geology, Elbow Lake, Manitoba; Preliminary 1:20 000 map, Shield-Margin Project, File ELBOW92.PS.

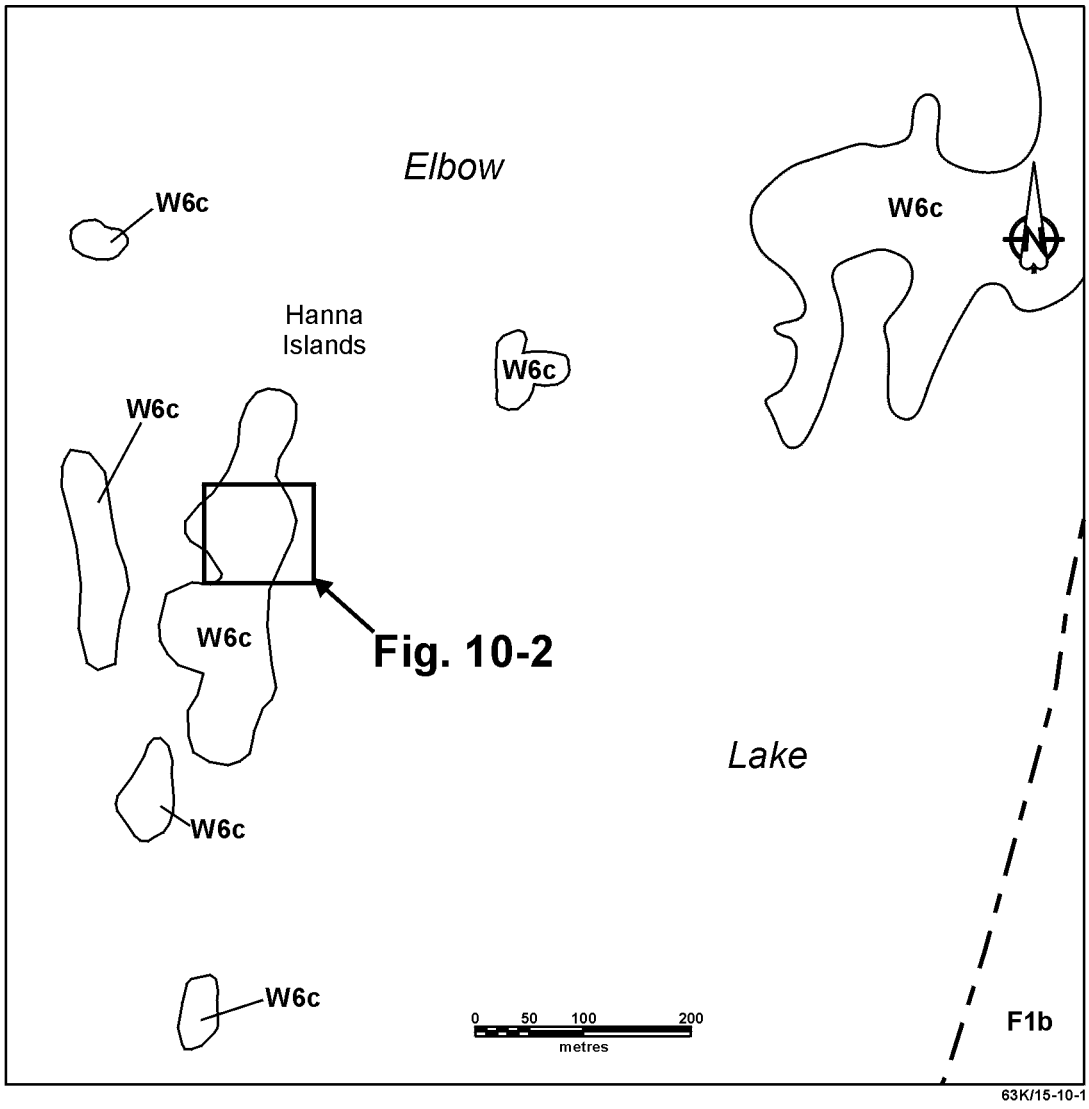

Figure 10-1: Geological setting of Harbour occurrence.

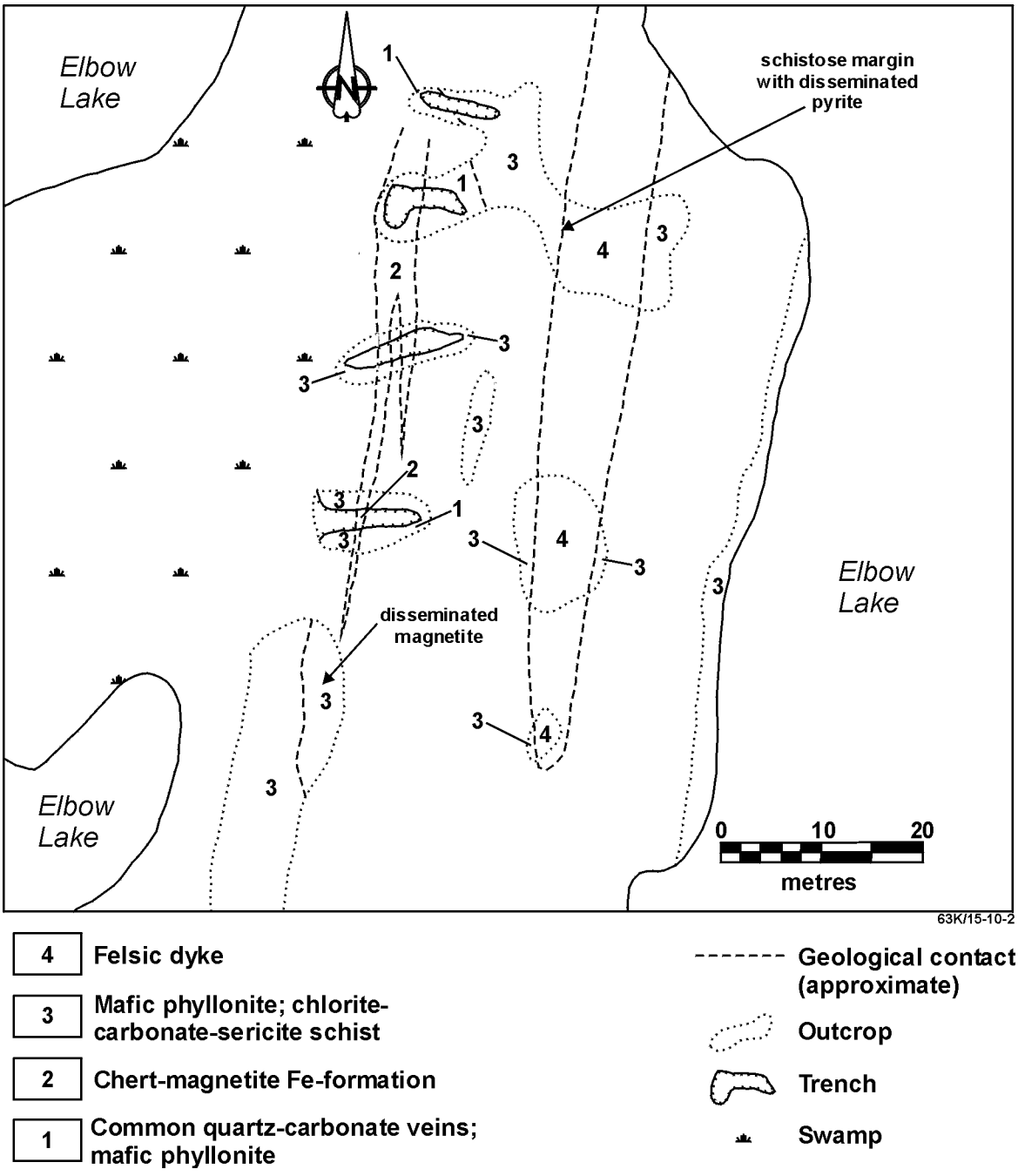

Figure 10-2: Geology and trench locations at Harbour occurrence.

LOCATION: 11

NAME: Independent
UTM: 379170E, 6080245N
AREA: northwest corner of Big Poplar Island, Elbow Lake
ACCESS: via bush aircraft, or by boat through the Cranberry Lakes from Cranberry Portage
AIRPHOTO: MB90025-118

EXPLORATION SUMMARY

Stockwell (1935) records the presence of one trench along the lake shore. Inspection of this occurrence in 1992 revealed the presence of a second trench 23 m to the ENE of the first. Both these excavations date from the 1920's or 30's. No work has been reported since that time.

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 11-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). The area is underlain by schists (unit W6c) of the Elbow Lake shear zone (Galley *et al*., 1987, 1989; Syme, 1990, 1991, 1992). Relatively unsheared gabbro and diorite (unit P2a) and basalt (unit F1a) occur as blocks within the shear zone.

A mass of smoky grey to brownish red chert and jasper 3 to 20 m thick has been traced for approximately 40 m NE from the shoreline (Fig. 11-2). It is located at the contact between massive to pillowed mafic volcanic flows to the southeast and a thick sequence of mafic volcaniclastic rocks to the northwest (Galley, field notes, 1988). The mafic volcanic and volcaniclastic rocks contain up to 3% fine-grained magnetite, and hematite forms a common fracture coating. The rocks are strongly foliated as part of the Elbow Lake shear zone, and trend 001°/83°E. The chert is fractured and is transected by numerous milky quartz veins. Brown weathering Fe-carbonate is a minor constituent of the chert.

MINERALIZATION

The chert contains up to 3% euhedral pyrite. Earthy pyrite is present in narrow (0.5 to 1.0 cm) laminae in intensely schistose areas. Up to 1% disseminated pyrite also occurs in the schistose volcanic and volcaniclastic rocks adjacent to the chert.

GEOCHEMICAL DATA

None.

CLASSIFICATION

Chemical sediment type deposit; silicate facies iron formation. Contains milky quartz veinlets and is located within the Elbow Lake shear zone.

REFERENCES

A.F. 93052; Cancelled Assessment File, Manitoba Industry, Trade and Mines, Minerals Division.

Galley, A.G., Ames, D.E. and Franklin, J.M.

1987: Geological setting of gold mineralization in the Elbow Lake region, Manitoba; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1987, pp.175-177.

1989: Results of studies on the gold metallogeny of the Flin Flon belt; in Investigations by the Geological Survey of Canada in Manitoba and Saskatchewan during the 1984-1989 Mineral Development Agreements, Geological Survey of Canada, Open File 2133, pp.25-32.

NATMAP Shield Margin Project Working Group

1998: Geology, NATMAP Shield Margin Project Area (Flin Flon Belt), Manitoba-Saskatchewan; Geological Survey of Canada 1968A; Manitoba Energy and Mines Map A-98-2, Sheets 1 to 7; Saskatchewan Energy and Mines Map 258A-2, scale 1:100 000.

Stockwell, C.H.

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Syme, E.C.

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1991: Elbow Lake project - Part A: supracrustal rocks and structural setting; in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1991, pp.14-27.

1992: Elbow Lake Project - Part A: Supracrustal rocks; in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1992, pp.32-46.

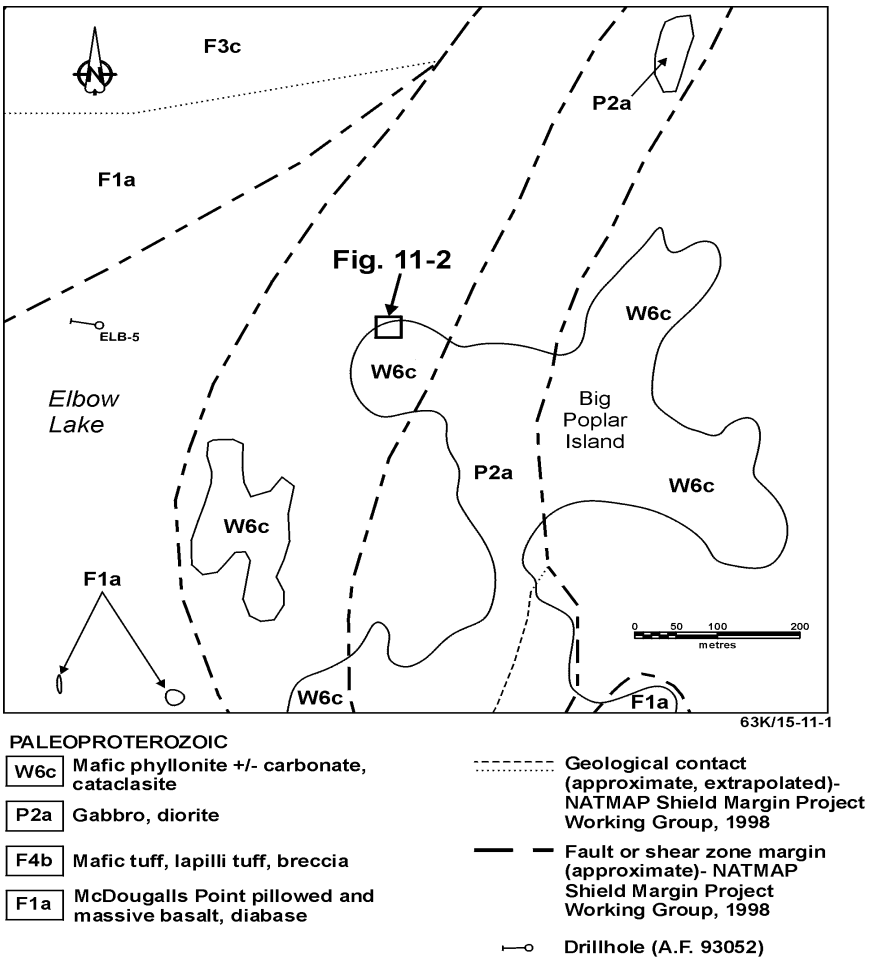

Figure 11-1: Geological setting of Independent occurrence.

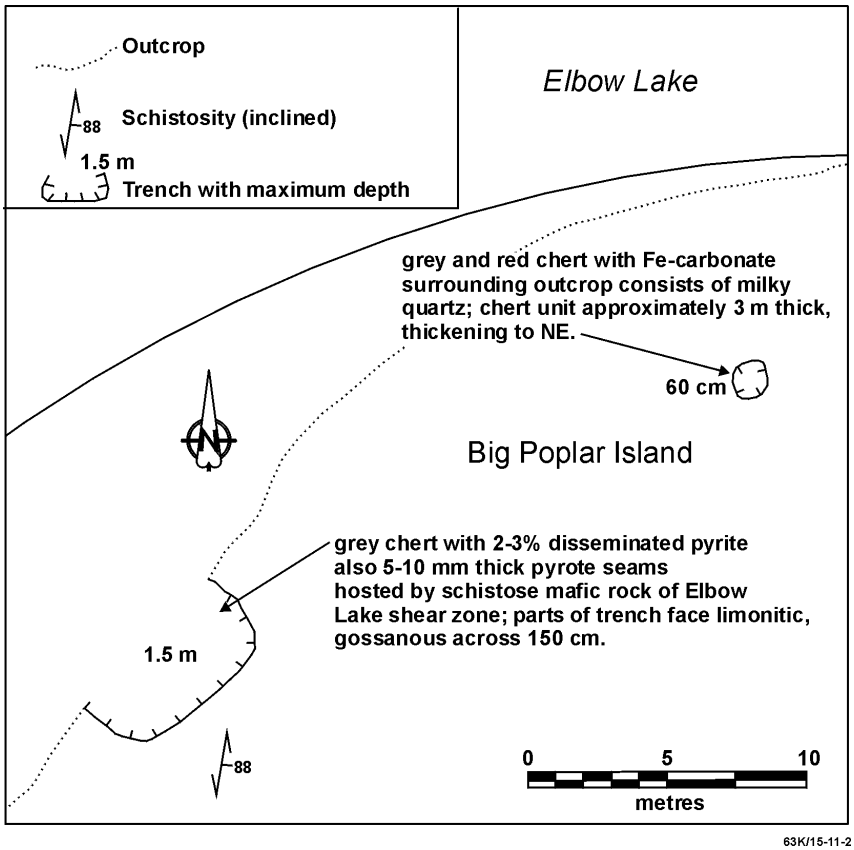

Figure 11-2: Geology and trench locations at Independent occurrence.

LOCATION: 12

NAME: June Bug
UTM: 379510E, 6080355N
AREA: north end of Big Poplar Island, Elbow Lake
ACCESS: via bush aircraft, or by boat through the Cranberry Lakes from Cranberry Portage
AIRPHOTO: MB90025-118

EXPLORATION SUMMARY

Stockwell (1935) observed a single trench at the time of his visit in 1934. No other work has been recorded since then.

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 12-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). The area is underlain by schists (unit W6c) of the Elbow Lake shear zone (Galley *et al*., 1987, 1989; Syme, 1990, 1991, 1992). A this latitude the structure has a thickness of approximately 2500 m (Syme and Whalen, 1992). Relatively unsheared gabbro and diorite (unit P2a) and basalt (unit F1a) occur as blocks within the shear zone.

A chert-jasper-magnetite, magnetite-mudstone and chlorite-carbonate schist sequence is exposed in a trench (Fig. 12-2) and intermittently for 200 m along the shore of Big Poplar Island near this occurrence (Galley, field notes, 1987). This sequence trends NE to NNE and lies between massive and pillowed mafic volcanic flows to the SE and mafic volcaniclastic rocks to the NW.

The rocks are strongly foliated at 015º/85ºE as part of the Elbow Lake shear zone, and show a steep north plunging mineral lineation (Galley, field notes, 1987). They are calcareous and contain a light green phyllosilicate.

MINERALIZATION

The single mostly overgrown trench exposes sheared mafic volcanic rock and chert. The chert is crosscut by numerous irregular milky quartz veinlets and contains minor fine-grained pyrite. Stockwell (1935) reported minor arsenopyrite in the chert.

GEOCHEMICAL DATA

None.

CLASSIFICATION

Chemical sediment type deposit; silicate facies iron formation with milky quartz veinlets within the Elbow Lake shear zone.

REFERENCES

Galley, A.G., Ames, D.E. and Franklin, J.M.

1987: Geological setting of gold mineralization in the Elbow Lake region, Manitoba; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1987, pp.175-177.

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1998: Geology, NATMAP Shield Margin Project Area (Flin Flon Belt), Manitoba-Saskatchewan; Geological Survey of Canada 1968A; Manitoba Energy and Mines Map A-98-2, Sheets 1 to 7; Saskatchewan Energy and Mines Map 258A-2, scale 1:100 000.

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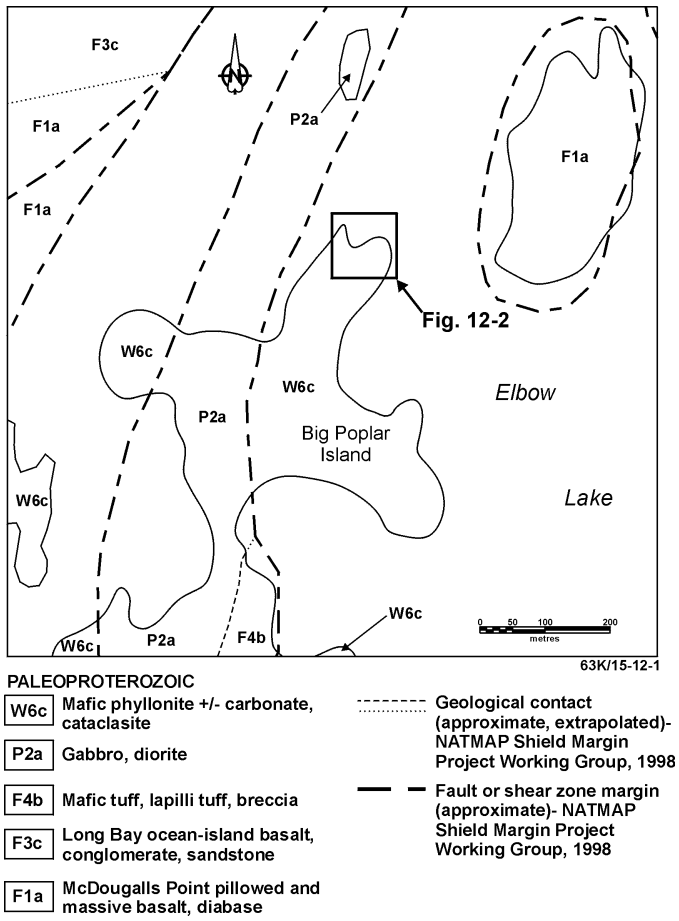

Figure 12-1: Geological setting of June Bug occurrence.

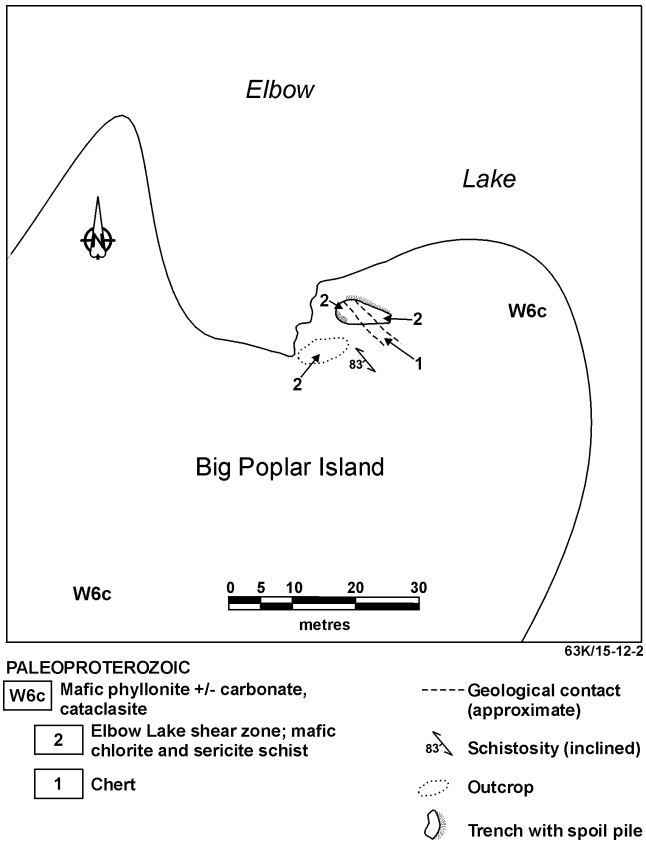

Figure 12-2: Geology and trench location at June Bug occurrence.

LOCATION: 13

NAME: Florence
UTM: 379870E, 6080605N
AREA: island NE of the north end of Big Poplar Island, Elbow Lake
ACCESS: via bush aircraft, or by boat through the Cranberry Lakes from Cranberry Portage
AIRPHOTO: MB90025-113

EXPLORATION SUMMARY

This occurrence was staked in 1922 by Mr Oliver Dickson (Stockwell, 1935). A trenching and stripping programme was completed, but no additional work has been recorded since Stockwell's examination of the property in 1934.

The area is now completely overgrown and exposures are generally thickly covered with moss. No trenches were located during a property visit in 1992.

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 13-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). The area is underlain by schists (unit W6c) of the Elbow Lake shear zone (Galley *et al*., 1987, 1989; Syme, 1990, 1991, 1992). In this area the structure has a total thickness of approximately 2200 m (Syme and Whalen, 1992). Relatively unsheared gabbro and diorite (unit P2a) and basalt (unit F1a) occur as blocks within the shear zone.

The following description is taken mainly from Stockwell (1935) and Galley (field notes, 1987). At the occurrence an unfoliated chert unit with an average thickness of 3 to 6 m trends 300^{o} for most of its length, but trends 350^{o} at its south end. At one point the chert unit thickens abruptly to approximately 15 m. The chert is intensely fractured and crosscut by an irregular network of coarse-grained milky quartz veins and stringers up to 30 cm thick. Contacts of this unit with the enclosing mafic volcanic schists are irregular. To the south, the chert is in contact with mafic tuff breccia. The mafic schist trends 355^{o}/80^{o} E.

MINERALIZATION

The chert and crosscutting coarse-grained quartz veins carry disseminated pyrite and arsenopyrite, and reportedly contain coarse native gold (Stockwell, 1935). Fractures within the chert are commonly coated with carbonate, hematite and pyrite.

GEOCHEMICAL DATA

Stockwell (1935) reported that a chip sample of chert mineralized with magnetite and pyrite assayed 12.5 g Au/t (0.40 oz. gold/ton).

CLASSIFICATION

Chemical sediment type deposit; silicate facies iron formation. Contains milky quartz veins, and is located within the Elbow Lake shear zone.

REFERENCES

Galley, A.G., Ames, D.E. and Franklin, J.M.

1987: Geological setting of gold mineralization in the Elbow Lake region, Manitoba; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1987, pp.175-177.

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NATMAP Shield Margin Project Working Group

1998: Geology, NATMAP Shield Margin Project Area (Flin Flon Belt), Manitoba-Saskatchewan; Geological Survey of Canada 1968A; Manitoba Energy and Mines Map A-98-2, Sheets 1 to 7; Saskatchewan Energy and Mines Map 258A-2, scale 1:100 000.

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Syme, E.C. and Whalen, J.B.

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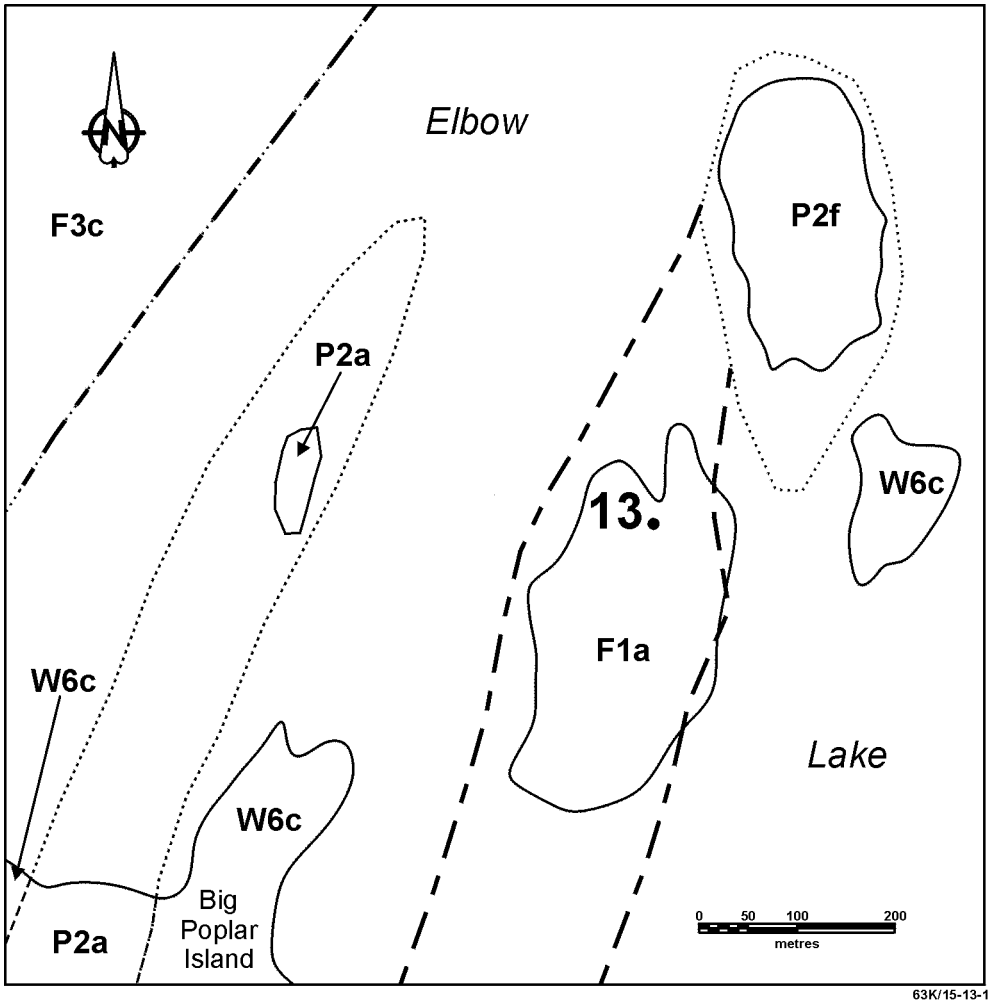

PALEOPROTEROZOIC

W6c	Mafic phyllonite +/- carbonate, cataclasite
P2a	Gabbro, diorite
P2f	Diabase, diabase dyke complex
F3c	Long Bay ocean-island basalt conglomerate, sandstone
F1a	McDougalls Point pillowed and massive basalt, diabase?

Geological contact (approximate, extrapolated) - NATMAP Shield Margin Project Working Group, 1998

Shear zone margin (approximate)- NATMAP Shield Margin Project Working Group, 1998

13. Mineral occurrence location

Figure 13-1: Geological setting of Florence occurrence.

LOCATION: 14

NAME: Gold Dust
UTM: 381120E, 6080475N
AREA: island near east side of Elbow Lake, north of Leaping Moose Island (informal name)
ACCESS: via bush aircraft, or by boat through the Cranberry Lakes from Cranberry Portage
AIRPHOTO: MB90025-55

EXPLORATION SUMMARY

The claim was staked in 1921 by Mr Thomas Hanna. Several trenches were excavated along the southeastern shore of the island (Stockwell, 1935). No additional work has been recorded since that time.

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 14-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). This occurrence is situated in the eastern part of the Elbow Lake shear zone (unit W6c) (Galley *et al*., 1987, 1989; Syme, 1990, 1991, 1992). In this area the structure is approximately 2300 m thick (Syme and Whalen, 1992). Massive diabase (unit P2f) outcrops to the west in the central part of Gold Dust Island.

The trench locations are shown in Fig. 14-2. Galley (field notes, 1987) has examined the geology of this occurrence. The mineralization is hosted by chlorite-carbonate-magnetite schist that appears to have been derived from a series of mafic volcanic flow and volcaniclastic rocks, exposed to the south and east. The dominant foliation in the north part of the occurrence trends 010°. This schistosity has been crenulated with the development of an axial planar cleavage at 035°. At the south end of the small bay, epidotized chloritic basalts are strongly foliated at 170° and show an axial planar crenulation cleavage at 025°. Several generations of quartz veins are present at this occurrence. North-south trending veins show relatively little macroscopic deformation compared to a boudinaged earlier set that trends 120°. East-west trending quartz boudins show unspecified rotation in the 025° foliation.

MINERALIZATION

A zone of schist up to 20 m thick with discontinuous boudinaged quartz veins and veinlets has been traced for approximately 150 m. Individual quartz masses are up to 1 m thick and 3 m long. The northern third of this zone contains up to 70% disseminated pyrite in both the quartz veins and schist. Finely disseminated magnetite is common within the schist, much of which is calcareous. Pitted limonitic areas are common.

GEOCHEMICAL DATA

Stockwell (1935) reported that the owner obtained the following assays:

21.9 g Au/t (0.70 oz. Au/ton) across approximately 10 m (32 ft.) in schist

3.8 to 5.9 g Au/t (0.12 to 0.19 oz. Au/ton) -grab samples of sulphides and schist

6.6 g Au/t (0.21 oz. Au/ton) -grab sample of unspecified material

CLASSIFICATION

Vein type deposit; multiple veins or lenses. Associated with the Elbow Lake shear zone.

REFERENCES

A.F. 92654; Cancelled Assessment File, Manitoba Industry, Trade and Mines, Minerals Division.

Galley, A.G., Ames, D.E. and Franklin, J.M.

1987: Geological setting of gold mineralization in the Elbow Lake region, Manitoba; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1987, pp.175-177.

1989: Results of studies on the gold metallogeny of the Flin Flon belt; in Investigations by the Geological Survey of Canada in Manitoba and Saskatchewan during the 1984-1989 Mineral Development Agreements, Geological Survey of Canada, Open File 2133, pp.25-32.

NATMAP Shield Margin Project Working Group

1998: Geology, NATMAP Shield Margin Project Area (Flin Flon Belt), Manitoba-Saskatchewan; Geological Survey of Canada 1968A; Manitoba Energy and Mines Map A-98-2, Sheets 1 to 7; Saskatchewan Energy and Mines Map 258A-2, scale 1:100 000.

Stockwell, C.H.

1935: Gold Deposits of the Elbow-Morton Area, Northern Manitoba; Geological Survey of Canada, Memoir 186, 74pp.

Syme, E.C.

1990: Elbow Lake project (part of NTS 63K/15W); in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1990, pp.49-57.

1991: Elbow Lake project - Part A: supracrustal rocks and structural setting; in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1991, pp.14-27.

1992: Elbow Lake Project - Part A: Supracrustal rocks; in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1992, pp.32-46.

Syme, E.C. and Whalen, J.B.

1992: Geology, Elbow Lake, Manitoba; Preliminary 1:20 000 map, Shield-Margin Project, File ELBOW92.PS.

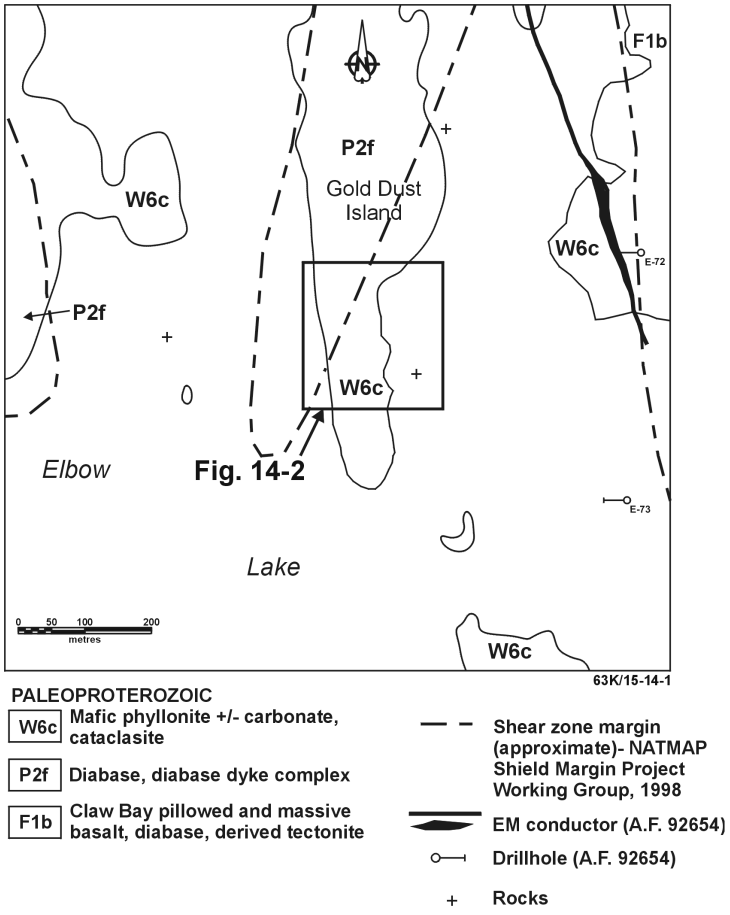

Figure 14-1: Geological setting of Gold Dust occurrence.

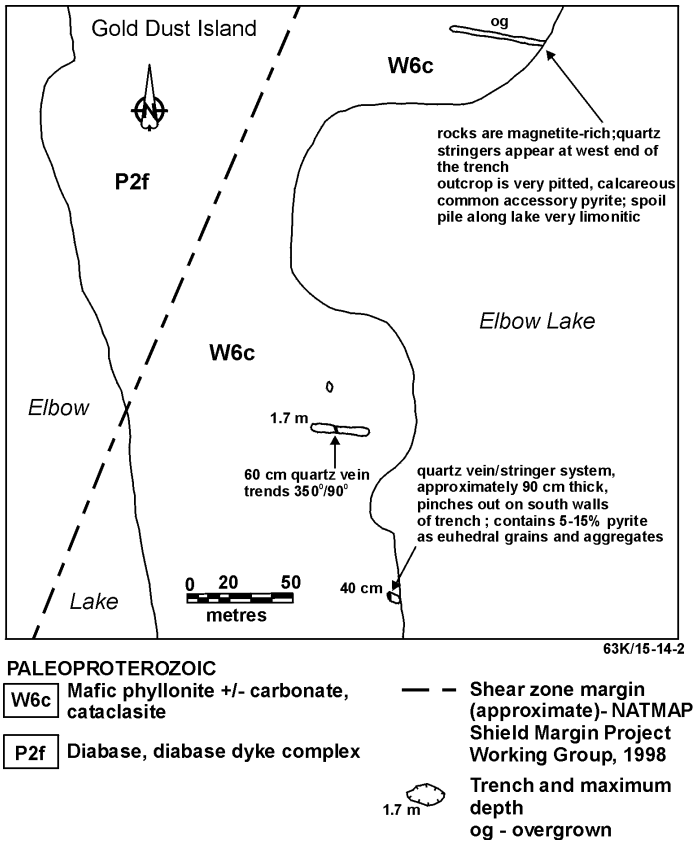

Figure 14-2: Geology and trench locations at Gold Dust occurrence.

LOCATION: 15

NAME: Century Fraction
UTM: 380930E, 6081305N
AREA: island near east side of Elbow Lake, north of Leaping Moose Island (informal name)
ACCESS: via bush aircraft, or by boat through the Cranberry Lakes from Cranberry Portage
AIRPHOTO: MB90025-54

EXPLORATION SUMMARY

The claim was staked in 1921 by Mr Thomas Hanna. The occurrence is exposed in a single trench (Stockwell, 1935).

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 15-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). The area is underlain by schists (unit W6c) of the Elbow Lake shear zone (Galley *et al*., 1987, 1989; Syme, 1990, 1991, 1992). In this area the structure is approximately 1700 m thick (Syme and Whalen, 1992).

The occurrence is located in the central part of the Elbow Lake shear zone within a sequence of felsic and mafic phyllonites. Galley (field notes, 1987) indicates that this occurrence is hosted by a 60 m thick sequence of argillite, chert breccia and chlorite-magnetite schist. This assemblage is bounded to the east by a 20 to 30 m thick aphanitic quartz-feldspar porphyritic rock, probably a dyke, and diabase (unit P2f), which outcrop in the central part of the island (Fig. 15-1). Lenses and irregular masses of blue grey chert to 1.2 m thick, containing thin ribbons of magnetite and disseminated euhedral pyrite, occur in ferruginous argillite, chlorite-magnetite schist and quartz porphyry schist.

MINERALIZATION

The chert is crosscut by numerous sugary white quartz veins. Quartz porphyry schist contains minor disseminated pyrite.

GEOCHEMICAL DATA

None.

CLASSIFICATION

Chemical sediment; silicate facies iron formation. As boudins within the Elbow Lake shear zone, spatially associated with a quartz-feldspar porphyry dyke(?).

REFERENCES

A.F. 92654; Cancelled Assessment File, Manitoba Industry, Trade and Mines, Minerals Division.

Galley, A.G., Ames, D.E. and Franklin, J.M.

1987: Geological setting of gold mineralization in the Elbow Lake region, Manitoba; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1987, pp.175-177.

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NATMAP Shield Margin Project Working Group

1998: Geology, NATMAP Shield Margin Project Area (Flin Flon Belt), Manitoba-Saskatchewan; Geological Survey of Canada 1968A; Manitoba Energy and Mines Map A-98-2, Sheets 1 to 7; Saskatchewan Energy and Mines Map 258A-2, scale 1:100 000.

Stockwell, C.H.

1935: Gold Deposits of the Elbow-Morton Area, Northern Manitoba; Geological Survey of Canada, Memoir 186, 74 pp.

Syme, E.C.

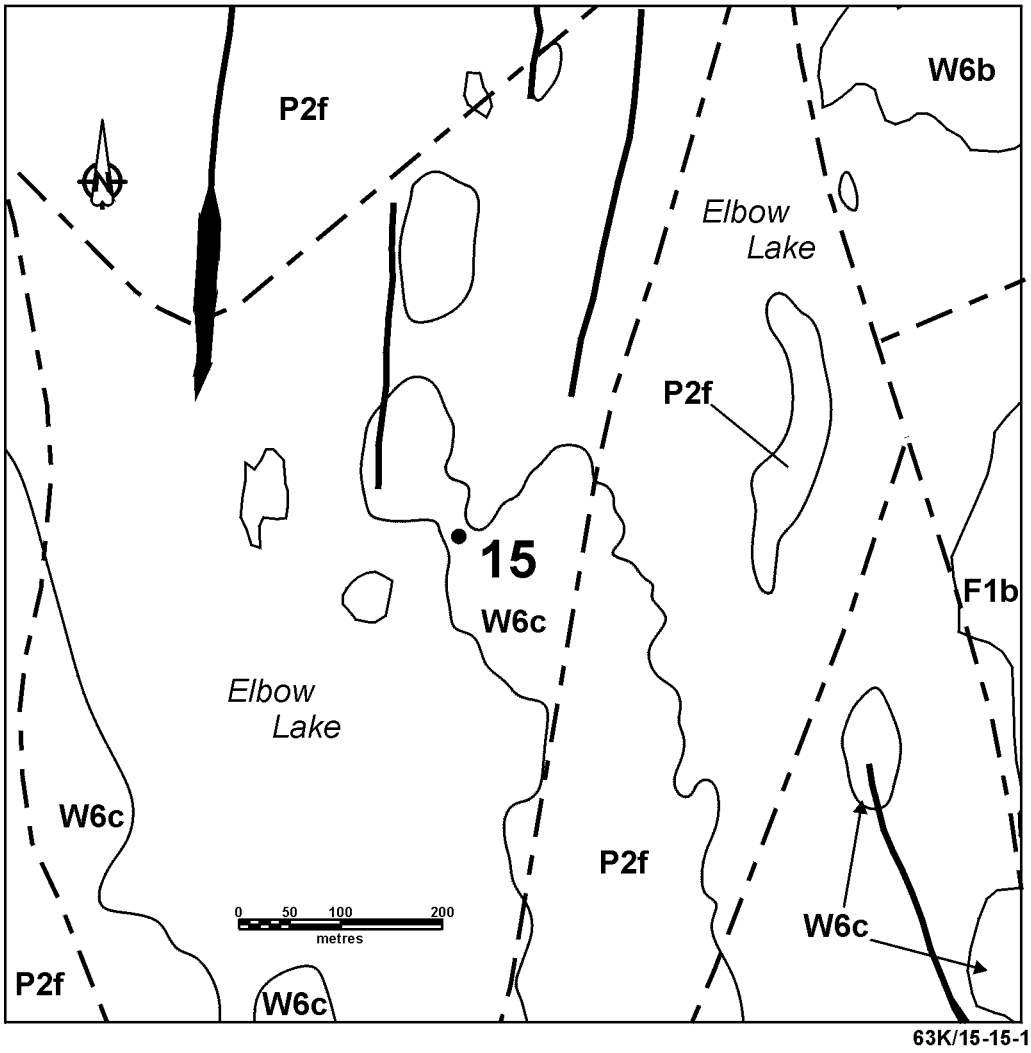
1990: Elbow Lake project (part of NTS 63K/15W); in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1990, pp.49-57.

1991: Elbow Lake project - Part A: supracrustal rocks and structural setting; in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1991, pp.14-27.

1992: Elbow Lake Project - Part A: Supracrustal rocks; in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1992, pp.32-46.

Syme, E.C. and Whalen, J.B.

1992: Geology, Elbow Lake, Manitoba; Geological Survey of Canada, Preliminary 1:20 000 map, Shield-Margin Project, File ELBOW92.PS.



PALEOPROTEROZOIC

- W6b — Mafic tectonite with mafic-felsic intrusive sheets
- W6c — Mafic phyllonite +/- carbonate, cataclasite
- P2f — Diabase, diabase dyke complex
- F1b — Claw Bay pillowed and massive basalt, diabase, derived tectonite

- Fault or shear zone margin (approximate)- NATMAP Shield Margin Project Working Group, 1998
- EM conductor (A.F. 92654)
- 15 • Mineral occurrence location

Figure 15-1: Geological setting of Century Fraction occurrence.

LOCATION: 16

NAME: Van No. 1 and No. 2
UTM: 381890E, 6081775N
AREA: east side of Elbow Lake, SE of Moen Bay
ACCESS: via bush aircraft, or by boat through the Cranberry Lakes from Cranberry Portage
AIRPHOTO: MB90025-55

EXPLORATION SUMMARY

The Van No. 1 and No. 2 claims were staked in 1933 by Mr John Vanberg. Several quartz veins and quartz masses containing schist xenoliths were exposed in a number of shallow trenches (Stockwell, 1935). In 1970 Mr H.N. Willis located claim CB 3160 over the occurrence and transferred ownership to the Noranda Exploration Company Limited. A single 71 m (232 ft.) diamond drill hole was drilled (Mineral Inventory File No. 786). No significant results were obtained.

Much of the area is now covered with new growth and deadfall, and examination of existing exposures proved difficult.

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 16-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). The area is underlain by mafic tectonite containing mafic to felsic intrusive sheets (unit W6b). The East Elbow tonalite stock (unit P6a) occurs to the east of the occurrence, and plagioclase-phyric pillowed Moen Bay basalt (unit F1c) is exposed to the west.

Galley (field notes, 1987) examined the occurrence and the following description is taken in part from his observations. The area at the occurrence is underlain by a 300 m thick sequence of felsic and mafic volcaniclastic rocks that is intruded by several quartz porphyritic dykes originating from the East Elbow tonalite. The volcaniclastic rocks are made up of layers 0.5 to 5 m thick consisting of chlorite, chlorite-magnetite, chlorite-sericite, chlorite-carbonate and tremolite-quartz schist, and cherty layers made up of dark to light grey silica with finely disseminated pyrite. Thin layers of felsic lapilli tuff are present SE of the Van No. 2 occurrence. This sequence is approximately 300 m thick. All of the rocks show a strong penetrative foliation at 350-010^{o}, parallel to the Elbow Lake shear zone, and dip 65-75^{o}E.

MINERALIZATION

In a trench at the Van No. 1 occurrence, a calcareous tuff layer at least 4 m thick contains up to 25% fine-grained disseminated pyrite. Most of the rocks are weathered and stained with iron oxides. The tuff is bounded to the west by a 1 m thick unit of interlayered chert and chlorite schist, and to the east by a quartz porphyritic tonalite dyke.

At the Van No. 2 occurrence a quartz vein up to 65 cm thick is poorly exposed for about 150 m along a 015-030^{o} trend. The quartz vein is weakly laminated and contains foliated chloritic inclusions. Minor pyrite and chalcopyrite are associated with the inclusions.

GEOCHEMICAL DATA

Stockwell (1935) reported the owner of the Van No. 2 occurrence obtained values of 15.07 g Au/t (0.44 oz. Au/ton) and 5.82 g Au/t (0.17 oz. Au/ton) in grab samples of quartz with sulphides. Galley (field notes, 1987) obtained an average of 6 ppb Au from 2 pyrite-rich calcareous tuff samples collected at the Van No. 1 occurrence.

CLASSIFICATION

The Van No. 1 occurrence appears to be a chemical sediment type deposit; sulphide facies iron formation. The Van No. 2 occurrence is a vein type deposit; single vein.

REFERENCES

Mineral Inventory File No. 786

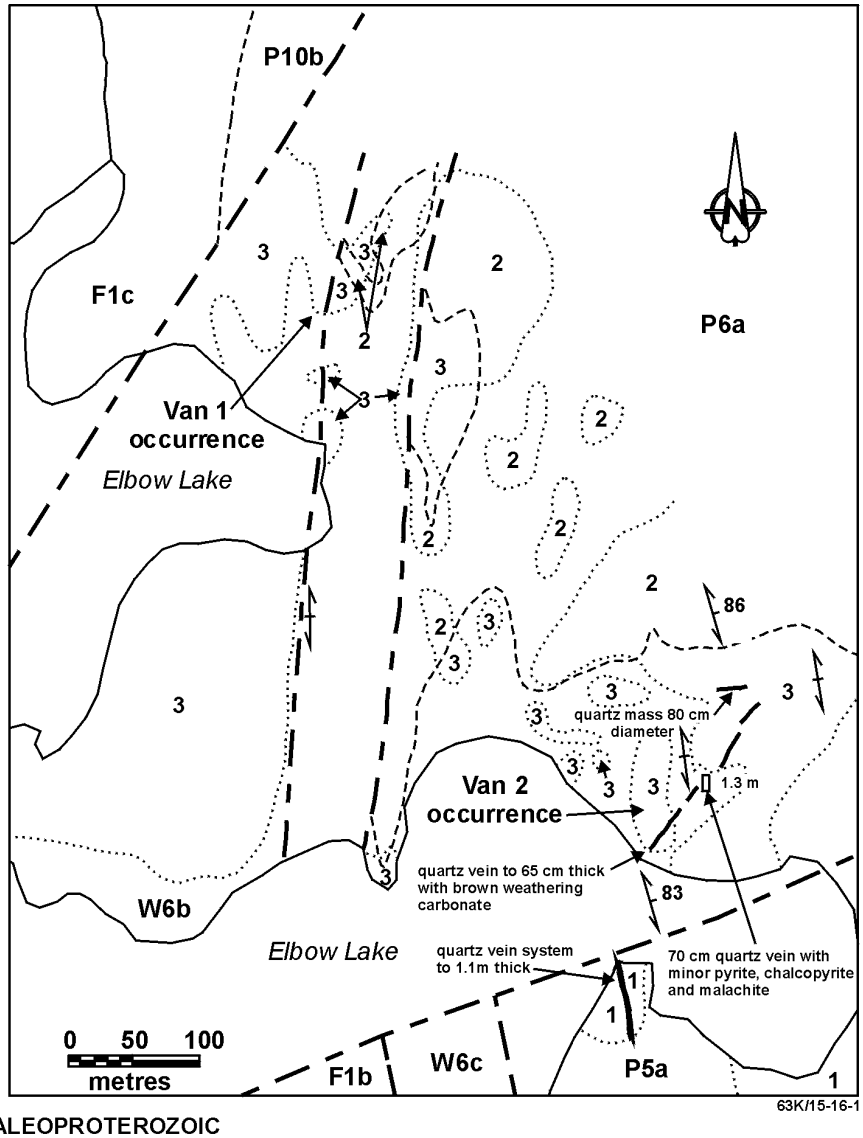
Manitoba Energy and Mines, Minerals Division

NATMAP Shield Margin Project Working Group

1998: Geology, NATMAP Shield Margin Project Area (Flin Flon Belt), Manitoba-Saskatchewan; Geological Survey of Canada 1968A; Manitoba Energy and Mines Map A-98-2, Sheets 1 to 7; Saskatchewan Energy and Mines Map 258A-2, scale 1:100 000.

Stockwell, C.H.

1935: Gold Deposits of the Elbow-Morton Area, Northern Manitoba; Geological Survey of Canada, Memoir 186, 74pp.



PALEOPROTEROZOIC

- W6b — Mafic tectonite with mafic-felsic intrusive sheets
- W6c — Mafic phyllonite +/- carbonate, cataclasite
- P10a — Quartz porphyry, feldspar porphyry, quartz-feldspar porphyry
- P6a — Tonalite
- F1b — Claw Bay pillowed and massive basalt, diabase, derived tectonite
- F1c — Moen Bay pillowed basalt and breccia
- F5a — Gabbro, diabase
- 3 — Mafic phyllonite
- 2 — Pink quartz-eye tonalite and hornblendite 15-20% quartz, well foliated; minor folded quartz fracture fills
- 1 — Massive mafic volcanic rock; minor sheared intervals

- Geological contact (approximate)- NATMAP Shield Margin Project Working Group, 1998
- Fault or shear zone margin (approximate)- NATMAP Shield Margin Project Working Group, 1998
- 83 — Schistosity (inclined, vertical)
- Outcrop
- 1.3 m — Trench and maximum depth

Figure 16-1: Geology and trench location at Van No. 1 and No. 2 occurrences.

