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ONTARIO GEOLOGICAL SURVEY

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# Gold-Quartz-Arsenopyrite Vein Deposits Localized near the Base of the Flinton Group, Kaladar and Barrie Townships, Southeastern Ontario

by

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ABSTRACT

The geological and structural setting of three shear zone hosted gold-base metal-quartz vein occurrences are described in detail.

These occurrences, the Addington Gold mine, Ore Chimney and the Ore Mountain occurrence are hosted within a biotite-garnet schist unit, called the Ore Chimney Formation. Evidence is presented regarding the stratigraphic or structural significance of the Ore Chimney Formation in controlling quartz-vein formation and base-precious metal concentration.

The schistosity developed within the biotite garnet schist (Ore Chimney Formation) as well as the accompanying mineralized quartz veins parallel the major post-Flinton regional foliation. Minor, less well developed mineralized quartz veins hosted in lower Flinton micaceous quartzites provide further evidence that places the mineralizing event during the major post-Flinton regional metamorphism.

Additional structural controls are evidenced by the pipe-like shape of individual gold-rich zones localized within a major linear shear structure at the Addington Mine which parallels the plunge of minor fold structures on the property. The present limited data base precludes a thorough interpretation of the relationships of major and minor structures in controlling gold concentration within the major shear structure.

## INTRODUCTION

During 1983 the geological and structural setting of the quartz-arsenopyrite-gold occurrences located near the lower boundary of the Flinton Group, in Kaladar and Barrie townships, Southeastern Ontario were studied. These occurrences included two past-producing properties, the Addington Mine and the Ore Chimney Mine, and one small occurrence, the Ore Mountain (Figure 1).

The three properties were mapped at 1:2500 scale on flagged 100 x 50m grids and samples of typical units associated with the mineralized areas were collected for thin section study.

## PURPOSE AND SCOPE OF THE PROGRAM

The study was designed to investigate the relative significance of structural and stratigraphic position in siting the gold-arsenopyrite mineralization hosted by quartz veins, which is localized in shear zones immediately adjoining the basal Flinton unconformity. Parallel studies by P. Barron (this report) expand the enquiry on the significance of the Flinton unconformity as a preferentially mineralized zone by examining base metal-gold-quartz dolomite veins hosted by carbonate or metaclastic rocks. These veins are also located at or near the unconformity, albeit within rocks of different sedimentary facies.

This program, presently in its infant stage, has already produced significant results. It remains to apply these results in unexplored regions hopefully to outline additional significant mineralization.

## REGIONAL GEOLOGY

The geological setting of the study area has been discussed by Barron (this report). Important background detail discussed below is the stratigraphic, structural and metamorphic inter-relationships of the Tudor mafic metavolcanics and the younger, unconformably overlying metaclastic rocks of the Flinton Group (Bishop Corners and Lessard Formations).

Figure 1 generally illustrates the disposition of the major lithologies in the study area. Much of it has recently been described in detail (the Kaladar area, Wolff 1982 and the Clarendon Lake area, Moore and Morton 1980) and this brief introductory discussion is largely based on previous work.

The oldest rocks of the study area are mafic metavolcanics (tholeiites, Wolff 1982) of the Hermon Group, Tudor Formation (Lumbers 1969) in which occasional primary flow features are seen. These include poorly preserved relict vesicles often infilled with carbonate, and pillows, whose selvedges are only partially preserved. Top determinations are not definitive (Wolff 1982). Metamorphic grade is upper greenschist to amphibolite facies.