LOCATION: 17

NAME: Mack
UTM: 381560E, 6082085N
AREA: east side of Elbow Lake, SE of Moen Bay
ACCESS: via bush aircraft, or by boat through the Cranberry Lakes from Cranberry Portage
AIRPHOTO: MB90025-55

EXPLORATION SUMMARY

The Mack claim was staked in 1924 by Mr P. Johnson. In 1925 an area of quartz and schist had been explored in several trenches and a shaft approximately 8.5 m (28 ft.) deep (Stockwell, 1935). In 1946 approximately 76 m (250 ft.) of diamond drilling was recorded and in 1947 another 64 m (210 ft.) were drilled. An EM survey and diamond drilling were recorded in 1957. Noranda Exploration Company performed an EM and magnetic survey over the property in 1972 (Mineral Inventory File No. 788).

Much of the area is now covered with new growth and deadfall, and outcrops are poorly exposed.

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 17-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). The area is underlain by mafic tectonite containing mafic to felsic intrusive sheets (unit W6b). The East Elbow tonalite stock (unit P6a) occurs to the east of the occurrence, and plagioclase-phyric pillowed Moen Bay basalt (unit F1c) is exposed to the west.

Galley (field notes, 1987) examined the Mack property and the following description is taken largely from his observations. The area at the occurrence is underlain by a 300 m thick sequence of interbanded felsic and mafic tectonites that are intruded by several quartz porphyritic dykes originating from the East Elbow tonalite. The tectonites consist of chlorite schist, chlorite-magnetite schist, chlorite-sericite schist, chlorite-carbonate schist, and tremolite-quartz schist layers 0.5 to 5 m thick. Cherty layers made up of dark to light grey silica with finely disseminated pyrite are also present. Thin layers of felsic lapilli tuff are present west of the Mack occurrence. All of the rocks show a strong penetrative foliation trending 350-010^{o} and dipping 65-75^{o}E, parallel to the Elbow Lake shear zone.

MINERALIZATION

Deformed quartz veins occur in banded, strongly schistose, calcareous chlorite and quartz-Fe-carbonate schist. The shaft has been sunk on a 2 by 5 m mass of banded grey and white quartz containing chlorite-tourmaline aggregates, with disseminated pyrite, chalcopyrite and pyrrhotite. Boudinaged quartz – Fe-carbonate veins occur in the schist for approximately 15 m north of the shaft. These have an aggregate thickness of up to 75 cm within a total schist thickness of 2 m. Beyond this area, deformed quartz and Fe-carbonate veins decrease in abundance, occurring as narrow stringers and lenses. Disseminated pyrite is a common accessory in both the schist and the veins.

Stockwell (1935) indicates that coarse gold had reportedly been recovered from the shaft.

GEOCHEMICAL DATA

Stockwell (1935) reported that the owner obtained an assay of 9.25 g Au/t (0.27 oz. Au/ton) from a channel sample taken from the bottom of the shaft.

CLASSIFICATION

Vein type deposit; multiple veins or lenses.

REFERENCES

Mineral Inventory File No. 788

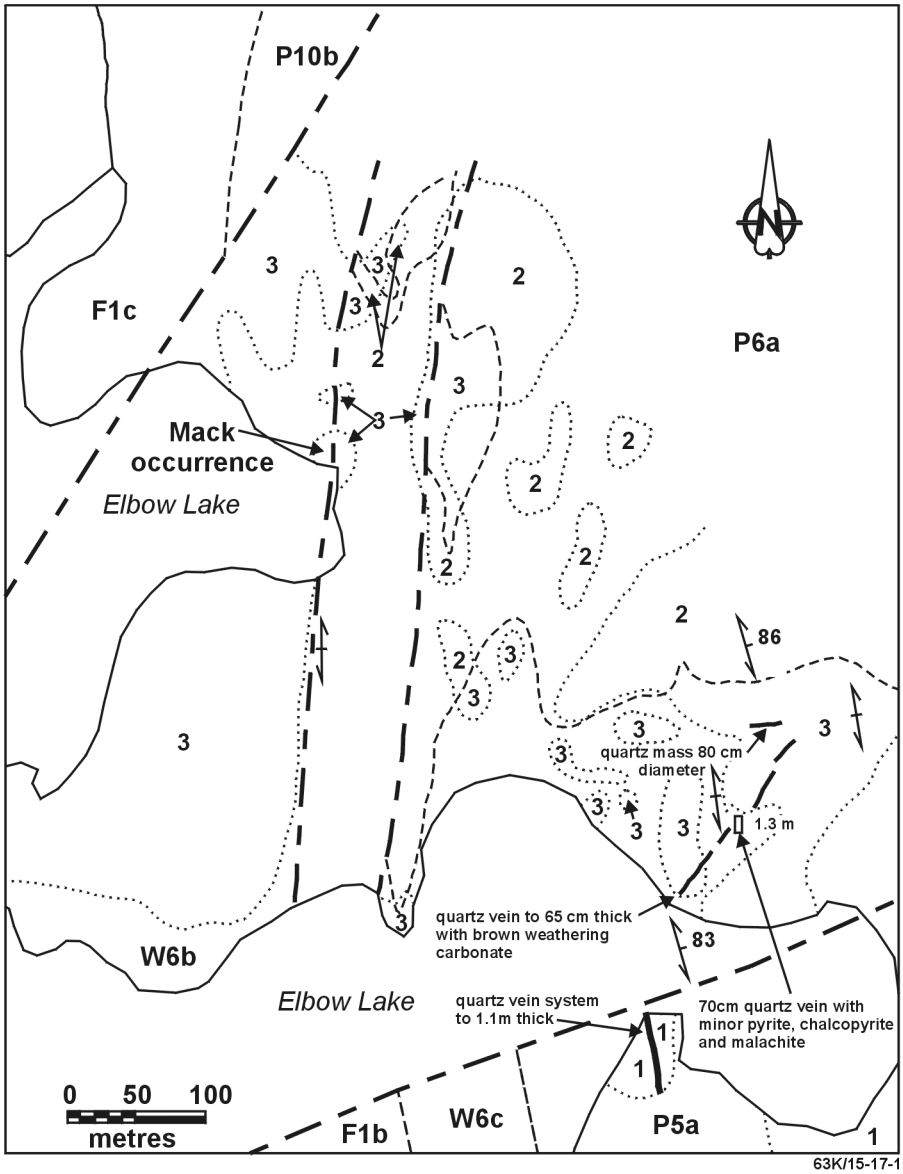
Manitoba Energy and Mines, Minerals Division

NATMAP Shield Margin Project Working Group

1998: Geology, NATMAP Shield Margin Project Area (Flin Flon Belt), Manitoba-Saskatchewan; Geological Survey of Canada 1968A; Manitoba Energy and Mines Map A-98-2, Sheets 1 to 7; Saskatchewan Energy and Mines Map 258A-2, scale 1:100 000.

Stockwell, C.H.

1935: Gold Deposits of the Elbow-Morton Area, Northern Manitoba; Geological Survey of Canada, Memoir 186, 74pp.



PALEOPROTEROZOIC

- W6b — Mafic tectonite with mafic-felsic intrusive sheets
- W6c — Mafic phyllonite +/- carbonate, cataclasite
- P10b — Quartz porphyry, feldspar porphyry, quartz-feldspar porphyry
- P6a — Tonalite
- F1b — Claw Bay pillowed and massive basalt, diabase, derived tectonite
- F1c — Moen Bay pillowed basalt and breccia
- F5a — Gabbro, diabase

- 3 — Mafic phyllonite
- 2 — Pink quartz-eye tonalite and hornblendite 15-20% quartz, well foliated;minor folded quartz fracture fills
- 1 — Massive mafic volcanic rock; minor sheared intervals

- Geological contact (approximate)- NATMAP Shield Margin Project Working Group, 1998
- Fault or shear zone margin (approximate)- NATMAP Shield Margin Project Working Group, 1998
- 83 — Schistosity (inclined, vertical)
- Outcrop
- 1.3 m — Trench and maximum depth

Figure 17-1: Geology of Mack occurrence.

LOCATION: 18

NAME: I.X.L.
UTM: 380230E, 6082085N
AREA: on point along west shore of Moen Bay, Elbow Lake
ACCESS: via bush aircraft, or by boat through the Cranberry Lakes from Cranberry Portage
AIRPHOTO: MB90025-117

EXPLORATION SUMMARY

Three trenches were excavated prior to Stockwell's 1934 visit to the occurrence (Stockwell, 1935). No further work appears to have been done since that time.

The trenches are located close to the shoreline and are now completely overgrown.

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 18-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). The occurrence is located near the western margin of the Elbow Lake shear zone (unit W6c) (Galley *et al*., 1987, 1989; Syme, 1990, 1991, 1992). In this area the structure is approximately 1000 m thick (Syme and Whalen, 1992). Pre-shear lithologies such as Long Bay basaltic conglomerate and diabase can be recognized in this part of the shear zone.

The occurrence is hosted by several subvertical chert bodies within chlorite-carbonate-magnetite schist (Fig. 18-2). The schistosity strikes 012^{o} and dips 81^{o}E. The schist is calcareous and Fe-carbonate stringers occur parallel to the foliation. Calcite stringers crosscut the schist.

The chert is vaguely banded, striking 160^{o} and dipping vertically, and is variably coloured white, red (jasper), brown and black. In some areas the banding shows a fine crenulation. Specularite is common in the chert as fracture coatings. In outcrops a few metres to the north of the trenches, chert fragments several centimetres long occur in magnetite-rich schist.

MINERALIZATION

The chert units are crosscut by irregular white quartz veins. In some areas the quartz forms the matrix to chert fragment breccia. Both the vein quartz and the chert contain minor (<1%) pyrite as disseminated euhedral grains.

GEOCHEMICAL DATA

None.

CLASSIFICATION

Vein type deposit; multiple veins or lenses. Associated with silicate facies cherty iron formation within the Elbow Lake shear zone.

REFERENCES

A.F. 90516, 90517; Cancelled Assessment Files, Manitoba Industry, Trade and Mines, Minerals Division.

Galley, A.G., Ames, D.E. and Franklin, J.M.

1987: Geological setting of gold mineralization in the Elbow Lake region, Manitoba; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1987, pp.175-177.

1989: Results of studies on the gold metallogeny of the Flin Flon belt; in Investigations by the Geological Survey of Canada in Manitoba and Saskatchewan during the 1984-1989 Mineral Development Agreements, Geological Survey of Canada, Open File 2133, pp.25-32.

NATMAP Shield Margin Project Working Group

1998: Geology, NATMAP Shield Margin Project Area (Flin Flon Belt), Manitoba-Saskatchewan; Geological Survey of Canada 1968A; Manitoba Energy and Mines Map A-98-2, Sheets 1 to 7; Saskatchewan Energy and Mines Map 258A-2, scale 1:100 000.

Stockwell, C.H.

1935: Gold Deposits of the Elbow-Morton Area, Northern Manitoba; Geological Survey of Canada, Memoir 186, 74pp.

Syme, E.C.

1990: Elbow Lake project (part of NTS 63K/15W); in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1990, pp.49-57.

1991: Elbow Lake project - Part A: supracrustal rocks and structural setting; in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1991, pp.14-27.

1992: Elbow Lake Project - Part A: Supracrustal rocks; in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1992, pp.32-46.

Syme, E.C. and Whalen, J.B.

1992: Geology, Elbow Lake, Manitoba; Geological Survey of Canada, Preliminary 1:20 000 map, Shield-Margin Project, File ELBOW92.PS.

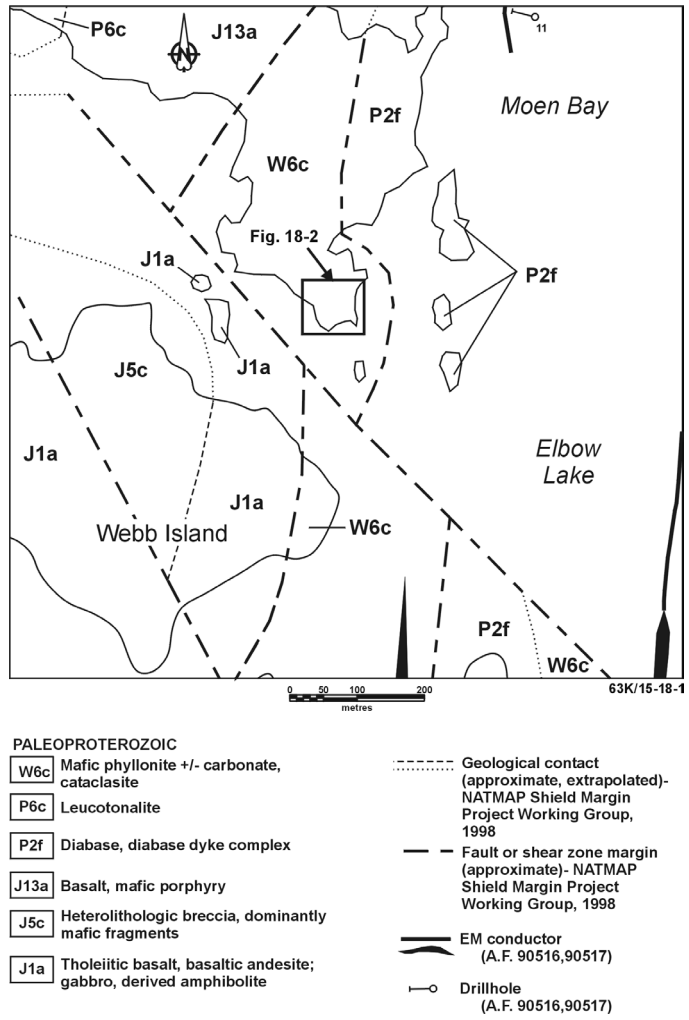


Figure 18-1: Geological setting of I.X.L. occurrence.

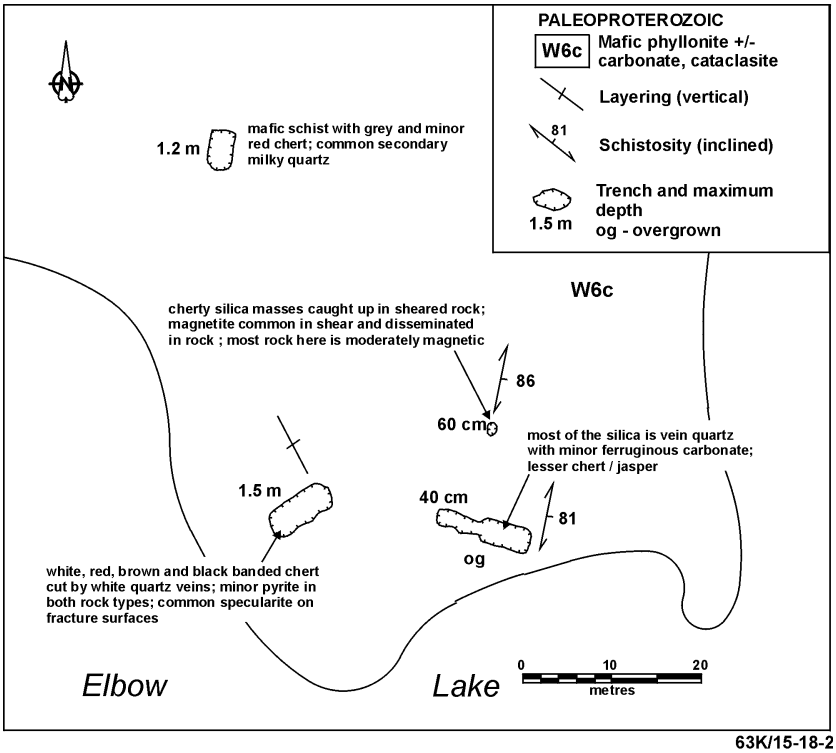


Figure 18-2: Trench locations and geology of I.X.L. occurrence.

LOCATION: 19

NAME: Webb-Garbutt (Stockwell, 1935)
Century mine (McGlynn, 1959)
UTM: 379750E, 6081875N
AREA: central part at east end of Webb Island, Elbow Lake
ACCESS: via bush aircraft, or by boat through the Cranberry Lakes from Cranberry Portage
AIRPHOTO: MB90025-117

EXPLORATION SUMMARY

The claims were staked in 1919 by Messrs. Thomas R. Webb and William Garbutt. By 1929 a shaft had been sunk to approximately 18 m (60 feet) and a 7 m (23 ft.) crosscut completed at a depth of 17 m (56 ft.) (Wright, 1930; Mineral Inventory File 769). Some drifting was done from the end of the crosscut. A small mining plant and mill were installed but moved to the Murray occurrence at the south end of Elbow Lake in the winter of 1934 (Stockwell, 1935). In 1936 and 1937 approximately 1390 m (4560 ft.) of diamond drilling was completed by the Century Mining Corporation. Underground development continued during this period, and by the end of 1937 a 3 compartment shaft had been sunk to a depth of approximately 88 m (288 ft.). Levels were established at 38 (125 ft.) and 76 m (250 ft.) and some drifting was completed. In 1938 1068 m (3504 ft.) of diamond drilling was completed. Reserves to that point were estimated at 91 200 tonnes with an average grade of 10.97 g Au/t (0.32 oz. Au/ton) and an additional 86 175 tonnes with a grade of 9.25 g Au/t (0.31 oz. Au/ton) (The Northern Miner, February 7, 1941).

In 1941 a 90 tonne/day mill was constructed. After a short period of operation, the mill was shut down in January 1942, and all work ceased. The only recorded production from this deposit occurred during this time: a gold bar weighing approximately 1854 g (59.6 oz.) was poured two weeks before the operation shut down. Developments at that time consisted of a raise from the 38 m level to surface, and a partially completed raise connecting the 76 to the 38 m level. Stopes were prepared on the 38 m level for a length of 46 m, and similar development was partially completed on the 76 m level.

Work resumed on the property in 1946 when the shaft was deepened to 161 m (528 ft.), with levels established at 114 (375 ft.) and 153 m (500 ft.). Development work proceeded on the lower two levels. In 1951, 2951 m ((9682 ft.) of diamond drilling was completed in 6 holes.

In 1980 Ram Petroleums estimated proven reserves on the property at 272 000 tonnes grading 11.99 g Au/tonne (0.35 oz. Au/ton), with the mineralized zones open along strike and to depth (Mineral Policy Sector, Ram Petroleums Limited). Geological, geochemical, electromagnetic and magnetic surveys suggested extensions of the known veins. Additional geophysical surveys and diamond drilling were performed in 1981.

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 19-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). The deposit is located approximately 400 m west of the western margin of the Elbow Lake shear zone (unit W6c) (Galley *et al.*, 1987, 1989; Syme, 1990, 1991, 1992). The area is underlain by amoeboid pillow breccia and pillowed flows of the Webb Island basalt (unit J1a) intercalated with aphyric and brecciated Century rhyolite (unit J5c) (Syme and Whalen, 1992).

Galley (field notes, 1987) mapped the occurrence and this description is taken largely from his observations. The rocks at the occurrence strike 160^{o} and dip vertically to steeply southwest (Fig. 19-2 to-6).

The mafic rocks consist of massive and pillowed flows, monolithic and heterolithic tuff breccia and breccia. The heterolithic breccia contains angular blocks of rhyolite to 1 m and smaller subangular blocks of basalt. Quartz-phyric to aphanitic rhyolite forms two NW-trending units within the mafic sequence. The northerly unit consists of monolithic, coarse-grained, layered lapilli tuff to tuff breccia containing rhyolite clasts to 25 cm. The southerly unit consists of massive aphanitic quartz-phyric rhyolite with no primary internal textures.

Mafic and felsic dykes crosscut the volcanic rock sequence. Fine-grained diorite dykes ranging from less than 1 m to over 10 m in thickness cut both the felsic and mafic volcanic rocks. Quartz porphyry dykes and aplite stringers cut the diorite.

Depositional indicators such as amygdule abundance and graded bedding indicate that stratigraphic tops are to the SW. All the rocks have been affected by a bedding parallel penetrative foliation that has flattened pillows and clasts. The margins of the larger dykes are strongly sheared, these shears being further deformed by a set of conjugate NE and SE-trending kink bands. The volcanic rocks contain numerous thin NNW-trending shears that can contain iron stained quartz veins.

MINERALIZATION

Most of the mineralized zone at this deposit is either overgrown or covered with mine waste. The deposit consists of quartz and quartz-Fe carbonate veins crosscutting a 3 m thick quartz porphyry dyke and diorite that it has intruded. Veins within the felsic dyke occur parallel to the dyke margins, as breccia zones and crossing the dyke as NE-trending extensional veins. The mafic dyke that hosts the quartz porphyry also contains abundant quartz veins, most of which are boudinaged parallel to the schistosity.

The vein minerals are dominated by white and grey quartz, and contain accessory Fe-carbonate, chlorite, sericite, bright green phyllosilicate and black tourmaline

(schorl). Pyrite, the main sulphide mineral, occurs as euhedral grains 0.5 to 5 mm in size in altered wallrock at the vein margins, in chloritic xenoliths within the veins and in the quartz of the vein. It appears to comprise less than 1% of the vein material. Lesser sulphide minerals include tetrahedrite, galena, pyrrhotite, arsenopyrite, chalcopyrite and sphalerite (Galley, field notes, 1987).

Native gold was found in quartz in the muck pile north of the shaft opening (Fig. 19-5). It is associated with chloritic masses in grey quartz.

GEOCHEMICAL DATA

Stockwell (1935) indicates that the owners had obtained the following assays:

2.05 to 4.79 g Au/t (0.06 to 0.14 oz. Au/ton) across 1.5 m or more (>5 feet) of porphyry and quartz at 4 localities on the Webb claim;

6.85 g Au/t across 2.4 m (0.20 oz. Au/ton across 8 feet) in porphyry with vein quartz in he shaft on the Garbutt claim.

CLASSIFICATION

Vein type deposit; multiple veins or lenses.

REFERENCES

Galley, A.G., Ames, D.E. and Franklin, J.M.

1987: Geological setting of gold mineralization in the Elbow Lake region, Manitoba; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1987, pp.175-177.

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McGlynn, J.C.

1959: Elbow-Heming Lakes Area, Manitoba; Geological Survey of Canada, Memoir 305, 72 pp.

Mineral Inventory File No. 769

Manitoba Energy and Mines, Minerals Division

NATMAP Shield Margin Project Working Group

1998: Geology, NATMAP Shield Margin Project Area (Flin Flon Belt), Manitoba-Saskatchewan; Geological Survey of Canada 1968A; Manitoba Energy and Mines Map A-98-2, Sheets 1 to 7; Saskatchewan Energy and Mines Map 258A-2, scale 1:100 000.

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1992: Geology, Elbow Lake, Manitoba; Geological Survey of Canada, Preliminary 1:20 000 map, Shield-Margin Project, File ELBOW92.PS.

Wright, J.F.

1930: Geology and mineral deposits of part of north-west Manitoba; in Geological Survey of Canada, Summary Report, 1930, Part C, pp.1-124.

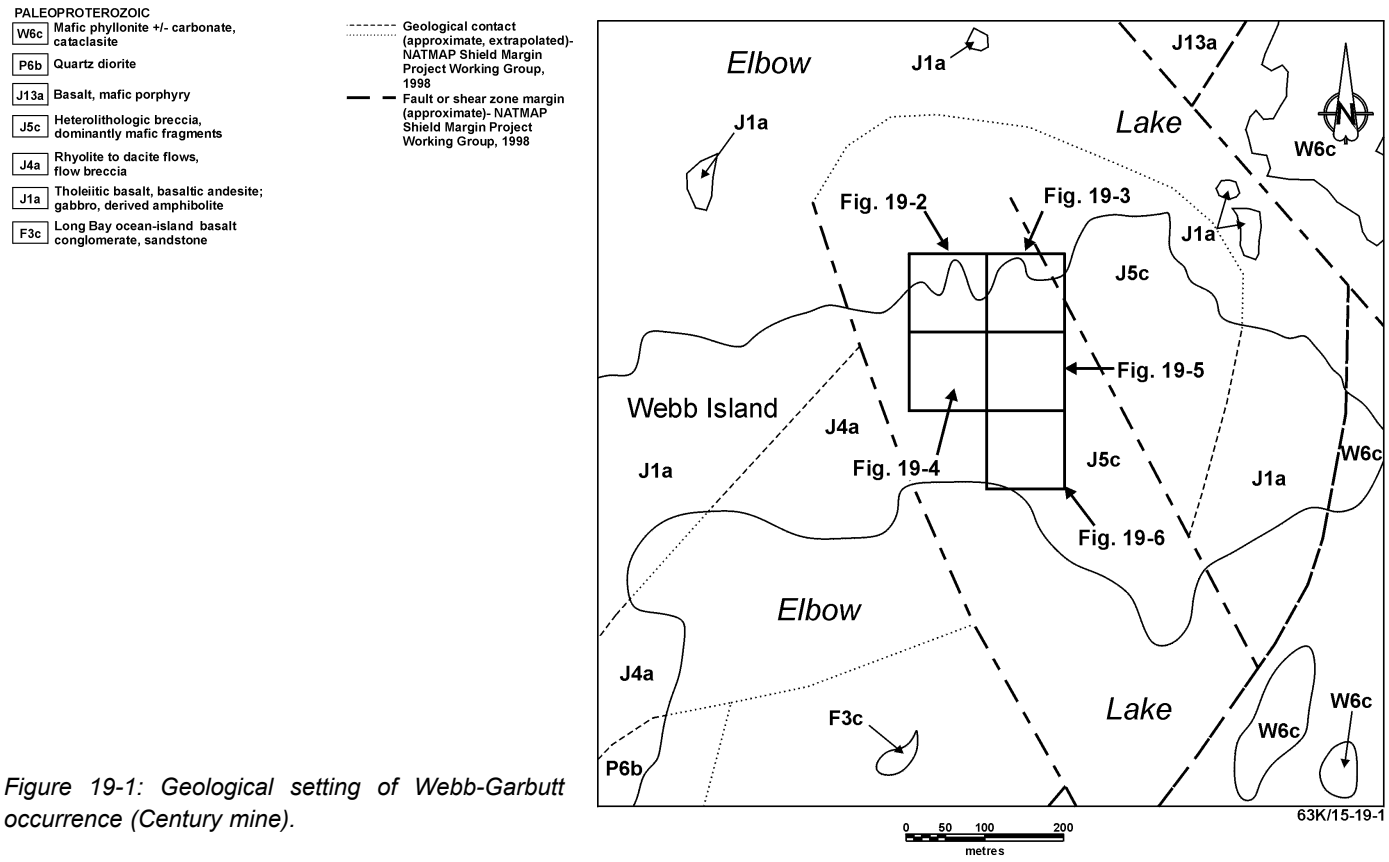

Figure 19-1: Geological setting of Webb-Garbutt occurrence (Century mine).

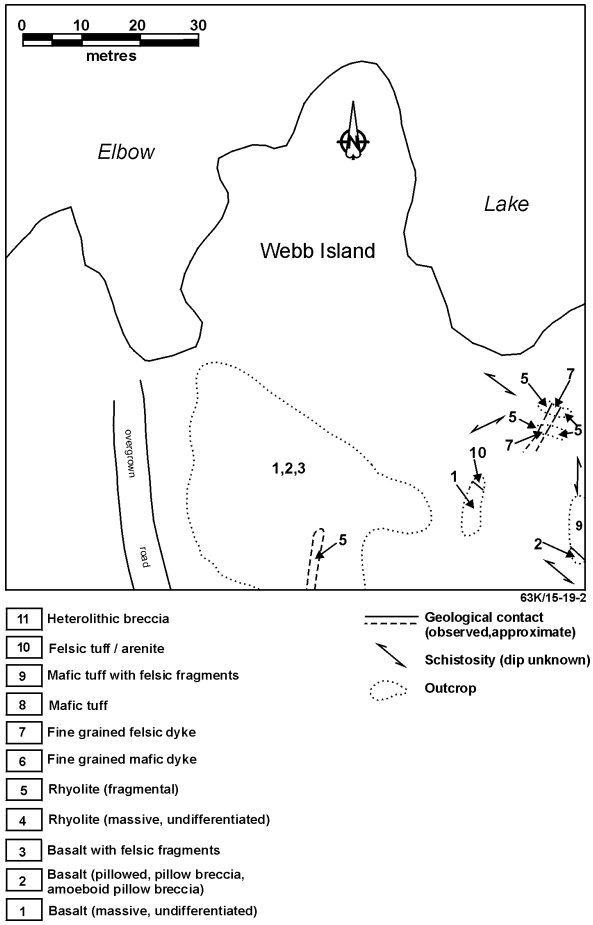

Figure 19-2: Detailed geology at Webb-Garbutt occurrence (Century mine).

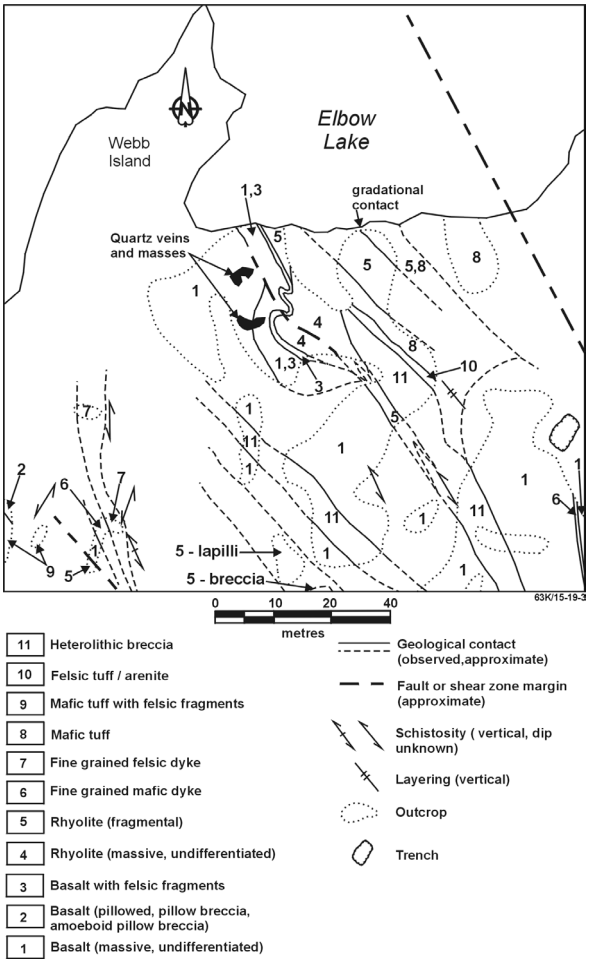

Figure 19-3: Detailed geology at Webb-Garbutt occurrence (Century mine).

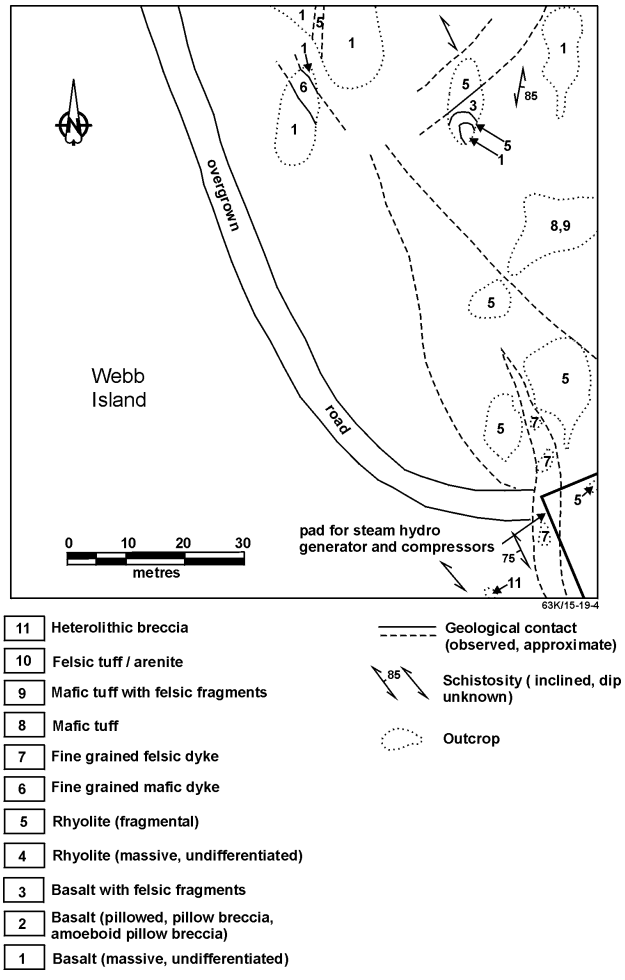

Figure 19-4: Detailed geology at Webb-Garbutt occurrence (Century mine).

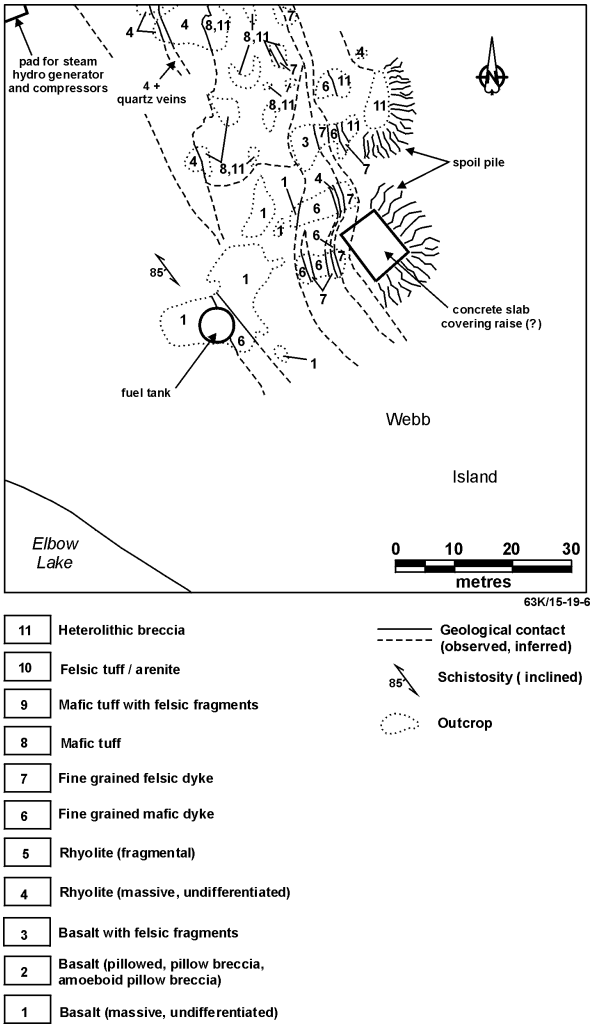

Figure 19-6: Detailed geology at Webb-Garbutt occurrence (Century mine).

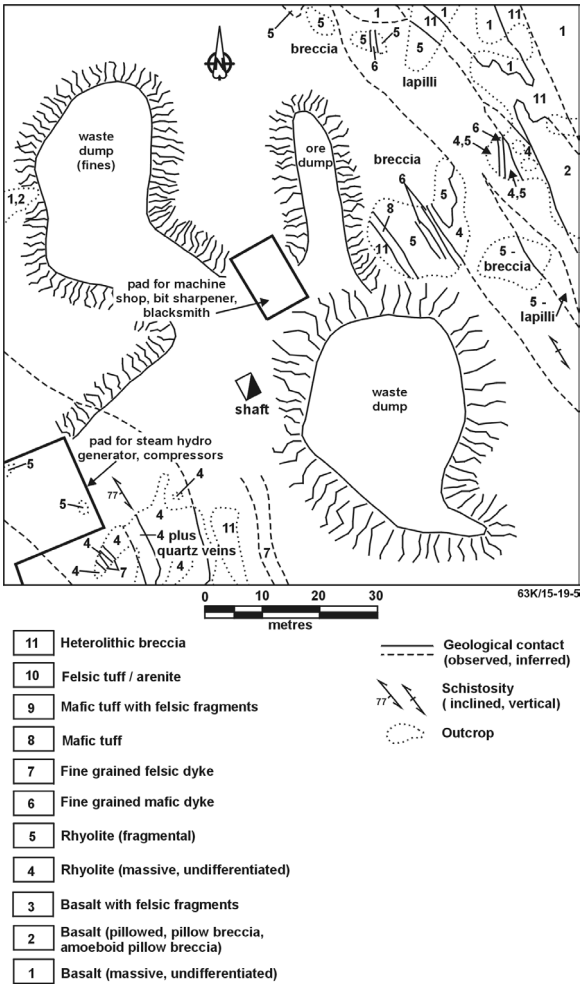

Figure 19-5: Detailed geology at Webb-Garbutt occurrence (Century mine).

LOCATION: 20

NAME: Bow
UTM: 379410E, 6081915N
AREA: near north shore of Webb Island, Elbow Lake
ACCESS: via bush plane or by boat through the Cranberry Lakes from Cranberry Portage
AIRPHOTO: MB90025-117

EXPLORATION SUMMARY

The occurrence was staked in 1919 by Messrs. Thomas R. Webb and William Garbutt. Four trenches were excavated into the vein over a distance of approximately 76 m (250 feet) (Stockwell, 1935). McGlynn (1959) indicates the occurrence has also been explored by diamond drilling.

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 20-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). The area is underlain by aphyric amoeboid pillow breccia and pillowed flows of the Webb Island basalt (unit J1a) (Syme and Whalen, 1992).

The host rocks of the occurrence consist of schistose massive, pillowed and flow brecciated basalt. Flow textures indicate that tops are to the west. The schistosity trends 010^{o} and dips vertically. A few thin diorite dykes cut the volcanic rocks.

MINERALIZATION

The quartz vein that hosts the mineralization trends north-northeasterly but follows an irregular course (Fig. 20-2). It varies from about 10 cm to 1 m in thickness, and averages 60 cm along most of its exposed length. The vein consists dominantly of white quartz with brown-weathering Fe-carbonate and minor red feldspar. The quartz contains up to 1% disseminated pyrite. Lesser galena and chalcopyrite are also present. Stockwell (1935) noted the presence of sphalerite and pyrrhotite, and indicated that native gold was intimately associated with pyrite.

GEOCHEMICAL DATA

Stockwell (1935) indicates that the owner had obtained the following assays across 1.5 m (5 feet) of quartz at 4 localities along the vein:

20.55 g Au/t (0.60 oz. Au/ton)

41.10 g Au/t (1.20 oz. Au/ton)

9.59 g Au/t (0.28 oz. Au/ton)

11.64 g Au/t (0.34 oz. Au/ton)

A value of 5.48 g Au/t (0.16 oz. Au/ton) was obtained from a grab sample of wallrock.

CLASSIFICATION

Vein type deposit; single vein.

REFERENCES

McGlynn, J.C.

1959: Elbow-Heming Lakes Area, Manitoba; Geological Survey of Canada, Memoir 305, 72 pp.

NATMAP Shield Margin Project Working Group

1998: Geology, NATMAP Shield Margin Project Area (Flin Flon Belt), Manitoba-Saskatchewan; Geological Survey of Canada 1968A; Manitoba Energy and Mines Map A-98-2, Sheets 1 to 7; Saskatchewan Energy and Mines Map 258A-2, scale 1:100 000.

Stockwell, C.H.

1935: Gold Deposits of the Elbow-Morton Area, Northern Manitoba; Geological Survey of Canada, Memoir 186, 74pp.

Syme, E.C. and Whalen, J.B.

1992: Geology, Elbow Lake, Manitoba; Geological Survey of Canada, Preliminary 1:20 000 map, Shield-Margin Project, File ELBOW92.PS.

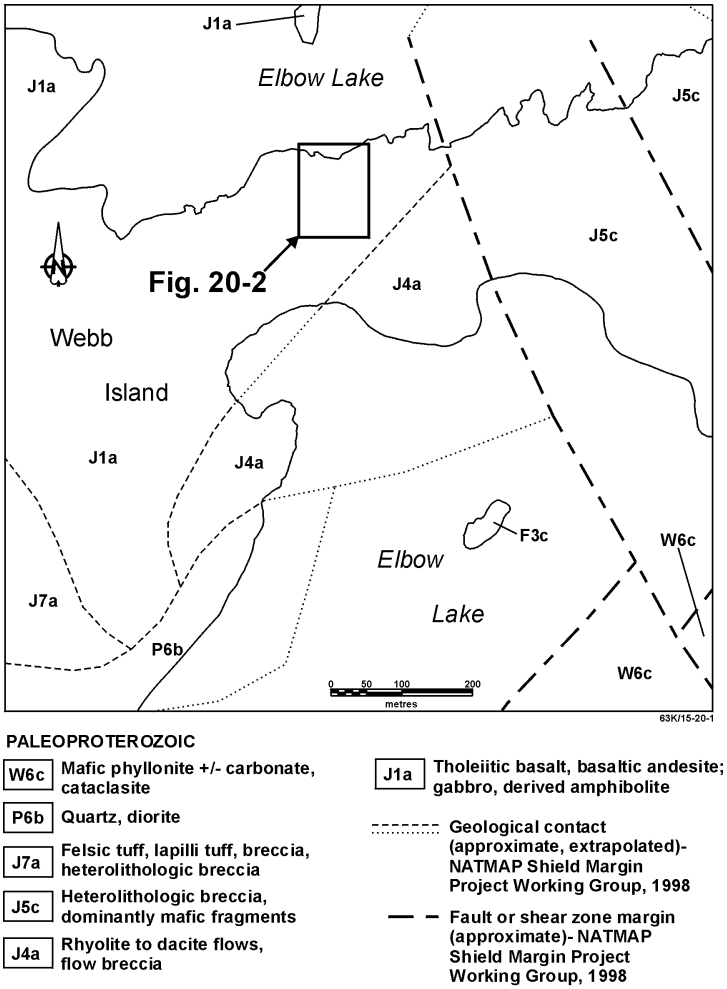

Figure 20-1: Geological setting of Bow occurrence.

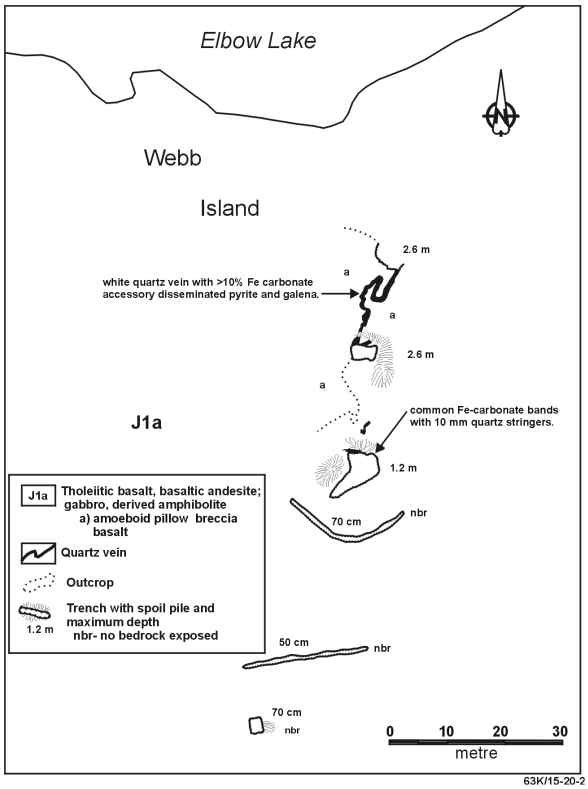

Figure 20-2: Geology and trench locations of Bow occurrence.

LOCATION: 21

NAME: Silvertone Group

UTM: Site 1. 381830E, 6085045N
Site 2. 381945E, 6085510N
Site 3a. 382455E, 6086110N
Site 3b. 382435E, 6086055N
Site 4. 382315E, 6085790N

AREA: approximately 1.6 km NNE of the north end of Moen Bay, Elbow Lake.

ACCESS: via bush plane or by boat through the Cranberry Lakes from Cranberry Portage, then traverse

AIRPHOTO: MB90025-58

EXPLORATION SUMMARY

The occurrence was staked in 1933 by Mr Harry N. Hawes. A 38 m (125 ft.) long trench with a 6.4 m (21 ft.) deep shaft were excavated in a 10.7 m (35 feet) thick zone of massive fine-grained pyrrhotite (Stockwell, 1935). In 1971 a horizontal loop EM survey was carried out over the property by Noranda Exploration Company Ltd. (Cancelled Assessment File 90643). Manitoba Mineral Resources drilled 6 holes totalling 603 m (1979 feet) to test four of the EM conductors (Cancelled Assessment File 90643, 92654). In 1973 Sherritt Gordon Mines carried out airborne EM and magnetic surveys under Airborne Permit No. 114 (A.F. 92020).

The trench with the shaft were not located during the 1992 field examination of the area. The locations of other excavations possibly related to the Silvertone occurrence are shown on Fig. 21-1.

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 21-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). The area is underlain by aphyric pillowed flows and plagioclase-phyric heterolithic breccia of the Moen Bay basalt (unit F1c) and fine- to medium-grained equigranular gabbro (unit P2a) (Syme and Whalen, 1992). Schists (unit W6c) related to the Elbow Lake shear zone (Galley *et al*., 1987, 1989; Syme, 1990, 1991, 1992) underlie the area west of the occurrence.

At Site 1 (Fig. 21-1), a trench has been excavated into mafic schist foliated at 010º and dips 85ºE. The western end of the trench exposes a 20 cm thick aphyric rhyolite mass. Parts of the schist are limonitic but no sulphides were observed. No quartz veins or stringers were noted either in situ or in the waste pile.

A trench at Site 2 (Fig. 21-1) exposes a fine-grained, light grey rhyolitic rock. It is massive and unfoliated, and is transected by an irregular network of white quartz stringers and veinlets that make up to 40% of the unit. Pyrite, as masses to 5 cm, makes up approximately 5% of the quartz veinlets. The western 30 cm of the trench exposes mafic schist trending 020º and dipping 76ºE. The contact with the felsic unit is sharp, planar and parallels the foliation of the schist.

Two trenches have been excavated at Site 3 (Fig. 21-1). The first (Site 3a) is 3.5 m deep, and exposes schistose mafic rock whose foliation trends 035º and dips vertically. The schistose interval is magnetic and limonitic, but no sulphides were observed. The north and south walls of the pit consist of massive mafic rock, probably basalt, and are unfoliated. The limonitic schistose unit trends approximately 135º as indicated by ferruginous overburden. The second trench (Site 3b) has been excavated into the SE extension of this limonitic zone, and exposes slightly to moderately schistose, limonitic mafic rock. Quartz stringers and veins to 10 cm thick occur along the north side of the trench at its western end. Pieces of quartz are also present in decrepitated excavated material. The rocks are magnetic due to their high pyrrhotite content.

Four trenches were excavated at the base of an 8 m cliff face at Site 4. All the excavated material has decrepitated and is limonitic, although the mafic rock exposed in the cliff face is massive and unfoliated. The rock in the trenches is only poorly exposed and is weathered and schistose. The rocks become less limonitic in the trenches to the south, but remain schistose and sericitic. The limonite has been derived from disseminated pyrrhotite, little of which is evident in hand specimen. Much of the rock is magnetic.

MINERALIZATION

Mineralized rock exposed in the trenches at the various sites is generally limonitic, schistose and decrepitated. Only minor sulphide was observed. It appears that pyrrhotite is the dominant phase, and occurs as disseminations within the schist. Much of the rock is magnetic although no magnetite was observed. Disseminated sulphides appear to make up to 10% of the rock, although Stockwell (1935) indicated that, “The western 35 feet of the exposed part of the deposit is of fine-grained, massive pyrrhotite.”

GEOCHEMICAL DATA

No assays have been reported for this occurrence.

CLASSIFICATION

Disseminated mineralization - not classified. All the trenched sites expose sulphide-bearing schist associated with the Elbow Lake shear zone. The trench that contains “…35 feet…of fine-grained, massive pyrrhotite” was not located despite considerable effort.

REFERENCES

A.F. 90516, 90517, 90643, 92020, 93052; Cancelled Assessment Files, Manitoba Industry, Trade and Mines, Minerals Division.

Galley, A.G., Ames, D.E. and Franklin, J.M.

1987: Geological setting of gold mineralization in the Elbow Lake region, Manitoba; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1987, pp.175-177.

1989: Results of studies on the gold metallogeny of the Flin Flon belt; in Investigations by the Geological Survey of Canada in Manitoba and Saskatchewan during the 1984-1989 Mineral Development Agreements, Geological Survey of Canada, Open File 2133, pp.25-32.

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Syme, E.C. and Whalen, J.B.

1992: Geology, Elbow Lake, Manitoba; Geological Survey of Canada, Preliminary 1:20 000 map, Shield-Margin Project, File ELBOW92.PS.

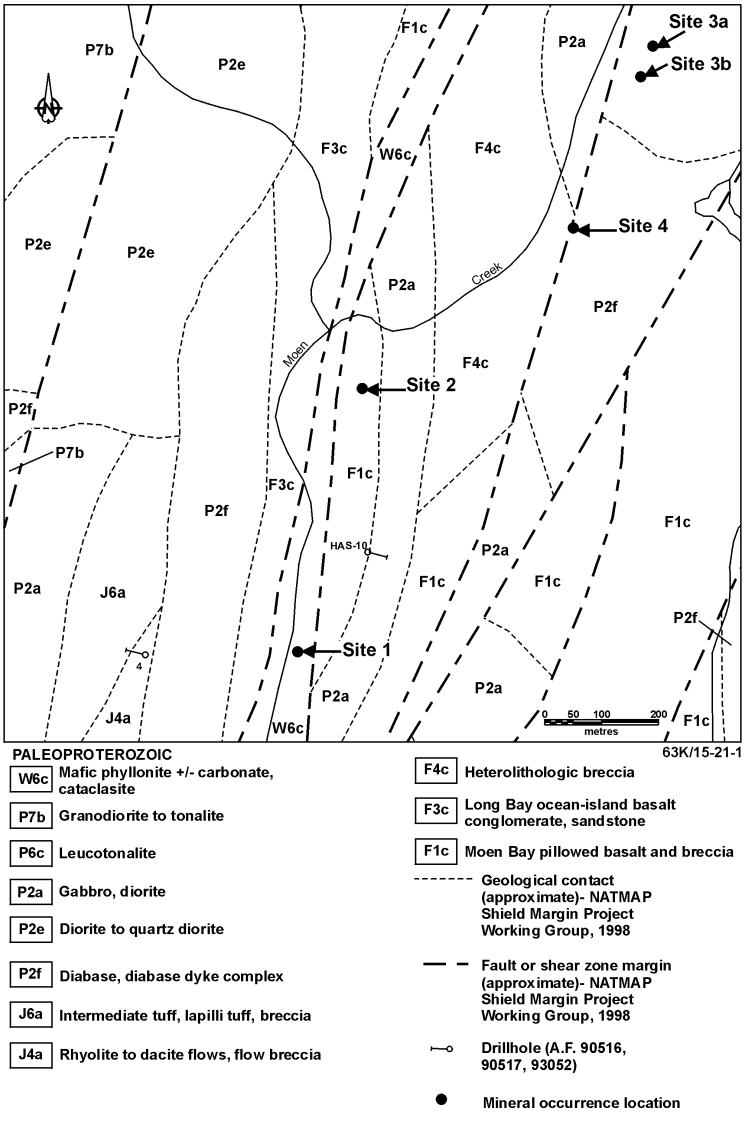

Figure 21-1: Geological setting of Silvertone occurrence.

LOCATION: 22

NAME: Long
UTM: 380490E, 6085635N
AREA: approximately 1.8 km east of Tee Lake and 1.5 km NW of head of Moen Bay, Elbow Lake
ACCESS: via bush plane or by boat through the Cranberry Lakes from Cranberry Portage, then traverse
AIRPHOTO: MB90025-115

EXPLORATION SUMMARY

Stockwell (1935) indicates the occurrence was staked in 1929 and re-staked in 1934. Three trenches were excavated during that period.

During the 1992 field examination of the occurrence, 11 trenches were located. All of the excavations appear to be fairly recent, but no history of work was found in the cancelled assessment files. The quartz vein has been exposed along strike for approximately 50 m.

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 22-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). The occurrence is underlain by plagioclase and plagioclase-pyroxene-phyric pillowed flows of the NW-trending Tee Lake basalt (unit J1a) (Syme, 1991; Syme and Whalen, 1992). This basalt is approximately 900 m thick and is conformably (?) overlain to the SW by the Tee Lake rhyolite.

At the occurrence (Fig. 22-2) the rocks consist of fine-grained pillowed basalt with lesser interlayered flow breccia. The metavolcanic rocks trend approximately 115^{o} and contain up to 1% disseminated pyrrhotite. Minor magnetite is also present. An irregular, fine-grained, medium green, rhyolitic unit containing minor quartz phenocrysts is interlayered with the basalt. The sequence is strongly foliated adjacent to the quartz vein that was the evaluation target for this occurrence. The schistosity is variable, but trends 190^{o} with a moderate to steep westerly dip.

MINERALIZATION

A quartz vein up to 80 cm thick is exposed in most of the trenches at the occurrence. The vein trends parallel to the schistosity in the enclosing rocks. Minor pyrite is disseminated throughout the quartz. In the southern part of the occurrence pyrite occurs as masses within the quartz and comprises up to 5% of the vein. Up to 1% chalcopyrite is associated with the pyrite in this area. Euhedral black tourmaline (schorl?) grains to 0.5 mm are also present in the southern part of the occurrence.

GEOCHEMICAL DATA

Stockwell (1935) indicates that selected grab samples assayed up to 44.5 g Au/t (1.3 oz. Au/ton) in the western part of the occurrence, and up to 24 g Au/t (0.69 oz. Au/ton) from material obtained from the eastern trench at the occurrence. Assays obtained from channel samples returned the following results:

21.23 g Au/t (0.62 oz. Au/ton) across 0.9 m (3 ft.)

7.88 g Au/t (0.23 oz. Au/ton) across 1.2 m (4 ft.)

CLASSIFICATION

Vein type deposit; single vein. Hosted by schistose interval crosscutting mafic metavolcanic rocks.

REFERENCES

A.F. 90643, 92654; Cancelled Assessment Files, Manitoba Industry, Trade and Mines, Minerals Division.

NATMAP Shield Margin Project Working Group

1998: Geology, NATMAP Shield Margin Project Area (Flin Flon Belt), Manitoba-Saskatchewan; Geological Survey of Canada 1968A; Manitoba Energy and Mines Map A-98-2, Sheets 1 to 7; Saskatchewan Energy and Mines Map 258A-2, scale 1:100 000.

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Syme, E.C.

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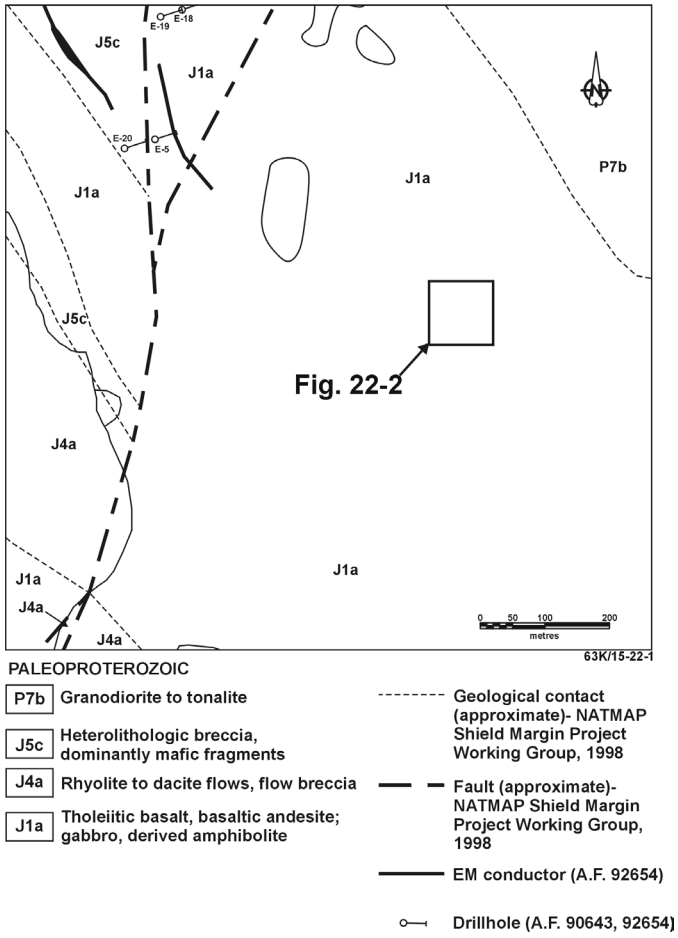

Figure 22-1: Geological setting of Long occurrence.

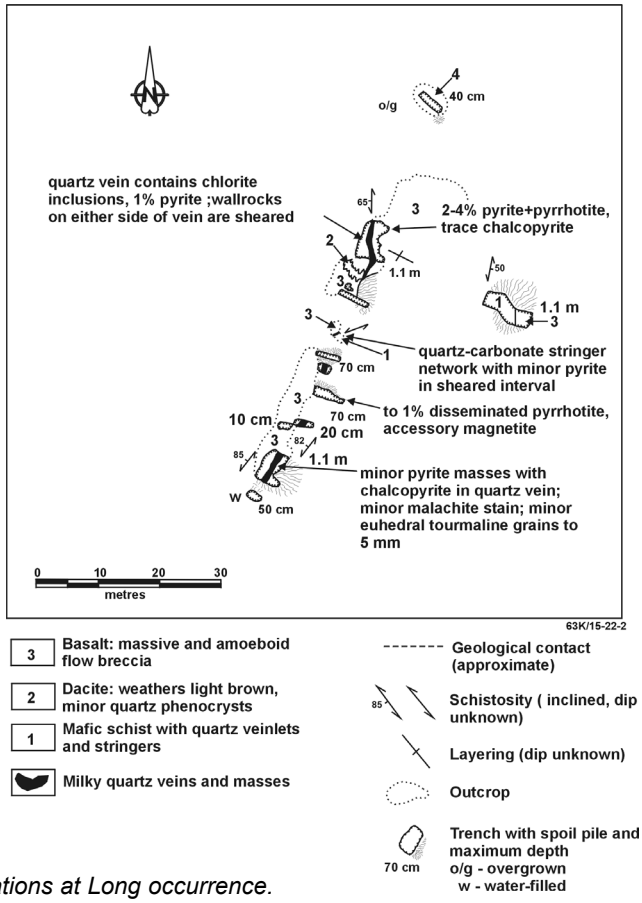

Figure 22-2: Geology and trench locations at Long occurrence.

LOCATION: 23

NAME: Veda No. 2
UTM: 380220E, 6085155N
AREA: approximately 1.7 km east of Tee Lake and 1.4 km NW of head of Moen Bay, Elbow Lake
ACCESS: via bush plane or by boat through the Cranberry Lakes from Cranberry Portage, then traverse
AIRPHOTO: MB90025-115

EXPLORATION SUMMARY

Stockwell (1935) indicates that several trenches were excavated in the occurrence area.

During the 1992 field examination of the occurrence, 3 trenches were located. No indication of work post-dating Stockwell's visit to the location was found in the cancelled assessment files.

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 23-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). The area is underlain by plagioclase and plagioclase-pyroxene-phyric pillowed flows of the NW-trending Tee Lake basalt (unit J1a) (Syme, 1991; Syme and Whalen, 1992). This unit is approximately 900 m thick and is conformably (?) overlain to the SW by the Tee Lake rhyolite (unit J4a).

The main rock at the occurrence consists of fine-grained, massive and flow brecciated basalt. A light grey, fine-grained quartz porphyry dyke containing uncommon quartz phenocrysts is exposed in one of the trenches. The metavolcanic and intrusive rocks contain thin schistose intervals that host the mineralization.

MINERALIZATION

Trench 1 exposes a quartz vein up to 7 cm thick trending 350^{o}/64^{o} in massive and flow brecciated basalt. Both the quartz vein and basalt contain minor disseminated pyrite. Several thin quartz veins with an irregular distribution were noted in exposures near the trench.

Trench 2 was excavated into a fine-grained, grey, siliceous, schistose quartz porphyry dyke. No sulphides were found in the trench or on the waste piles, but the rocks are extensively stained with Fe oxides. Minor disseminated pyrite and pyrrhotite are present in the dyke and enclosing mafic metavolcanic rock.

Trench 3 appears to be a relatively recent excavation into the side of a steep hill. The rock exposed in the trench is schistose and contains abundant pyrite that is banded parallel to the schistosity of the enclosing rock.

GEOCHEMICAL DATA

No assays have been reported for this occurrence, but Stockwell (1935) indicates that "Iron-stained, weathered bands in the schistose porphyry are said to pan plentiful free gold.".

CLASSIFICATION

Disseminated mineralization - not classified. Sulphides occur within schist, some of which is derived from quartz porphyry.

REFERENCES

A.F. 90643, 92654; Cancelled Assessment Files, Manitoba Industry, Trade and Mines, Minerals Division.

NATMAP Shield Margin Project Working Group

1998: Geology, NATMAP Shield Margin Project Area (Flin Flon Belt), Manitoba-Saskatchewan; Geological Survey of Canada 1968A; Manitoba Energy and Mines Map A-98-2, Sheets 1 to 7; Saskatchewan Energy and Mines Map 258A-2, scale 1:100 000.

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Syme, E.C. and Whalen, J.B.

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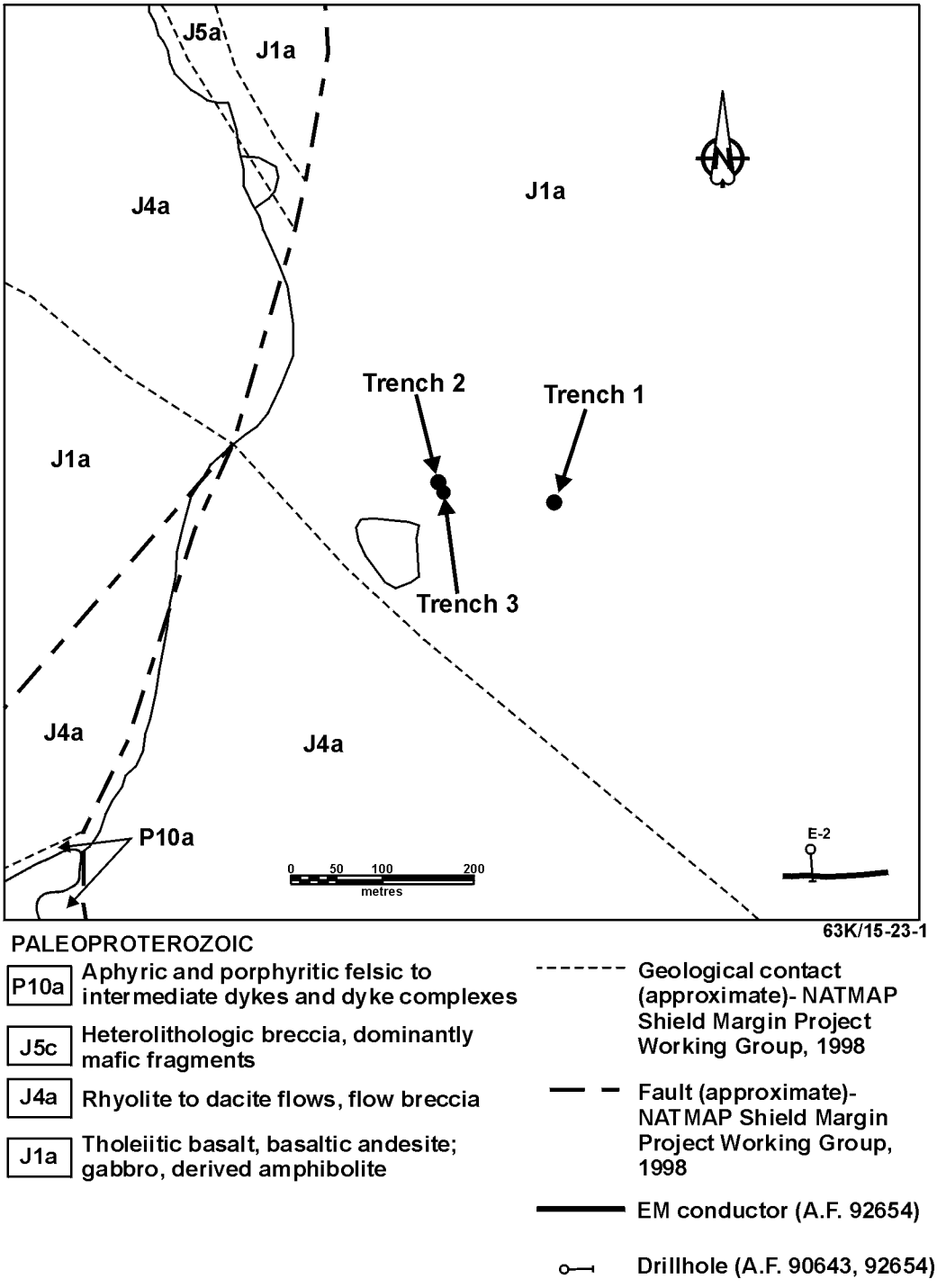

Figure 23-1: Geological setting and trench locations of Veda No. 2 occurrence.

LOCATION: 24

NAME: Tee Lake No. 4
UTM: 379430E, 6085745N
AREA: approximately 0.6 km east of Tee Lake
ACCESS: via bush plane or by boat through the Cranberry Lakes from Cranberry Portage, then traverse
AIRPHOTO: MB90025-115

EXPLORATION SUMMARY

Stockwell (1935) indicates that several trenches were excavated in the occurrence area.

During the 1992 field examination of the occurrence, an extensively stripped area was located. No history of work in the area was found in the cancelled assessment files.

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 24-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). The occurrence area is underlain by massive aphyric to quartz-phyric Tee Lake rhyolite (unit J4a) (Syme, 1991; Syme and Whalen, 1992). This unit is approximately 600 m thick north of Webb Island. The rhyolite is conformably (?) underlain to the NE by the Tee Lake basalt. It comprises the largest felsic complex in the Elbow Lake area.

The rocks in the occurrence area consist dominantly of fine-grained rhyolite containing up to 2% quartz phenocrysts. The rhyolite is made up of fragments that are several metres long in a dark green chloritic matrix. It is unclear if the fragmental character of this unit is primary or the result of hydrothermal alteration.

MINERALIZATION

Little sulphide was found at the occurrence, but the rocks are extensively stained by brown Fe oxides. Silicified areas consisting of quartz lined vugs, open spaces and barren massive quartz veins are present. At the north end of the occurrence fine-grained magnetite is associated with quartz and dark green chlorite. The chloritic alteration extends to the east over most of the outcrop. To the south of the main stripped area the chlorite alteration disappears and is replaced by fine-grained sericite.

The only sulphides noted were <2% pyrrhotite, as disseminated grains and aggregates up to 5 mm, and minor disseminated pyrite.

GEOCHEMICAL DATA

Stockwell (1935) indicated that the "... fresh and rusty porphyries are said to pan coarse gold and to assay from 0.10 to 0.18 ounce of gold a ton."

CLASSIFICATION

Disseminated mineralization - not classified. Occurs in extensively altered rhyolitic sequence.

REFERENCES

A.F. 90504; Cancelled Assessment File, Manitoba Industry, Trade and Mines, Minerals Division.

NATMAP Shield Margin Project Working Group

1998: Geology, NATMAP Shield Margin Project Area (Flin Flon Belt), Manitoba-Saskatchewan; Geological Survey of Canada 1968A; Manitoba Energy and Mines Map A-98-2, Sheets 1 to 7; Saskatchewan Energy and Mines Map 258A-2, scale 1:100 000.

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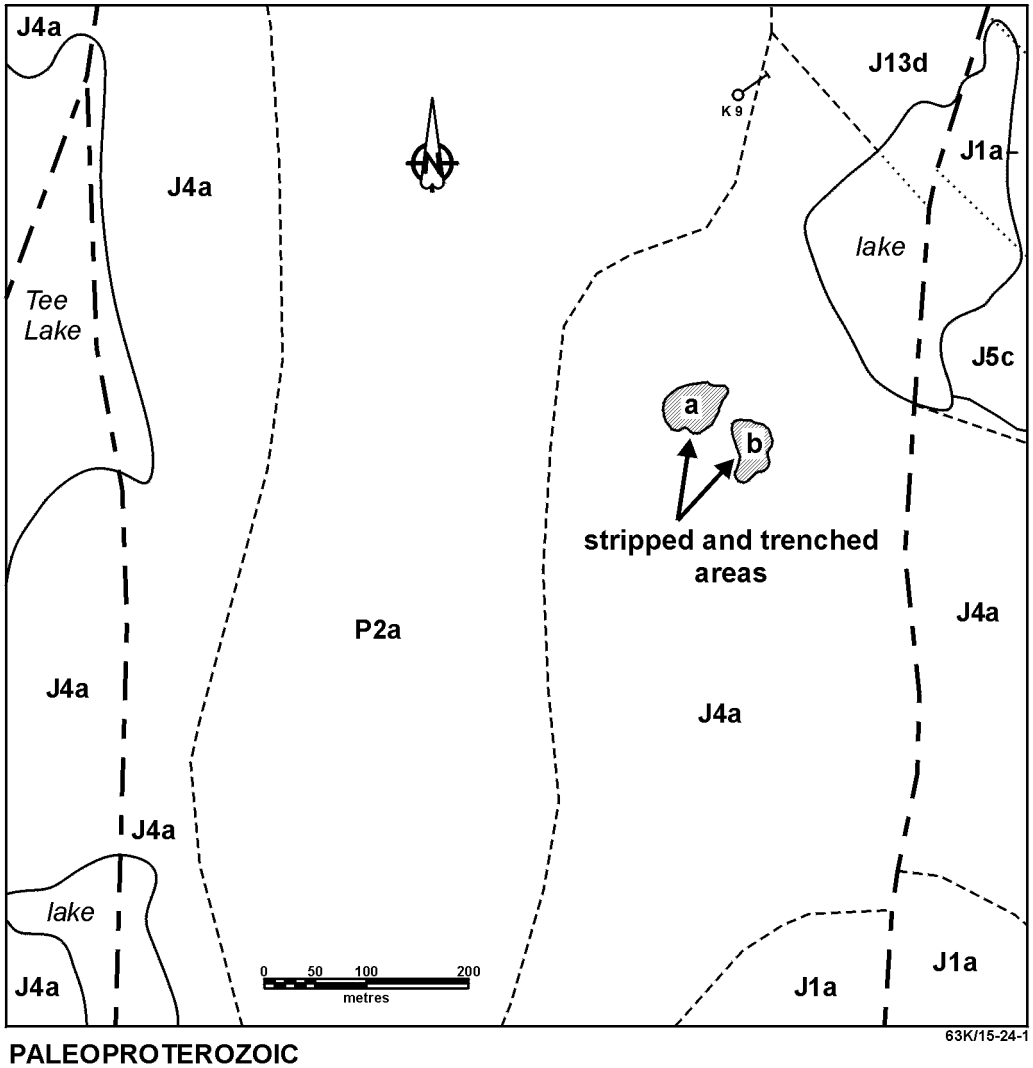
Syme, E.C. and Whalen, J.B.

1992: Geology, Elbow Lake, Manitoba; Geological Survey of Canada, Preliminary 1:20 000 map, Shield-Margin Project, File ELBOW92.PS.



PALEOPROTEROZOIC

P2a	Gabbro, diorite
J13d	Felsic to mafic dyke complex
J5c	Heterolithologic breccia, dominantly mafic fragments
J4a	Rhyolite to dacite flows, flow breccia
J1a	Tholeiitic basalt, basaltic andesite; gabbro, derived amphibolite

Geological contact (approximate, extrapolated)- NATMAP Shield Margin Project Working Group, 1998

Fault (approximate)- NATMAP Shield Margin Project Working Group, 1998

Drillhole (A.F. 90504)

Figure 24-1: Geological setting of Tee Lake No. 4 occurrence.

LOCATION: 25

NAME: Fred
UTM: 378500E, 6079735N
AREA: on eastern shoreline of small island west of Big Poplar Island, Elbow Lake
ACCESS: via bush plane or by boat through the Cranberry Lakes from Cranberry Portage
AIRPHOTO: MB90025-120

EXPLORATION SUMMARY

Stockwell (1935) indicates that a single trench was excavated at the occurrence.

This overgrown trench was located during the 1992 field examination of the occurrence. No history of additional work at the occurrence was found in the cancelled assessment files.

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 25-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). The occurrence is located approximately 450 m W of the western margin of the Elbow Lake shear zone (unit W6c) (Galley *et al*., 1987, 1989; Syme, 1990, 1991, 1992), and the area is underlain by pillowed and massive aphyric flows of the McDougalls Point basalt (unit F1a) (Syme, 1991; Syme and Whalen, 1992).

Stockwell (1935) and Galley (field notes, 1987) indicate the occurrence is located at the contact of a red quartz-feldspar porphyry dyke, at least 15 m thick, and well foliated mafic metavolcanic rock. A thin chert-magnetite Fe-formation is exposed in the trench along the SW edge of the dyke. The sequence to the west of the occurrence on the main part of the island is dominated by mafic, moderately calcareous, volcaniclastic rocks.

MINERALIZATION

Disseminated pyrite occurs in both the schistose mafic metavolcanic rocks at the contact with the quartz-feldspar porphyry dyke and within the dyke itself. The dyke contains abundant irregular white quartz fracture fillings as well as a planar vein set trending 070^{o}. The Fe-formation contains minor pyrite, molybdenite and possibly sphalerite and greenalite. Minor arsenopyrite has been noted within quartz veins in the dyke (Galley, field notes, 1987).

GEOCHEMICAL DATA

No assays were reported for this occurrence.

CLASSIFICATION

Vein type deposit; single vein/lenses. Quartz vein associated with quartz-feldspar porphyry dyke and magnetite-chert Fe-formation.

REFERENCES

A.F. 90511, 91487, 92654; Cancelled Assessment Files, Manitoba Industry, Trade and Mines, Minerals Division.

Galley, A.G., Ames, D.E. and Franklin, J.M.

1987: Geological setting of gold mineralization in the Elbow Lake region, Manitoba; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1987, pp.175-177.

1989: Results of studies on the gold metallogeny of the Flin Flon belt; in Investigations by the Geological Survey of Canada in Manitoba and Saskatchewan during the 1984-1989 Mineral Development Agreements, Geological Survey of Canada, Open File 2133, pp.25-32.

NATMAP Shield Margin Project Working Group

1998: Geology, NATMAP Shield Margin Project Area (Flin Flon Belt), Manitoba-Saskatchewan; Geological Survey of Canada 1968A; Manitoba Energy and Mines Map A-98-2, Sheets 1 to 7; Saskatchewan Energy and Mines Map 258A-2, scale 1:100 000.

Stockwell, C.H.

1935: Gold Deposits of the Elbow-Morton Area, Northern Manitoba; Geological Survey of Canada, Memoir 186, 74pp.

Syme, E.C.

1990: Elbow Lake project (part of NTS 63K/15W); in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1990, pp.49-57.

1991: Elbow Lake project - Part A: supracrustal rocks and structural setting; in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1991, pp.14-27.

1992: Elbow Lake Project - Part A: Supracrustal rocks; in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1992, pp.32-46.

Syme, E.C. and Whalen, J.B.

1992: Geology, Elbow Lake, Manitoba; Geological Survey of Canada, Preliminary 1:20 000 map, Shield-Margin Project, File ELBOW92.PS.

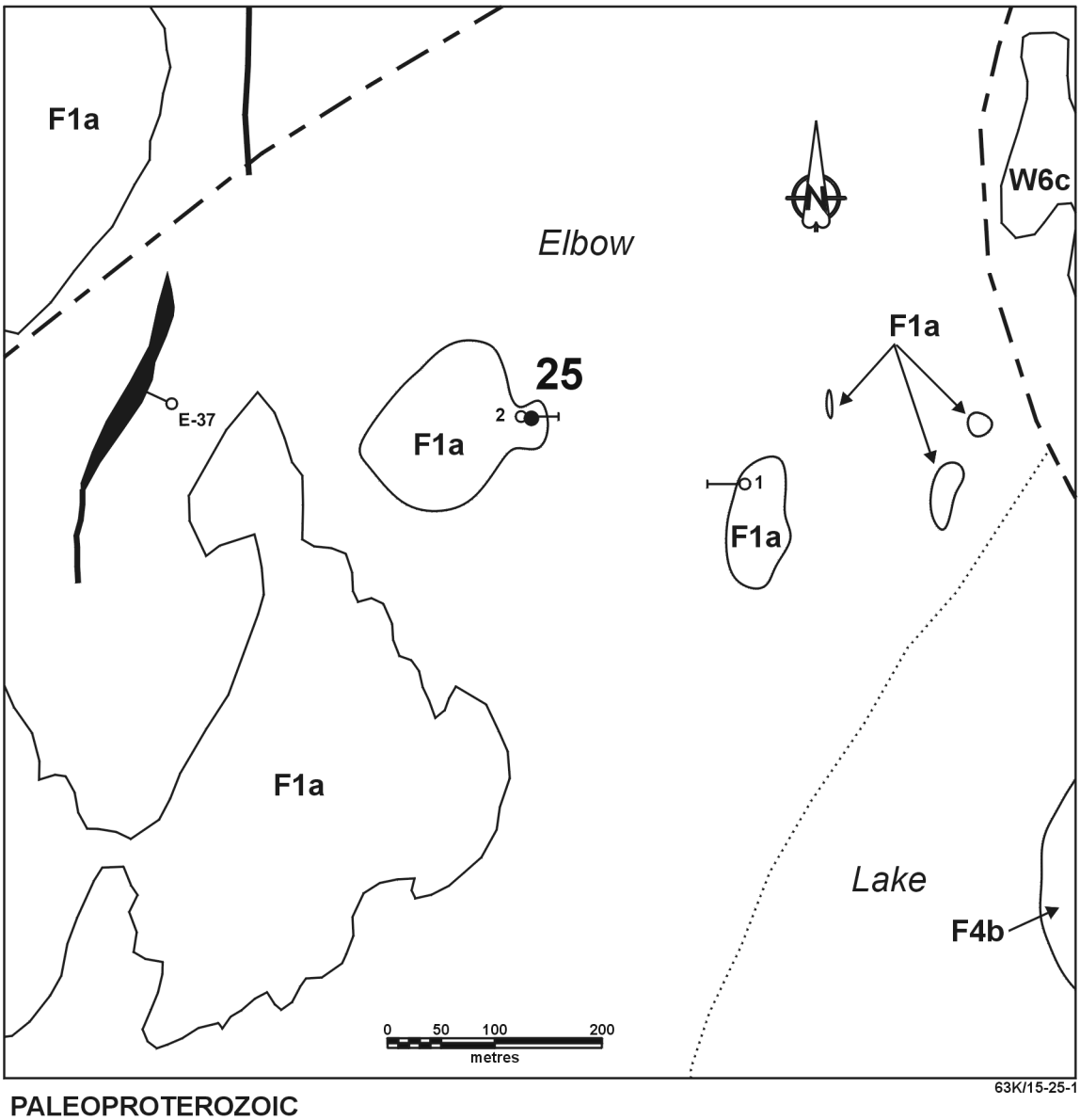


Figure 25-1: Geological setting of Fred occurrence.

LOCATION: 26

NAME: G.H.
UTM: 377830E, 6080355N
AREA: near west side of Elbow Lake, east of Long Bay
ACCESS: via bush plane or by boat through the Cranberry Lakes from Cranberry Portage, then traverse
AIRPHOTO: MB90025-139

EXPLORATION SUMMARY

Stockwell (1935) indicates that several trenches were excavated at the occurrence.

Five trenches, now mostly overgrown, were located during the 1992 field examination of the occurrence. No history of additional work at the occurrence was found in the cancelled assessment files.

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 26-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). The occurrence is located approximately 1.1 km W of the western margin of the Elbow Lake shear zone (Galley *et al*., 1987, 1989; Syme, 1990, 1991, 1992). The area is underlain by NE-trending, SE-topping pillowed and massive plagioclase-phyric flows of the McDougalls Point basalt (unit F1a). The basalt is at least 1100 m thick (Syme, 1991; Syme and Whalen, 1992). The mafic flows are intruded by synvolcanic diabase/gabbro intrusions and east-west striking felsic dykes (Galley, field notes, 1987). A series of NNW- striking shears crosscut the basalt in the area.

The two northernmost trenches of the three trenches at the southern part of the occurrence (Fig. 26-2) expose brown-weathering quartz porphyry, which extends at least 45 m east of the trenches. The southernmost trench appears to have been excavated into slightly schistose metavolcanic rock. The contact of the basalt with the quartz porphyry is not exposed.

MINERALIZATION

The quartz porphyry and schistose basalt are cut by discrete white quartz veins and veinlets to 30 cm thick that show little strike continuity. In the spoil pile beside the central trench (Fig. 26-2), quartz makes up 50% of the rock. The quartz contains patches of carbonate and minor disseminated pyrite. Minor disseminated pyrite and arsenopyrite are also present along fractures in the quartz porphyry.

GEOCHEMICAL DATA

Galley (field notes, 1987) obtained an average of 138 ppb Au and 43 ppm tungsten from two sulphide-rich rock samples at the occurrence.

CLASSIFICATION

Vein type deposit; multiple veins or lenses. Multiple stringer network hosted by basalt and quartz porphyry.

REFERENCES

A.F. 92654; Cancelled Assessment File, Manitoba Industry, Trade and Mines, Minerals Division.

Galley, A.G., Ames, D.E. and Franklin, J.M.

1987: Geological setting of gold mineralization in the Elbow Lake region, Manitoba; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1987, pp.175-177.

1989: Results of studies on the gold metallogeny of the Flin Flon belt; in Investigations by the Geological Survey of Canada in Manitoba and Saskatchewan during the 1984-1989 Mineral Development Agreements, Geological Survey of Canada, Open File 2133, pp.25-32.

NATMAP Shield Margin Project Working Group

1998: Geology, NATMAP Shield Margin Project Area (Flin Flon Belt), Manitoba-Saskatchewan; Geological Survey of Canada 1968A; Manitoba Energy and Mines Map A-98-2, Sheets 1 to 7; Saskatchewan Energy and Mines Map 258A-2, scale 1:100 000.

Stockwell, C.H.

1935: Gold Deposits of the Elbow-Morton Area, Northern Manitoba; Geological Survey of Canada, Memoir 186, 74pp.

Syme, E.C.

1990: Elbow Lake project (part of NTS 63K/15W); in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1990, pp.49-57.

1991: Elbow Lake project - Part A: supracrustal rocks and structural setting; in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1991, pp.14-27.

1992: Elbow Lake Project - Part A: Supracrustal rocks; in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1992, pp.32-46.

Syme, E.C. and Whalen, J.B.

1992: Geology, Elbow Lake, Manitoba; Geological Survey of Canada, Preliminary 1:20 000 map, Shield-Margin Project, File ELBOW92.PS.

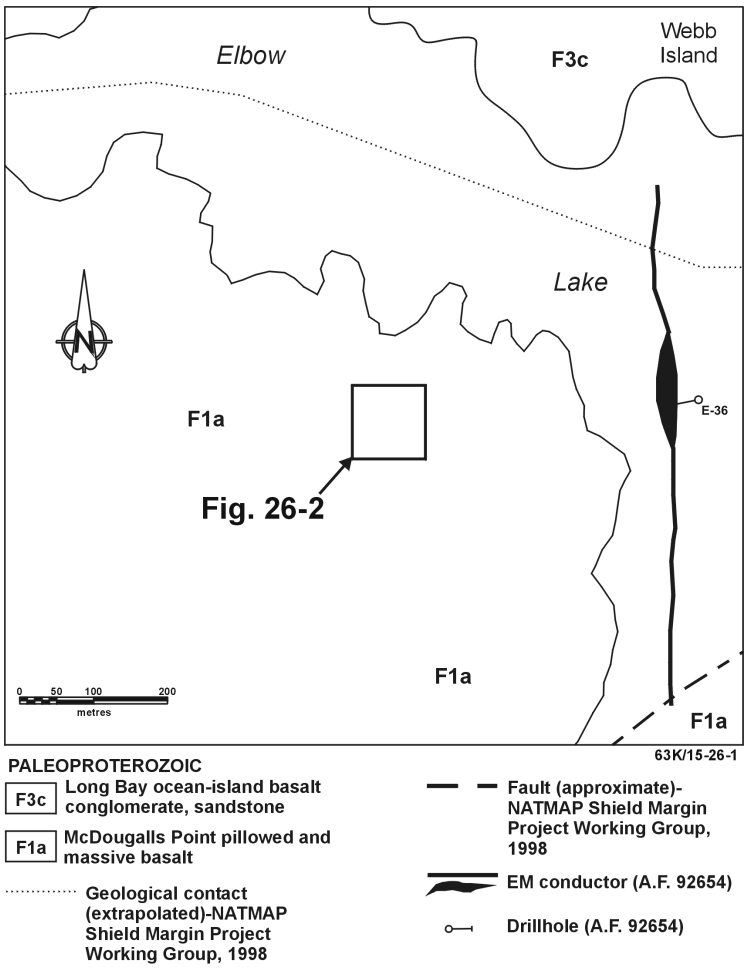


Figure 26-1: Geological setting of G.H. occurrence.

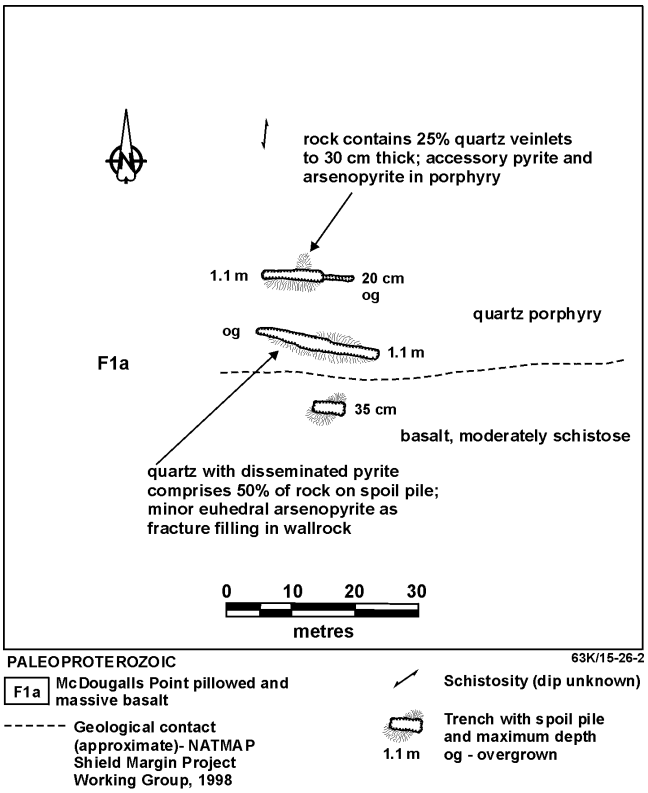


Figure 26-2: Geology and trench locations at G.H. occurrence.

LOCATION: 27

NAME: Jessie
UTM: 377260E, 6080685N
AREA: along west side of Elbow Lake at mouth of Long Bay
ACCESS: via bush plane or by boat through the Cranberry Lakes from Cranberry Portage
AIRPHOTO: MB90025-139

EXPLORATION SUMMARY

Stockwell (1935) indicates that two trenches were excavated along the shoreline at the occurrence.

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 27-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). The occurrence is located approximately 2 km W of the western margin of the Elbow Lake shear zone (Galley *et al*., 1987, 1989; Syme, 1990, 1991, 1992). The area is underlain by NE-trending, SE-topping pillowed and massive aphyric flows of the McDougalls Point basalt (unit F1a). A synvolcanic, fine to medium-grained, equigranular gabbro (unit P2a) occurs a short distance to the SE of the occurrence. Northwest-striking quartz-feldspar dykes crosscut the sequence (Galley, field notes, 1987).

A series of NNW and ESE striking shears crosscut the basalt in the area. These shears show patchy carbonatization and minor sulphide mineralization.

MINERALIZATION

Quartz veins occur in an east-west striking carbonate alteration zone. Carbonate stringers occur parallel to the foliation and form *en échelon* vein networks. Stockwell (1935) indicated the quartz occurs as stringers and veins across a width of approximately 3 m, and individual quartz veins are up to 15 cm thick. The quartz contains carbonate, feldspar, chlorite and small quantities of disseminated pyrite. Some disseminated pyrite is also present in the schist surrounding the vein.

GEOCHEMICAL DATA

No assays were reported for this occurrence.

CLASSIFICATION

Vein type deposit; multiple veins or lenses.

REFERENCES

A.F. 92654; Cancelled Assessment File, Manitoba Industry, Trade and Mines, Minerals Division.

Galley, A.G., Ames, D.E. and Franklin, J.M.

1987: Geological setting of gold mineralization in the Elbow Lake region, Manitoba; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1987, pp.175-177.

1989: Results of studies on the gold metallogeny of the Flin Flon belt; in Investigations by the Geological Survey of Canada in Manitoba and Saskatchewan during the 1984-1989 Mineral Development Agreements, Geological Survey of Canada, Open File 2133, pp.25-32.

NATMAP Shield Margin Project Working Group

1998: Geology, NATMAP Shield Margin Project Area (Flin Flon Belt), Manitoba-Saskatchewan; Geological Survey of Canada 1968A; Manitoba Energy and Mines Map A-98-2, Sheets 1 to 7; Saskatchewan Energy and Mines Map 258A-2, scale 1:100 000.

Stockwell, C.H.

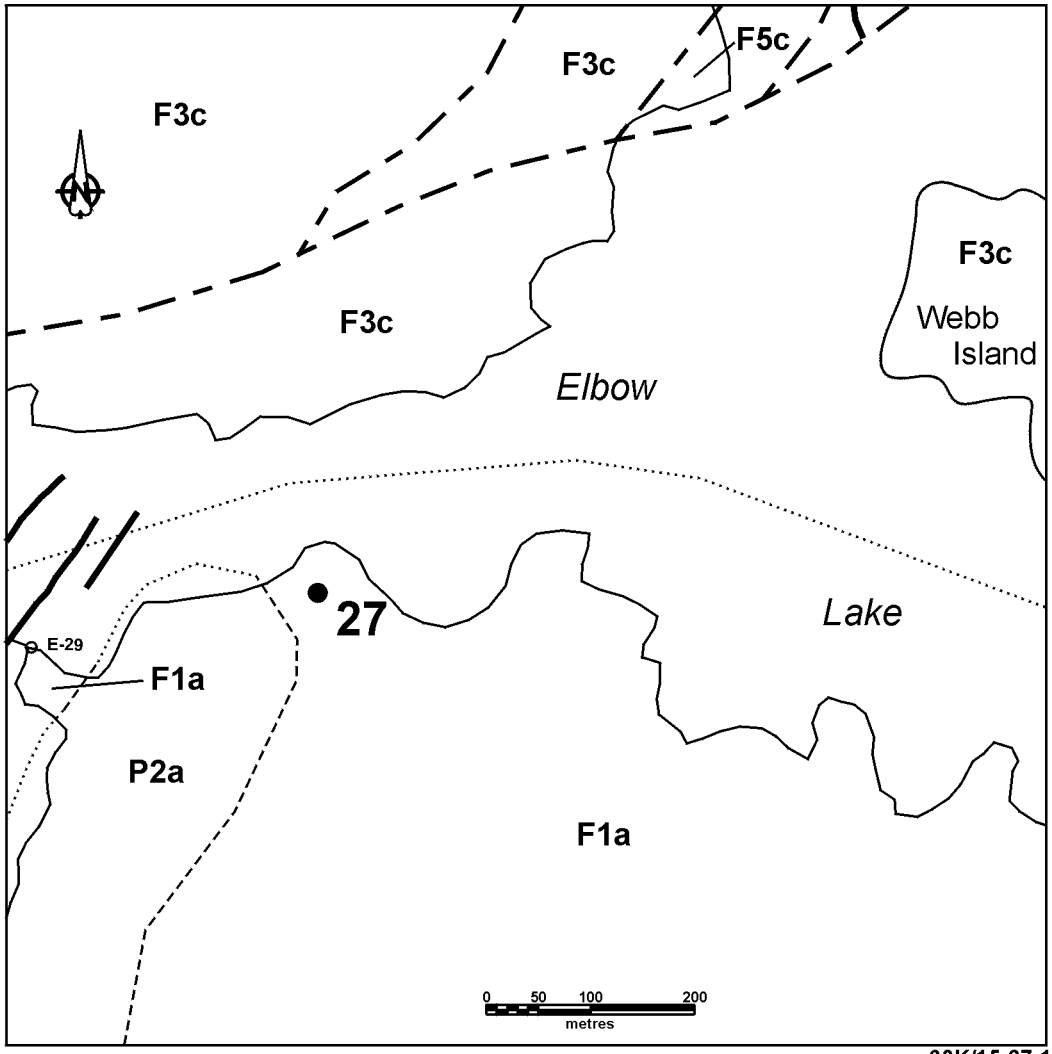
1935: Gold Deposits of the Elbow-Morton Area, Northern Manitoba; Geological Survey of Canada, Memoir 186, 74pp.

Syme, E.C.

1990: Elbow Lake project (part of NTS 63K/15W); in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1990, pp.49-57.

1991: Elbow Lake project - Part A: supracrustal rocks and structural setting; in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1991, pp.14-27.

1992: Elbow Lake Project - Part A: Supracrustal rocks; in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1992, pp.32-46.



PALEOPROTEROZOIC

- P2a — Gabbro, diorite
- J5c — Heterolithologic breccia, dominantly mafic fragments
- F3c — Long Bay ocean-island basalt conglomerate, sandstone
- F1a — McDougalls Point pillowed and massive basalt

- Geological contact (approximate, extrapolated)- NATMAP Shield Margin Project Working Group, 1998
- Fault (approximate)- NATMAP Shield Margin Project Working Group, 1998
- EM conductor (A.F. 92654)
- Drillhole (A.F. 92654)
- 27 Mineral occurrence location

Figure 27-1: Geological setting of Jessie occurrence.

LOCATION: 28

NAME: Rod
UTM: 375525E, 6079595N
AREA: approximately 0.4 km WSW of south end of Long Bay, Elbow Lake
ACCESS: via bush plane or by boat through the Cranberry Lakes from Cranberry Portage, then traverse
AIRPHOTO: MB90025-139

EXPLORATION SUMMARY

The claim was staked in 1933 and a trench excavated (Stockwell, 1935). Noranda Exploration Company, Ltd. undertook an HLEM (Ronka Mk. III) survey adjacent to the occurrence area in 1971 (A.F. 90500). In 1986 the occurrence area was mapped and sampled (A.F. 93250).

Two mostly overgrown trenches were located during the 1992 examination of the occurrence.

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 28-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). Syme (1991) and Syme and Whalen (1992) indicate that the area is underlain by massive, coarse-grained pyroxenite and melagabbro, coarse-grained gabbro to hornblende-biotite diorite (units P2a and P2d) of the Echo Lake pluton, gabbro and melagabbro (unit P1a) of the Long Bay gabbro complex , and the Long Bay basaltic conglomerate (unit F3c). The sequence has been intruded by felsic and feldspar porphyry dykes.

The occurrence is located near the contact of a well-foliated fragmental mafic unit and quartz diorite. It is unclear if the volcanic unit represents a large xenolith within the diorite.

MINERALIZATION

Two quartz veins 25 and 30 cm thick are exposed in the NE side of the southern trench. These veins trend 182/62º. Much quartz is present on the spoil pile. The quartz vein material contains orange feldspar and minor pyrite. A 25 cm thick quartz vein is exposed along the E side of the northern trench. It trends 165/71º, and has similar characteristics as those exposed in the southern trench.

GEOCHEMICAL DATA

Stockwell (1935) indicated that a sample across 1.2 m (4 ft.) of quartz carried 8.56 g Au/t (0.25 oz. Au/ton). An assay from a grab sample collected in 1986 from the occurrence area returned an assay of 0.68 g Au/t (0.02 oz. Au/ton) (A.F. 93250).

CLASSIFICATION

Vein type deposit; multiple veins or lenses. Hosted by schistose mafic metavolcanic rock near a quartz diorite intrusion.

REFERENCES

A.F. 90500, 91487, 92654, 93250; Cancelled Assessment Files, Manitoba Industry, Trade and Mines, Minerals Division.

NATMAP Shield Margin Project Working Group

1998: Geology, NATMAP Shield Margin Project Area (Flin Flon Belt), Manitoba-Saskatchewan; Geological Survey of Canada 1968A; Manitoba Energy and Mines Map A-98-2, Sheets 1 to 7; Saskatchewan Energy and Mines Map 258A-2, scale 1:100 000.

Stockwell, C.H.

1935: Gold Deposits of the Elbow-Morton Area, Northern Manitoba; Geological Survey of Canada, Memoir 186, 74pp.

Syme, E.C.

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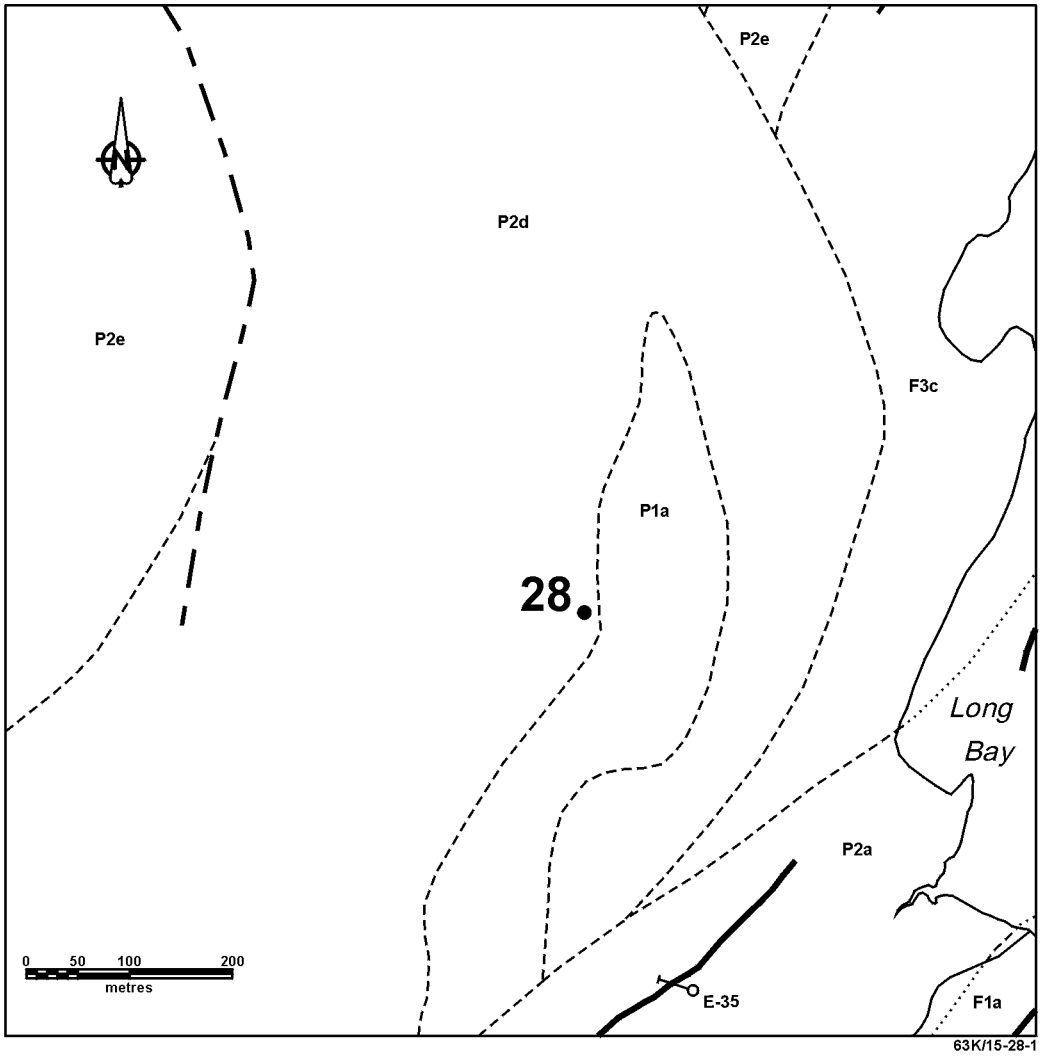
Syme, E.C. and Whalen, J.B.

1992: Geology, Elbow Lake, Manitoba; Geological Survey of Canada, Preliminary 1:20 000 map, Shield-Margin Project, File ELBOW92.PS.



PALEOPROTEROZOIC

- **P2a** Gabbro, diorite
- **P2d** Quartz diorite and gabbro
- **P2e** Diorite to quartz diorite
- **P1a** Pyroxenite, melagabbro
- **F3c** Long Bay ocean-island basalt conglomerate, sandstone
- **F1a** McDougalls Point pillowed and massive basalt

- Geological contact (approximate, extrapolated)- NATMAP Shield Margin Project Working Group, 1998
- Fault (approximate)- NATMAP Shield Margin Project Working Group, 1998
- EM conductor (A.F. 91487, 92654)
- Drillhole (A.F. 91487, 92654)
- **28.** Mineral occurrence location

Figure 28-1: Geological setting of Rod occurrence.

LOCATION: 29

NAME: Beta
UTM: 375755E, 6079620N
AREA: approximately 0.6 km W of south end of Long Bay, Elbow Lake
ACCESS: via bush plane or by boat through the Cranberry Lakes from Cranberry Portage, then traverse
AIRPHOTO: MB90025-139

EXPLORATION SUMMARY

The claim was staked in 1933 and several trenches excavated (Stockwell, 1935). In 1986 the occurrence area was mapped and sampled (A.F. 93250). This assessment file indicates that some of the work was performed on the Rod occurrence, but the western trenches are located at the Beta occurrence.

In 1992 a stripped and trenched area was located; most of the excavations were flooded or overgrown, and bedrock was only poorly exposed.

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 29-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). The area is underlain by massive, coarse-grained pyroxenite and melagabbro, coarse-grained gabbro to hornblende-biotite diorite (unit P2d) of the Echo Lake pluton, gabbro and melagabbro of the Long Bay gabbro complex, and the Long Bay basaltic conglomerate (unit F3c) (Syme, 1991; Whalen, 1991, 1992; Syme and Whalen, 1992).

The occurrence is located in a series of intrusive rocks that are dominated by a hornblende-rich granite, in places becoming a hornblendite. Irregular fine-grained intermediate to felsic dykes of several generations are common in the area.

MINERALIZATION

The location of the trenches is shown in Fig. 29-2 and 29-3. A chloritic schistose area along the SE margin of a fine-grained intermediate to felsic dyke contains a quartz vein and quartz masses (Fig. 29-2). The quartz vein trends 035^{o}, is up to 70 cm thick and locally contains up to 15% disseminated pyrite. Minor chalcopyrite is present, and is rarely stained with malachite and azurite. Angular wallrock fragments are common inclusions. At the north end of the main series of trenches, the quartz vein and schistose area is truncated by an irregular fine-grained felsic dyke (Fig. 29-2).

GEOCHEMICAL DATA

Assays from grab samples collected from various trenches in the occurrence area returned assays ranging from trace to 3.08 g Au/t (to 0.09 oz. Au/ton) and up to 2.14% Cu (A.F. 93250).

CLASSIFICATION

Vein type deposit; single vein. In chlorite schist adjacent to fine-grained intermediate to felsic dyke.

REFERENCES

A.F. 91487, 92654, 93250; Cancelled Assessment Files, Manitoba Industry, Trade and Mines, Minerals Division.

NATMAP Shield Margin Project Working Group

1998: Geology, NATMAP Shield Margin Project Area (Flin Flon Belt), Manitoba-Saskatchewan; Geological Survey of Canada 1968A; Manitoba Energy and Mines Map A-98-2, Sheets 1 to 7; Saskatchewan Energy and Mines Map 258A-2, scale 1:100 000.

Stockwell, C.H.

1935: Gold Deposits of the Elbow-Morton Area, Northern Manitoba; Geological Survey of Canada, Memoir 186, 74pp.

Syme, E.C.

1991: Elbow Lake project - Part A: supracrustal rocks and structural setting; in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1991, pp.14-27.

Syme, E.C. and Whalen, J.B.

1992: Geology, Elbow Lake, Manitoba; Geological Survey of Canada, Preliminary 1:20 000 map, Shield-Margin Project, File ELBOW92.PS.

Whalen, J.B.

1991: Elbow Lake project - Part B: Granitoid rocks; in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1991, pp. 28-30.

1992: Elbow Lake project - Part B: Granitoid rocks; in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1992, pp. 47-51.

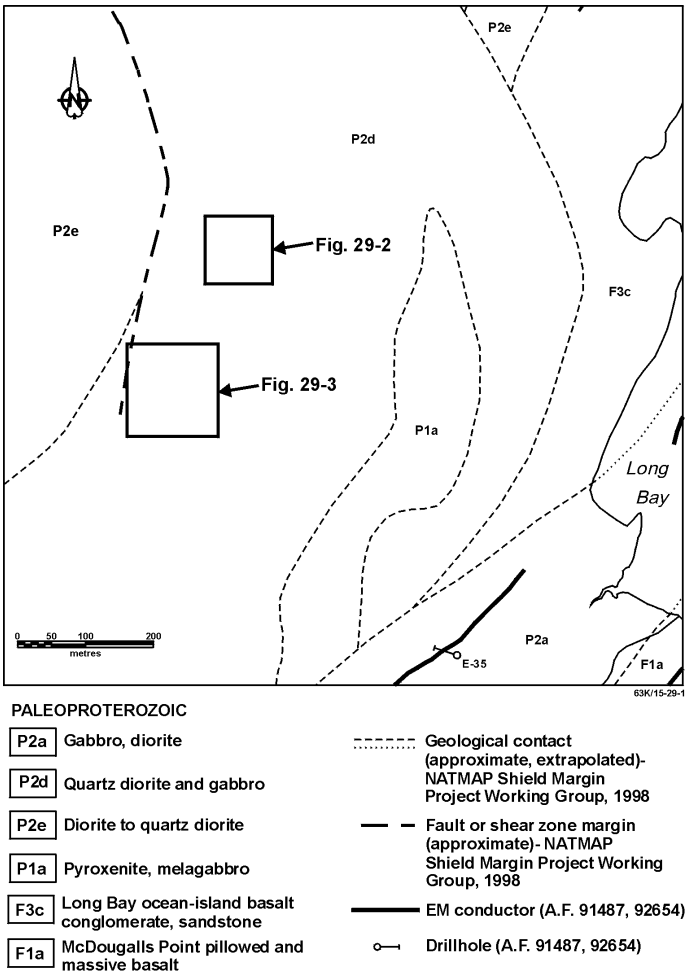


Figure 29-1: Geological setting of Beta occurrence.

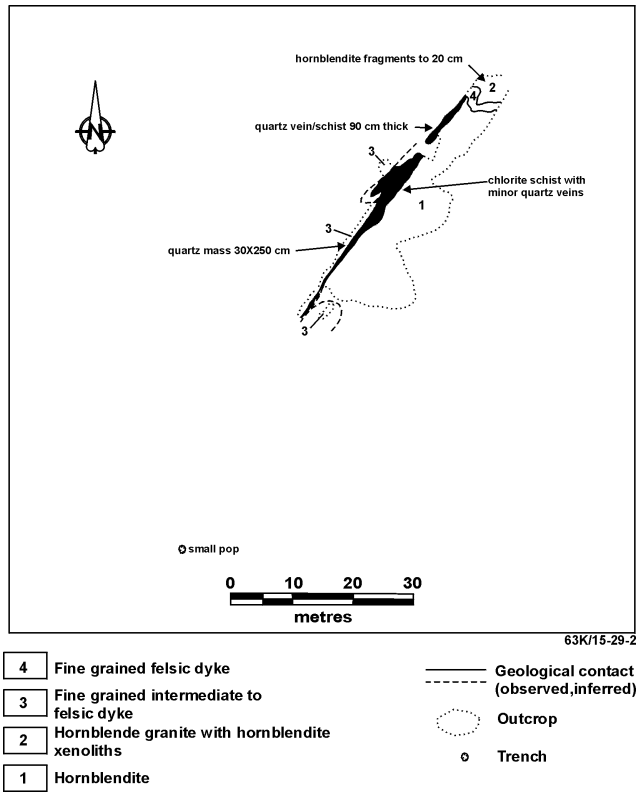


Figure 29-2: Geology and trench locations at Beta occurrence.

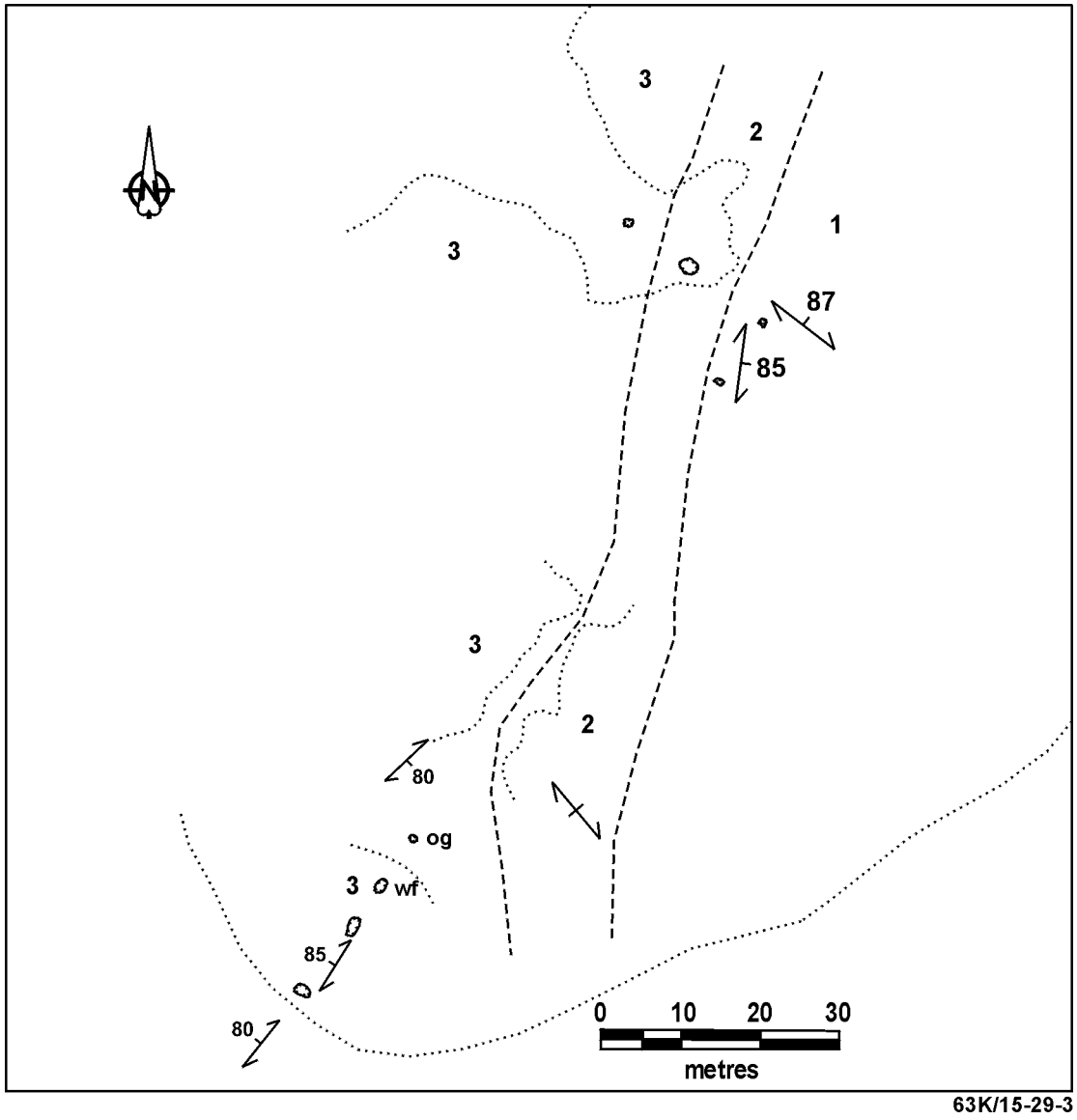


Figure 29-3: Geology and trench locations at Beta occurrence.

LOCATION: 30

NAME: Moneystone
UTM: 375450E, 6080725N
AREA: approximately 1.3 km W of north end of Long Bay, Elbow Lake
ACCESS: via bush plane or by boat through the Cranberry Lakes from Cranberry Portage, then traverse
AIRPHOTO: MB90025-139

EXPLORATION SUMMARY

Stockwell (1935) indicates that this occurrence was evaluated by a shaft and several trenches.

These were located during the 1992 examination of the occurrence.

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 30-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). The area is underlain by granitoid rocks (unit P2d) of the Echo Lake pluton (Whalen, 1991, 1992; Syme and Whalen, 1992). This pluton is bounded to the east by the Tee Lake dyke complex (unit J13d) (Syme, 1991).

The occurrence is hosted by medium-grained, massive quartz diorite. The diorite is intruded by an easterly-striking feldspar porphyry dyke that also cuts the quartz-bearing shear zone.

MINERALIZATION

A quartz vein up to 60 cm thick occurs in a shear zone that cuts pink and medium green quartz diorite. The vein trends 210/65º, contains minor carbonate and can be traced for approximately 65 m along strike. The quartz has moderately limonitic fractures and contains wallrock inclusions, but no sulphides were observed. Stockwell (1935) indicates that minor disseminated pyrite is present in the vein.

GEOCHEMICAL DATA

No assays were reported for this occurrence.

CLASSIFICATION

Vein type deposit; single vein. In a narrow shear zone that cuts quartz diorite.

REFERENCES

NATMAP Shield Margin Project Working Group

1998: Geology, NATMAP Shield Margin Project Area (Flin Flon Belt), Manitoba-Saskatchewan; Geological Survey of Canada 1968A; Manitoba Energy and Mines Map A-98-2, Sheets 1 to 7; Saskatchewan Energy and Mines Map 258A-2, scale 1:100 000.

Stockwell, C.H.

1935: Gold Deposits of the Elbow-Morton Area, Northern Manitoba; Geological Survey of Canada, Memoir 186, 74pp.

Syme, E.C.

1991: Elbow Lake project - Part A: supracrustal rocks and structural setting; in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1991, pp.14-27.

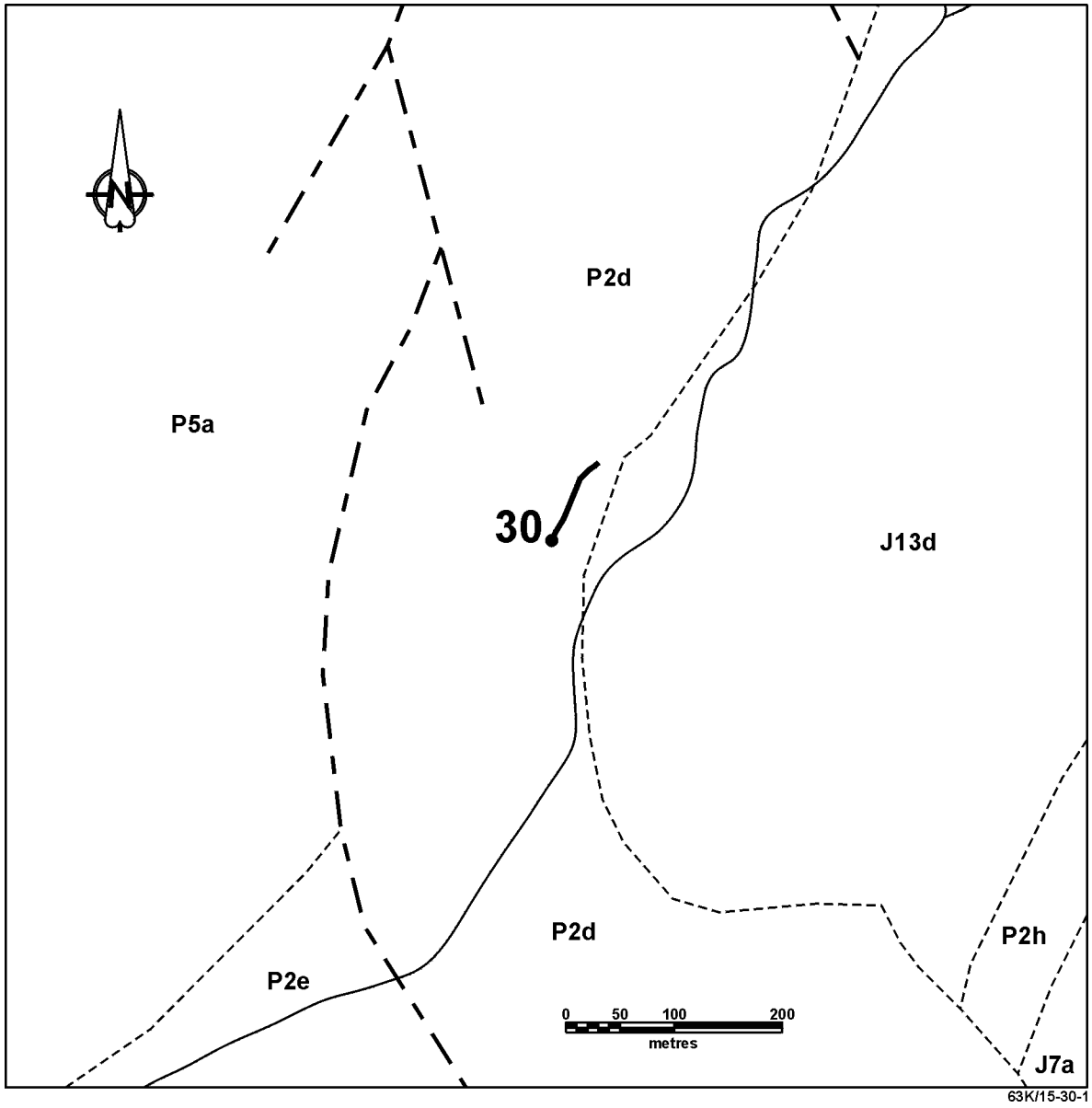
Syme, E.C. and Whalen, J.B.

1992: Geology, Elbow Lake, Manitoba; Geological Survey of Canada, Preliminary 1:20 000 map, Shield-Margin Project, File ELBOW92.PS.

Whalen, J.B.

1991: Elbow Lake project - Part B: Granitoid rocks; in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1991, pp. 28-30.

1992: Elbow Lake project - Part B: Granitoid rocks; in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1992, pp. 47-51.



PALEOPROTEROZOIC

- P5a — Quartz diorite to granodiorite
- P2d — Quartz diorite and gabbro
- P2e — Diorite to quartz diorite
- P2h — Gabbro, diorite, quartz diorite and derived amphibolite: xenolith-rich phase
- J13d — Felsic to mafic dyke complex
- J7a — Felsic tuff, lapilli tuff, breccia, heterolithologic breccia
- F3c — Long Bay ocean-island basalt conglomerate, sandstone
- Quartz vein (Stockwell, 1935)
- Geological contact (approximate)- NATMAP Shield Margin Project Working Group, 1998
- Fault (approximate)- NATMAP Shield Margin Project Working Group, 1998
- 30. Mineral occurrence location

Figure 30-1: Geological setting of Moneystone occurrence.

LOCATION: 31

NAME: Gunwor
UTM: 375640E, 6080685N
AREA: approximately 1.1 km W of north end of Long Bay, Elbow Lake
ACCESS: via bush plane or by boat through the Cranberry Lakes from Cranberry Portage, then traverse
AIRPHOTO: MB90025-139

EXPLORATION SUMMARY

Gold was discovered at the occurrence in 1933 (Stockwell, 1935), and by 1934 several quartz veins had been evaluated in two shafts approximately 7 m (24 ft.) deep and 45 trenches. In 1963 Juma Mining and Exploration Limited performed a magnetic survey of the area and undertook a geological mapping and diamond drilling programme. Twelve holes were subsequently drilled on geological and magnetic targets (A.F. 91955).

The shafts and trenches were located during the 1992 field examination of the property. Most of the excavations had caved and the bedrock obscured. Many of the trees burned during the 1989 fire have blown over, and the old trenches and outcrops are further obscured by deadfall and new growth. Two trenches at the north end of the occurrence appear to have been excavated fairly recently.

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 31-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). The area is underlain by an assemblage consisting of diabase, rhyolite, leucotonalite, plagioclase- and plagioclase-amphibole mafic porphyry, and plagioclase-quartz felsic porphyry dykes emplaced in hornfelsed pillowed basalt flows (unit J13d). These units comprise part of the Tee Lake dyke complex (Syme, 1991, 1992). Various granitoid rocks (unit P2d) of the Echo Lake pluton occur a short distance to the west of the complex (Whalen, 1991, 1992; Syme and Whalen, 1992).

The rocks at the occurrence consist dominantly of fine-grained basalt flows (Fig. 31-2 and –3). The flows have a moderately well developed schistosity that trends northeasterly with a dip ranging from 60 to 85^{o} SE. Some outcrops show a steep southwesterly dip. Minor rhyolitic units are intercalated with the basalt, trending at a slight angle to the regional schistosity. The assemblage is cut by a variety of dykes including quartz porphyry, quartz-feldspar porphyry, intermediate (“dacite”) porphyry, and quartz diorite. The latter lithology is probably related to the Echo Lake pluton.

Two trenches at the north part of the occurrence are fairly recent excavations, although no information about them is available in the cancelled assessment files. They expose a light brown, fine-grained, quartz-porphyritic felsic dyke. This unit trends to the NNE and dips vertically. Contacts with the surrounding basalt are sharp, but are irregular in detail.

MINERALIZATION

Stockwell (1935) described 7 quartz veins at the occurrence, and his work provides the basis for the current description. The veins comprise two sets that trend east-northeasterly and northerly.

Veins #1 and #2 (Fig. 31-3) appear to have received the most attention. The ENE-trending north dipping #1 vein has been traced in outcrop and trenches along a strike length of approximately 90 m (300 ft.). The western 25 m of the vein has been offset approximately 5 m to the north by a fault. The vein varies from 15 to 90 cm in thickness and has been followed down-dip in a shaft for approximately 7 m. It is located within a schistose interval 0.9 to 1.5 m thick at the contact of basalt with rhyolite, although it can locally be exclusively hosted by either unit. The quartz vein and adjacent schistose wallrock contain disseminated and small lenses of pyrite. Trace amounts of chalcopyrite and sphalerite are also present in the quartz vein. Petrographic investigations have shown that the pyrite contains small amounts of gold.

The #2 vein has been traced along strike for approximately 90 m and is hosted by a schistose and massive rhyolite dyke up to 3 m thick. The quartz vein consists of a discontinuous series of lenses up to 60 cm thick. The lenses pinch out along strike. A lens 15 m long occurs at the western end of the vein, and a shaft was sunk at its centre part. The quartz is well mineralized with pyrite and chalcopyrite that occur as disseminations, bands and irregular short veinlets. In the most easterly exposure of this vein, quartz and schist are exposed across a width of 3.7 m. Both the schist and the quartz veins are contorted and “drag-folded”. A 30 cm thick quartz vein occurs in the south part of the trench at the contact of the rhyolite with the basalt. The vein continues for approximately 6 m to the east of the trench and has been drag folded along a north-trending sinistral fault. A similar-looking rhyolitic unit occurs approximately 15 m north of the vein and continues east of the fault but does not contain the extension of the vein.

The #3 vein (Fig. 31-2) is a NNE striking structure in basalt that has been followed in trenches for approximately 45 m. It consists of quartz lenses up to 45 cm thick that occur in a schistose interval up to 2.1 m thick. The quartz contains patches of carbonate with minor pyrite and chalcopyrite.

The northerly-striking #4 vein (Fig. 31-3) occurs in a fault that cuts basalt. The basalt contains irregular units of fine-grained quartz diorite and a quartz-feldspar porphyry dyke. Quartz lenses up to 15 cm thick occur in the schist of the fault.

The #5 vein (Fig. 31-3) consists of a series of disconnected veins and lenses that have been traced north-northeasterly within a 0.9 to 5.8 m thick schistose interval for approximately 60 m. One quartz lens is up to 2.4 m thick and can be followed along strike for approximately 11 m. The quartz contains patches and

veinlets of carbonate, is well mineralized with pyrite and contains minor chalcopyrite and sphalerite.

The #6 vein (Fig. 31-3) has been traced for approximately 75 m within a northerly-striking schistose interval that cuts basalt. The schistose interval is usually not more than 45 cm thick, and the included quartz vein varies from 2 to 30 cm thick. The quartz is generally well mineralized with disseminated pyrite.

Vein #7 (Fig. 31-2) marks the discovery of gold at this occurrence. A quartz-feldspar porphyry dyke is cut by a network of quartz veinlets that contain carbonate, pyrite and chalcopyrite. Some of the fractures in the porphyry are filled with arsenopyrite or pyrite and sphalerite.

At Site 8 (Fig. 31-2) disseminated pyrite is common throughout the felsic dyke, as are irregular quartz stringers up to 2 cm thick. Minor malachite and rare azurite are present as fracture coatings. The basalt is limonitic at its contact with the felsic dyke, and disseminated pyrite comprises <1% of the rock.

Stockwell (1935) reported that initial work at the occurrence recovered a fair amount of free gold by panning surficial material and weathered rock from the #1 and #7 veins.

GEOCHEMICAL DATA

No assays were reported for this occurrence by Stockwell (1935). Samples collected by Juma Mining and Exploration Ltd. from the #1 vein returned the following assays (A.F. 91955):

#1 vein	chip sample	0.34 g Au/t across 1.1 m (0.01 oz. Au/ton across 3.5 ft.)
#1 vein	grab sample	6.16 g Au/t (0.18 oz. Au/ton)
hole M-4	25.5-25.8 m (83.8-84.8 ft.)	0.34 g Au/t (0.01 oz. Au/ton)
	27.3-27.5 m (89.6-90.1 ft.)	0.34 g Au/t (0.01 oz. Au/ton)
hole M-5	32.3-32.8 m (106.0-107.7 ft.)	0.68 g Au/t (0.02 oz. Au/ton)
	32.8-33.0 m (107.7-108.2 ft.)	0.34 g Au/t (0.01 oz. Au/ton)
hole M-6	76.1-76.3 m (249.7-250.3 ft.)	1.37 g Au/t (0.04 oz. Au/ton)
	76.3-76.7 m (250.3-251.8 ft.)	0.34 g Au/t (0.01 oz. Au/ton)

CLASSIFICATION

Vein type deposit; multiple veins or lenses. Quartz veins occur that cut basalt and are associated with rhyolite and rhyolitic dykes.

REFERENCES

A.F. 91955; Cancelled Assessment File, Manitoba Industry, Trade and Mines, Minerals Division.

NATMAP Shield Margin Project Working Group

1998: Geology, NATMAP Shield Margin Project Area (Flin Flon Belt), Manitoba-Saskatchewan; Geological Survey of Canada 1968A; Manitoba Energy and Mines Map A-98-2, Sheets 1 to 7; Saskatchewan Energy and Mines Map 258A-2, scale 1:100 000.

Stockwell, C.H.

1935: Gold Deposits of the Elbow-Morton Area, Northern Manitoba; Geological Survey of Canada, Memoir 186, 74pp.

Syme, E.C.

1991: Elbow Lake project - Part A: supracrustal rocks and structural setting; in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1991, pp.14-27.

1992: Elbow Lake Project - Part A: Supracrustal rocks; in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1992, pp.32-46.

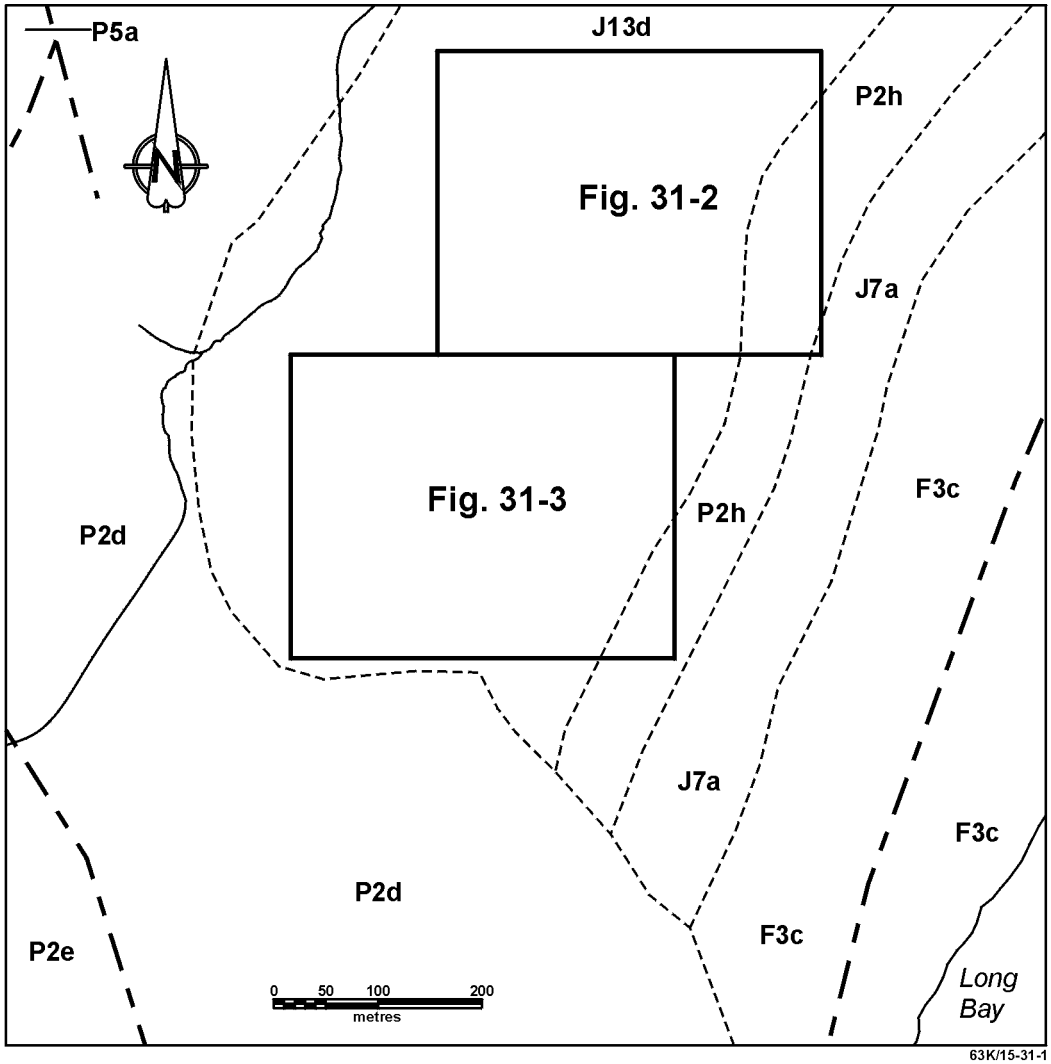
Syme, E.C. and Whalen, J.B.

1992: Geology, Elbow Lake, Manitoba; Geological Survey of Canada, Preliminary 1:20 000 map, Shield-Margin Project, File ELBOW92.PS.

Whalen, J.B.

1991: Elbow Lake project - Part B: Granitoid rocks; in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1991, pp. 28-30.

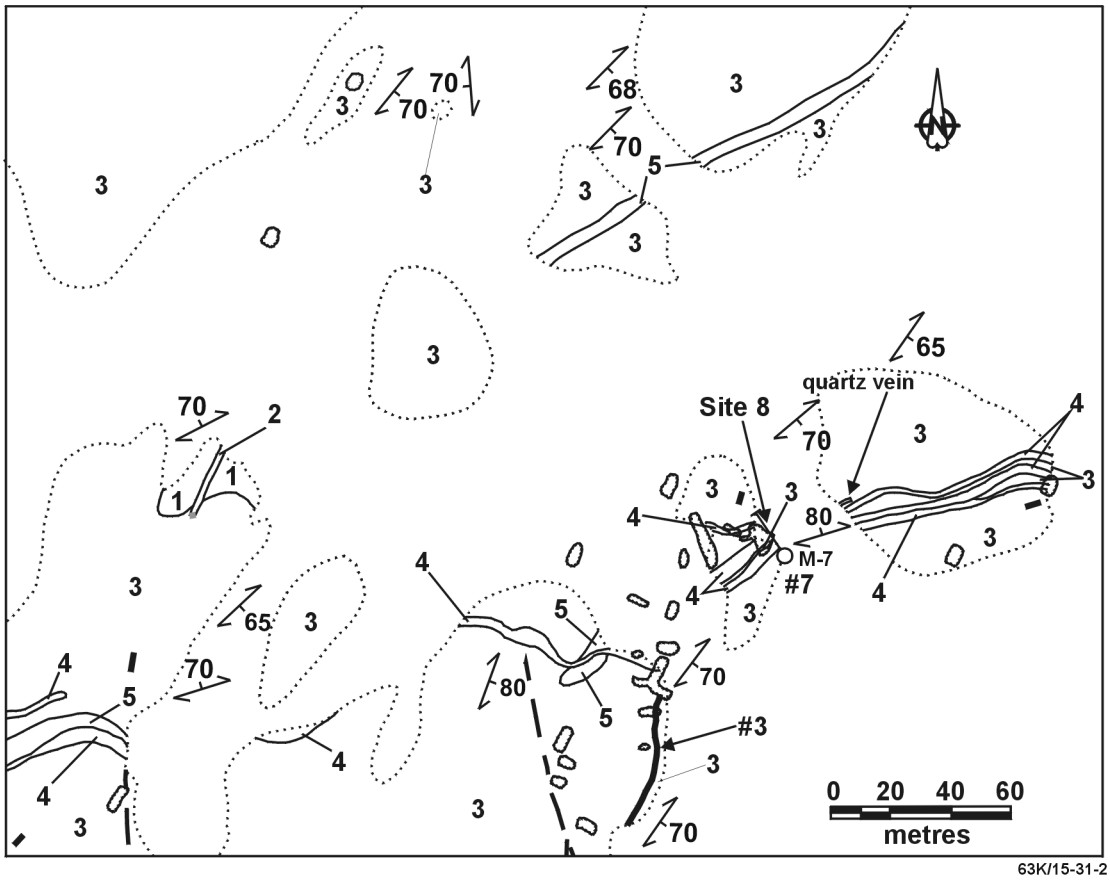
1992: Elbow Lake project - Part B: Granitoid rocks; in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1992, pp. 47-51.



PALEOPROTEROZOIC

- P5a — Quartz diorite to granodiorite
- P2d — Quartz diorite and gabbro
- P2e — Diorite to quartz diorite
- P2h — Gabbro, diorite, quartz diorite and derived amphibolite: xenolith-rich phase
- J13d — Felsic to mafic dyke complex
- J7a — Felsic tuff, lapilli tuff, breccia, heterolithologic breccia
- F3c — Long Bay ocean-island basalt conglomerate, sandstone
- Geological contact (approximate)- NATMAP Shield Margin Project Working Group, 1998
- Fault (approximate)- NATMAP Shield Margin Project Working Group, 1998

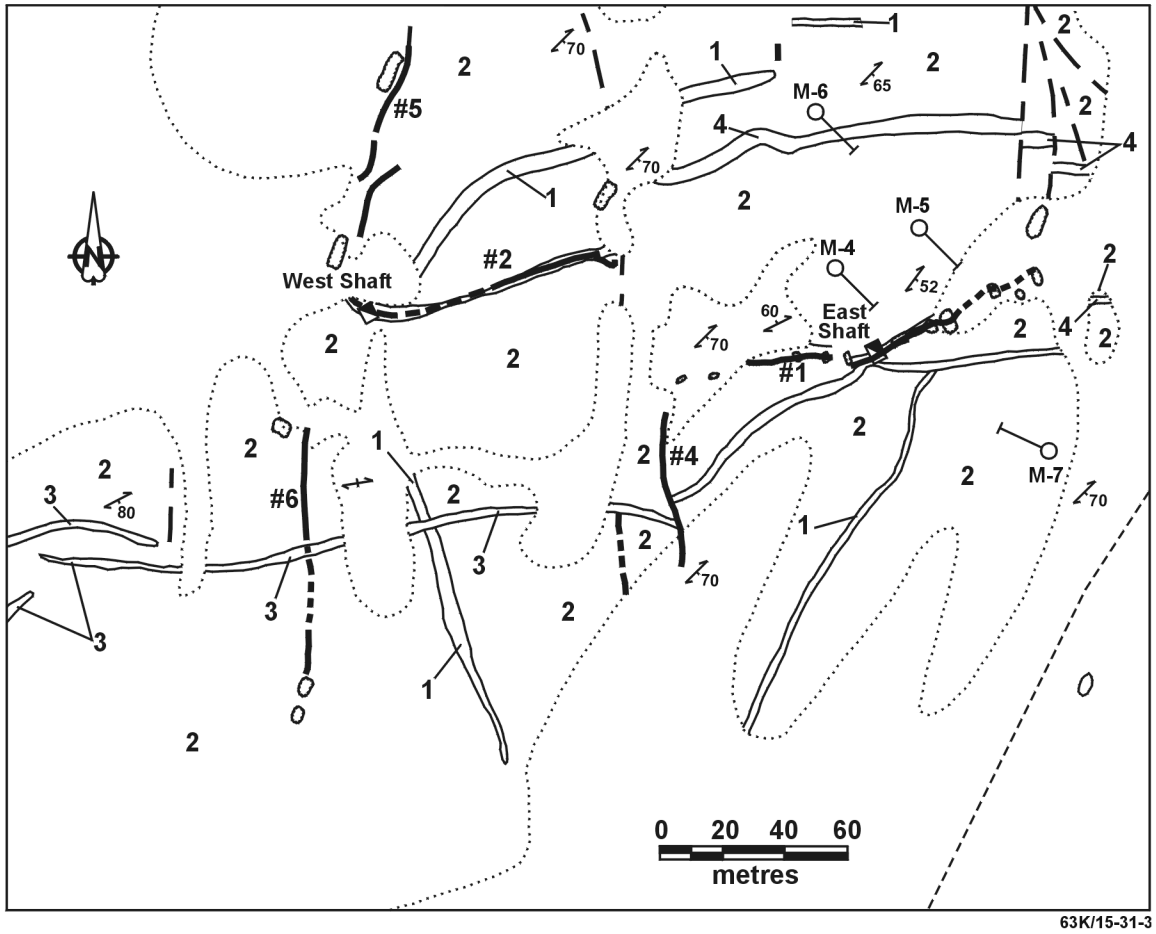
Figure 31-1: Geological setting of Gunwor occurrence.



PALEOPROTEROZOIC

- 5 Rhyolite - undifferentiated
- 4 Quartz-feldspar porphyry
- 3 Basalt - undifferentiated
- 2 Feldspar porphyry
- 1 Quartz diorite
- #3 Quartz vein and number (referred to in text)
- Geological contact (defined)
- Sheared area
- Outcrop
- 65 Schistosity (inclined, vertical)
- Drillhole (A.F. 91955)
- Trench

Figure 31-2: Detailed geology and trench locations at Gunwor occurrence.



PALEOPROTEROZOIC

- 4 Rhyolite - undifferentiated
- 3 Quartz-feldspar porphyry
- 2 Basalt - undifferentiated
- 1 Feldspar porphyry
- #6 Quartz vein and number (referred to in text)

- Geological contact (defined)
- Sheared area
- Outcrop
- 70 Schistosity (inclined, vertical)
- Drillhole (A.F. 91955)
- Trench

Figure 31-3: Detailed geology, trench and shaft locations at Gunwor occurrence.

LOCATION: 32

NAME: Sherlock
UTM: 376410E, 6080445N
AREA: along northwest shore of Long Bay, Elbow Lake
ACCESS: via bush plane or by boat through the Cranberry Lakes from Cranberry Portage
AIRPHOTO: MB90025-139

EXPLORATION SUMMARY

The claim was staked in 1919 following the discovery of gold-bearing quartz. It is reported that Mr Thomas R. Webb panned about $800 worth of coarse gold from a small quartz lens at the occurrence. In 1922 a second quartz lens approximately 2.5 m long and up to 50 cm thick was uncovered: this proved to be spectacularly rich in gold (Armstrong, 1922). By 1930 a prospect shaft at least 9 m deep, an adit and 200 m of trenches had been excavated (Stockwell, 1935). In 1963 Juma Mining and Exploration Limited undertook a geological mapping programme and performed a magnetic survey of the area. Twelve holes were subsequently drilled on geological and magnetic targets (A.F. 91955).

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 32-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). The area is underlain by mafic volcaniclastic conglomerate, pebbly sandstone and sandstone (unit F3c) of the Long Bay picrite conglomerate (Syme, 1991). This metasedimentary unit is bounded to the WNW by the Webb Island rhyolite breccia (unit J7a), and to the ESE by pillowed and massive aphyric flows of the McDougalls Point basalt (unit F1a), which has been intruded by fine- to medium-grained equigranular gabbro (unit P2a) (Syme and Whalen, 1992).

Trenches and outcrops are shown in Fig. 32-2 to 32-4. The clastic assemblage comprises the host rock for the Sherlock occurrence. The dominant rock at the occurrence is a mafic sandstone with occasional thin polymictic pebbly intervals. Magnetite as disseminated grains is a common constituent in some of the finer-grained units, comprising up to 5% of the rock. Conglomeratic intervals become dominant in the WNW part of the occurrence. Syme (1991) has noted that clasts within the conglomeratic portion of this assemblage consist of basaltic scoria, basalt, diabase, gabbro, pyroxenite and jasper. Chert as conformable layers is present in the immediate occurrence area. Immediately to the northeast of the “shaft” there is a folded, fine-grained grey chert layer 2.9 m thick. Stockwell (1935) indicates that numerous cherty quartz lenses are irregularly distributed throughout the rocks of the area, and appear to represent conformable chert layers. Similar chert occurs as rounded clasts within conglomerate. Jasper pebbles up to 10 cm have been noted in exposures in the western part of the occurrence.

MINERALIZATION

One sample of quartz containing visible gold was found during the 1992 examination of the occurrence. The gold occurs in milky quartz lenses irregularly distributed through the metasedimentary rocks. The lenses are generally thin and discontinuous, and can be traced for only short distances along strike. They often have a lensoid character, are typically 5 to 20 cm thick, and are both conformable and discordant to the foliation of the host rocks.

GEOCHEMICAL DATA

No assays have been reported for this occurrence, although Stockwell (1935) indicates that the original discoverer “…panned about $800 of coarse gold from a small quartz lens during the preliminary prospecting of the deposit.”

CLASSIFICATION

Vein type deposit; multiple veins or lenses. In mafic metasedimentary rocks derived from picritic volcanic rocks, and associated grey chert layers.

REFERENCES

A.F. 90500, 91485, 91487, 91955, 92654; Cancelled Assessment Files, Manitoba Industry, Trade and Mines, Minerals Division.

Armstrong, P.

1922: Geology and ore deposits of Elbow Lake area, northern Manitoba; in Geological Survey of Canada, Summary Report 1922, Part C, pp.37-44.

NATMAP Shield Margin Project Working Group

1998: Geology, NATMAP Shield Margin Project Area (Flin Flon Belt), Manitoba-Saskatchewan; Geological Survey of Canada 1968A; Manitoba Energy and Mines Map A-98-2, Sheets 1 to 7; Saskatchewan Energy and Mines Map 258A-2, scale 1:100 000.

Stockwell, C.H.

1935: Gold Deposits of the Elbow-Morton Area, Northern Manitoba; Geological Survey of Canada, Memoir 186, 74pp.

Syme, E.C.

1991: Elbow Lake project - Part A: supracrustal rocks and structural setting; in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1991, pp.14-27.

Syme, E.C. and Whalen, J.B.

1992: Geology, Elbow Lake, Manitoba; Geological Survey of Canada, Preliminary 1:20 000 map, Shield-Margin Project, File ELBOW92.PS.

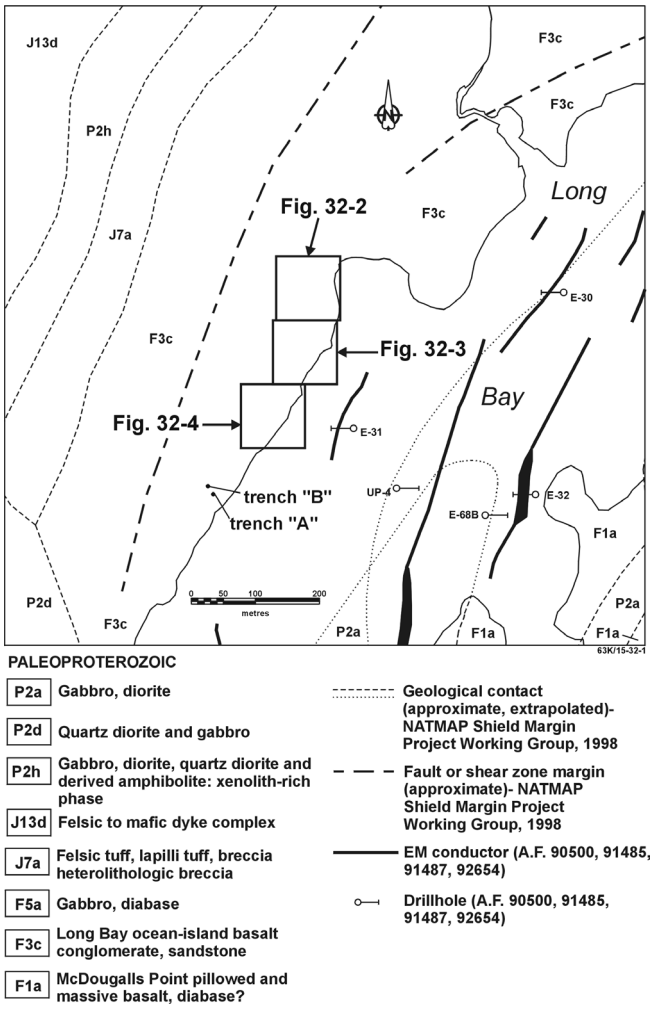


Figure 32-1: Geological setting of Sherlock occurrence.

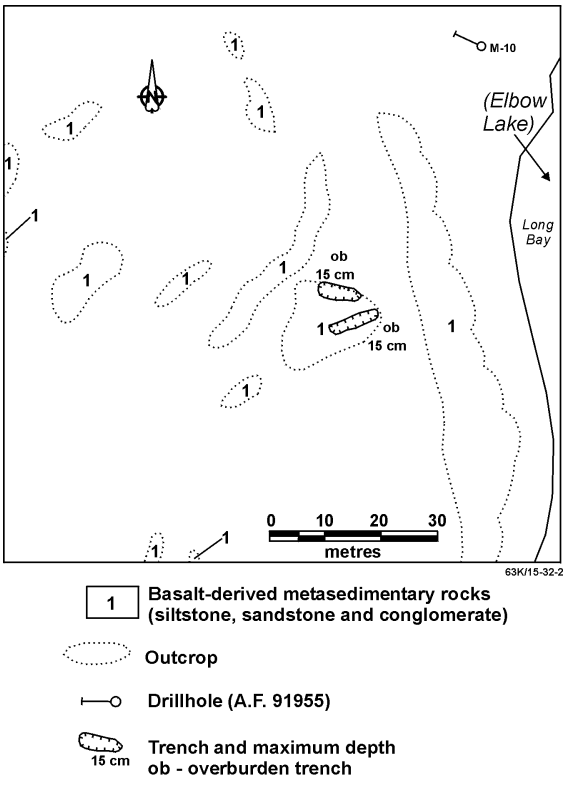


Figure 32-2: Detailed geology and trench locations at Sherlock occurrence.

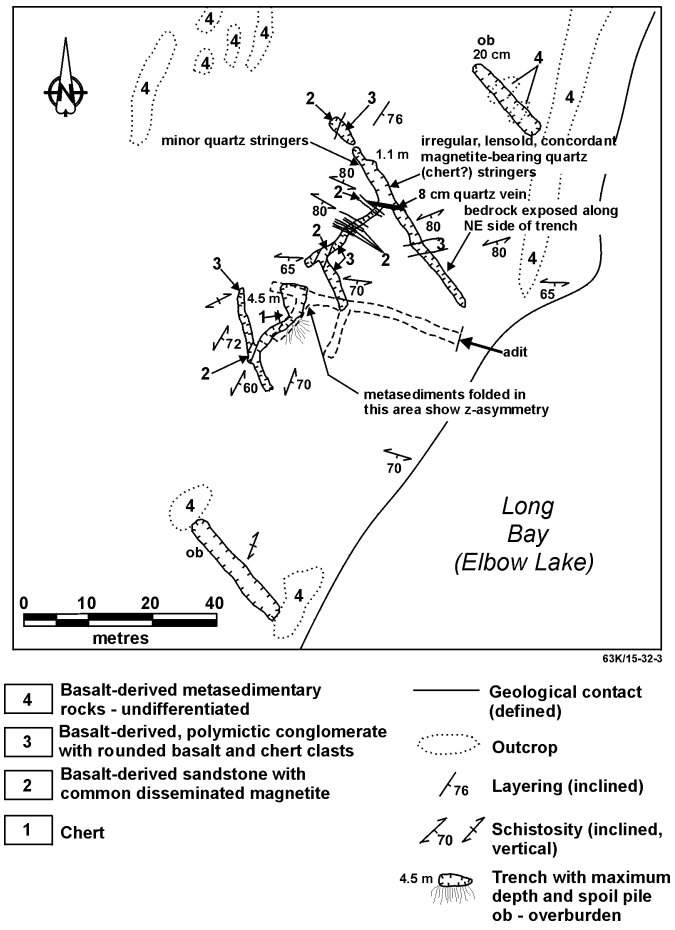


Figure 32-3: Detailed geology and workings at Sherlock occurrence.

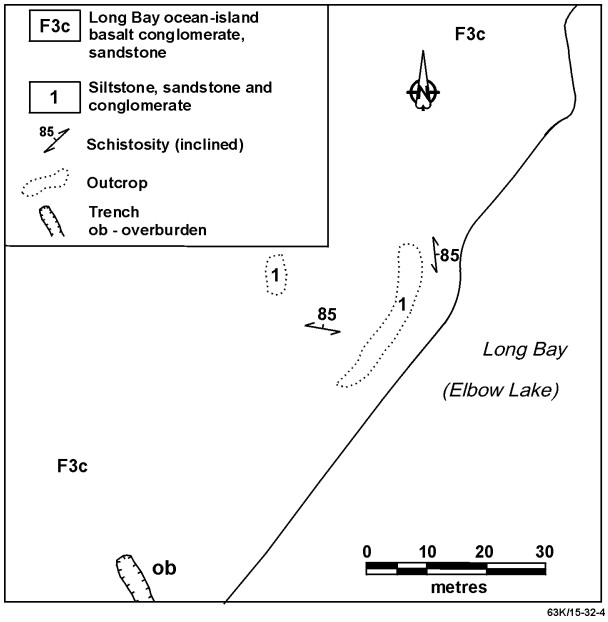


Figure 32-4: Detailed geology and trench locations at Sherlock occurrence.

LOCATION: 33

NAME: H.M.B.
UTM: 378230E, 6082815N
AREA: along NW shore of Elbow Lake, approximately 150 m W of small bay north of Webb Island
ACCESS: via bush plane or by boat through the Cranberry Lakes from Cranberry Portage, then traverse
AIRPHOTO: MB90025-116

EXPLORATION SUMMARY

The ownership history of the occurrence is outlined in Manitoba Energy and Mines Mineral Inventory File No. 787. It was staked in 1933 and a trench excavated.

A trench and an area where the edge of an outcrop has been blasted were located during the 1992 examination of the occurrence. Both of the excavations are overgrown and bedrock is poorly exposed.

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 33-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). The area is underlain by aphyric pillowed flows (unit J1a) of the Webb Island basalt. It is bounded to the SE by fine-grained leucotonalite (unit P6c) and to the NW by medium- to coarse-grained equigranular gabbro (unit P2a).

The excavation along the western edge of the outcrop is at the contact of diorite with mafic volcanic rocks. It is unclear if the volcanic rocks are in place or represent a xenolith incorporated into the diorite. The largest trench at the occurrence has been excavated into a fine-grained siliceous rock, possibly dacite or rhyolite.

MINERALIZATION

The geological setting of the quartz vein in the area along the outcrop edge is uncertain. Locally, the quartz vein interfingers with the mafic volcanic rocks and the diorite, and is hosted by a schistose interval that crosscuts these units. Large pieces of quartz are present on the spoil piles along the margin of the excavation. Most of the quartz is barren, but some pieces are composed mainly of limonite that appear to be the weathering product of Fe-sulphides. The main trench at the occurrence exposes a discontinuous barren quartz vein. Euhedral pyrite grains to 5 mm and rare chalcopyrite grains are disseminated in the enclosing siliceous rock.

GEOCHEMICAL DATA

Stockwell (1935) indicates that mineralized schist was reported to contain 5.14 g Au/t (0.15 oz. Au/ton).

CLASSIFICATION

Vein type deposit; multiple veins or lenses. Hosted by schistose interval in diorite, and mafic and intermediate/siliceous volcanic rocks.

REFERENCES

A.F. 90643, 92654; Cancelled Assessment Files, Manitoba Industry, Trade and Mines, Minerals Division.

Mineral Inventory File No. 787

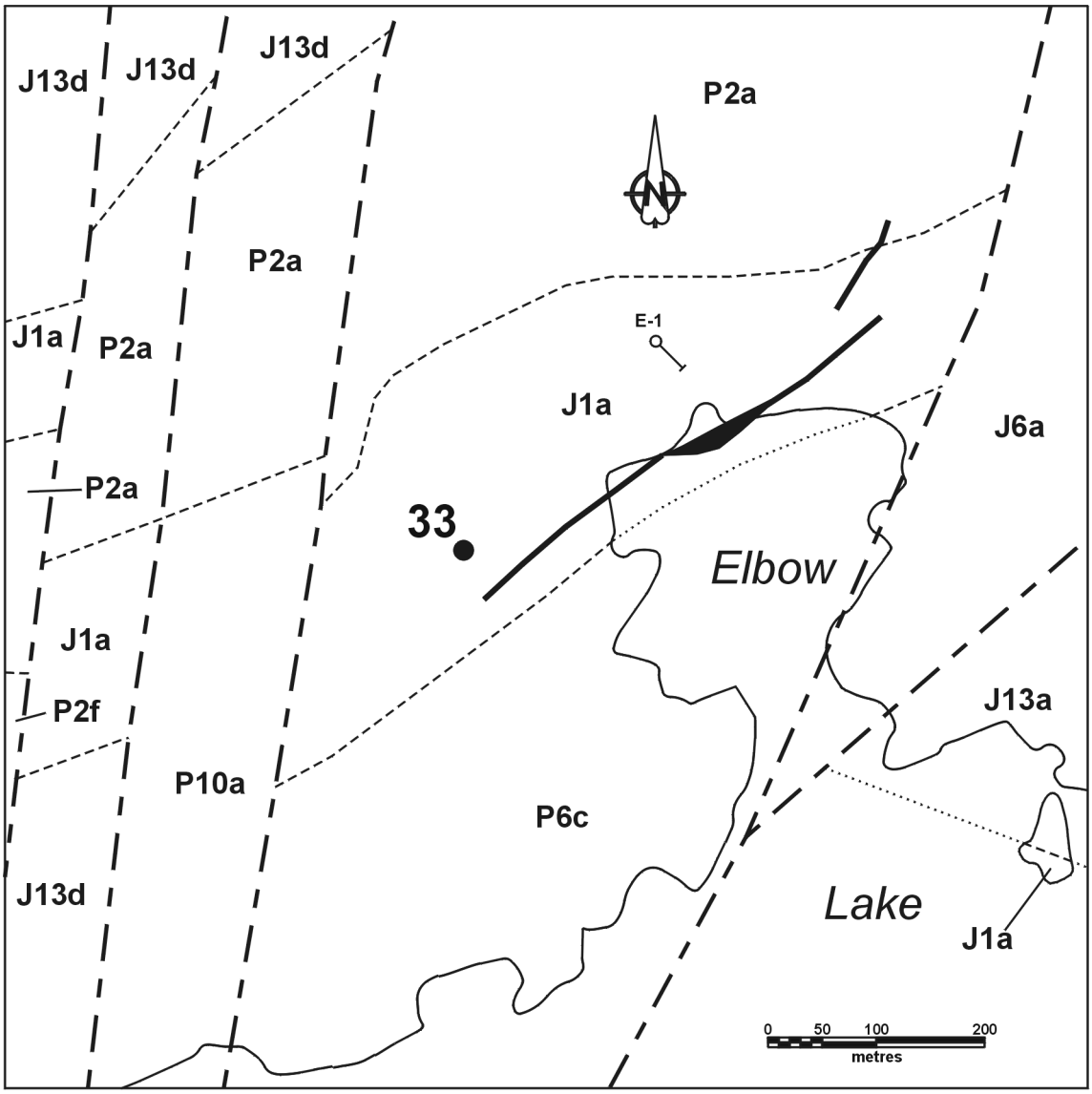
Manitoba Energy and Mines, Minerals Division

NATMAP Shield Margin Project Working Group

1998: Geology, NATMAP Shield Margin Project Area (Flin Flon Belt), Manitoba-Saskatchewan; Geological Survey of Canada 1968A; Manitoba Energy and Mines Map A-98-2, Sheets 1 to 7; Saskatchewan Energy and Mines Map 258A-2, scale 1:100 000.

Stockwell, C.H.

1935: Gold Deposits of the Elbow-Morton Area, Northern Manitoba; Geological Survey of Canada, Memoir 186, 74pp.



PALEOPROTEROZOIC

P10a	Aphyric and porphyritic felsic to intermediate dykes and dyke complexes
P6c	Leucotonalite
P2a	Gabbro, diorite
P2f	Diabase, diabase dyke complex
J13a	Basalt, mafic porphyry
J13d	Felsic to mafic dyke complex
J6a	Intermediate tuff, lapilli tuff, breccia
J1a	Tholeiitic basalt, basaltic andesite; gabbro, derived amphibolite

Geological contact (approximate, extrapolated)- NATMAP Shield Margin Project Working Group, 1998

Fault (approximate)- NATMAP Shield Margin Project Working Group, 1998

EM conductor (A.F. 92654)

Drillhole (A.F. 90643, 92654)

33 Mineral occurrence location

Figure 33-1: Geological setting of H,M.B. occurrence.

LOCATION: 34

NAME: Dan
UTM: 377360E, 6082055N
AREA: near NW shore of Elbow Lake, approximately 0.3 km NW of shoreline NW of Webb Island
ACCESS: via bush plane or by boat through the Cranberry Lakes from Cranberry Portage, then traverse
AIRPHOTO: MB90025-116

EXPLORATION SUMMARY

The Dan occurrence was staked in 1924. A trench 3.7 m (12.0 ft.) deep was excavated across approximately 2.4 m (8.0 ft.) of quartz and mafic schist (Stockwell, 1935). In 1963 Juma Mining and Exploration Limited undertook a geological mapping programme and performed a magnetic survey of the area. Twelve holes were subsequently drilled on geological and magnetic targets (A.F. 91955).

Several trenches and a drill hole casing trending 137°/-50° were found at the occurrence. All trenches are overgrown or flooded, and little bedrock is exposed. The 1989 fire that affected most of the Elbow Lake area had little affect on the vegetation in this area, and outcrops at the occurrence remain lichen covered.

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 34-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). The area is underlain by a diabase dyke intrusive complex (unit P2f), part of which belongs to the Tee Lake dyke complex, aphyric amoeboid pillow breccia of the Webb Island basalt (unit J1a), and gabbro and gabbroic intrusion breccia (unit P2h). The intrusive complex consists of diabase, diabasic pegmatite, andesite, rhyolite, fine-grained leucotonalite, plagioclase-amphibole porphyry, plagioclase porphyry, quartz-feldspar porphyry and screens of pillowed basalt (Syme, 1991; Syme and Whalen, 1992).

Trench locations are shown in Fig. 34-2, 34-3 and 34-4. Outcrops in the vicinity of the trenches consist primarily of mafic volcanic rocks. A schistose graphitic unit (argillite?) trending 075°/80°SSE is exposed in the southwestern trenches.

MINERALIZATION

The spoil piles adjacent to the two northern trenches contain abundant white quartz blocks. No quartz was noted at the southern trenches, but the rocks are strongly foliated and appear to be sheared. Outcrops in the area contain quartz masses and/or veins. The quartz veins appear to be barren, although Stockwell (1935) noted the presence of grains and streaks of pyrite.

GEOCHEMICAL DATA

Stockwell (1935) indicated that the following assays were obtained from channel samples collected from the deep trench at this occurrence:

4.79 g Au/t across 0.46 m (0.14 oz. Au/ton across 1.5 ft.)

7.88 g Au/t across 0.46 m (0.23 oz. Au/ton across 1.5 ft.)

1.71 g Au/t across 1.52 m (0.05 oz. Au/ton across 5.0 ft.)

CLASSIFICATION

Vein type deposit; multiple veins or lenses.

REFERENCES

A.F. 91955; Cancelled Assessment File, Manitoba Industry, Trade and Mines, Minerals Division.

NATMAP Shield Margin Project Working Group

1998: Geology, NATMAP Shield Margin Project Area (Flin Flon Belt), Manitoba-Saskatchewan; Geological Survey of Canada 1968A; Manitoba Energy and Mines Map A-98-2, Sheets 1 to 7; Saskatchewan Energy and Mines Map 258A-2, scale 1:100 000.

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Syme, E.C. and Whalen, J.B.

1992: Geology, Elbow Lake, Manitoba; Geological Survey of Canada, Preliminary 1:20 000 map, Shield-Margin Project, File ELBOW92.PS.

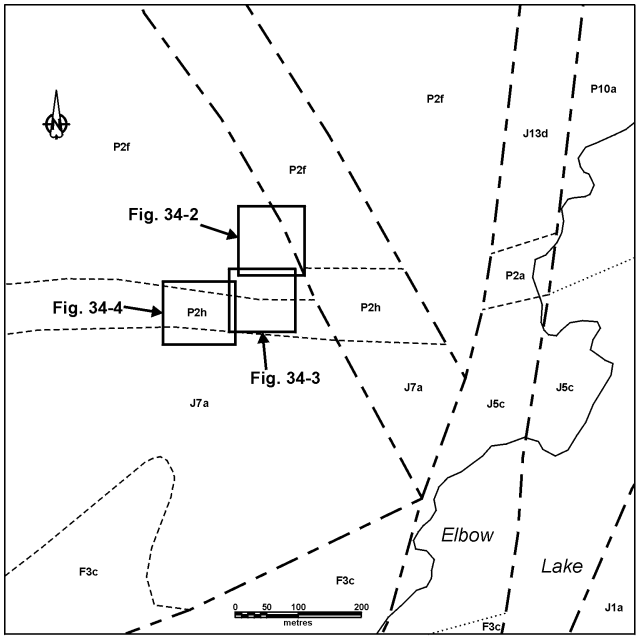


Figure 34-1: Geological setting of Dan occurrence.

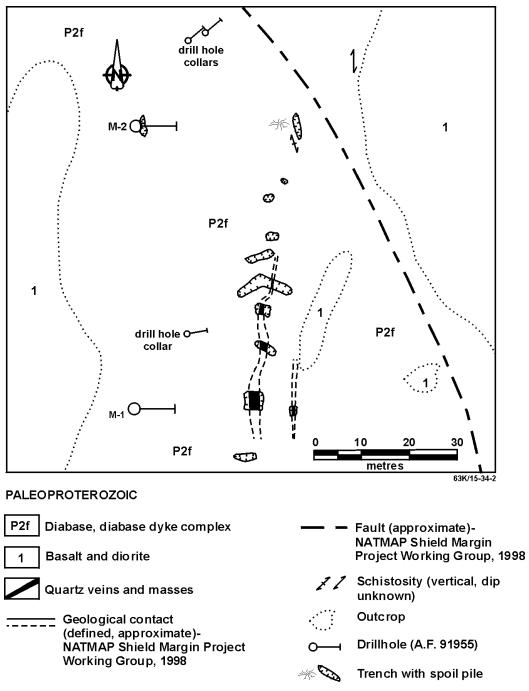


Figure 34-2: Geology and trench locations at Dan occurrence.

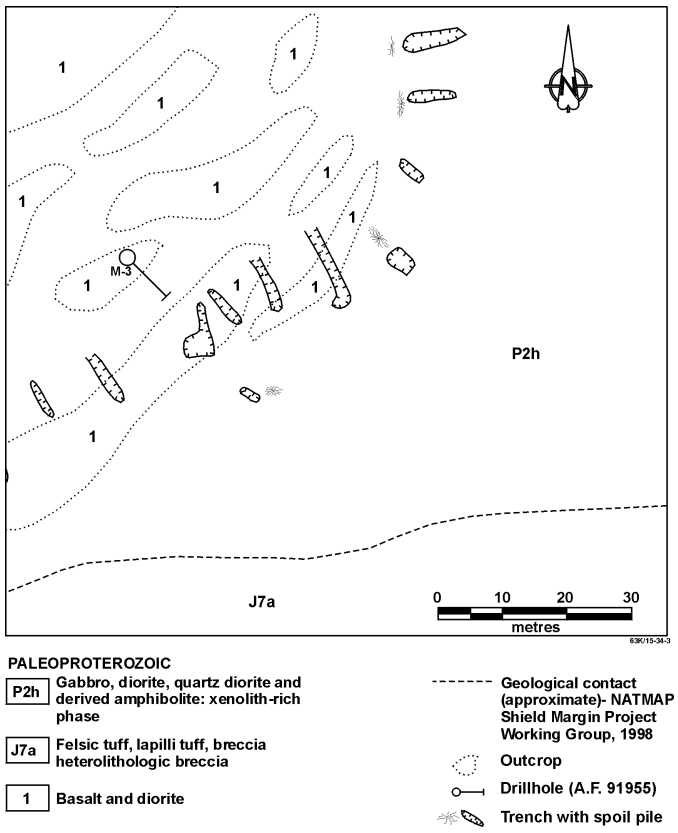


Figure 34-3: Geology and trench locations at Dan occurrence.

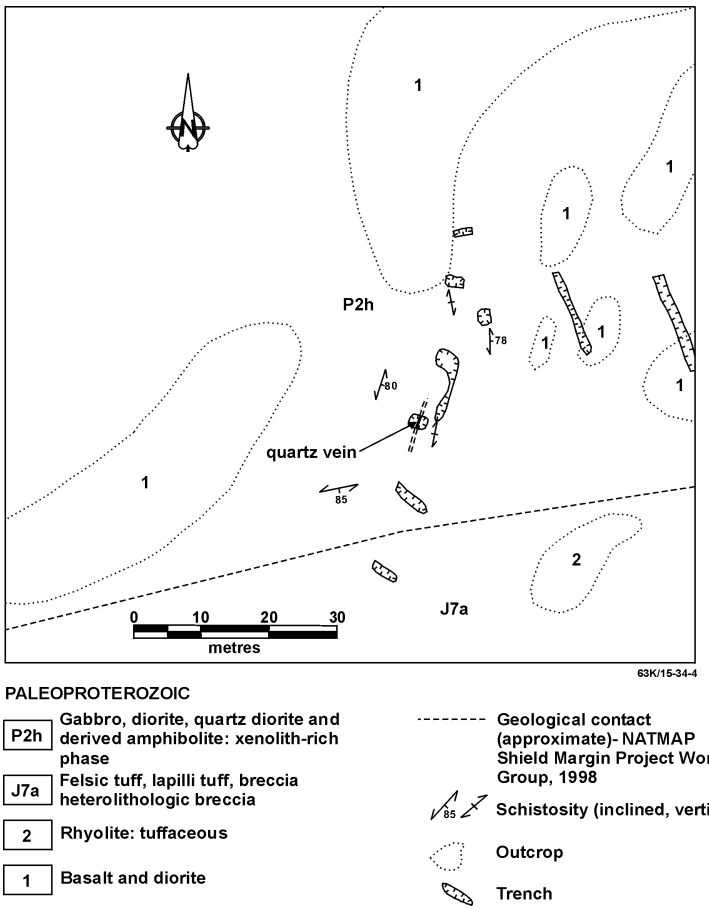


Figure 34-4: Geology and trench locations at Dan occurrence.

LOCATION: 35

NAME: Bell-Apex No.1
UTM: 377750E, 6082305N
AREA: near NW shore of Elbow Lake, approximately 150 m W of shoreline NW of Webb Island
ACCESS: via bush plane or by boat through the Cranberry Lakes from Cranberry Portage, then traverse
AIRPHOTO: MB90025-141

EXPLORATION SUMMARY

The Bell claim was staked in 1932 and the Apex No.1 claim in 1933. The quartz vein is poorly exposed in outcrop and trenches for a strike length of approximately 140 m (450 ft.) (Stockwell, 1935). McGlynn (1959) indicated that some diamond drilling had been undertaken on the Vanderberg claim group staked over the former Bell and Apex Nos. 1, 2 and 3 claims. In 1963 Juma Mining and Exploration Limited undertook a geological mapping programme and performed a magnetic survey of the area. Twelve holes were subsequently drilled on geological and magnetic targets (A.F. 91955).

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 35-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). The area is underlain by a diabase dyke intrusive complex (unit J13d), part of which belongs to the Tee Lake dyke complex, aphyric amoeboid pillow breccia of the Webb Island basalt (unit J1a), and gabbro and gabbroic intrusion breccia (unit P2f). The intrusive complex consists of diabase, diabasic pegmatite, andesite, rhyolite, fine-grained leucotonalite, plagioclase-amphibole porphyry, plagioclase porphyry, quartz-feldspar porphyry and screens of pillowed basalt (Syme, 1991; Syme and Whalen, 1992). A series of steeply-dipping north-trending faults can be traced south from Tee Lake to Elbow Lake.

The occurrence is located in schist at the contact between diorite and basalt. The schistose interval represents a sinistral fault that shows a strike offset of approximately 230 m.

MINERALIZATION

Quartz veins at the occurrence are hosted by a schistose interval up to 5 m thick in mafic volcanic rock. The veins have been boudinaged and occur as lenses and bands up to 60 cm thick. Minor brown-weathering carbonate is associated with the quartz. Stockwell (1935) indicates that the quartz vein contains minor grains and stringers of pyrite and trace amounts of disseminated chalcopyrite.

GEOCHEMICAL DATA

Stockwell (1935) indicates the owner of the claim obtained an assay of 13.7 g Au/t (0.40 oz. Au/ton) from a chip sample across 2.4 m (8 ft.) of quartz and sulphide at the Bell claim. Samples obtained across 4.3 m (14 ft.) of vein and enclosing schist at the Apex No. 1 claim reportedly assayed 8.22 g Au/t (0.24 oz. Au/ton). The claim owner also reported that channel samples collected across quartz veins and schist assayed no less than 1.71 g Au/t (0.05 oz. Au/ton).

CLASSIFICATION

Vein type deposit; multiple veins or lenses. Quartz veins occur within a schistose interval at the contact between diorite and basalt.

REFERENCES

A.F. 91955, 92654; Cancelled Assessment Files, Manitoba Industry, Trade and Mines, Minerals Division.

McGlynn, J.C.

1959: Elbow-Heming Lakes Area, Manitoba; Geological Survey of Canada, Memoir 305, 72 pp.

NATMAP Shield Margin Project Working Group

1998: Geology, NATMAP Shield Margin Project Area (Flin Flon Belt), Manitoba-Saskatchewan; Geological Survey of Canada 1968A; Manitoba Energy and Mines Map A-98-2, Sheets 1 to 7; Saskatchewan Energy and Mines Map 258A-2, scale 1:100 000.

Stockwell, C.H.

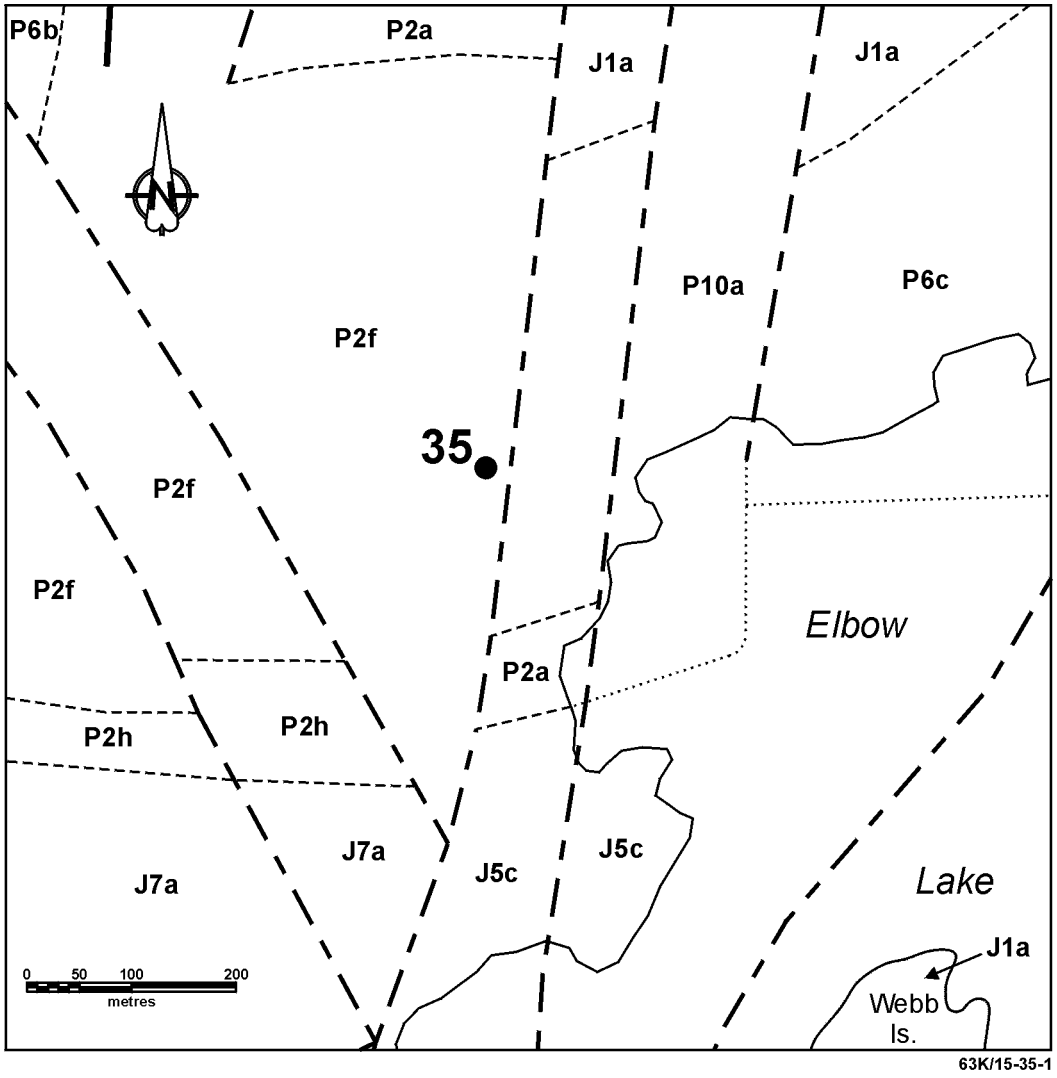
1935: Gold Deposits of the Elbow-Morton Area, Northern Manitoba; Geological Survey of Canada, Memoir 186, 74pp.

Syme, E.C.

1991: Elbow Lake project - Part A: supracrustal rocks and structural setting; in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1991, pp.14-27.

Syme, E.C. and Whalen, J.B.

1992: Geology, Elbow Lake, Manitoba; Geological Survey of Canada, Preliminary 1:20 000 map, Shield-Margin Project, File ELBOW92.PS.



PALEOPROTEROZOIC

- P10a — Aphyric and porphyritic felsic to intermediate dykes and dyke complexes
- P6b — Quartz diorite
- P6c — Leucotonalite
- P2a — Gabbro, diorite
- P2f — Diabase, diabase dyke complex
- P2h — Gabbro, diorite, quartz diorite and derived amphibolite: xenolith-rich phase
- J13d — Felsic to mafic dyke complex
- J7a — Felsic tuff, lapilli tuff, breccia heterolithologic breccia
- J5c — Heterolithologic breccia, dominantly mafic fragments
- J1a — Tholeiitic basalt, basaltic andesite; gabbro, derived amphibolite
- Geological contact (approximate, extrapolated)- NATMAP Shield Margin Project Working Group, 1998
- Fault (approximate)- NATMAP Shield Margin Project Working Group, 1998
- EM conductor (A.F. 92654)
- 35 ● Mineral occurrence location

Figure 35-1: Geological setting of Bell-Apex No. 1 occurrence.

LOCATION: 36

NAME: Apex No.2
UTM: 377920E, 6083335N
AREA: near NW shore of Elbow Lake, approximately 0.6 km NW of small bay north of Webb Island
ACCESS: via bush plane or by boat through the Cranberry Lakes from Cranberry Portage, then traverse
AIRPHOTO: MB90025-141

EXPLORATION SUMMARY

Stockwell (1935) indicates that the occurrence was staked in 1933 and is exposed in several trenches. McGlynn (1959) indicates that some diamond drilling had been undertaken on the Vanderberg claim group staked over the former Bell and Apex Nos. 1, 2 and 3 claims. In 1963 Juma Mining and Exploration Limited undertook a geological mapping programme and performed a magnetic survey of the area. Twelve holes were subsequently drilled on geological and magnetic targets (A.F. 91955).

Four trenches were found during the 1992 examination of the occurrence.

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 36-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). The area is underlain by a diabase dyke intrusive complex (unit J13d), part of which belongs to the Tee Lake dyke complex, aphyric amoeboid pillow breccia of the Webb Island basalt (unit J1a), and a gabbro and gabbroic intrusion breccia (unit P2a). The intrusive complex consists of diabase, diabasic pegmatite, andesite, rhyolite, fine-grained leucotonalite, plagioclase-amphibole porphyry, plagioclase porphyry, quartz-feldspar porphyry and screens of pillowed basalt (Syme, 1991; Syme and Whalen, 1992).

The location of the trenches is shown in Fig. 36-2. At the occurrence fine-grained mafic volcanic rocks have been intruded by a series of east-west trending felsic dykes up to 20 m thick. The contacts of the felsic intrusion with the mafic volcanic rocks are sharp but irregular. Blocks of the enclosing mafic rock are common in the dyke. A north-trending shear zone cuts both rock types and hosts a quartz vein. No offset could be determined along this shear.

MINERALIZATION

A quartz vein 20 to 60 cm thick occurs within the schistose interval. The vein is not a continuous feature and was not observed in all of the trenches. It has probably been boudinaged within the shear zone. Brown weathering carbonate is a lesser constituent of the vein. Minor disseminated pyrite occurs within the quartz and enclosing rock, and trace amounts of chalcopyrite were noted.

GEOCHEMICAL DATA

No assays have been reported for this occurrence.

CLASSIFICATION

Vein type deposit; single vein. A quartz vein is hosted by a shear zone that transects mafic volcanic rock and a felsic intrusion.

REFERENCES

A.F. 91955; Cancelled Assessment File, Manitoba Industry, Trade and Mines, Minerals Division.

McGlynn, J.C.

1959: Elbow-Heming Lakes Area, Manitoba; Geological Survey of Canada, Memoir 305, 72 pp.

NATMAP Shield Margin Project Working Group

1998: Geology, NATMAP Shield Margin Project Area (Flin Flon Belt), Manitoba-Saskatchewan; Geological Survey of Canada 1968A; Manitoba Energy and Mines Map A-98-2, Sheets 1 to 7; Saskatchewan Energy and Mines Map 258A-2, scale 1:100 000.

Stockwell, C.H.

1935: Gold Deposits of the Elbow-Morton Area, Northern Manitoba; Geological Survey of Canada, Memoir 186, 74pp.

Syme, E.C.

1991: Elbow Lake project - Part A: supracrustal rocks and structural setting; in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1991, pp.14-27.

Syme, E.C. and Whalen, J.B.

1992: Geology, Elbow Lake, Manitoba; Geological Survey of Canada, Preliminary 1:20 000 map, Shield-Margin Project, File ELBOW92.PS.

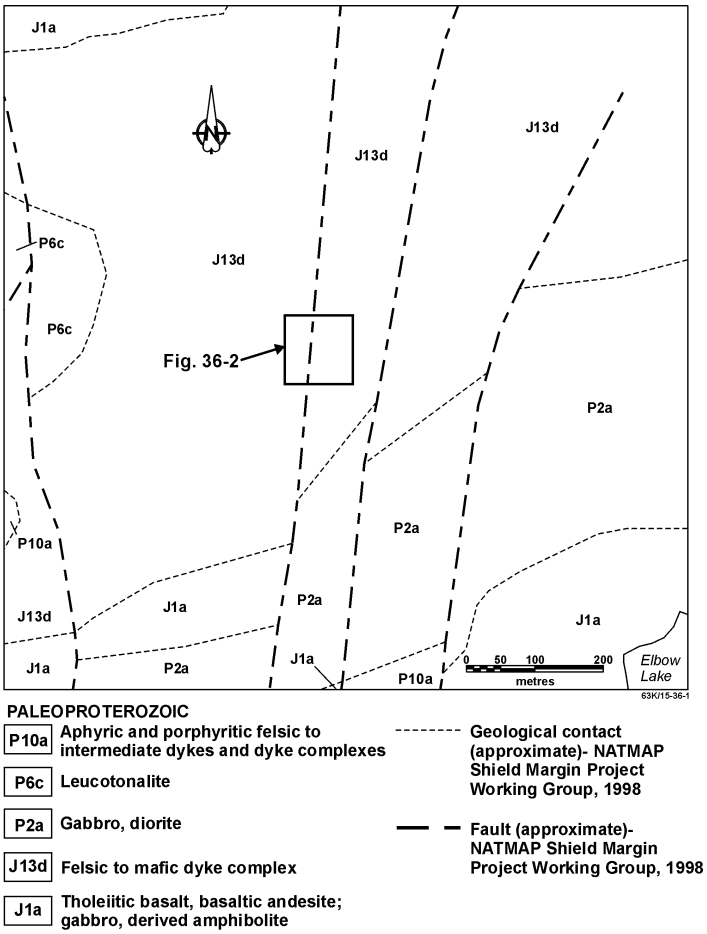


Figure 36-1: Geological setting of Apex No. 2 occurrence.

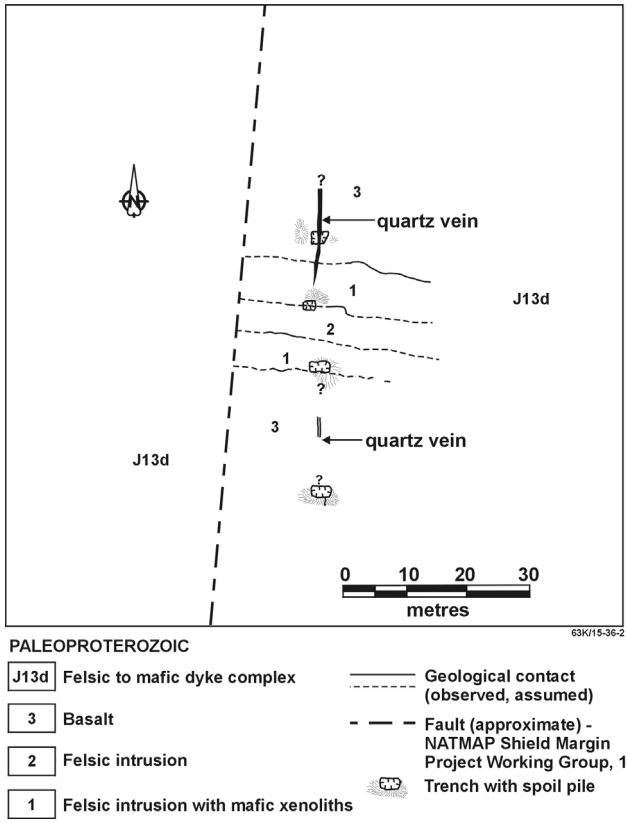


Figure 36-2: Detailed geology and trench locations at Apex No. 2 occurrence.

LOCATION: 37

NAME: Apex No.3
UTM: 378100E, 6083625N
AREA: near NW shore of Elbow Lake, approximately 0.8 km NNW of small bay north of Webb Island
ACCESS: via bush plane or by boat through the Cranberry Lakes from Cranberry Portage
AIRPHOTO: MB90025-141

EXPLORATION SUMMARY

Stockwell (1935) indicates that the occurrence was staked in 1933 and is exposed in several trenches. McGlynn (1959) indicates that some diamond drilling had been undertaken on the Vanderberg claim group that had been staked over the former Bell and Apex Nos. 1, 2 and 3 claims. In 1963 Juma Mining and Exploration Limited undertook a geological mapping programme and performed a magnetic survey of the area. Twelve holes were subsequently drilled on geological targets (A.F. 91955).

Eight trenches were located during the 1992 examination of the occurrence. Bedrock is only poorly exposed in these excavations.

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 37-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). The area is underlain by a diabase dyke intrusive complex (grouped under unit J13d), part of which belongs to the Tee Lake dyke complex, aphyric amoeboid pillow breccia of the Webb Island basalt (unit J1a), and a gabbro and gabbroic intrusion breccia (unit P2a). The intrusion complex consists of diabase, diabasic pegmatite, andesite, rhyolite, fine-grained leucotonalite, plagioclase-amphibole porphyry, plagioclase porphyry, quartz-feldspar porphyry and screens of pillowed basalt (Syme, 1991; Syme and Whalen, 1992).

At the occurrence (Fig. 37-2 and 37-3) fine-grained mafic volcanic rocks have been intruded by a series of felsic and feldspar porphyry dykes that average 3 m thick. The contacts of the felsic intrusion with the mafic volcanic rocks are sharp, but irregular. A series of NNE to NE-trending, steeply dipping schistose intervals cut both rock types and provide the host for most of the quartz veins. No offset could be determined along these shears.

MINERALIZATION

Quartz veins occur in schistose intervals that cut both mafic and felsic lithologies. The veins occur as thin stringers and lenses and as discrete veins up to 110 cm thick. The veins show little strike continuity and have been boudinaged within the shears. Brown-weathering carbonate and dark green chlorite masses are minor constituents of the quartz veins. No sulphides were noted in the veins. Stockwell (1935) indicated that disseminated pyrite is a common minor constituent of the quartz veins, the enclosing schist and the porphyry, and that chalcopyrite and galena are also present.

GEOCHEMICAL DATA

Stockwell (1935) indicated that assays of channel samples taken across 0.9 to 1.5 m (3 to 5 ft.) of schist and quartz in the northern two trenches reportedly returned 6.16 and 5.82 g Au/t (0.18 and 0.17 oz. Au/ton). A channel sample across 1.8 m (6 ft.) of pyritic porphyry containing minor quartz stringers reportedly assayed 2.05 g Au/t (0.06 oz. Au/ton).

CLASSIFICATION

Vein type deposit; multiple veins or lenses. Quartz veins are hosted by shear zones that cut mafic volcanic and felsic intrusive rocks.

REFERENCES

A.F. 91955; Cancelled Assesment File, Manitoba Industry, Trade and Mines, Minerals Division.

McGlynn, J.C.

1959: Elbow-Heming Lakes Area, Manitoba; Geological Survey of Canada, Memoir 305, 72 pp.

NATMAP Shield Margin Project Working Group

1998: Geology, NATMAP Shield Margin Project Area (Flin Flon Belt), Manitoba-Saskatchewan; Geological Survey of Canada 1968A; Manitoba Energy and Mines Map A-98-2, Sheets 1 to 7; Saskatchewan Energy and Mines Map 258A-2, scale 1:100 000.

Stockwell, C.H.

1935: Gold Deposits of the Elbow-Morton Area, Northern Manitoba; Geological Survey of Canada, Memoir 186, 74pp.

Syme, E.C.

1991: Elbow Lake project - Part A: supracrustal rocks and structural setting; in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1991, pp.14-27.

Syme, E.C. and Whalen, J.B.

1992: Geology, Elbow Lake, Manitoba; Geological Survey of Canada, Preliminary 1:20 000 map, Shield-Margin Project, File ELBOW92.PS.

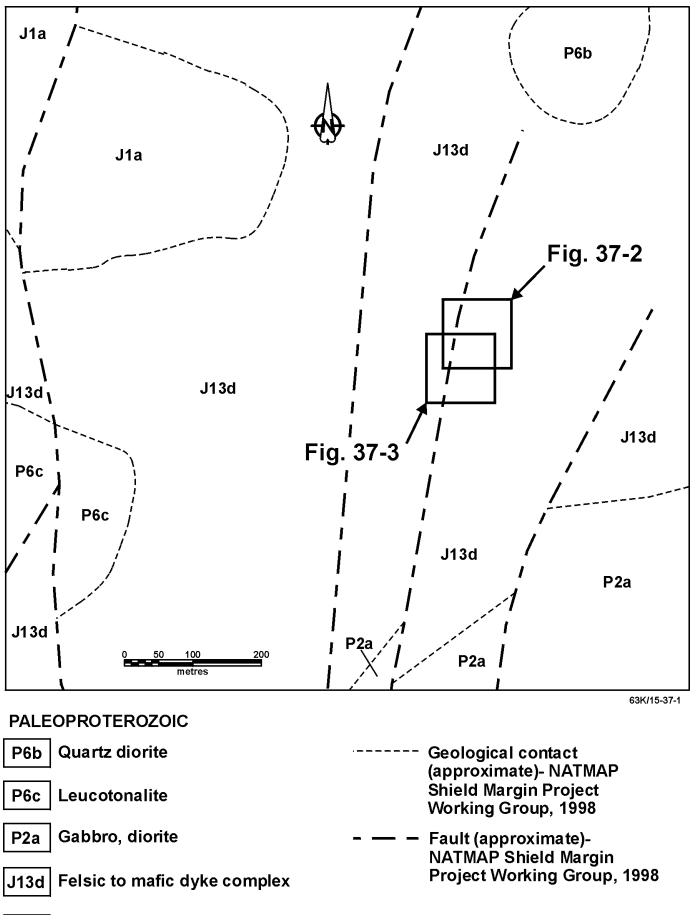


Figure 37-1: Geological setting of Apex No. 3 occurrence.

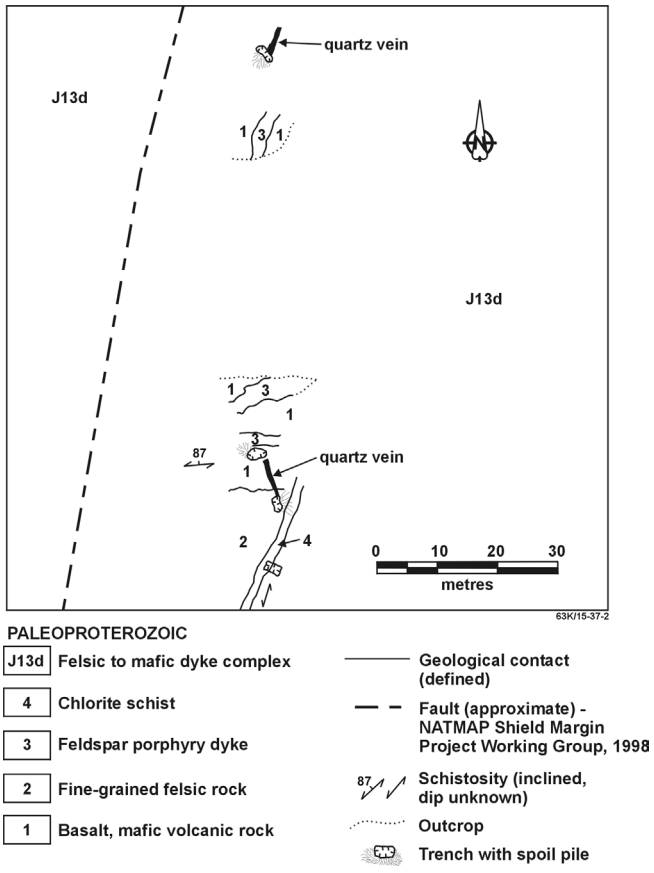
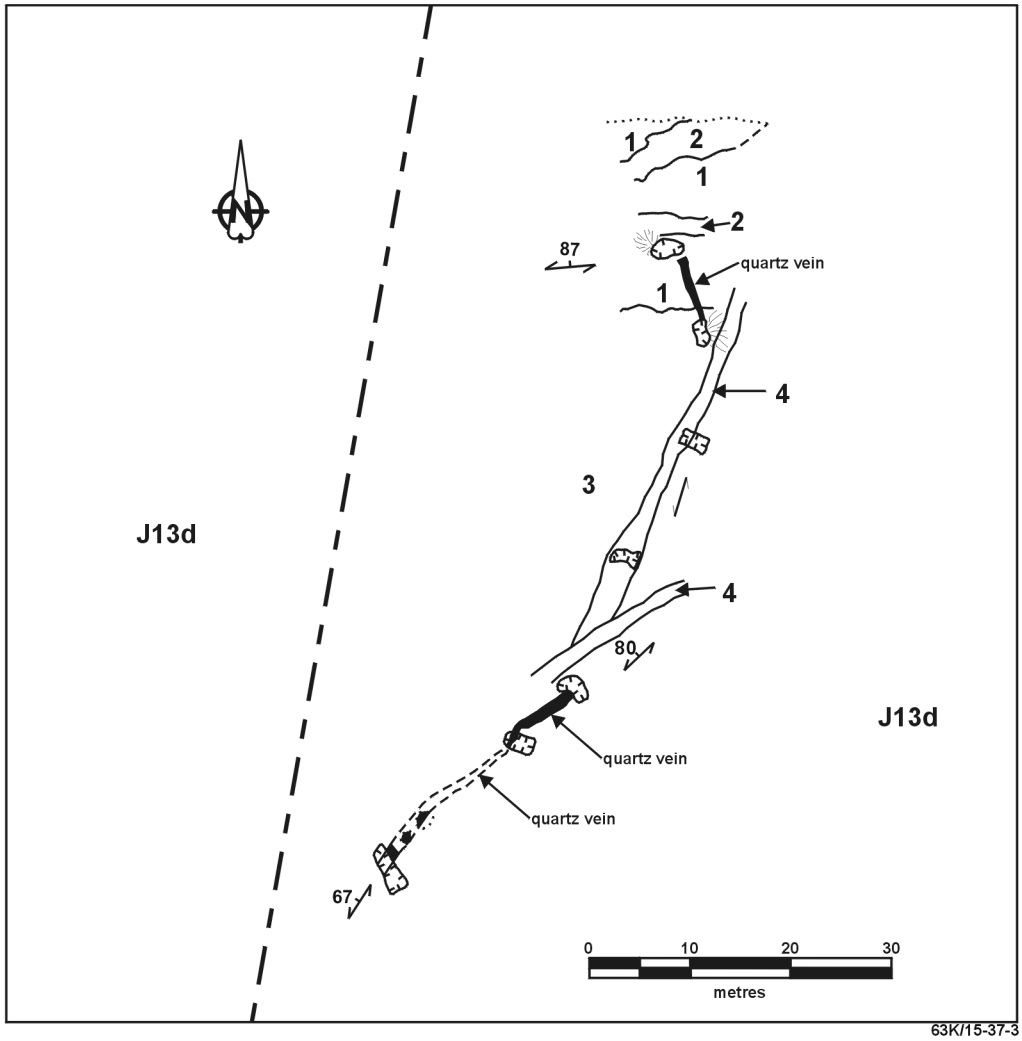


Figure 37-2: Geology and trench locations at Apex No. 3 occurrence.



PALEOPROTEROZOIC

J13d	Felsic to mafic dyke complex
4	Chlorite schist
3	Fine-grained felsic rock
2	Feldspar porphyry intrusion
1	Basalt, mafic volcanic rock

Geological contact (observed, approximate)

Fault (approximate) - NATMAP Shield Margin Project Working Group, 1998

87 Schistosity (inclined, dip unknown)

Trench with spoil pile

Figure 37-3: Geology and trench locations at Apex No. 3 occurrence.

LOCATION: 38

NAME:
UTM: 379840E, 6077970N
AREA: Smith Island, Elbow Lake
ACCESS: via bush aircraft, or by boat through the Cranberry Lakes from Cranberry Portage
AIRPHOTO: MB90025-120

EXPLORATION SUMMARY

This occurrence was staked in 1933 by Mr James A. Smith (Stockwell, 1935). Several pits were excavated, but no work has been recorded since that time.

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 38-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). The area is underlain by schists (unit W6c) of the Elbow Lake shear zone (Galley *et al*., 1987, 1989; Syme, 1990, 1991, 1992). The structure is approximately 1500 m thick in this area.

The rocks on Smith Island consist of chlorite and carbonate schists. The shear zone is crosscut by NNE-trending quartz and/or feldspar-phyric dykes. Several dioritic sills and/or dykes are also present. The rocks show a strong pervasive penetrative foliation that trends 025^{o} and dips 85^{o}SE. Dyke margins are schistose and some of the thinner feldspar porphyry dykes have been boudinaged. Several areas of carbonate alteration host deformed quartz-carbonate veins.

MINERALIZATION

Stockwell (1935) indicates that quartz veins occur in a quartz porphyry dyke that has been exposed at intervals for approximately 140 m (450 feet) from the north shore of the island. The porphyry is sparsely mineralized with disseminated arsenopyrite and pyrite. Quartz stringers within the porphyry carry minor sphalerite. Galley (field notes, 1987) indicates that the mineralization is associated with strongly hematitic alteration halos around a series of quartz-feldspar veins. The host schist to the porphyry contains deformed quartz veins and disseminated pyrite.

GEOCHEMICAL DATA

None

CLASSIFICATION

Vein type deposit; multiple veins or lenses. Associated with quartz porphyry dyke hosted by schists of the Elbow Lake shear zone.

REFERENCES

A.F. 91487, 92654; Cancelled Assessment Files, Manitoba Industry, Trade and Mines, Minerals Division.

Galley, A.G., Ames, D.E. and Franklin, J.M.

1987: Geological setting of gold mineralization in the Elbow Lake region, Manitoba; in Manitoba Energy and Mines, Minerals Division, Report of Field Activities, 1987, pp.175-177.

1989: Results of studies on the gold metallogeny of the Flin Flon belt; in Investigations by the Geological Survey of Canada in Manitoba and Saskatchewan during the 1984-1989 Mineral Development Agreements, Geological Survey of Canada, Open File 2133, pp.25-32.

NATMAP Shield Margin Project Working Group

1998: Geology, NATMAP Shield Margin Project Area (Flin Flon Belt), Manitoba-Saskatchewan; Geological Survey of Canada 1968A; Manitoba Energy and Mines Map A-98-2, Sheets 1 to 7; Saskatchewan Energy and Mines Map 258A-2, scale 1:100 000.

Stockwell, C.H.

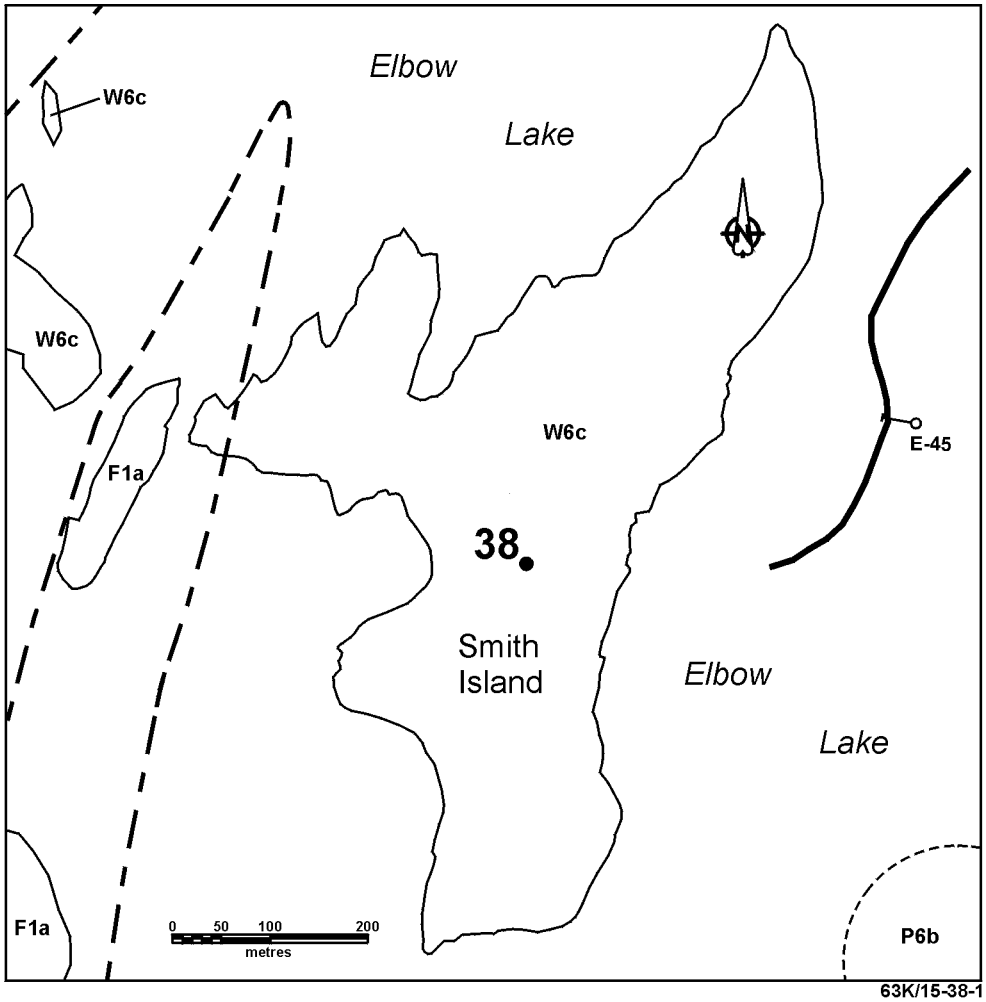
1935: Gold Deposits of the Elbow-Morton Area, Northern Manitoba; Geological Survey of Canada, Memoir 186, 74pp.

Syme, E.C.

1990: Elbow Lake project (part of NTS 63K/15W); in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1990, pp.49-57.

1991: Elbow Lake project - Part A: supracrustal rocks and structural setting; in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1991, pp.14-27.

1992: Elbow Lake Project - Part A: Supracrustal rocks; in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1992, pp.32-46.



PALEOPROTEROZOIC

W6c Mafic phyllonite +/- carbonate, cataclasite

P6b Quartz diorite

F1a McDougall's Point pillowed and massive basalt, diabase?

Shear zone margin (approximate)- NATMAP Shield Margin Project Working Group, 1998

EM conductor (A.F. 92654)

Drillhole (A.F. 91487, 92654)

38 Mineral occurrence location

Figure 38-1: Geological setting of occurrence 38.

LOCATION: 39

NAME: Gold Shower
UTM: 400320E, 6078935N
AREA: approximately 300 m east of NE side of North Star Lake
ACCESS: via bush plane to North Star Lake, then traverse
AIRPHOTO: MB90034-67

EXPLORATION SUMMARY

The Gold Shower claim was staked in 1928 by Mr Ole Birkeland. In 1934 the claim was held by Canadian Mining Projects, Limited and Mr V.A. Lackner (Stockwell, 1935). In 1981 an airborne EM (INPUT) and magnetic survey was performed for BP Minerals Limited, followed by a geological mapping programme (A.F. 92828).

The vein has been exposed over a strike length of approximately 75 m. Ten trenches were located during the 1992 examination of the occurrence.

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 39-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). The occurrence is located in the Eastern zone of Norquay *et al*. (1993). It is dominated by basaltic pillowed flows and fine- to medium-grained mafic intrusions (unit J1d) that are synvolcanic in part (Norquay *et al*., 1993, 1994a, b; Prouse and Gale, 1993). The mafic volcanic rocks may correlate with the Preaston Formation (Bailes, 1980). The occurrence is located less than 100 m east of Zacks fault, a well defined, discrete regional structure that separates the Eastern from the Central zone assemblage in this area.

The trenches at the occurrence are shown is Fig. 39-2. The host rocks to the occurrence consist of foliated fine- to medium-grained gabbro. Fine-grained mafic volcanic rocks are intercalated with the gabbroic units, the two often showing gradational contacts. The mafic rocks are intruded by a 50 cm thick garnetiferous biotite granite dyke.

MINERALIZATION

The occurrence consists of a white to grey quartz vein up to 4 m thick and trending approximately 008°. The vein has been traced more or less continuously for approximately 75 m. Chloritic inclusions of enclosing wallrock are common. No sulphides were found during the 1992 examination of the property, but Stockwell (1935) indicates minor quantities of pyrite, pyrrhotite and sphalerite are present.

GEOCHEMICAL DATA

No assays were reported for this occurrence. Stockwell (1935) indicates that gold values were disappointingly low.

CLASSIFICATION

Vein type deposit; single vein. Quartz vein and lenses are hosted by gabbro intercalated with basaltic volcanic rocks.

REFERENCES

A.F. 92828; Cancelled Assessment File, Manitoba Industry, Trade and Mines, Minerals Division.

Bailes, A.H.

1980: Geology of the File Lake Area; Manitoba Energy and Mines, Mineral Resources Division, Geological Report 78-1, 134 pp.

NATMAP Shield Margin Project Working Group

1998: Geology, NATMAP Shield Margin Project Area (Flin Flon Belt), Manitoba-Saskatchewan; Geological Survey of Canada 1968A; Manitoba Energy and Mines Map A-98-2, Sheets 1 to 7; Saskatchewan Energy and Mines Map 258A-2, scale 1:100 000.

Norquay, L.I., Prouse, D.E. and Gale, G.H.

1993: Geological investigations in the North Star Lake area (NTS 63K/15); in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1993, pp. 78-83.

1994a: The North Star Lake project (NTS 63K/15); in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1994, pp. 83-84.

1994b: North Star Lake (NTS 63K/15SE4); Manitoba Energy and Mines, Minerals Division, Preliminary Map 1994S-3, 1:10 000.

Prouse, D.E. and Gale, G.H.

1993: North Star Lake (NTS 63K/15SE4); Manitoba Energy and Mines, Minerals Division, Preliminary Map 1993S-3, 1:10 000.

Stockwell, C.H.

1935: Gold Deposits of the Elbow-Morton Area, Northern Manitoba; Geological Survey of Canada, Memoir 186, 74pp.

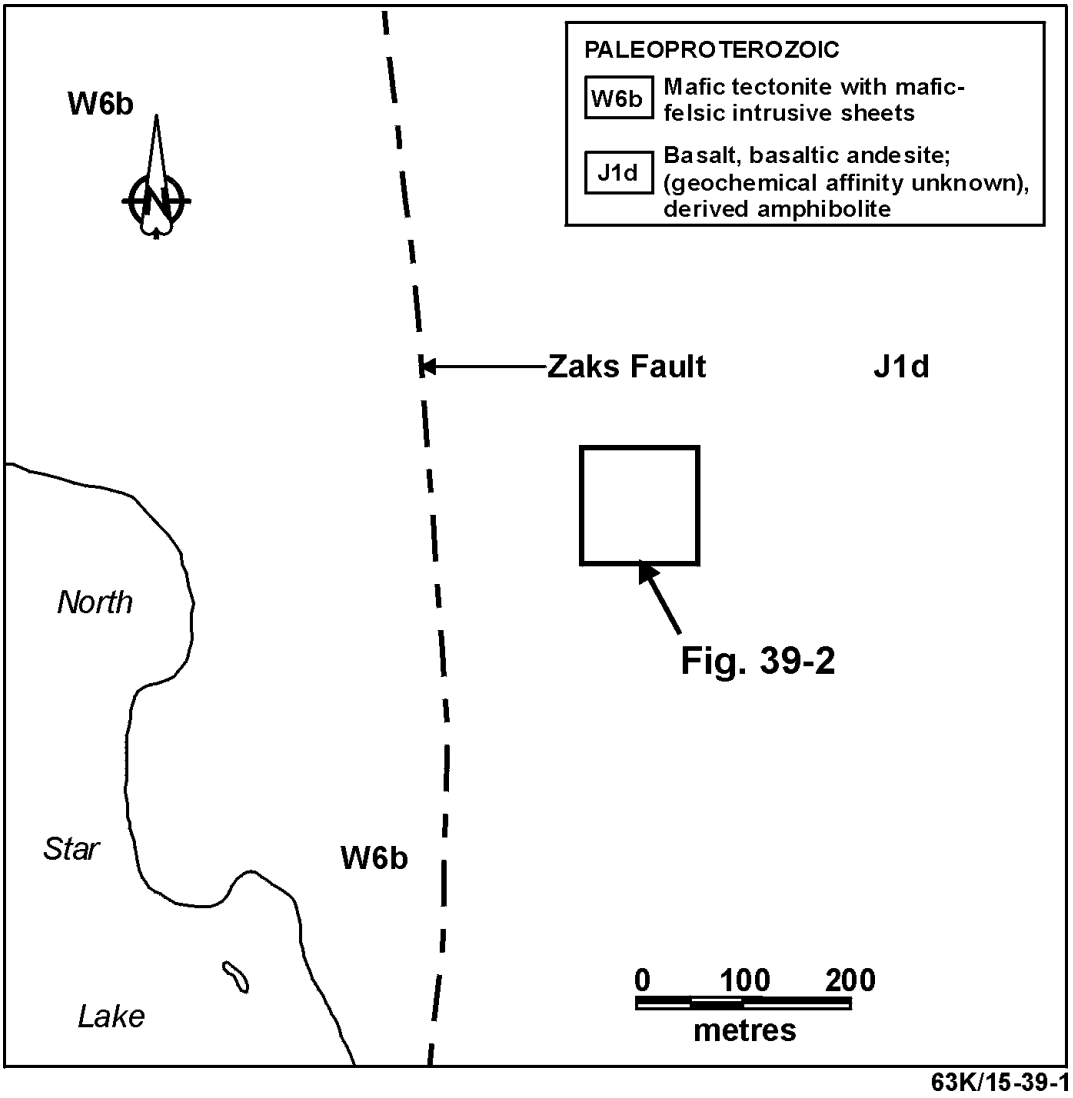
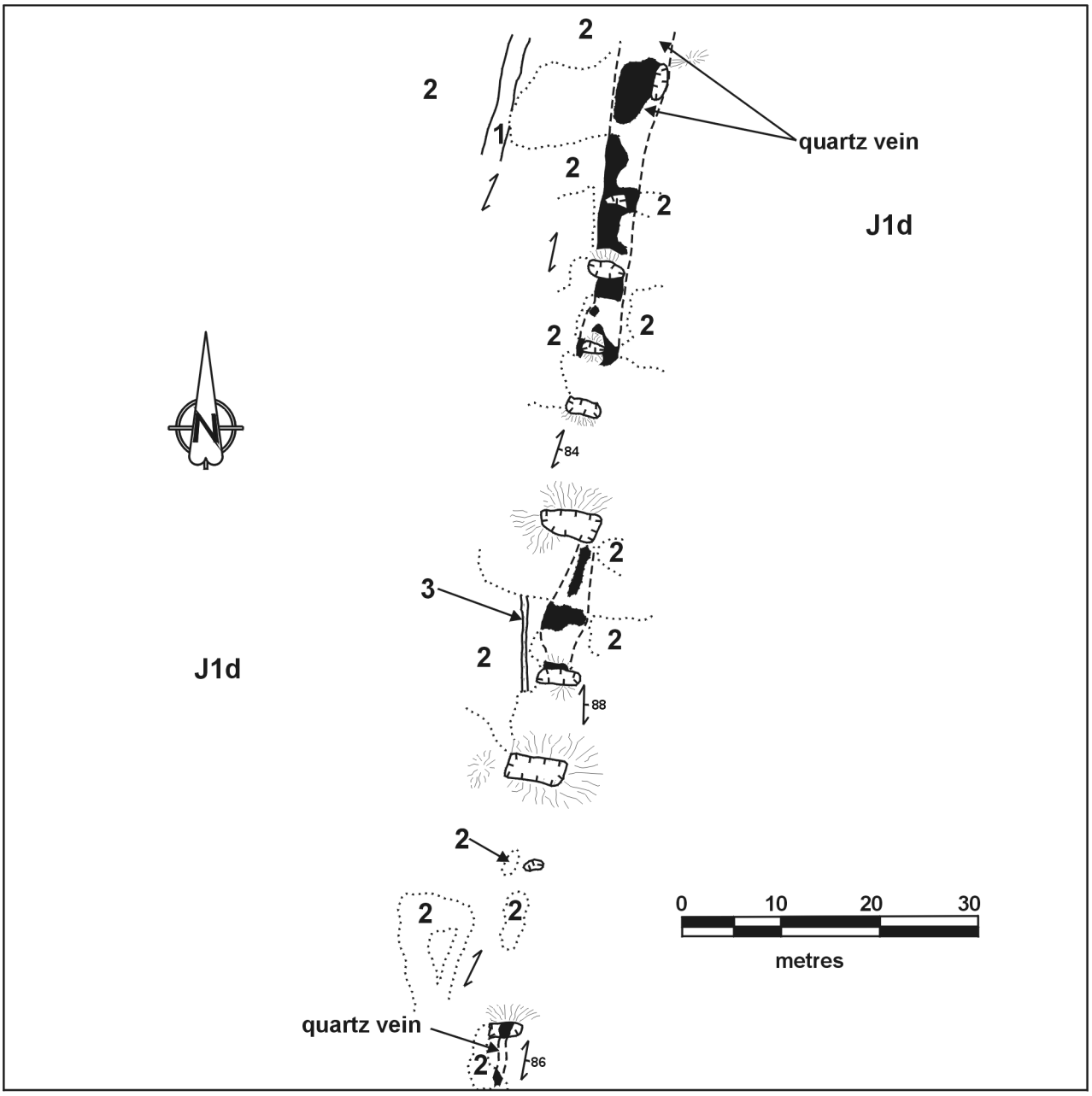


Figure 39-1: Geological setting of Gold Shower occurrence.



PALEOPROTEROZOIC

J1d	Basalt, basaltic andesite; (geochemical affinity unknown), derived amphibolite
3	Felsic dyke
2	Mafic hypabyssal intrusion, massive volcanic flow
1	Basalt, mafic volcanic rock

	Geological contact (observed, approximate)
88	Schistosity (inclined, dip unknown)
	Outcrop
	Trench with spoil pile

Figure 39-2: Geology and trench locations at Gold Shower occurrence.

LOCATION: 40

NAME: Gold Rock
UTM: 400490E, 6078725N
AREA: approximately 350 m east of North Star Lake
ACCESS: via bush plane to North Star Lake, then traverse
AIRPHOTO: MB90034-67

EXPLORATION SUMMARY

The Gold Rock claim was staked in 1928 by Mr Ole Birkeland. An option was given to Canadian Mining Projects, Limited in 1934 (Stockwell, 1935). A number of trenches were excavated on the quartz vein system during this period. In 1981 an airborne EM (INPUT) and magnetic survey was performed for BP Minerals Limited, followed by a geological mapping programme (A.F. 92828). In 1993 Mr Lloyd Smith obtained a mining lease that covers this occurrence. He operated the occurrence as a quarry for a short period. Mr Smith was extracting quartz, reportedly containing visible gold, from the central part of the occurrence for ornamental purposes.

Forty-three trenches were located during the examination of the occurrence in 1992. Many are overgrown or flooded and bedrock is only poorly exposed.

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 40-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). The occurrence is located in the Eastern zone of Norquay *et al*. (1993, 1994a, b) and Prouse and Gale (1993). The Eastern zone is dominated by basaltic pillowed flows and fine- to medium-grained mafic intrusions (unit J1d) that are synvolcanic in part (Norquay *et al*., 1993). The mafic volcanic rocks may correlate with the Preaston Formation (Bailes, 1980). The occurrence is located approximately 100 m east of Zaks Fault, a well defined, discrete, regional structure that separates the Eastern from the Central zone assemblage in this area.

The vein on the Gold Rock has been exposed over a strike length of approximately 200 m (Fig. 40-2). The host rocks consist of foliated fine-grained massive and pillowed basalt intercalated with coarser grained gabbroic to dioritic lithologies. Pillows are strongly deformed, typically showing length-to-thickness ratios exceeding 10:1. The mafic rocks are intruded by several 1 m thick mafic feldspar porphyry dykes that trend subparallel to the cleavage of the host rocks.

MINERALIZATION

The occurrence is hosted by a series (?) of milky quartz veins that trend 015º to 020º. Stockwell (1935) indicated the vein system consists of 4 distinct *en échelon* zones. Individual quartz veins vary from several centimetres up to 1.4 m thick, with quartz-impregnated schistose areas attaining thicknesses of up to 2.9 m. Because the vein system is only poorly exposed, it was not possible to determine with certainty if this series of veins represents a single shear-folded vein, similar to that at the North Star No. 1 and 2 occurrence (occurrence 45, this volume).

The veins contain common chloritic inclusions of the enclosing wallrock. In some areas the vein grades into the enclosing wallrock with a gradual decrease in the number of quartz veins. Red feldspar and carbonate are common accessories in the quartz. Pyrite was found as a minor constituent of the veins during the 1992 examination of the property, and Stockwell (1935) indicated that minor quantities of pyrrhotite, chalcopyrite and sphalerite are also present.

GEOCHEMICAL DATA

Stockwell (1935) indicated that Canadian Mining Projects, Limited obtained the following assays:

- one section approximately 17 m (55 ft.) long averaged 14.863 g Au/tonne (0.434 oz. Au/ton) across an average width of 0.95 m (3.12 ft.)
- an adjoining section approximately 52 m (170 ft.) long averaged approximately 39.38 g Au/tonne (1.15 oz. Au/ton) across an average width of 0.36 m (1.17 ft.).

CLASSIFICATION

Vein type deposit; single vein. A single quartz vein appears to have been shear folded, in pillowed basalt and synvolcanic mafic intrusions.

REFERENCES

A.F. 92828; Cancelled Assessment File, Manitoba Industry, Trade and Mines, Minerals Division.

Bailes, A.H.

1980: Geology of the File Lake Area; Manitoba Energy and Mines, Mineral Resources Division, Geological Report 78-1, 134 pp.

NATMAP Shield Margin Project Working Group

1998: Geology, NATMAP Shield Margin Project Area (Flin Flon Belt), Manitoba-Saskatchewan; Geological Survey of Canada 1968A; Manitoba Energy and Mines Map A-98-2, Sheets 1 to 7; Saskatchewan Energy and Mines Map 258A-2, scale 1:100 000.

Norquay, L.I., Prouse, D.E. and Gale, G.H.

1993: Geological investigations in the North Star Lake area (NTS 63K/15); in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1993, pp. 78-83.

1994a: The North Star Lake project (NTS 63K/15); in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1994, pp. 83-84.

1994b: North Star Lake (NTS 63K/15SE4); Manitoba Energy and Mines, Minerals Division, Preliminary Map 1994S-3, 1:10 000.

Prouse, D.E. and Gale, G.H.

1993: North Star Lake (NTS 63K/15SE4); Manitoba Energy and Mines, Minerals Division, Preliminary Map 1993S-3, 1:10 000.

Stockwell, C.H.

1935: Gold Deposits of the Elbow-Morton Area, Northern Manitoba; Geological Survey of Canada, Memoir 186, 74pp.

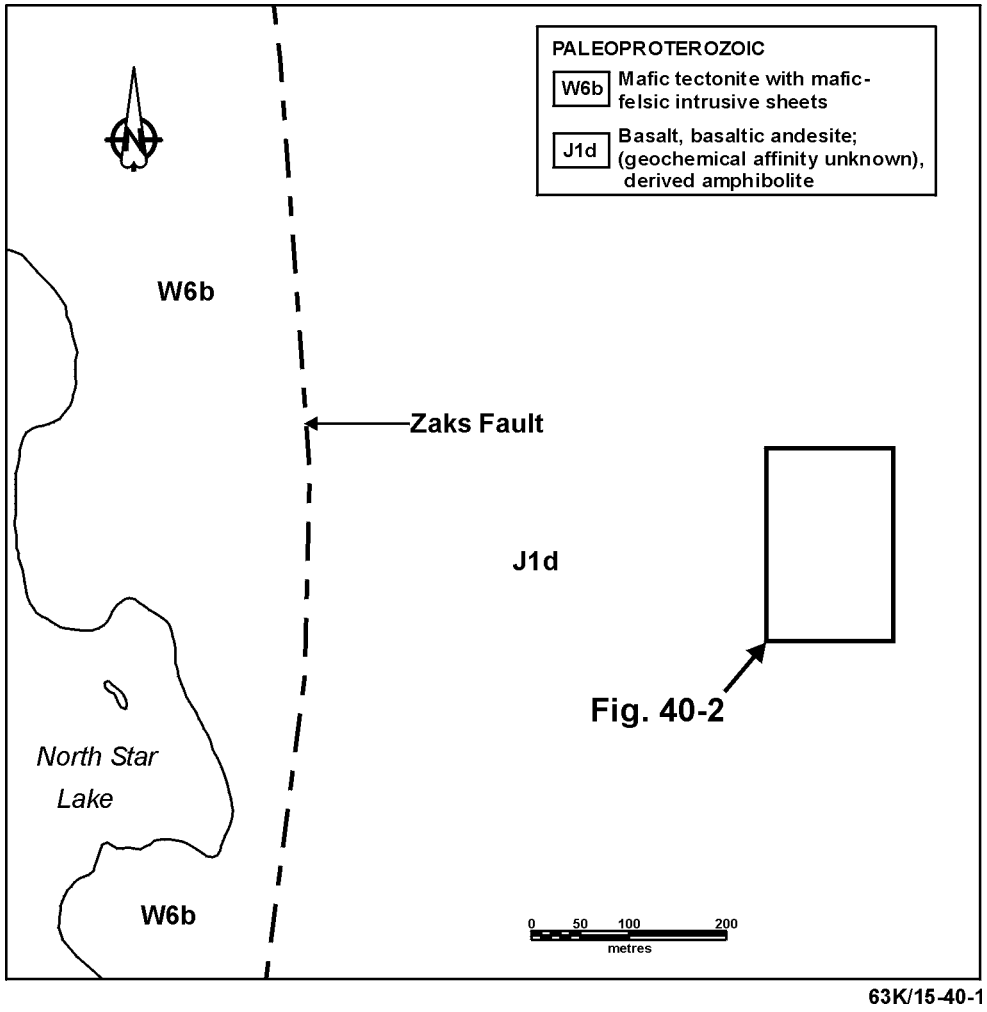


Figure 40-1: Geological setting of Gold Rock occurrence.

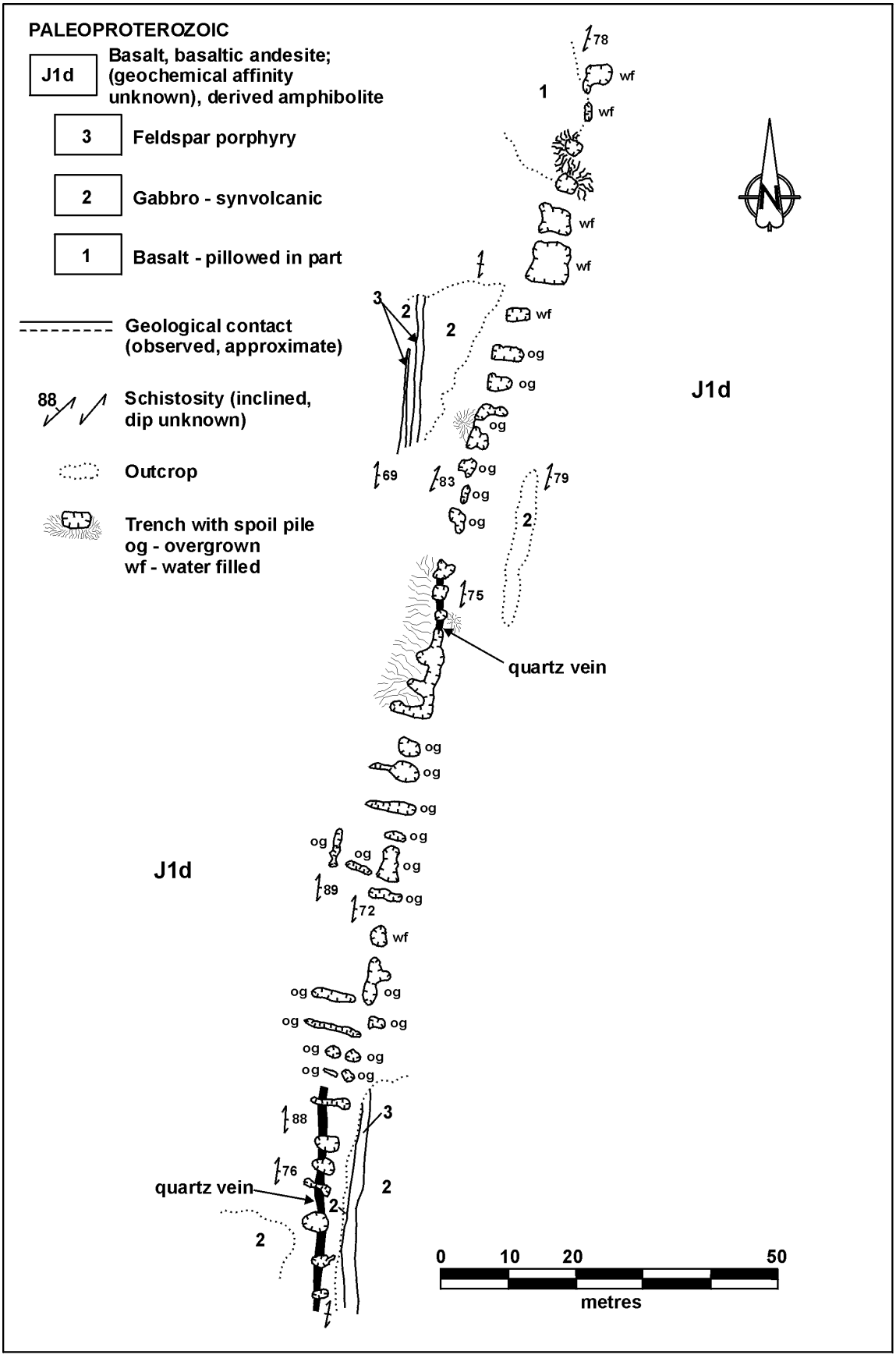


Figure 40-2: Geology and trench locations at Gold Rock occurrence.

LOCATION: 41

NAME: Key Fraction
UTM: 400450E, 6078345N
AREA: approximately 400 m east of North Star Lake
ACCESS: via bush plane to North Star Lake, then traverse
AIRPHOTO: MB90027-213

EXPLORATION SUMMARY

This occurrence was staked in 1933 by Mr Oliver Dickson. In 1934 it was owned by Mr Gisli Gislason (Stockwell, 1935). In 1981 an airborne EM (INPUT) and magnetic survey was flown for BP Minerals Limited, followed by a geological mapping programme (A.F. 92828).

Eight trenches were located during the 1993 investigation of this occurrence. Most of these are overgrown and bedrock is exposed only in the central excavations.

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 41-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). The occurrence is located in the Eastern zone of Norquay *et al*. (1993, 1994a, b) and Prouse and Gale (1993). The Eastern zone rocks are dominated by basaltic pillowed flows and fine- to medium-grained mafic intrusions (unit J1d) that are synvolcanic in part (Norquay *et al*., 1993). The mafic volcanic rocks may correlate with the Preaston Formation (Bailes, 1980). The occurrence is located approximately 300 m east of Zaks Fault, a well defined, discrete, regional structure that separates the Eastern from the Central zone assemblage in this area.

The location of the trenches is shown in Fig. 41-2. The rocks at the occurrence consist of foliated, fine-grained, massive and pillowed basalt. Pillows are strongly deformed, typically showing length-to-thickness ratios exceeding 10:1. The basalt is intercalated with coarser grained gabbroic to dioritic lithologies, the two rock types showing both sharp and gradational boundaries.

MINERALIZATION

Stockwell (1935) indicated that the quartz vein that hosts the mineralization is exposed over a strike length of approximately 60 m. The vein is up to 2 m thick, trends approximately 017º and dips 75ºE. The vein contains common chloritic inclusions of the enclosing wallrock. Red feldspar and carbonate are minor constituents of the vein. The sulphide content of the vein is low, but some quartz vein material on the spoil piles contains up to 40% pyrite. The sulphide occurs as disseminated grains and masses, and is in part fracture controlled.

GEOCHEMICAL DATA

No assays were reported for this occurrence.

CLASSIFICATION

Vein type deposit; single vein. Quartz vein and lenses are hosted by basalt with intercalated mafic intrusions.

REFERENCES

A.F. 92828, 93722, 93723; Cancelled Assessment Files, Manitoba Industry, Trade and Mines, Minerals Division.

Bailes, A.H.

1980: Geology of the File Lake Area; Manitoba Energy and Mines, Mineral Resources Division, Geological Report 78-1, 134 pp.

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1998: Geology, NATMAP Shield Margin Project Area (Flin Flon Belt), Manitoba-Saskatchewan; Geological Survey of Canada 1968a; Manitoba Energy and Mines Map A-98-2, Sheets 1 to 7; Saskatchewan Energy and Mines Map 258A-2, Scale 1:100 000.

Norquay, L.I., Prouse, D.E. and Gale, G.H.

1993: Geological investigations in the North Star Lake area (NTS 63K/15); in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1993, pp. 78-83.

1994a: The North Star Lake project (NTS 63K/15); in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1994, pp. 83-84.

1994b:North Star Lake (NTS 63K/15SE4); Manitoba Energy and Mines, Minerals Division, Preliminary Map 1994S-3, 1:10 000.

Prouse, D.E. and Gale, G.H.

1993: North Star Lake (NTS 63K/15SE4); Manitoba Energy and Mines, Minerals Division, Preliminary Map 1993S-3, 1:10 000.

Stockwell, C.H.

1935: Gold Deposits of the Elbow-Morton Area, Northern Manitoba; Geological Survey of Canada, Memoir 186, 74pp.

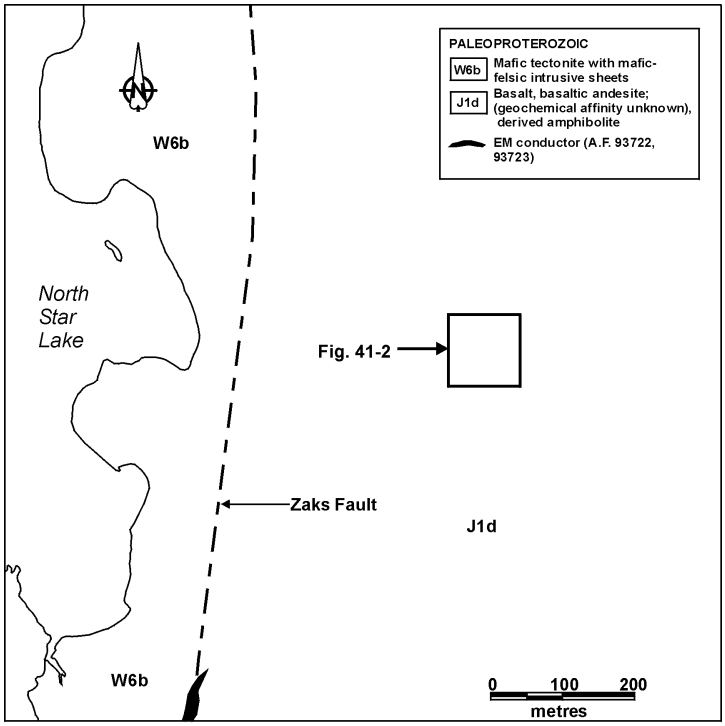

Figure 41-1: Geological setting of Key Fraction occurrence.

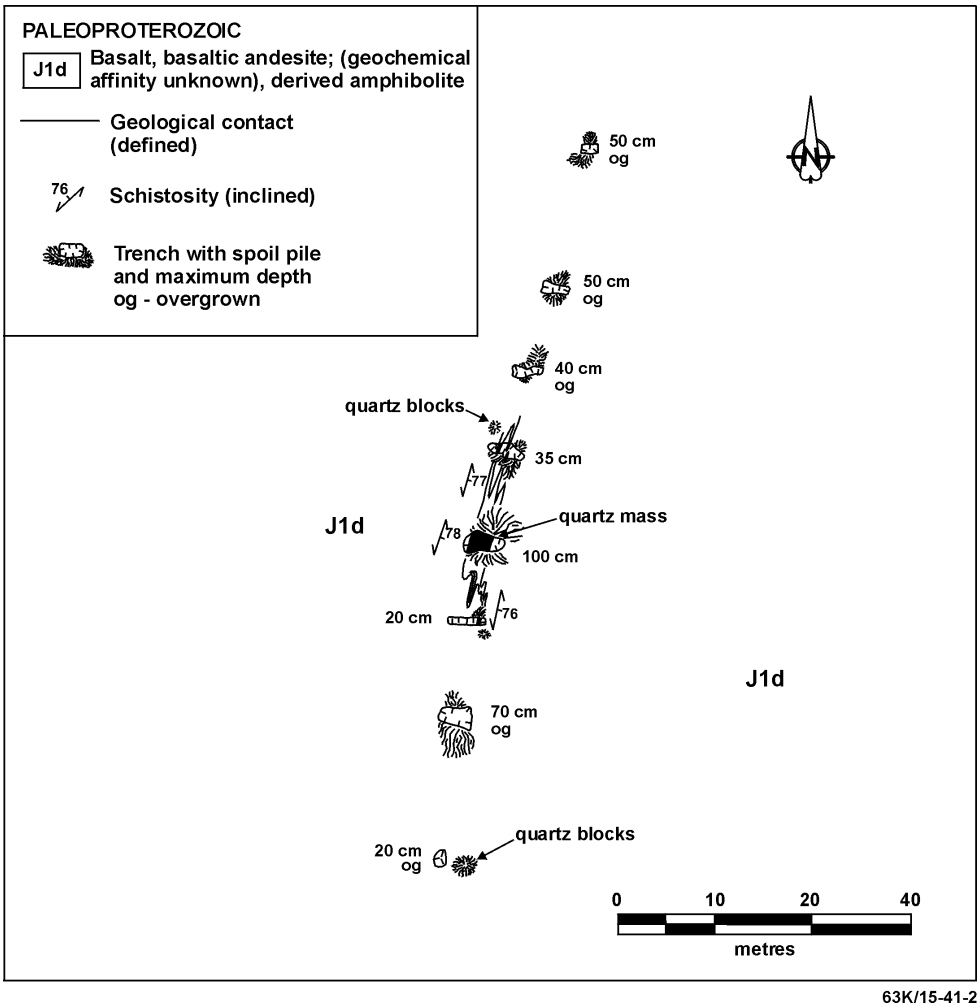

Figure 41-2: Geology and trench locations at Key Fraction occurrence.

LOCATION: 42

NAME: Apex Fraction
UTM: 400670E, 6078225N
AREA: approximately 750 m east of North Star Lake
ACCESS: via bush plane to North Star Lake, then traverse
AIRPHOTO: MB90027-211

EXPLORATION SUMMARY

This occurrence was staked in 1933, and in 1934 was owned by Mr Oliver Dickson (Stockwell, 1935). In 1981 an airborne EM (INPUT) and magnetic survey was flown for BP Minerals Limited, followed by a geological mapping programme (A.F. 92828).

Three trenches were located during the 1993 investigation of this occurrence. Bedrock is exposed in only the northernmost excavation. A fourth trench is located approximately 30 m to the NNW of the main occurrence and was not excavated on the same quartz vein as the other three.

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 42-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). The occurrence is located in the Eastern zone of Norquay *et al*. (1993, 1994a, b) and Prouse and Gale (1993). The Eastern zone rocks are dominated by basaltic pillowed flows and fine- to medium-grained mafic intrusions (unit J1d) that are synvolcanic in part (Norquay *et al*., 1993). The mafic volcanic rocks may correlate with the Preaston Formation (Bailes, 1980). The occurrence is located approximately 500 m east of Zaks Fault, a well defined, discrete, regional structure that separates the Eastern from the Central zone assemblage in this area.

The location of the trenches is shown in Fig. 42-2. The rocks at the occurrence consist of foliated, fine-grained, massive and pillowed basalt. Pillows and amygdules are strongly deformed, typically showing length-to-thickness ratios exceeding 10:1. Top directions of the flows are ambiguous.

MINERALIZATION

A single white, Fe oxide-stained quartz vein up to 60 cm thick is exposed in trench and outcrop at the northern part of the occurrence. The vein trends 022^{o} and dips 82^{o}E. Minor pyrite is disseminated throughout the vein material. Stockwell (1935) indicates that the most southerly trench exposed approximately 4.8 m of mixed quartz and chloritic schist.

GEOCHEMICAL DATA

No assays were reported for this occurrence.

CLASSIFICATION

Vein type deposit; single vein. Quartz vein is hosted by basalt.

REFERENCES

A.F. 92828, 93722, 93723; Cancelled Assessment Files, Manitoba Industry, Trade and Mines, Minerals Division.

Bailes, A.H.

1980: Geology of the File Lake Area; Manitoba Energy and Mines, Mineral Resources Division, Geological Report 78-1, 134 pp.

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1998: Geology, NATMAP Shield Margin Project Area (Flin Flon Belt), Manitoba-Saskatchewan; Geological Survey of Canada 1968A; Manitoba Energy and Mines Map A-98-2, Sheets 1 to 7; Saskatchewan Energy and Mines Map 258A-2, scale 1:100 000.

Norquay, L.I., Prouse, D.E. and Gale, G.H.

1993: Geological investigations in the North Star Lake area (NTS 63K/15); in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1993, pp. 78-83.

1994a: The North Star Lake project (NTS 63K/15); in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1994, pp. 83-84.

1994b: North Star Lake (NTS 63K/15SE4); Manitoba Energy and Mines, Minerals Division, Preliminary Map 1994S-3, 1:10 000.

Prouse, D.E. and Gale, G.H.

1993: North Star Lake (NTS 63K/15SE4); Manitoba Energy and Mines, Minerals Division, Preliminary Map 1993S-3, 1:10 000.

Stockwell, C.H.

1935: Gold Deposits of the Elbow-Morton Area, Northern Manitoba; Geological Survey of Canada, Memoir 186, 74pp.

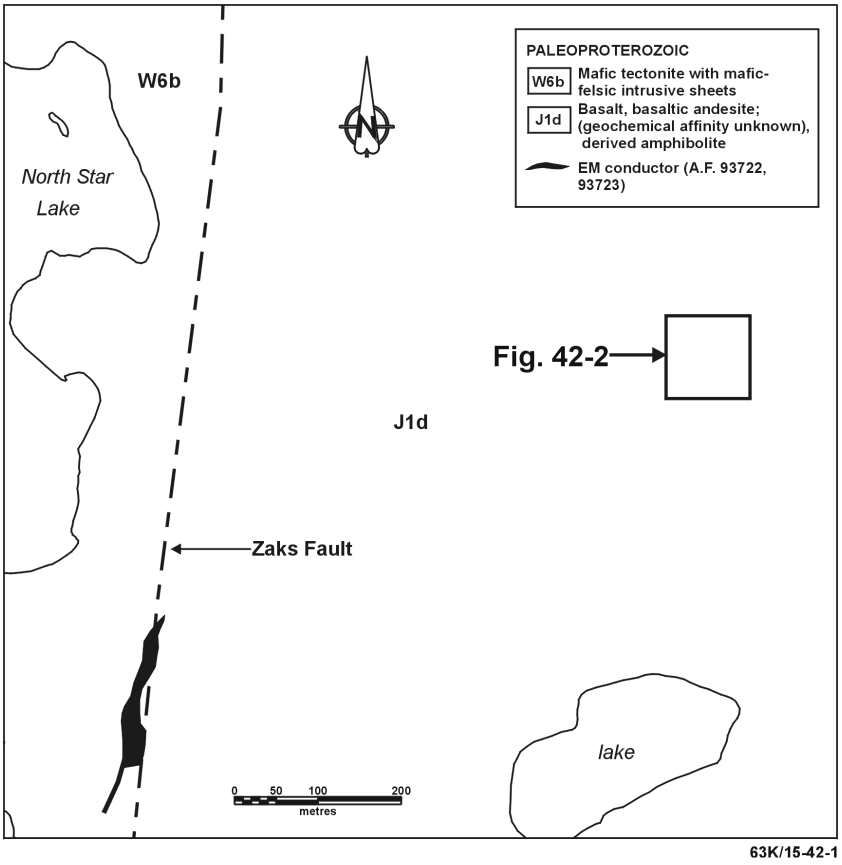

Figure 42-1: Geological setting of Apex Fraction occurrence.

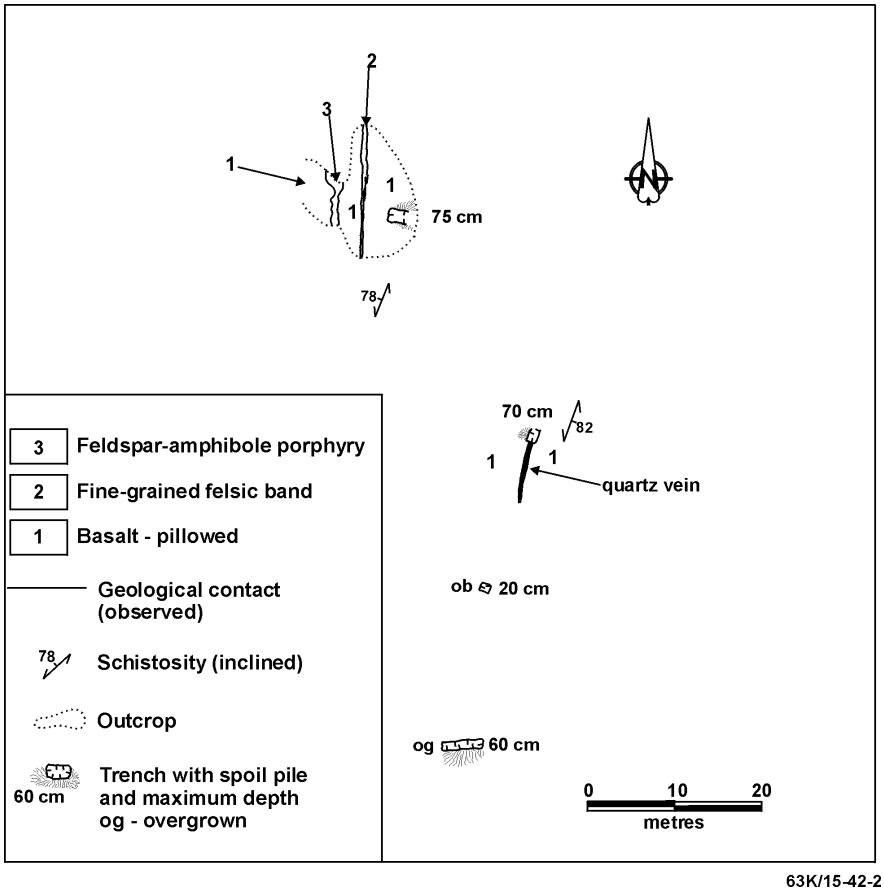

Figure 42-2: Geology and trench locations at Apex Fraction occurrence.

LOCATION: 43

NAME: North Star No. 2 and No. 4
UTM: 400350E, 6077735N
AREA: approximately 400 m SE of southeast side of North Star Lake
ACCESS: via bush plane to North Star Lake, then traverse
AIRPHOTO: MB90027-211

EXPLORATION SUMMARY

The North Star No. 4 claim was staked in 1927 by Mr Hjalmer Peterson (Stockwell, 1935) and several trenches excavated. In 1981 an airborne EM (INPUT) and magnetic survey was for BP Minerals Limited, followed by a geological mapping programme (A.F. 92828).

Quartz veins occur in three areas at this occurrence. The easternmost occurrence has been explored in 5 trenches, the northern quartz vein in 2 trenches, and the western occurrence in 17 excavations. Most of the trenches are completely overgrown and/or water-filled, and bedrock is generally only poorly exposed.

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 43-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). The occurrence is located in the Eastern zone of Norquay *et al*. (1993, 1994a, b) and Prouse and Gale (1993). The Eastern zone rocks are dominated by basaltic pillowed flows and fine- to medium-grained mafic intrusions (unit J1d) that are synvolcanic in part (Norquay *et al*., 1993). The mafic volcanic rocks may correlate with the Preaston Formation (Bailes, 1980). The occurrence is located approximately 150 m east of Zaks Fault, a well defined, discrete, regional structure that separates the Eastern from the Central zone assemblage in this area.

The locations of two groups of trenches is shown in Fig. 43-2 and 43-3. The lithologic sequence at the occurrence consists of foliated fine-grained massive and pillowed basalt, flow-top breccia, finely laminated mafic rock, and coarser grained gabbroic to dioritic lithologies. Contacts between rock types are often gradational suggesting that the lithologies represent a flow sequence. Pillows are strongly deformed, typically showing length-to-thickness ratios exceeding 10:1. Top directions of the flows are ambiguous. Feldspar porphyry dykes that trend parallel to the regional foliation are also present.

MINERALIZATION

The North Star No. 4, the easternmost occurrence (Fig. 43-3), corresponds to locality 43b of Stockwell (1935), and is more or less on strike with the Key Fraction occurrence approximately 275 m to the north. The quartz vein is exposed in the two northern trenches and pinches out to the south. The vein is up to 160 cm thick, strikes 019^{o} and has a subvertical dip. It consists of white quartz and contains up to 2% brown-weathering Fe-carbonate. Chloritic wallrock fragments are common inclusions within the vein, which also contains minor disseminated pyrite. The location of the vein appears to be controlled by a feldspar porphyry dyke, and is located within and at the margins of this intrusion.

The North Star No. 2 and No. 4, approximately 120 m WNW of the North Star No. 4 occurrence (Fig. 43-2), is more or less on strike with the North Star No. 1 and No. 2 occurrence 350 m to the SSW. It corresponds to locality 43c of Stockwell (1935). The character of the quartz veins ranges from discrete features up to 1.6 m thick to areas of chloritic schist that contain abundant quartz stringers. Most of the quartz veins observed in the trenched areas are less than 20 cm thick. Disseminated sulphides form a minor constituent of the veins. Pyrite is the most common sulphide, and chalcopyrite was observed in several areas. Stockwell (1935) indicated that pyrrhotite and sphalerite are present as minor constituents.

The North Star No. 2 occurs approximately 100 m NNE of the north end of the trenches on the North Star No. 1 and No. 4 part of the occurrence. A white quartz vein 5 to 20 cm thick, trending 004^{o} and dipping 84^{o}E, is exposed in one trench. The vein pinches and swells along strike. The quartz contains common minor disseminated chalcopyrite and trace amounts of pyrite, and is very limonitic.

GEOCHEMICAL DATA

No assays were reported for this occurrence.

CLASSIFICATION

Vein-type deposit; multiple veins and lenses.

REFERENCES

A.F. 90493, 92828, 93722; Cancelled Assessment Files, Manitoba Industry, Trade and Mines, Minerals Division.

Bailes, A.H.

1980: Geology of the File Lake Area; Manitoba Energy and Mines, Mineral Resources Division, Geological Report 78-1, 134 pp.

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1998: Geology, NATMAP Shield Margin Project Area (Flin Flon Belt), Manitoba-Saskatchewan; Geological Survey of Canada 1968A; Manitoba Energy and Mines Map A-98-2, Sheets 1 to 7; Saskatchewan Energy and Mines Map 258A-2, scale 1:100 000.

Norquay, L.I., Prouse, D.E. and Gale, G.H.

1993: Geological investigations in the North Star Lake area (NTS 63K/15); in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1993, pp. 78-83.

1994a: The North Star Lake project (NTS 63K/15); in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1994, pp. 83-84.

1994b: North Star Lake (NTS 63K/15SE4); Cancelled Assessment File, Manitoba Industry, Trade and Mines, Minerals Division, Preliminary Map 1994S-3, 1:10 000.

Prouse, D.E. and Gale, G.H.

1993: North Star Lake (NTS 63K/15SE4); Manitoba Energy and Mines, Minerals Division, Preliminary Map 1993S-3, 1:10 000.

Stockwell, C.H.

1935: Gold Deposits of the Elbow-Morton Area, Northern Manitoba; Geological Survey of Canada, Memoir 186, 74pp.

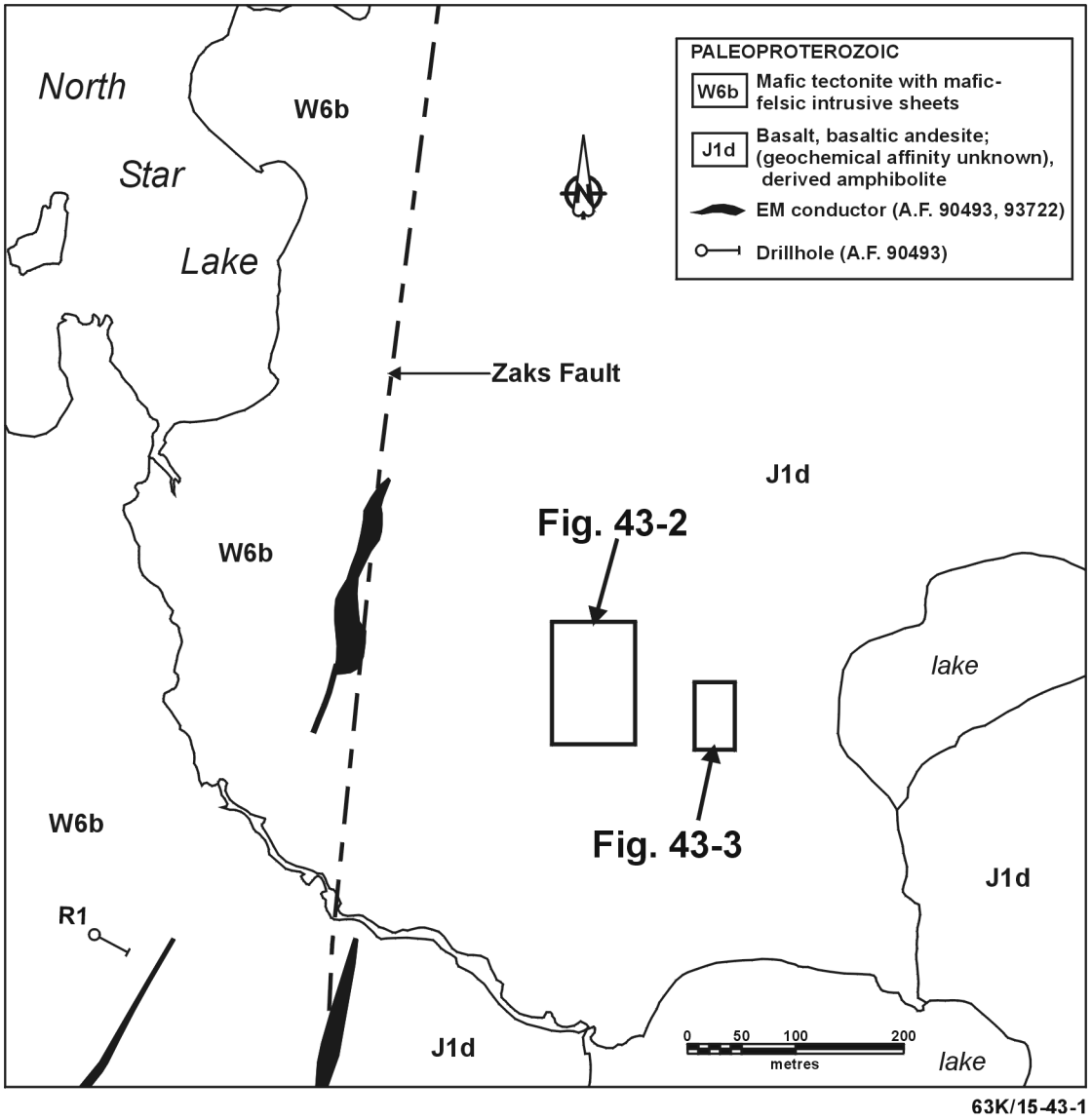

Figure 43-1: Geological setting of North Star No. 2 and No. 4 occurrence.

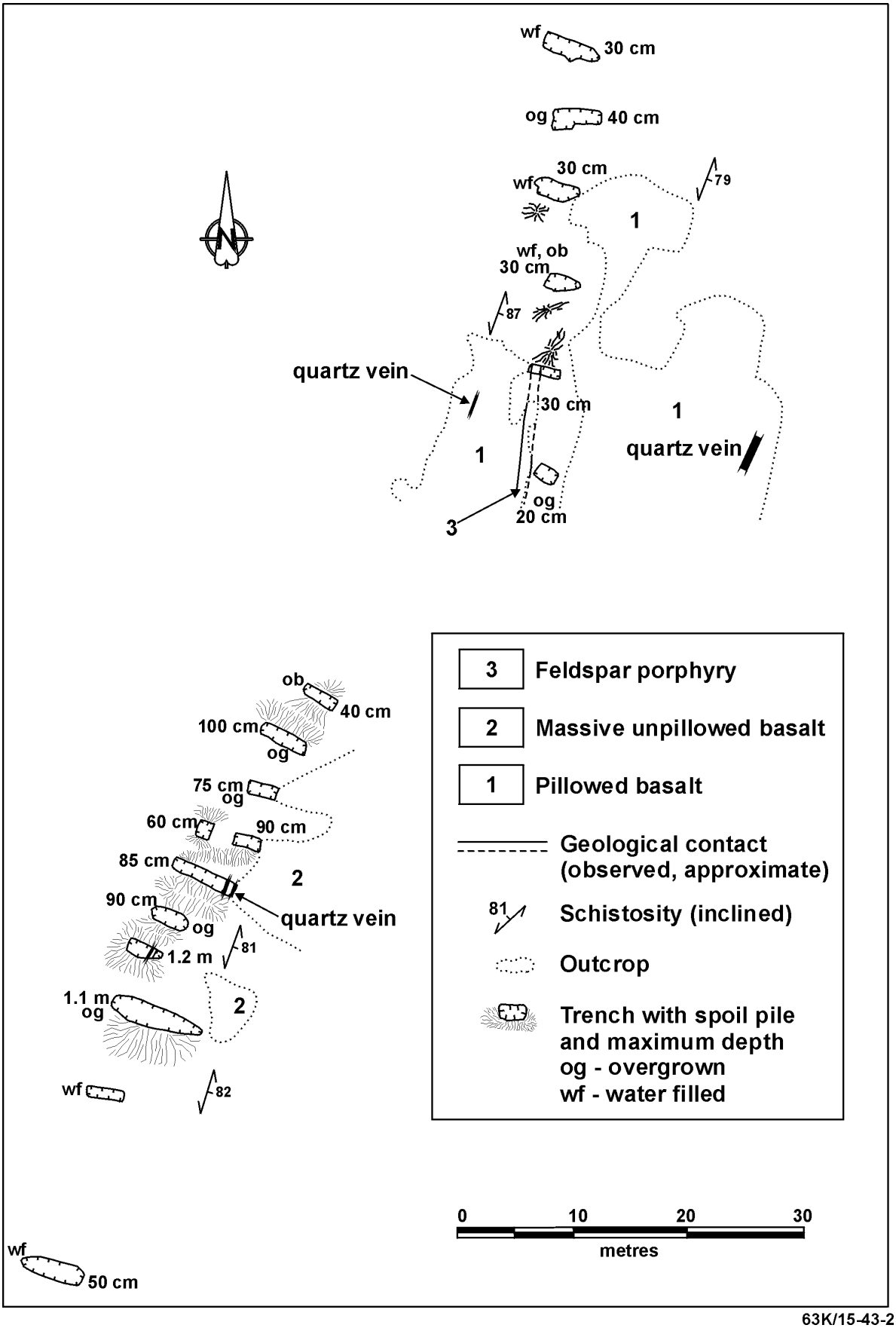

Figure 43-2: Geology and trench locations at North Star No. 2 and No. 4 occurrence.

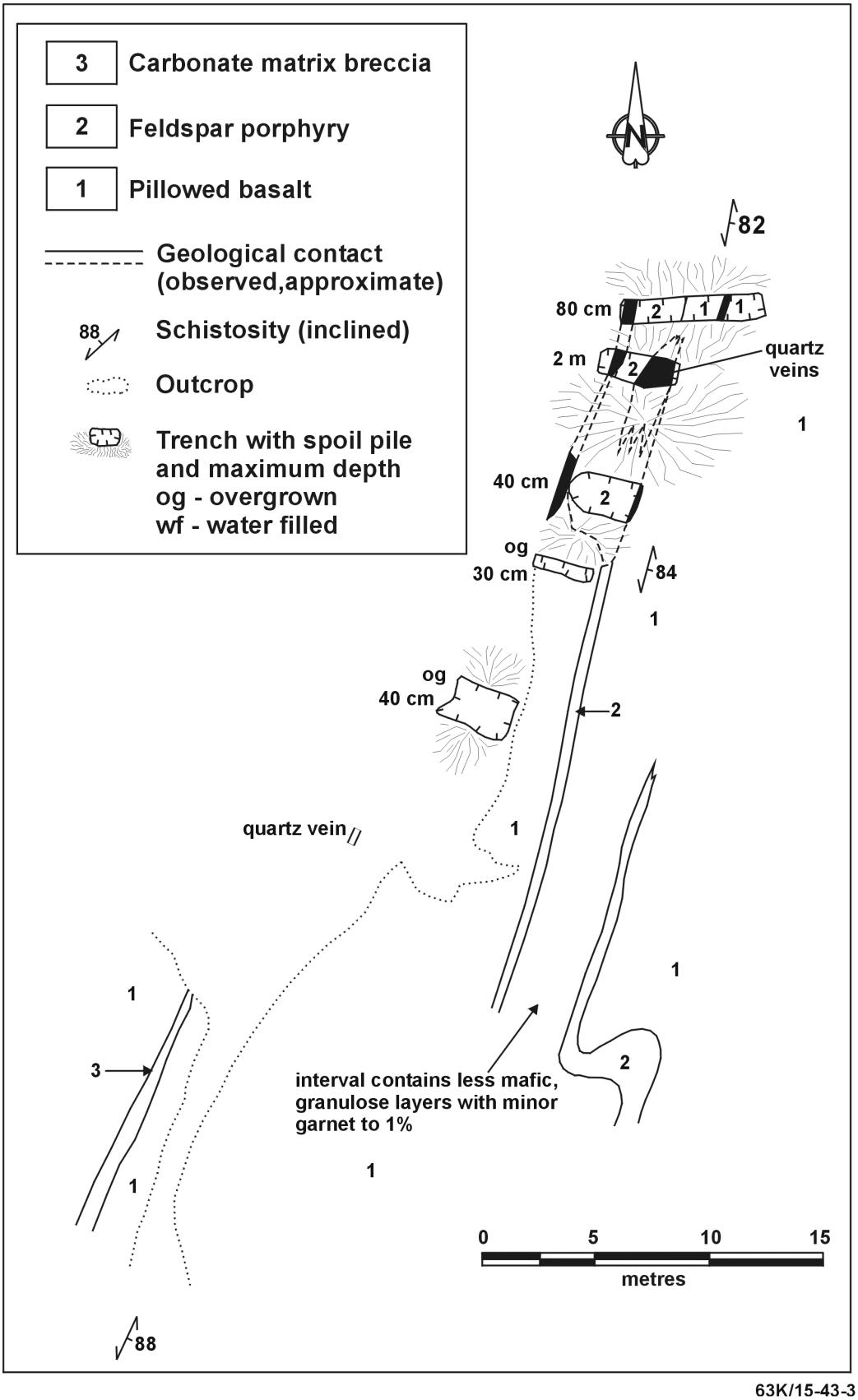

Figure 43-3: Geology and trench locations at North Star No. 2 and No. 4 occurrence.

LOCATION: 44

NAME: North Star No. 7
UTM: 400670E, 6077565N
AREA: approximately 800 m SE of southeast end of North Star Lake
ACCESS: via bush plane to North Star Lake, then traverse
AIRPHOTO: MB90027-211

EXPLORATION SUMMARY

The occurrence was staked in 1927, and several trenches excavated to evaluate a quartz vein (Stockwell, 1935). In 1981 an airborne EM (INPUT) and magnetic survey was flown for BP Minerals Limited, followed by a geological mapping programme (A.F. 92828).

A single, mostly-overgrown trench and stripped area were located during the 1992 examination of the occurrence.

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 44-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). The occurrence is located in the Eastern zone of Norquay *et al*. (1993, 1994a, b) and Prouse and Gale (1993). The Eastern zone rocks are dominated by basaltic pillowed flows and fine- to medium-grained mafic intrusions (unit J1d) that are synvolcanic in part (Norquay *et al*., 1993). The mafic volcanic rocks may correlate with the Preaston Formation (Bailes, 1980). The occurrence is located approximately 700 m east of Zaks Fault, a well defined, discrete, regional structure that separates the Eastern from the Central zone assemblage in this area.

The occurrence is underlain by basalt and synvolcanic dioritic to gabbroic intrusions. A granitic dyke trending 025^{o} is exposed approximately 30 m east of the south end of the occurrence.

MINERALIZATION

Stockwell (1935) indicated the occurrence had been traced along strike for approximately 75 m. Quartz veins and quartz in schist occur across thicknesses ranging from 1.5 to 5.5 m, with individual quartz veins from 1.0 to 1.8 m thick. The veins and schistose interval trends 015^{o} and dips steeply to the east. The quartz is generally fairly limonitic on the weathered surface and contains minor disseminated pyrite.

GEOCHEMICAL DATA

No assay values have been reported for this occurrence.

CLASSIFICATION

Vein type deposit; single vein.

REFERENCES

A.F. 92828, 93722, 93723; Cancelled Assessment Files, Manitoba Industry, Trade and Mines, Minerals Division.

Bailes, A.H.

1980: Geology of the File Lake Area; Manitoba Energy and Mines, Mineral Resources Division, Geological Report 78-1, 134 pp.

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1998: Geology, NATMAP Shield Margin Project Area (Flin Flon Belt), Manitoba-Saskatchewan; Geological Survey of Canada 1968A; Manitoba Energy and Mines Map A-98-2, Sheets 1 to 7; Saskatchewan Energy and Mines Map 258A-2, scale 1:100 000.

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1994a:The North Star Lake project (NTS 63K/15); in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1994, pp. 83-84.

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1993: North Star Lake (NTS 63K/15SE4); Manitoba Energy and Mines, Minerals Division, Preliminary Map 1993S-3, 1:10 000.

Stockwell, C.H.

1935: Gold Deposits of the Elbow-Morton Area, Northern Manitoba; Geological Survey of Canada, Memoir 186, 74pp.

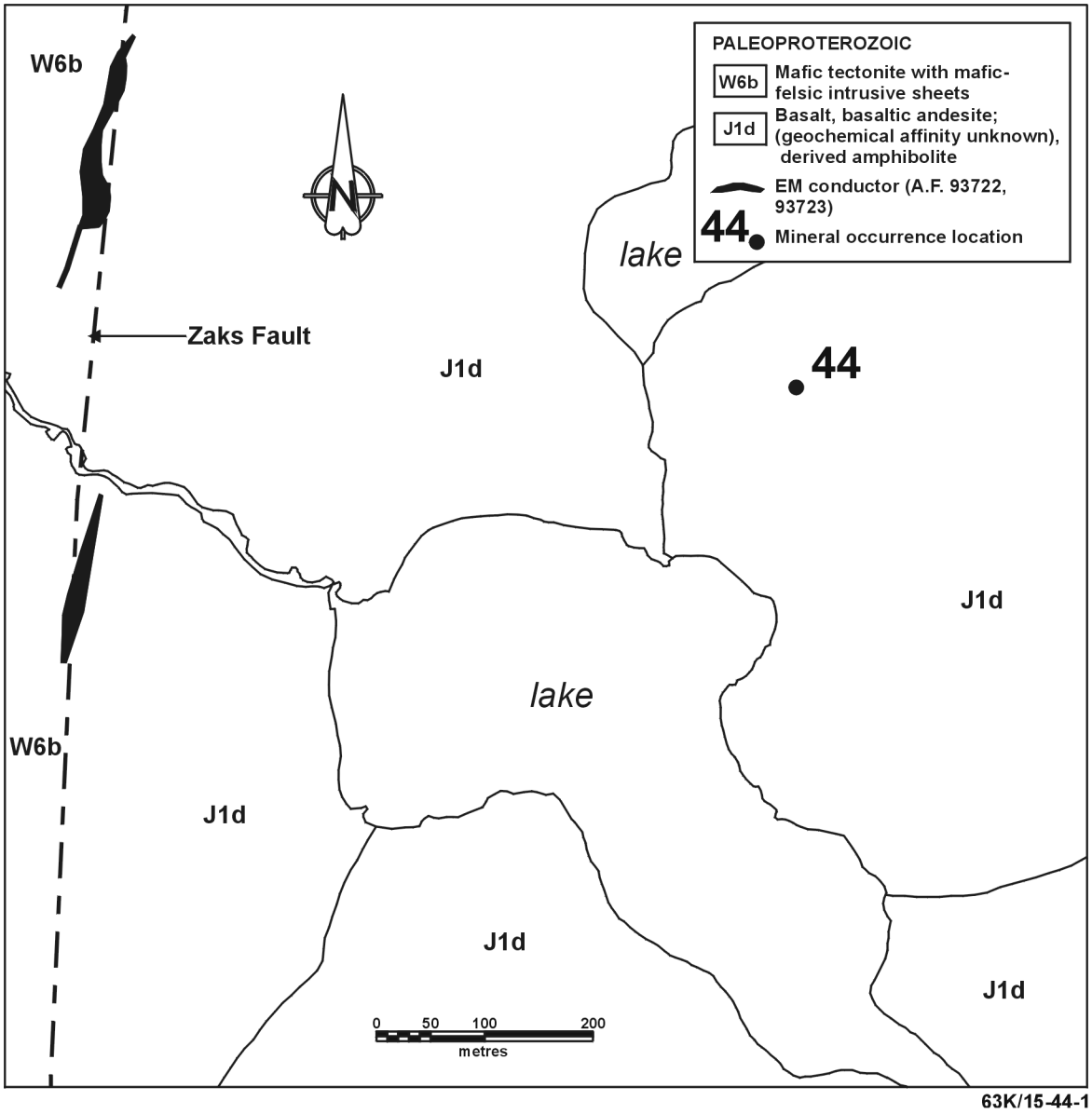

Figure 44-1: Geological setting of North Star No. 7 occurrence.

LOCATION: 45

NAME: North Star No. 1 and No. 2
UTM: 400080E, 6077425N
AREA: along south side of stream approximately 500 m SE of southeast side of North Star Lake
ACCESS: via bush plane to North Star Lake, then traverse
AIRPHOTO: MB90034-69

EXPLORATION SUMMARY

The claim was staked in 1927 and in 1934 was owned by Messrs Lambert Nelson and George M. Solberg. Canadian Mining Projects, Ltd. collected a suite of samples and published the assay results. In 1933 Canadian Minerals, Limited obtained a 230 kg (500 lb.) bulk (?) sample for testing (Stockwell, 1935). In 1981 an airborne EM (INPUT) and magnetic survey was flown for BP Minerals Limited, followed by a geological mapping programme (A.F. 92828). Hudson Bay Exploration and Development Company, Ltd. did an HLEM (MaxMin II) survey over the area in 1980, and some of the conductive responses and extension of the North Star No. 1 and No. 2 vein systems were drill tested in 1983 and 1984 (A.F. 93723 and 93722).

More than 75 trenches, now mostly caved and overgrown, and a shaft of unknown depth are located at the occurrence.

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 45-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). The occurrence is located in the Eastern basalts of Norquay *et al*. (1993, 1994a, b) and Prouse and Gale (1993). The Eastern zone rocks are dominated by basaltic pillowed flows and fine- to medium-grained mafic intrusions (unit J1d) that are synvolcanic in part (Norquay *et al*., 1993). The mafic volcanic rocks may correlate with the Preaston Formation (Bailes, 1980). The occurrence is located approximately 100 m east of Zaks Fault, a well defined, discrete, regional structure that separates the Eastern from the Central zone assemblage in this area.

The rocks at the occurrence (Fig. 45-2, 45-3 and 45-4) are dominated by massive and strongly flattened pillowed basalts and massive gabbroic rocks that are probably intrusive equivalents to the volcanic flows. Finely laminated intervals are present, but it is unclear if these are a result of shear deformation or represent mafic tuffaceous layers.

The volcanic rocks and veins are cut by mafic feldspar porphyry and granitic biotite-phyric dykes. The granitic dyke forms an irregular unit with a complex geometry. It is unclear if the distribution of this unit is a result of structural modification of a once linear intrusion or reflects its primary mode of emplacement. Lack of a strong foliation within this unit would suggest the latter case. A NNE-trending mafic feldspar porphyry dyke up to 1 m thick cuts the eastern quartz vein system at a shallow angle. It contains fragments of vein material.

MINERALIZATION

The mineralization at this occurrence is hosted by a series of quartz veins that occur in schistose intervals of the mafic volcanic sequence. The schistose zones tend to occur in the fine-grained, massive, mafic lithology that appears to represent massive basaltic flow units or their hypabyssal equivalents. The size and character of the quartz veins show a high degree of variability along strike, ranging from discrete well defined quartz veins >3 m thick and containing few wallrock inclusions, to intervals containing various proportions of quartz stringers and veinlets, and chloritic schist. The change in character along strike is rapid. A well defined quartz vein exposed in one trench wall can be represented by a quartz-chlorite schist interval containing relatively little quartz in the opposite wall. Some of the veins show a marked thickening along strike. This is at least partially due to shear folding parallel to the strike of the vein. The *Z*-asymmetry of one of these folds can be observed in one group of trenches.

Based on its appearance and texture, more than one generation of quartz is present, but it is unclear what generation(s) hosts the mineralization. Pyrite occurs as a minor disseminated constituent in the quartz veins, in some areas comprising up to 1% of the vein material. Light brown weathering carbonate is a common minor constituent of the veins. Stockwell (1935) indicated chalcopyrite, sphalerite, pyrrhotite, arsenopyrite and native gold occur as minor constituents in the quartz. Petrographic investigations revealed the gold is paragenetically associated with the chalcopyrite and sphalerite.

GEOCHEMICAL DATA

Stockwell (1935) indicated that Canadian Mining Projects, Limited obtained the following assays over a distance of 116 m (380 ft.) along the eastern part of the occurrence:

8 trenches returned values of less than 1.71 g Au/t (0.05 oz. Au/ton)

13 samples returned 3.42 to 6.85 g Au/t (0.10 to 0.20 oz. Au/ton) across widths ranging from 0.8 to 1.5 m (2.5 to 5.0 ft.)

5.719 g Au/t (0.167 oz. Au/ton) across 9 m (30 ft.)

11 samples returned 6.85 to 13.70 g Au/t (0.20 to 0.40 oz. Au/ton) across widths ranging from 0.85 to 2.07 m (2.8 to 6.8 ft.)

12 samples returned 17.12 to 37.33 g Au/t (0.50 to 1.09 oz. Au/ton) across widths ranging from 0.2 to 4.0 m (0.5 to 13.0 ft.)

47.95 g Au/t (1.4 oz. Au/ton) across 1.5 m (5 ft.)

106.51 g Au/t (3.11 oz Au/ton) across 0.12 m (0.4 ft.)
The sample collected by Canadian Minerals, Limited

returned 19.52 g Au/t (0.57 oz. Au/ton), and contained small quantities of silver, zinc and copper (Stockwell, 1935).

Metal values obtained by Hudson Bay Exploration and Development from their 1983 (hole STA-8; A.F. 93723) and 1984 programmes (holes STA-14, -15; A.F. 93722) returned mostly low metal values over narrow widths: 0.01% Cu, .01% Zn, 0.34 g Au/t (0.01 oz. Au/ton), 0.34 g Ag/t (0.01 oz. Ag/ton). Hole STA-16 intersected 4.11 g Au/t (0.12 oz Au/ton) between 86.5-86.8 m (283.9-284.8 ft.). Visible gold was noted in hole STA-8 at 96.0 m (314.9 ft.) and 118.9 m (390.2 ft.). Hole STA-17 intersected several auriferous intervals, the best returning 5.82 g Au/t (0.17 oz. Au/ton) from 75.3-75.6 m (247.0-248.0 ft.). Visible gold was noted between 71.6-71.9 m (234.8-236.0 ft.), but the assay returned only 2.74 g Au/t (0.08 oz. Au/ton).

CLASSIFICATION

Vein-type deposit; multiple veins and lenses.

REFERENCES

A.F. 92828, 93722 and 93723; Cancelled Assessment Files, Manitoba Industry, Trade and Mines, Minerals Division.

Bailes, A.H.

1980: Geology of the File Lake Area; Manitoba Energy and Mines, Mineral Resources Division, Geological Report 78-1, 134 pp.

NATMAP Shield Margin Project Working Group

1998: Geology, NATMAP Shield Margin Project Area (Flin Flon Belt), Manitoba-Saskatchewan; Geological Survey of Canada 1968A; Manitoba Energy and Mines Map A-98-2, Sheets 1 to 7; Saskatchewan Energy and Mines Map 258A-2, scale 1:100 000.

Norquay, L.I., Prouse, D.E. and Gale, G.H.

1993: Geological investigations in the North Star Lake area (NTS 63K/15); in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1993, pp. 78-83.

1994a: The North Star Lake project (NTS 63K/15); in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1994, pp. 83-84.

1994b: North Star Lake (NTS 63K/15SE4); Manitoba Energy and Mines, Minerals Division, Preliminary Map 1994S-3, 1:10 000.

Prouse, D.E. and Gale, G.H.

1993: North Star Lake (NTS 63K/15SE4); Manitoba Energy and Mines, Minerals Division, Preliminary Map 1993S-3, 1:10 000.

Stockwell, C.H.

1935: Gold Deposits of the Elbow-Morton Area, Northern Manitoba; Geological Survey of Canada, Memoir 186, 74pp.

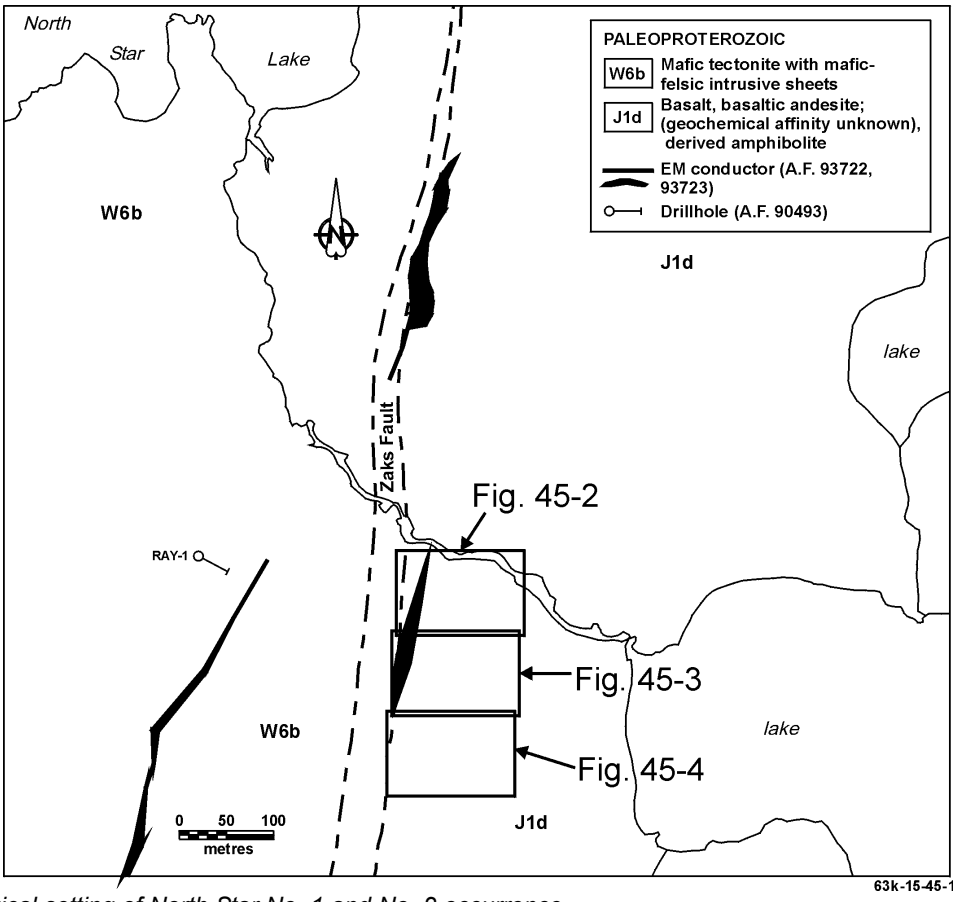

Figure 45-1: Geological setting of North Star No. 1 and No. 2 occurrence.

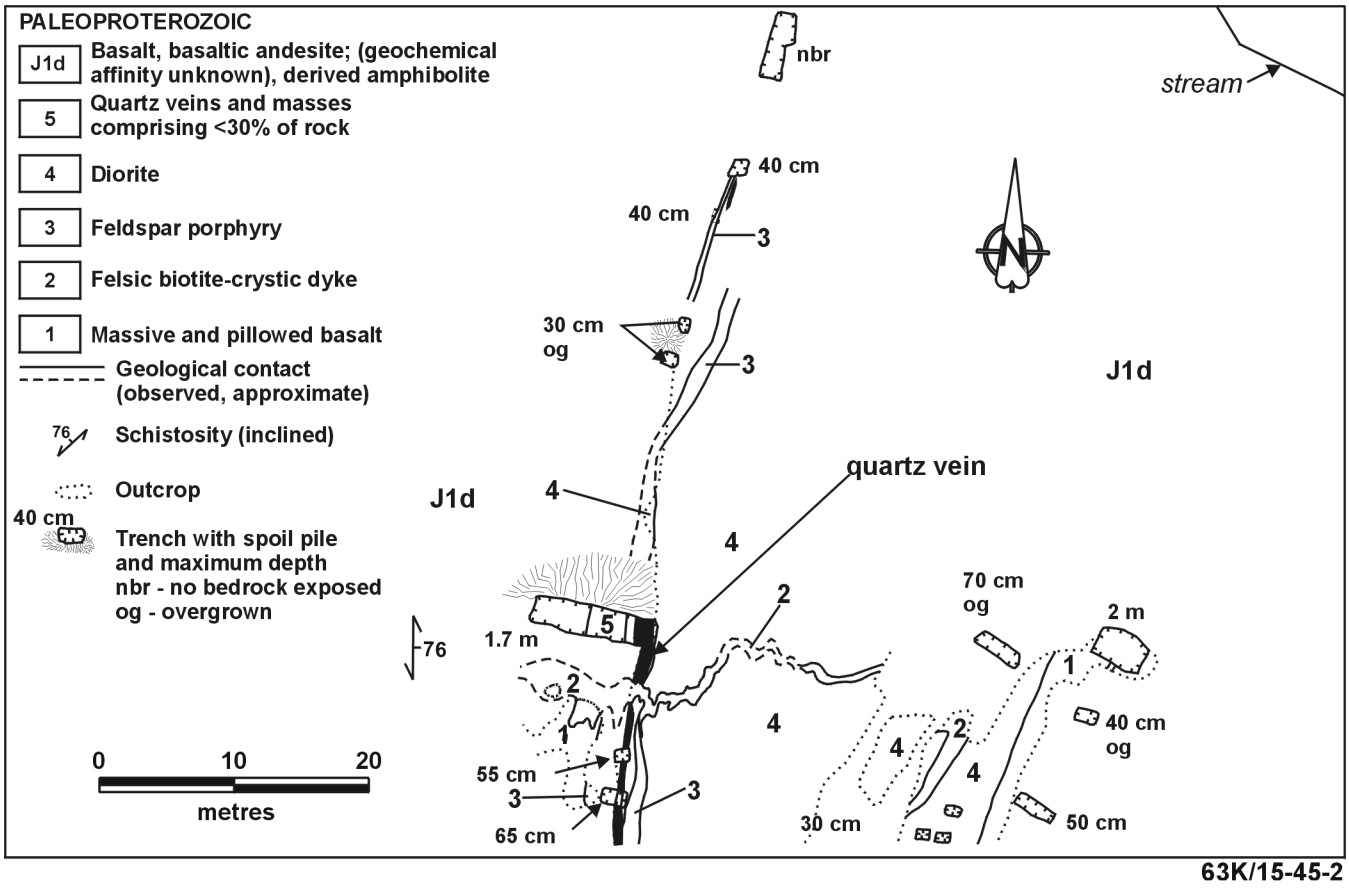

Figure 45-2: Geology and trench locations at North Star No. 1 and No. 2 occurrence.

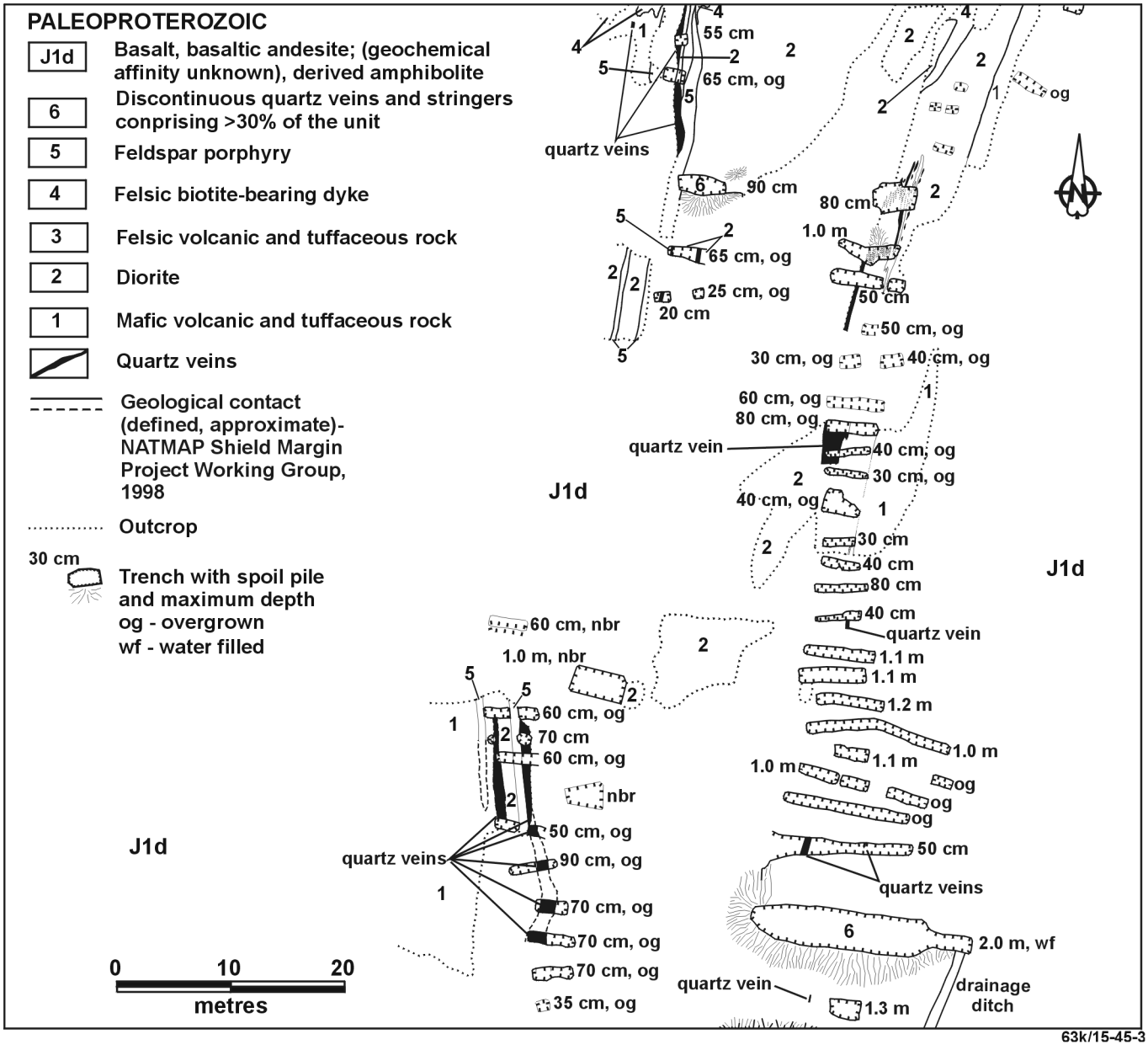

Figure 45-3: Geology and trench locations at North Star No. 1 and No. 2 occurrence.

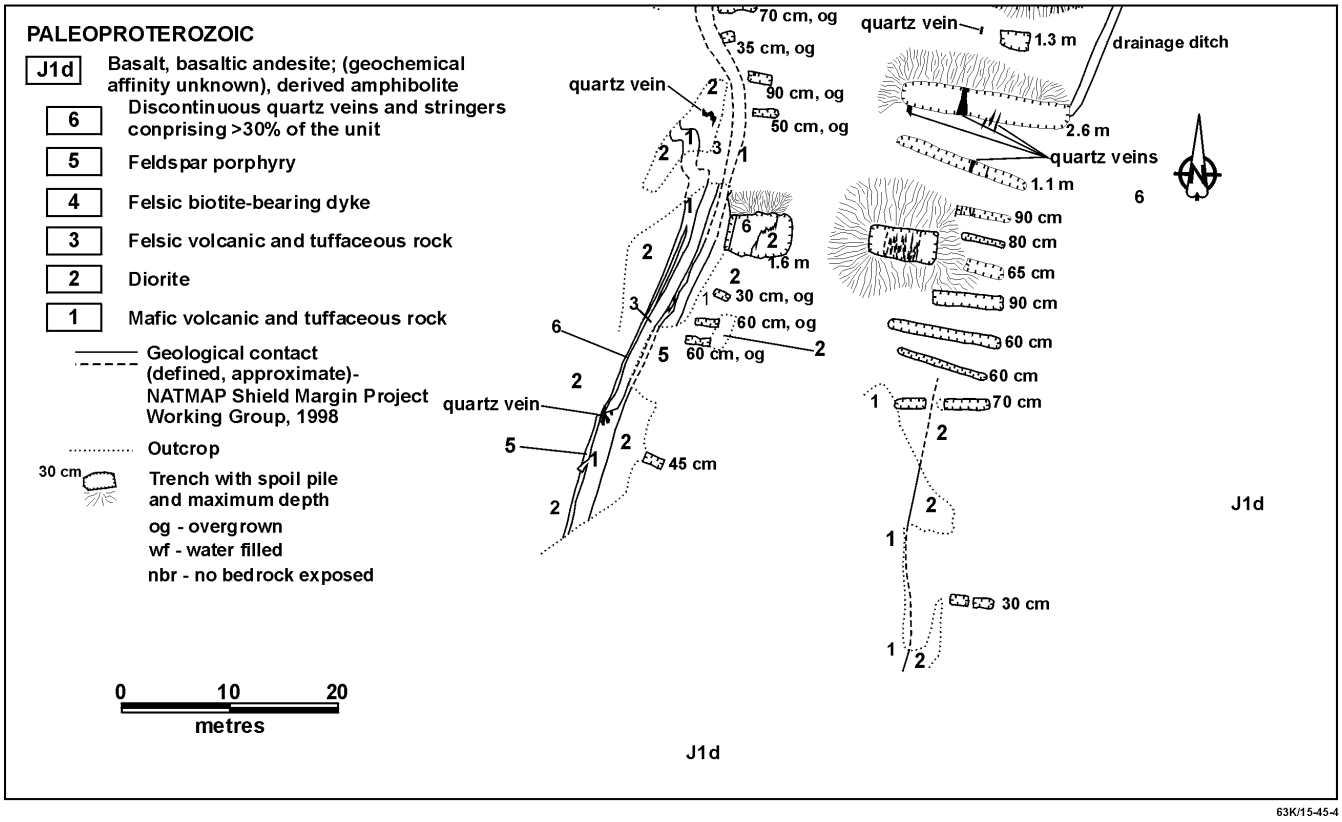

Figure 45-4: Geology and trench locations at North Star No. 1 and No. 2 occurrence.

LOCATION: 46

NAME: K.U. No. 1
UTM: 400780E, 6076675N
AREA: approximately 1.5 km SE of southeast side of North Star Lake
ACCESS: via bush plane to North Star Lake, then traverse
AIRPHOTO: MB90024-171

EXPLORATION SUMMARY

This claim was staked in 1928 and was exposed in 3 trenches (Stockwell, 1935). In 1981 an airborne EM (INPUT) and magnetic survey was undertaken for BP Minerals Limited, followed by a geological mapping programme (A.F. 92828).

Seven trenches are present at the occurrence. Most of which were flooded when the occurrence was examined.

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 46-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). The occurrence is located in the Eastern basalts of Norquay *et al*. (1993, 1994a, b) and Prouse and Gale (1993). The Eastern zone rocks are dominated by basaltic pillowed flows and fine- to medium-grained mafic intrusions (unit J1d) that are synvolcanic in part (Norquay *et al*., 1993). The mafic volcanic rocks may correlate with the Preaston Formation (Bailes, 1980). The occurrence is located approximately 900 m east of Zaks Fault, a well defined, discrete, regional structure that separates the Eastern from the Central zone assemblage in this area.

The trench locations are shown on Fig. 46-2. The dominant rocks at the occurrence consist of massive and pillowed basalt some of which is finely laminated. It is unclear if the lamination is tectonically formed or represents finely layered mafic tuffaceous beds. A schistose interval trending 355^{o} is exposed in the trenches. It contains discontinuous lenses and stringers of quartz across a thickness of up to 1.8 m.

MINERALIZATION

The quartz occurs as lenses and stringers within the shear zone. Chloritic wallrock inclusions are common. The vein material also includes minor carbonate. Stockwell (1935) indicated that minor disseminated pyrite and chalcopyrite were present in the quartz.

This occurrence may be the strike extension of the Jupiter No. 2 and 3 occurrence to the south.

GEOCHEMICAL DATA

No geochemical results have been reported for this occurrence.

CLASSIFICATION

Vein-type deposit; single vein. The quartz vein is hosted within a schistose interval of basalt.

REFERENCES

A.F. 92828; Cancelled Assessment File, Manitoba Industry, Trade and Mines, Minerals Division.

Bailes, A.H.

1980: Geology of the File Lake Area; Manitoba Energy and Mines, Mineral Resources Division, Geological Report 78-1, 134 pp.

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1998: Geology, NATMAP Shield Margin Project Area (Flin Flon Belt), Manitoba-Saskatchewan; Geological Survey of Canada 1968A; Manitoba Energy and Mines Map A-98-2, Sheets 1 to 7; Saskatchewan Energy and Mines Map 258A-2, scale 1:100 000.

Norquay, L.I., Prouse, D.E. and Gale, G.H.

1993: Geological investigations in the North Star Lake area (NTS 63K/15); in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1993, pp. 78-83.

1994a: The North Star Lake project (NTS 63K/15); in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1994, pp. 83-84.

1994b: North Star Lake (NTS 63K/15SE4); Manitoba Energy and Mines, Minerals Division, Preliminary Map 1994S-3, 1:10 000.

Prouse, D.E. and Gale, G.H.

1993: North Star Lake (NTS 63K/15SE4); Manitoba Energy and Mines, Minerals Division, Preliminary Map 1993S-3, 1:10 000.

Stockwell, C.H.

1935: Gold Deposits of the Elbow-Morton Area, Northern Manitoba; Geological Survey of Canada, Memoir 186, 74pp.

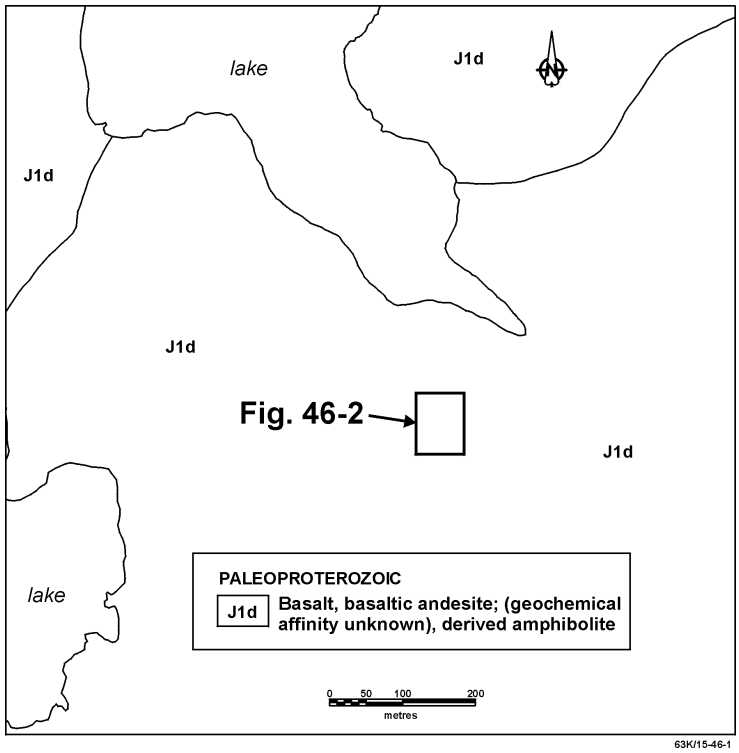

Figure 46-1: Geological setting of K.U. No. 1 occurrence.

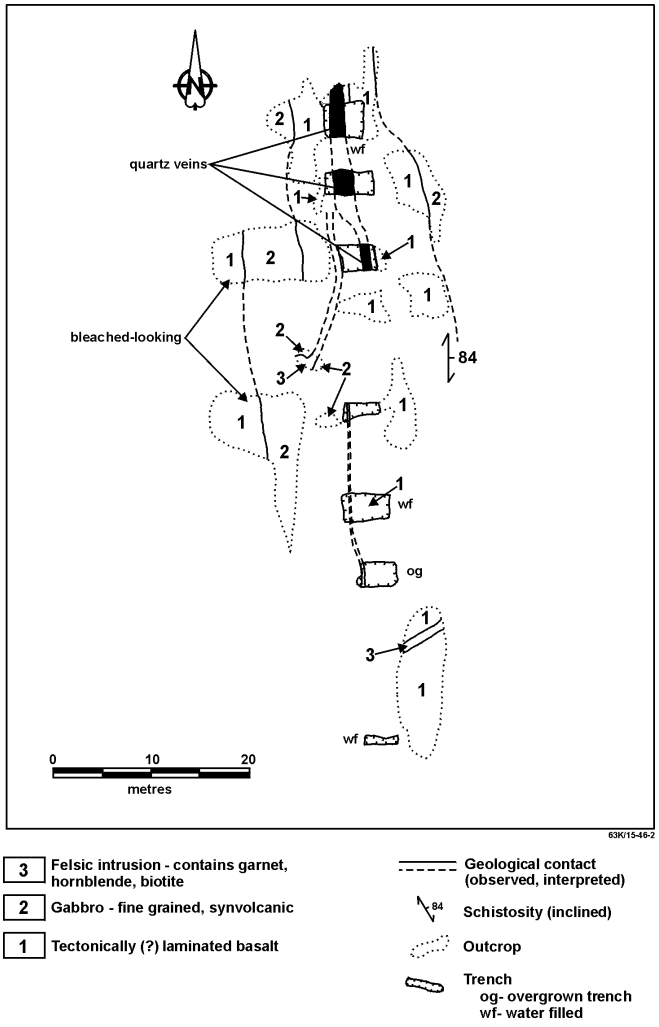

Figure 46-2: Geology and trench locations at K.U. No. 1 occurrence.

LOCATION: 47

NAME: Beaver
UTM: 399800E, 6076455N
AREA: approximately 1.5 km south of southeast side of North Star Lake
ACCESS: via bush plane to North Star Lake, then traverse
AIRPHOTO: MB90034-71

EXPLORATION SUMMARY

This claim was staked in 1928. Stockwell (1935) indicated the occurrence was exposed in 11 trenches along a strike length of approximately 110 m. In 1981 an airborne EM (INPUT) and magnetic survey was flown for BP Minerals Limited, followed by a geological mapping programme (A.F. 92828).

Stockwell's trenches were located during the 1993 examination of the occurrence. Most are either overgrown, flooded or caved, and bedrock is generally only poorly exposed. The 1989 fire that affected the surrounding area did not burn the vegetation at the occurrence, and the rock exposures remain lichen covered.

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 47-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). The occurrence is located in the Eastern zone near the contact with the Central zone (Norquay *et al*., 1993, 1994a, b; Prouse and Gale, 1993). The Eastern zone rocks are dominated by basaltic pillowed flows (Eastern basalts) and fine- to medium-grained mafic intrusions (grouped under unit J1d) that are synvolcanic in part (Norquay *et al.*, 1993). The mafic volcanic rocks may correlate with the Preaston Formation (Bailes, 1980).

The location of the trenches is shown in Fig. 47-2. The rocks at the occurrence are dominated by a fine-grained mafic lithology, possibly basalt. Strongly deformed pillow selvages appear to be present west of the southernmost trenches. The rocks have a well developed, steeply dipping schistosity trending 000-030°. The trenches have been excavated along a trend striking 030°.

MINERALIZATION

Several quartz veins to 60 cm thick and parallel to the schistosity of the basalt are exposed in the trenches, but have limited strike extent. The veins contain some carbonate, and minor disseminated pyrite was noted in the quartz. Stockwell (1935) also noted the presence of minor chalcopyrite.

The basalts at the occurrence contain up to 2% disseminated pyrrhotite.

GEOCHEMICAL DATA

No geochemical analyses have been reported for this occurrence.

CLASSIFICATION

Vein type deposit; single vein.

REFERENCES

A.F. 90491, 92828; Cancelled Assessment Files, Manitoba Industry, Trade and Mines, Minerals Division.

Bailes, A.H.

1980: Geology of the File Lake Area; Manitoba Energy and Mines, Mineral Resources Division, Geological Report 78-1, 134 pp.

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1998: Geology, NATMAP Shield Margin Project Area (Flin Flon Belt), Manitoba-Saskatchewan; Geological Survey of Canada 1968A; Manitoba Energy and Mines Map A-98-2, Sheets 1 to 7; Saskatchewan Energy and Mines Map 258A-2, scale 1:100 000.

Norquay, L.I., Prouse, D.E. and Gale, G.H.

1993: Geological investigations in the North Star Lake area (NTS 63K/15); in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1993, pp. 78-83.

1994a: The North Star Lake project (NTS 63K/15); in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1994, pp. 83-84.

1994b: North Star Lake (NTS 63K/15SE4); Manitoba Energy and Mines, Minerals Division, Preliminary Map 1994S-3, 1:10 000.

Prouse, D.E. and Gale, G.H.

1993: North Star Lake (NTS 63K/15SE4); Manitoba Energy and Mines, Minerals Division, Preliminary Map 1993S-3, 1:10 000.

Stockwell, C.H.

1935: Gold Deposits of the Elbow-Morton Area, Northern Manitoba; Geological Survey of Canada, Memoir 186, 74pp.

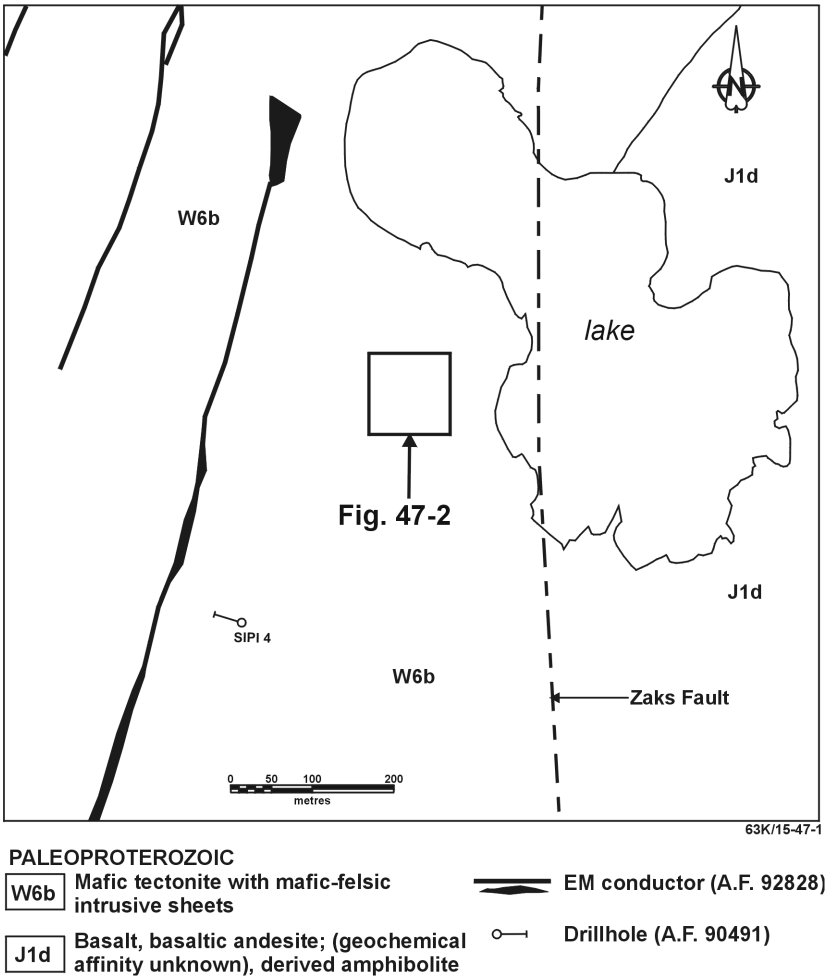

Figure 47-1: Geological setting of Beaver occurrence.

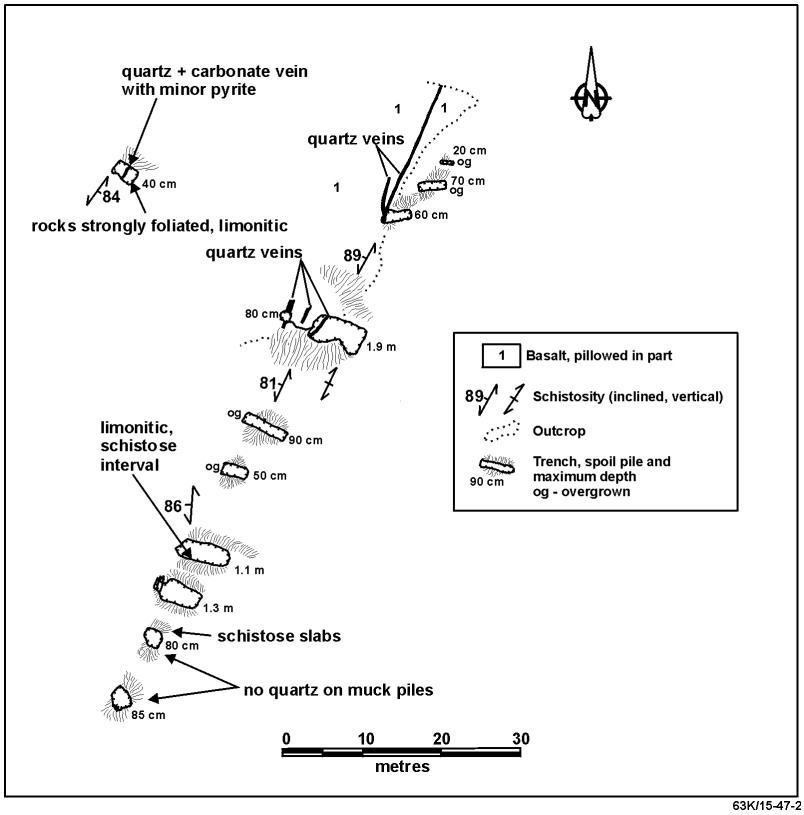

Figure 47-2: Geology and trench locations at Beaver occurrence.

LOCATION: 48

NAME:
UTM: 399770E, 6075755N
AREA: approximately 2.2 km south of southeast side of North Star Lake
ACCESS: via bush plane to North Star Lake, then traverse
AIRPHOTO: MB90034-73

EXPLORATION SUMMARY

In 1981 an airborne EM (INPUT) and magnetic survey was undertaken on behalf of BP Minerals Limited, followed by a geological mapping programme (A.F. 92828).

Four trenches were located at the site, but no record was found to indicate who excavated them or when.

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 48-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). The occurrence is located in the Eastern zone near the contact with the Central zone (Norquay *et al*., 1993, 1994a, b; Prouse and Gale, 1993). The Eastern zone rocks are dominated by basaltic pillowed flows (Eastern basalts) and fine- to medium-grained mafic intrusions (grouped under unit J1d) that are synvolcanic in part (Norquay *et al.*, 1993). The mafic volcanic rocks may correlate with the Preaston Formation (Bailes, 1980). The occurrence is located approximately 200 m west of Zaks Fault, a well defined, discrete, regional structure.

The location of the trenches is shown in Fig. 48-2. The host rock for the occurrence is a foliated felsic dyke that contains minor quartz and feldspar phenocrysts. The host rocks for the dyke are pillowed basalt and massive equivalents. Contacts with the enclosing volcanic rocks are sharp, trending 007-021^{o}. The schistosity varies from 006-025^{o} and is subvertical.

MINERALIZATION

Discontinuous quartz stringers and veinlets up to 1 m thick are hosted by the felsic dyke. The quartz contains dark green, chloritic wallrock fragments. Pieces of vein material on one of the spoil piles contain up to 20% pyrite as limonite coated, vuggy masses.

GEOCHEMICAL DATA

No geochemical information is available for this occurrence.

CLASSIFICATION

Vein type deposit; single vein. Discontinuous quartz veins occur in a felsic dyke.

REFERENCES

A.F. 90491, 92828; Cancelled Assessment Files, Manitoba Industry, Trade and Mines, Minerals Division.

Bailes, A.H.

1980: Geology of the File Lake Area; Manitoba Energy and Mines, Mineral Resources Division, Geological Report 78-1, 134 pp.

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1994a: The North Star Lake project (NTS 63K/15); in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1994, pp. 83-84.

1994b: North Star Lake (NTS 63K/15SE4); Manitoba Energy and Mines, Minerals Division, Preliminary Map 1994S-3, 1:10 000.

Prouse, D.E. and Gale, G.H.

1993: North Star Lake (NTS 63K/15SE4); Manitoba Energy and Mines, Minerals Division, Preliminary Map 1993S-3, 1:10 000.

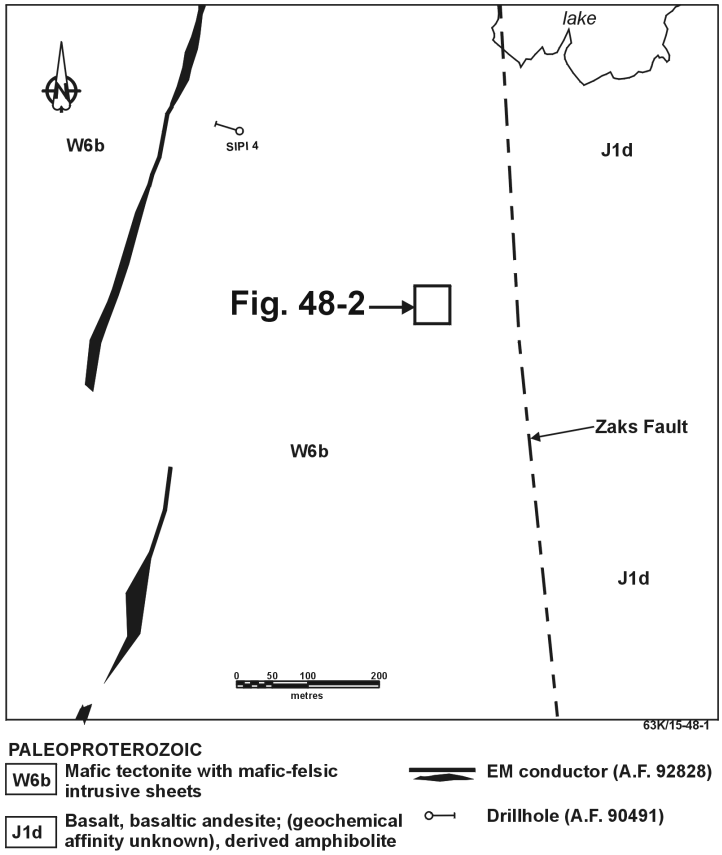

Figure 48-1: Geological setting of occurrence 48.

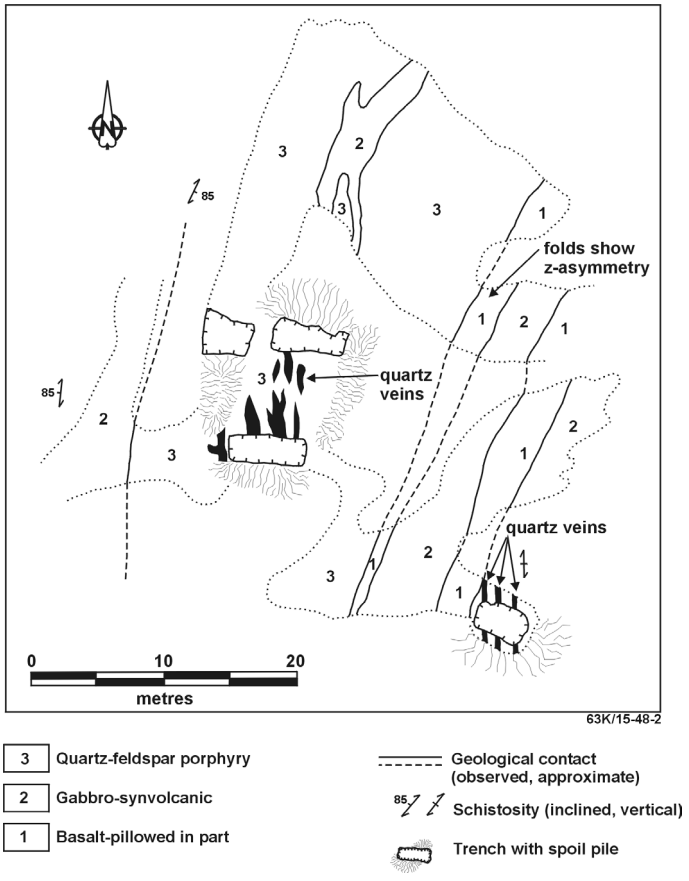

Figure 48-2: Trench locations and detailed geology at occurrence 48.

LOCATION: 49

NAME: Jupiter No. 2 and No. 3
UTM: 400440E, 6075685N
AREA: approximately 2.3 km SSE of southeast side of North Star Lake
ACCESS: via bush plane to North Star Lake, then traverse
AIRPHOTO: MB90024-140

EXPLORATION SUMMARY

The quartz veins at the occurrence were discovered in 1930 and staked by Messrs Axel Nieme and Charles Foss of The Pas (Stockwell, 1935). Many trenches and a shaft of unspecified depth were excavated prior to Stockwell's visit to the property. In 1976 and 1977 Mr J.W. Robinson undertook a prospecting and sampling programme at the occurrence (A.F. 92096, 92315), and indicated one shaft had been excavated to a depth of more than 14 m (45 ft.). In 1981 an airborne EM (INPUT) and magnetic survey was performed for BP Minerals Limited, followed by a geological mapping programme (A.F. 92828).

More than 60 trenches and 2 shafts were located during the 1994 examination of the occurrence. Most of the workings provided good bedrock exposures, but those in the southern part of the occurrence were generally overgrown and/or flooded.

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 49-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). The occurrence is located in the Eastern zone east of Zaks Fault, a regional structure that separates the Eastern basalts (unit J1d) from lithologies of the Central zone (grouped under unit W6b) northwest of the occurrence (Norquay *et al*., 1993, 1994a, b; Prouse and Gale, 1993). The Eastern zone rocks are dominated by basaltic pillowed flows (Eastern basalts) and fine- to medium-grained mafic intrusions that are synvolcanic in part (Norquay *et al*., 1993). The mafic volcanic rocks may correlate with the Preaston Formation (Bailes, 1980) east of the map area.

The locations of the trenches are shown in Fig. 49-2, 49-3, 49-4, 49-5, 49-6 and 49-7. The rocks at the occurrence are dominated by a fine-grained mafic lithology, probably basalt. Strongly deformed pillow selvages are present west of the northern group of trenches. The rocks have a well developed, steeply dipping schistosity trending 005-030^{o}, parallel to the trend of the main quartz vein. Feldspar porphyry and granitic intrusions intrude the mafic volcanic sequence and trend parallel to the schistosity. Schistosity in the feldspar porphyry parallels that of the enclosing volcanic rocks. Amphibole crystals in this dyke plunge 66^{o} at 140^{o}. The granitic dyke is poorly foliated and contains chloritic rock fragments. It may be part of a series of granitic plugs W and NW of the occurrence.

MINERALIZATION

The quartz occurs as a discontinuous vein system within the shear zone. The quartz vein ranges from a discrete feature consisting of milky quartz up to 360 cm thick to chlorite schist dominated intervals containing 30% quartz stringers and veinlets. The vein has been broken up along strike, in part by the feldspar porphyry intrusion. In some areas it appears to have been comminuted and truncated as a result of deformation along the shear zone that provided the locus for initial emplacement of the vein. Thickened portions of the vein may be related to shear folds along this structure, similar to that observed at the North Star No. 1 and 2 occurrence. Chloritic wallrock inclusions are common. The vein material also includes minor patches and stringers of buff weathering carbonate. Almost no sulphides were noted during the 1994 examination of the occurrence, but Stockwell (1935) indicates that minor disseminated pyrite, chalcopyrite and pyrrhotite are present in the quartz.

This occurrence may be the strike extension of the K.U. No. 1 occurrence to the north.

GEOCHEMICAL DATA

Assays from material obtained from one of the shafts returned values ranging from 31.16 to 65.07 g Au/t (0.91 to 1.90 oz. Au/ton) across 3 m (10 ft.) (Stockwell, 1935).

Samples collected from the north wall of the same (?) shaft (shaft #1, Fig. 49-3) returned the following values (A.F. 92096) (see table below).

Depth below surface	Sample width	g Au/t (oz. Au/ton)
0.9 m (3 ft.)	185 cm (73 in.)	11.575 (0.338)
2.4 m (8 ft.)	218 cm (86 in.)	29.247 (0.854)
4.0 m (13 ft.)	152 cm (60 in.)	0.514 (0.015) (west side of face)
4.0 m (13 ft.)	112 cm (44 in.)	0.685 (0.20) (east side of face)
5.5 m (18 ft.)	152 cm (60 in.)	15.822 (0.462) (west side of face)
5.5 m (18 ft.)	117 cm (46 in.)	2.055 (0.060) (east side of face)
7.0 m (23 ft.)	152 cm (60 in.)	26.096 (0.762) (west side of face)
7.0 m (23 ft.)	135 cm (53 in.)	1.233 (0.036) (east side of face)
8.5 m (28 ft.)	152 cm (60 in.)	0.171 (0.005) (west side of face)
8.5 m (28 ft.)	102 cm (40 in.)	3.493 (0.102) (east side of face)

The trenches SSW of the shaft were also sampled and the following assays obtained (see table below):

Trench No. (Fig. 49-3)	Sample width	g Au/t (oz. Au/ton)
1	91 cm (36 in.)	0.103 (0.003)
1	119 cm (47 in.)	1.301 (0.038)
1	137 cm (54 in.)	<0.1 (<0.003)
1	104 cm (41 in.)	0.171 (0.005)
2	140 cm (55 in.)	0.856 (0.025)
2	107 cm (42 in.)	0.753 (0.022)
3	163 cm (64 in.)	0.171 (0.005)
3	51 cm (20 in.) (?)	0.548 (0.016)
4	127 cm (50 in.)	0.411 (0.012)
4	135 cm (53 in.)	0.274 (0.008)
5	74 cm (29 in.)	0.171 (0.005)
5	74 cm (29 in.)	0.274 (0.008)
5	64 cm (25 in.)	<0.1 (<0.003)

CLASSIFICATION

Vein type deposit; single vein.

REFERENCES

A.F. 92096, 92315, 92828; Cancelled Assessment Files, Manitoba Industry, Trade and Mines, Minerals Division.

Bailes, A.H.

1980: Geology of the File Lake Area; Manitoba Energy and Mines, Mineral Resources Division, Geological Report 78-1, 134 pp.

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Prouse, D.E. and Gale, G.H.

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Stockwell, C.H.

1935: Gold Deposits of the Elbow-Morton Area, Northern Manitoba; Geological Survey of Canada, Memoir 186, 74pp.

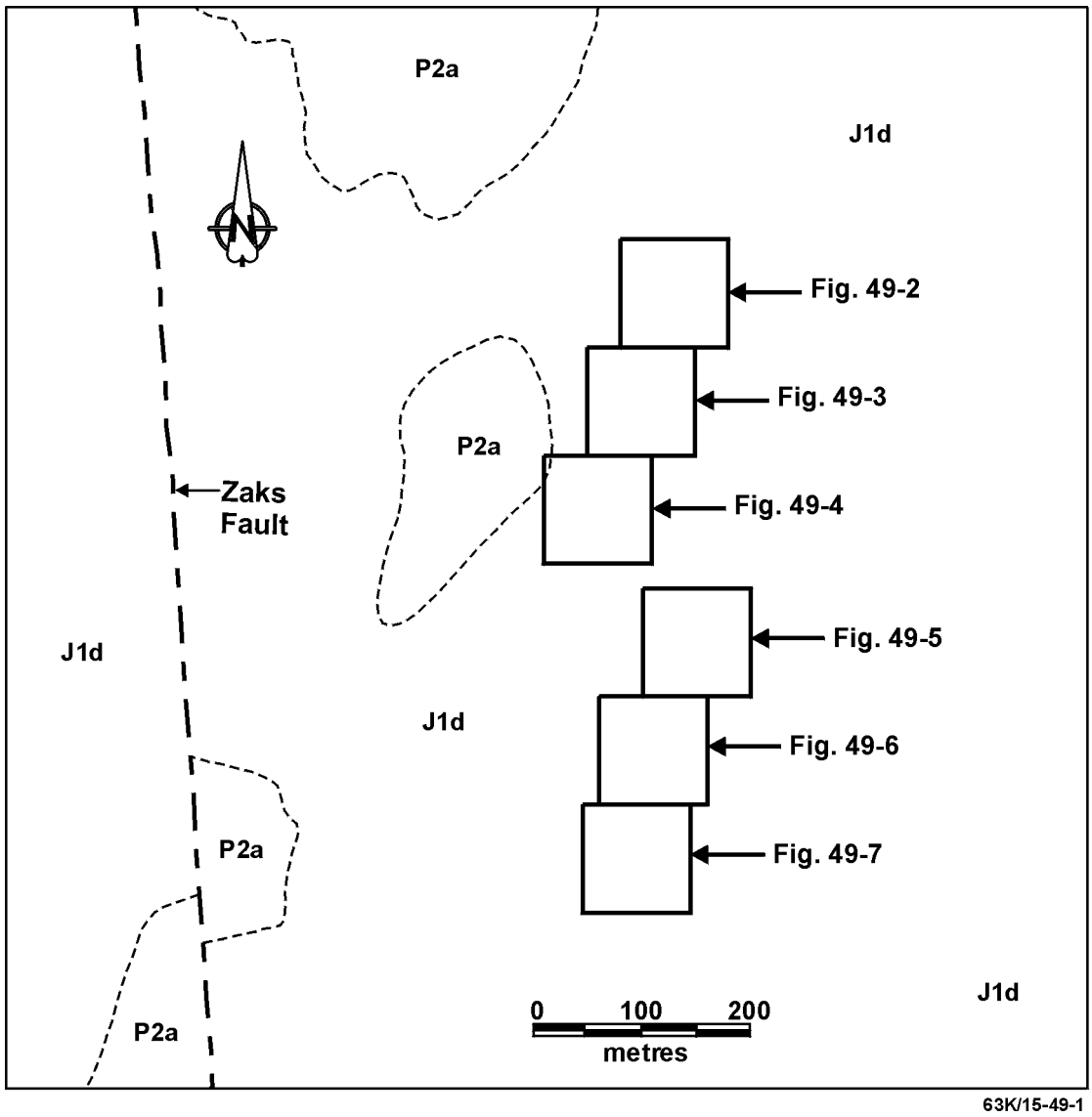
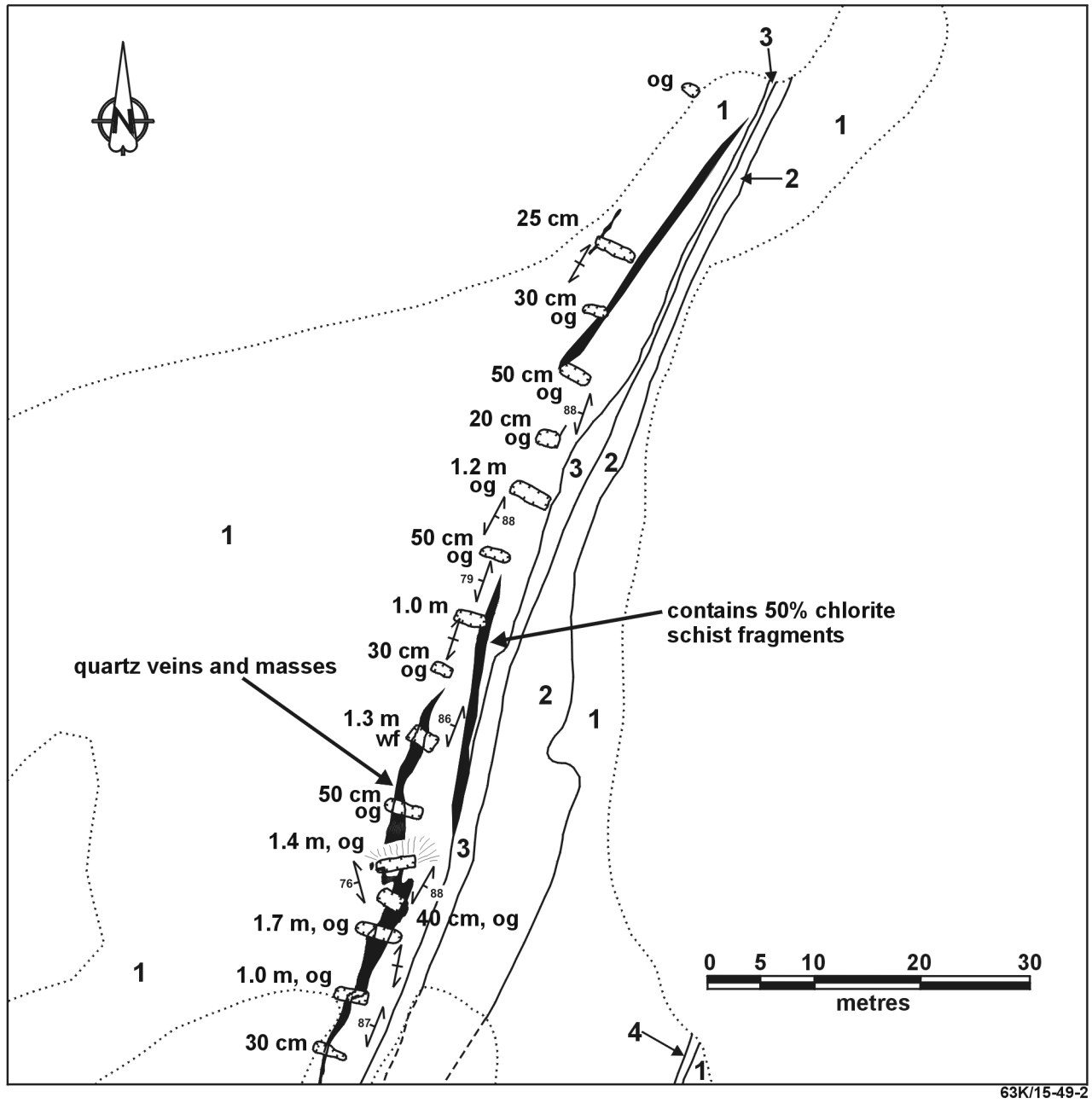


Figure 49-1: Geological setting of Jupiter No. 2 and No. 3 occurrence.



4 Quartz-feldspar porphyry

3 Feldspar porphyry

2 Gabbro - synvolcanic

1 Basalt - pillowed in part

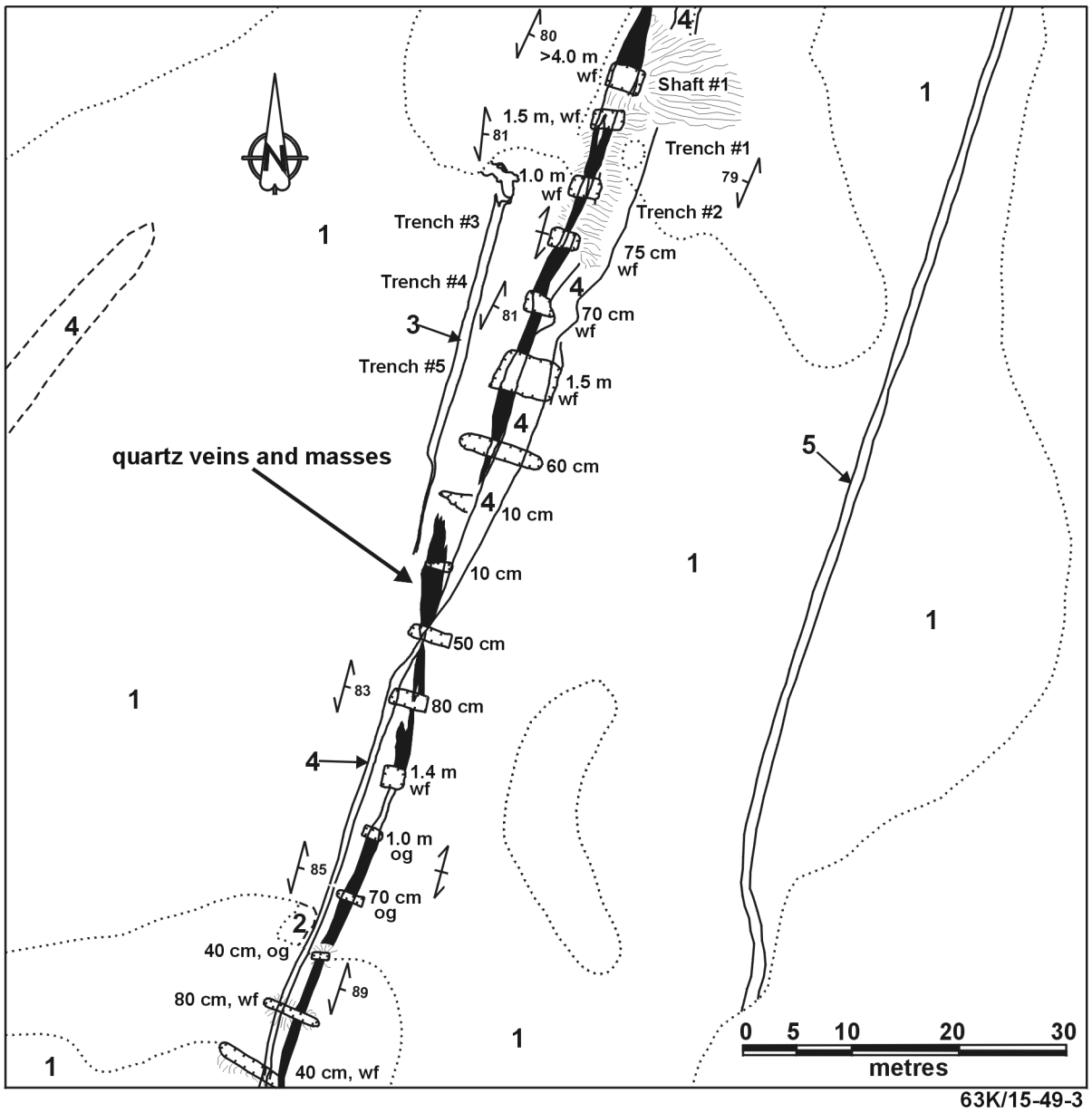
Geological contact (observed, approximate) -NATMAP Shield Margin Project Working Group, 1998

Outcrop

87 Schistosity (inclined, vertical)

30 cm Trench with spoil pile and maximum depth
og - overgrown
wf - water-filled

Figure 49-2: Geology and trench locations at Jupiter No. 2 and No. 3 occurrence.



5 Quartz-feldspar porphyry

4 Feldspar porphyry

3 Quartz diorite

2 Gabbro - synvolcanic

1 Basalt - pillowed in part

Geological contact (observed, approximate)

Outcrop

89 Schistosity (inclined, vertical)

80 cm Trench with spoil pile and maximum depth
og - overgrown
wf - water-filled

Figure 49-3: Geology and trench locations at Jupiter No. 2 and No. 3 occurrence.

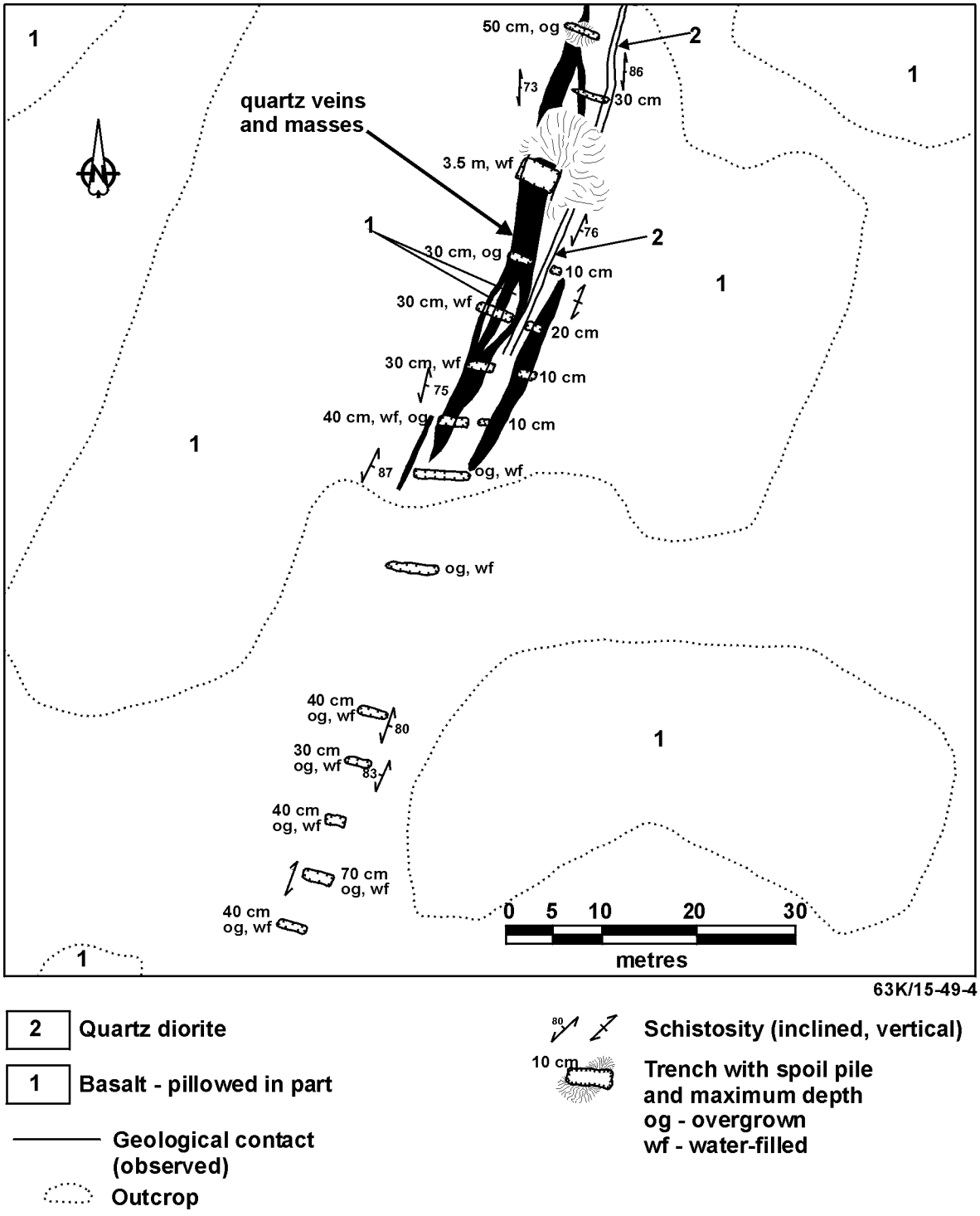


Figure 49-4: Geology and trench locations at Jupiter No. 2 and No. 3 occurrence.

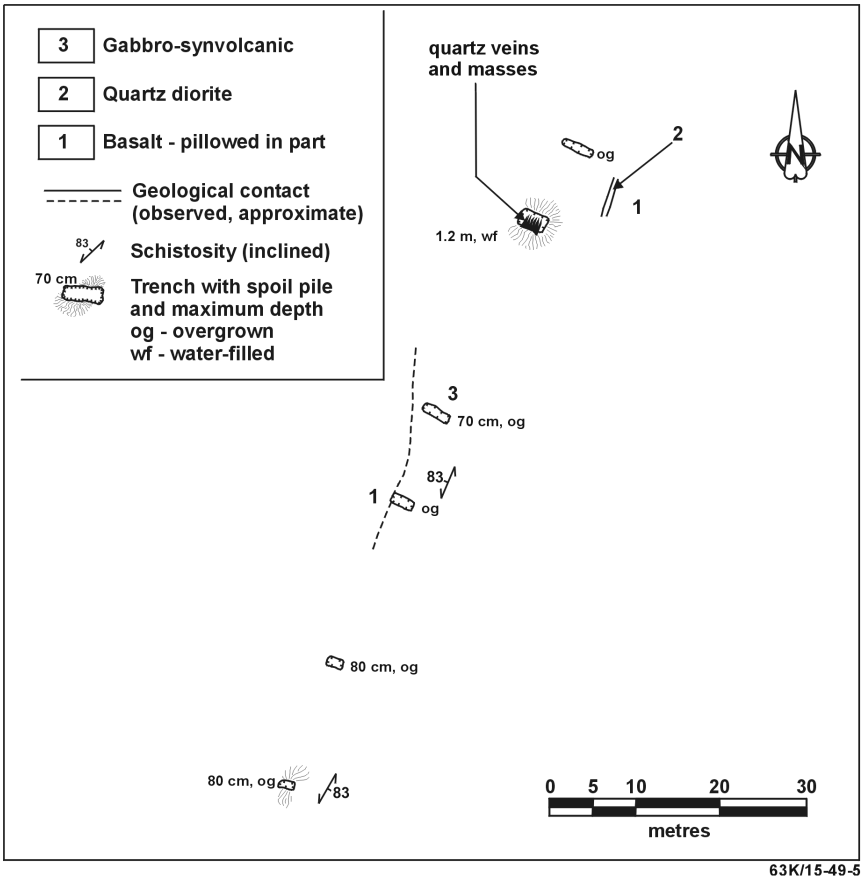


Figure 49-5: Geology and trench locations at Jupiter No. 2 and No. 3 occurrence.

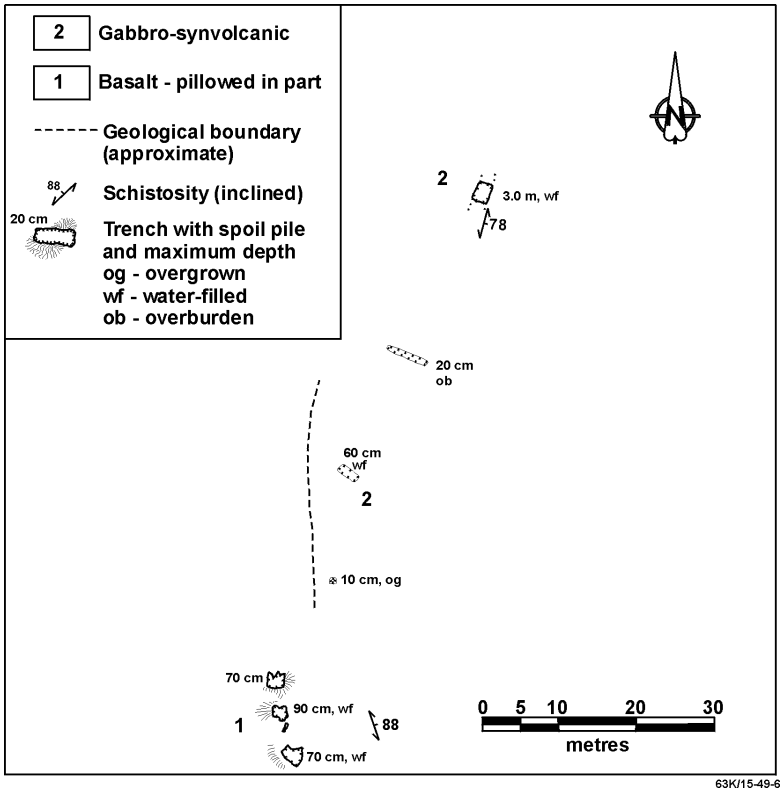


Figure 49-6: Geology and trench locations at Jupiter No. 2 and No. 3 occurrence.

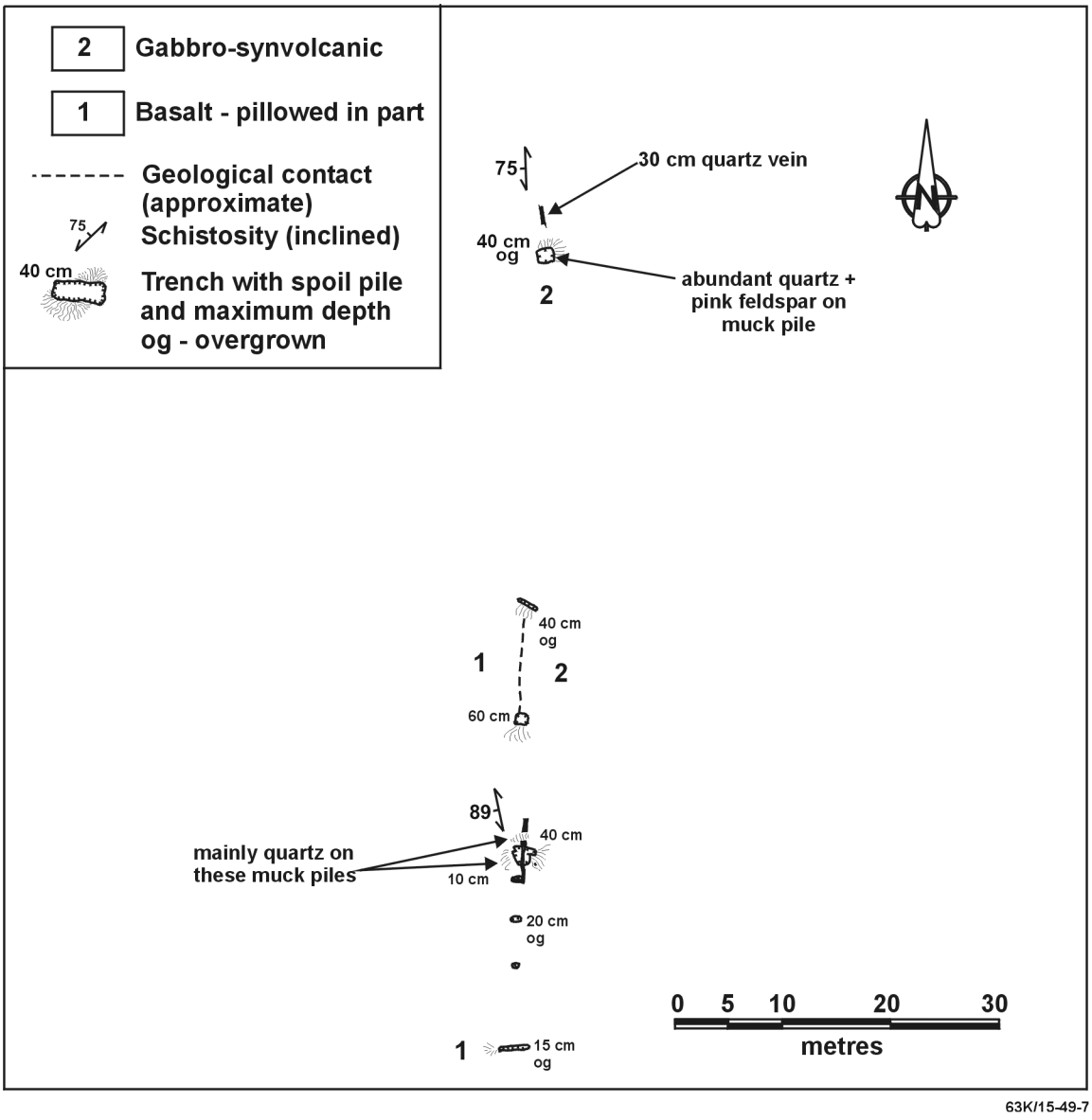


Figure 49-7: Geology and trench locations at Jupiter No. 2 and No. 3 occurrence.

LOCATION: 50

NAME: Winnipeg-Jupiter No. 7
UTM: 399950E, 6075595N
AREA: approximately 2.3 km south of southeast side of North Star Lake
ACCESS: via bush plane to North Star Lake, then traverse
AIRPHOTO: MB90034-74

EXPLORATION SUMMARY

The Winnipeg claim was staked in 1928 by Mr George Solberg and the Jupiter No. 7 in 1930 by Mr Mike Talo. Stockwell (1935) indicated the occurrence was exposed in several trenches. In 1977 Mr J.W. Robinson undertook a prospecting programme in the area (A.F. 92315). In 1981 an airborne EM (INPUT) and magnetic survey was flown for BP Minerals Limited, followed by a geological mapping programme (A.F. 92828).

Two pits up to 3 m deep have been excavated at the north end of the occurrence, probably subsequent to Stockwell's visit. Several shallow trenches were located SSW of the deep pits, and these are mostly caved, overgrown and/or flooded.

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 50-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). The occurrence is located in the Eastern zone immediately west of Zaks Fault, a regional brittle structure (Norquay *et al*., 1993, 1994a, b; Prouse and Gale, 1993). The Eastern zone rocks in the area are dominated by basaltic pillowed flows and fine- to medium-grained mafic intrusions (unitJ1d) that are synvolcanic in part (Norquay *et al.*, 1993). These rocks may correlate with the Preaston Formation (Bailes, 1980) east of the map area.

The trench locations are shown in Fig. 50-2 and 50-3. The rocks at the occurrence are dominated by a fine-grained mafic lithology, probably basalt. Strongly deformed pillows are sometimes present. The sequence contains massive intervals that show sharp to gradational contacts with the enclosing pillowed flows, and probably represent flow interiors. The rocks have a well developed, steeply dipping schistosity trending 010-030°. Fine-grained feldspar porphyry and a thin amphibolitic dyke parallel to the foliation in the volcanic rocks are present in the occurrence area.

The location of Zaks Fault is marked by the north-trending valley immediately east of the occurrence. Outcrops on both sides of the valley expose strongly brecciated rocks, in part cemented with white weathering carbonate. The character of this deformed interval is identical to that exposed west of the North Star No. 1 and 2 occurrence.

MINERALIZATION

A discontinuous quartz vein trending approximately 020° is exposed in trenches and outcrops. It is up to 100 cm thick and varies from a discrete single well defined vein containing up to 40% lithic fragments to intervals dominated by chlorite schist with 30% quartz stringers and veinlets. Its character is probably a result of continued deformation within the schistose interval that provided the site for emplacement of the vein. Rare disseminated pyrite grains were noted in the quartz during the 1992 examination of the occurrence, and Stockwell (1935) indicates the presence of minor pyrrhotite and chalcopyrite.

GEOCHEMICAL DATA

No assays were reported for this occurrence.

CLASSIFICATION

Vein type deposit; single vein.

REFERENCES

A.F. 90491, 92315, 92828; Cancelled Assessment Files, Manitoba Industry, Trade and Mines, Minerals Division.

Bailes, A.H.

1980: Geology of the File Lake Area; Manitoba Energy and Mines, Mineral Resources Division, Geological Report 78-1, 134 pp.

NATMAP Shield Margin Project Working Group

1998: Geology, NATMAP Shield Margin Project Area (Flin Flon Belt), Manitoba-Saskatchewan; Geological Survey of Canada 1968A; Manitoba Energy and Mines Map A-98-2, Sheets 1 to 7; Saskatchewan Energy and Mines Map 258A-2, scale 1:100 000.

Norquay, L.I., Prouse, D.E. and Gale, G.H.

1993: Geological investigations in the North Star Lake area (NTS 63K/15); in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1993, pp. 78-83.

1994a: The North Star Lake project (NTS 63K/15); in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1994, pp. 83-84.

1994b: North Star Lake (NTS 63K/15SE4); Manitoba Energy and Mines, Minerals Division, Preliminary Map 1994S-3, 1:10 000.

Prouse, D.E. and Gale, G.H.

1993: North Star Lake (NTS 63K/15SE4); Manitoba Energy and Mines, Minerals Division, Preliminary Map 1993S-3, 1:10 000.

Stockwell, C.H.

1935: Gold Deposits of the Elbow-Morton Area, Northern Manitoba; Geological Survey of Canada, Memoir 186, 74pp.

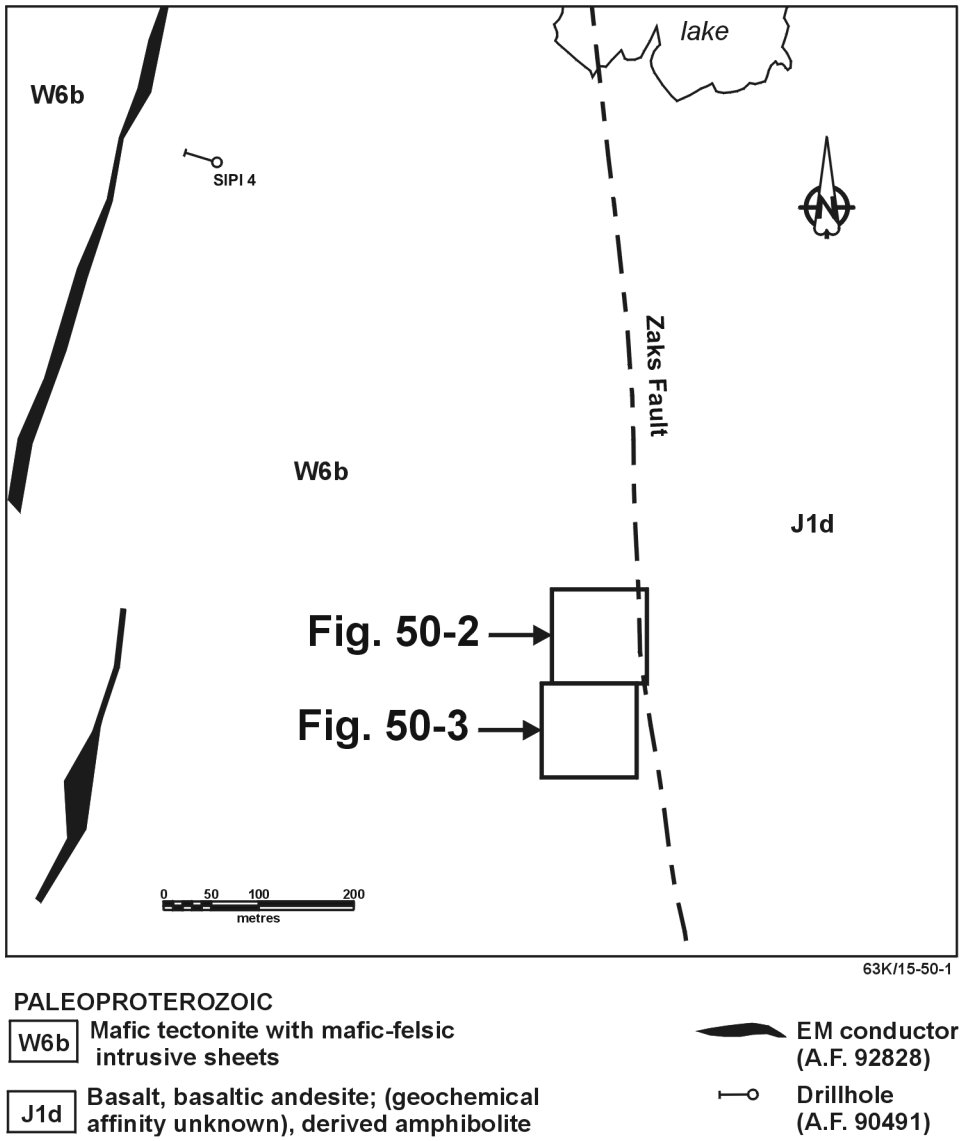


Figure 50-1: Geological setting of Winnipeg-Jupiter No. 7 occurrence.

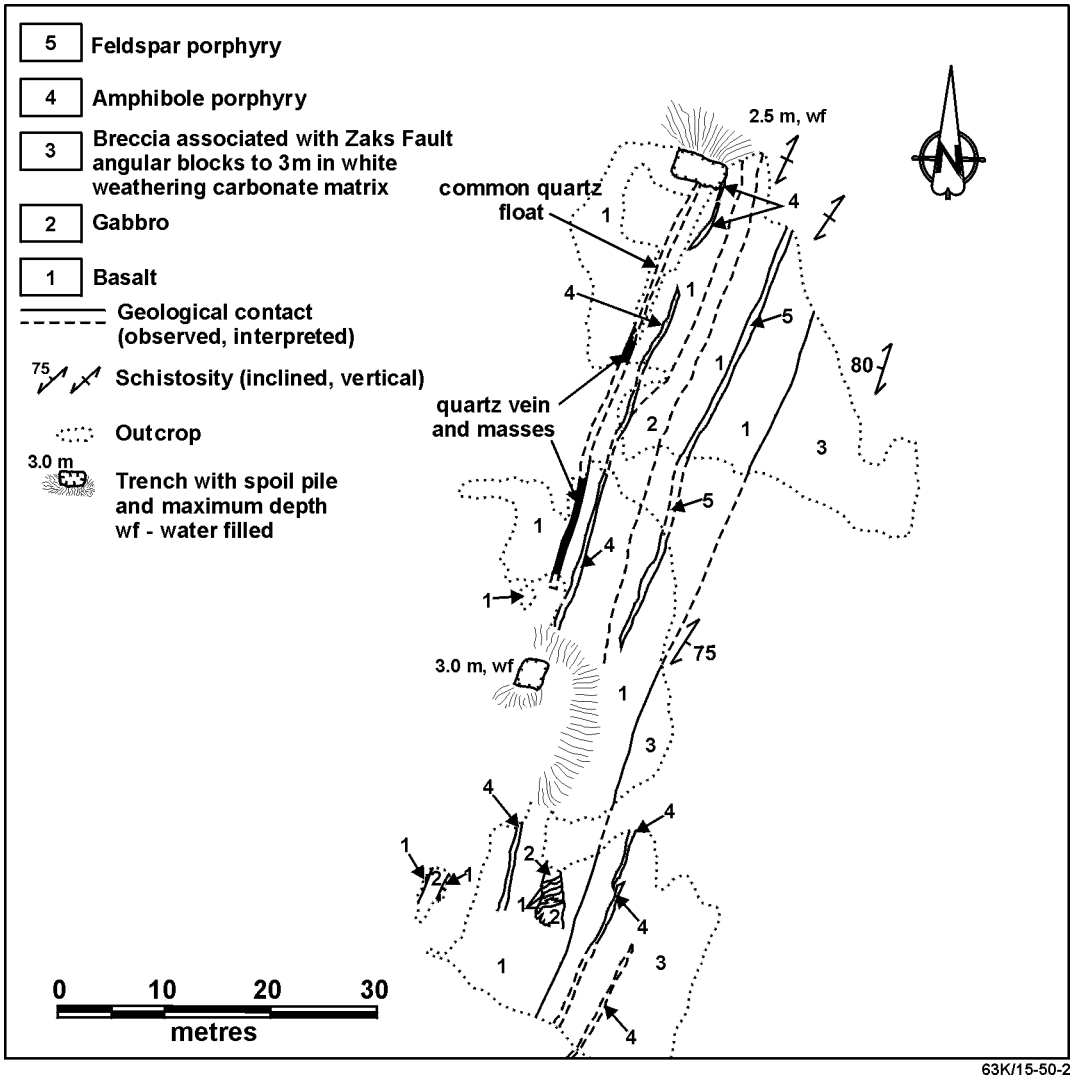


Figure 50-2: Geology and trench locations at Winnipeg and Jupiter No. 7 occurrence.

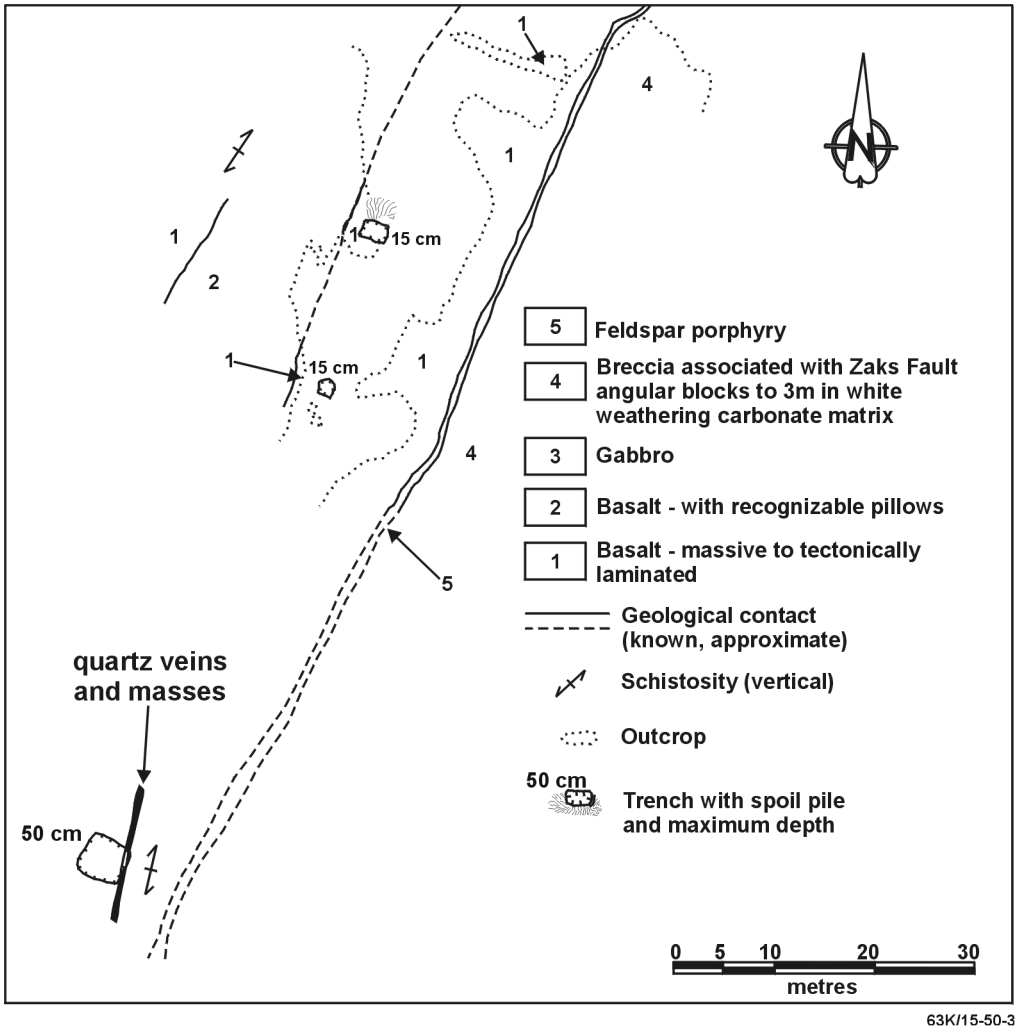


Figure 50-3: Geology and trench locations at Winnipeg and Jupiter No. 7 occurrence.

LOCATION: 51

NAME: Bonny-Castle
UTM: 399530E, 6075105N
AREA: approximately 2.8 km SSW of southeast side of North Star Lake
ACCESS: via bush plane to North Star Lake, then traverse
AIRPHOTO: MB90034-74

EXPLORATION SUMMARY

Mr Oliver Evans staked this claim in 1932, and several trenches were excavated (Stockwell, 1935). In 1981 an airborne EM (INPUT) and magnetic survey was performed for BP Minerals Limited, followed by a geological mapping programme (A.F. 92828).

One trench and a stripped area were located during the 1992 examination of the occurrence.

GEOLOGICAL SETTING

The geological unit designations indicated on the geological setting map (Fig. 51-1) and their descriptions are from the compilation maps of the NATMAP Shield Margin Project Working Group (1998). The occurrence is located in the Eastern zone west of Zaks Fault, a regional brittle structure (Norquay *et al.*, 1993, 1994a, b; Prouse and Gale, 1993). The Eastern zone rocks are dominated by basaltic pillowed flows and fine- to medium-grained mafic intrusions (unit J1d) that are synvolcanic in part (Norquay *et al.*, 1993). The mafic volcanic rocks may correlate with the Preaston Formation (Bailes, 1980) east of the map area.

The occurrence is underlain by massive and pillowed mafic volcanic rocks, probably basalt. The pillowed intervals show a high degree of deformation, and have been folded and flattened.

MINERALIZATION

A NNW-trending quartz vein to 70 cm thick is present in the trench. It shows a patchy limonitic stain, but no sulphides were noted. Small quantities of disseminated pyrite occur in the wallrock. Spoil piles in the stripped area contain minor quartz. The veins in both exposures appear to have little strike extent. Stockwell (1935) noted the presence of a small quantity of pyrrhotite.

GEOCHEMICAL DATA

No assays were reported for this occurrence.

CLASSIFICATION

Vein type deposit; single vein.

REFERENCES

A.F. 90491, 92828; Cancelled Assessment Files, Manitoba Industry, Trade and Mines, Minerals Division.

Bailes, A.H.

1980: Geology of the File Lake Area; Manitoba Energy and Mines, Mineral Resources Division, Geological Report 78-1, 134 pp.

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1998: Geology, NATMAP Shield Margin Project Area (Flin Flon Belt), Manitoba-Saskatchewan; Geological Survey of Canada 1968A; Manitoba Energy and Mines Map A-98-2, Sheets 1 to 7; Saskatchewan Energy and Mines Map 258A-2, scale 1:100 000.

Norquay, L.I., Prouse, D.E. and Gale, G.H.

1993: Geological investigations in the North Star Lake area (NTS 63K/15); in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1993, pp. 78-83.

1994a: The North Star Lake project (NTS 63K/15); in Manitoba Energy and Mines, Minerals Division, Report of Activities, 1994, pp. 83-84.

1994b: North Star Lake (NTS 63K/15SE4); Manitoba Energy and Mines, Minerals Division, Preliminary Map 1994S-3, 1:10 000.

Prouse, D.E. and Gale, G.H.

1993: North Star Lake (NTS 63K/15SE4); Manitoba Energy and Mines, Minerals Division, Preliminary Map 1993S-3, 1:10 000.

Stockwell, C.H.

1935: Gold Deposits of the Elbow-Morton Area, Northern Manitoba; Geological Survey of Canada, Memoir 186, 74pp.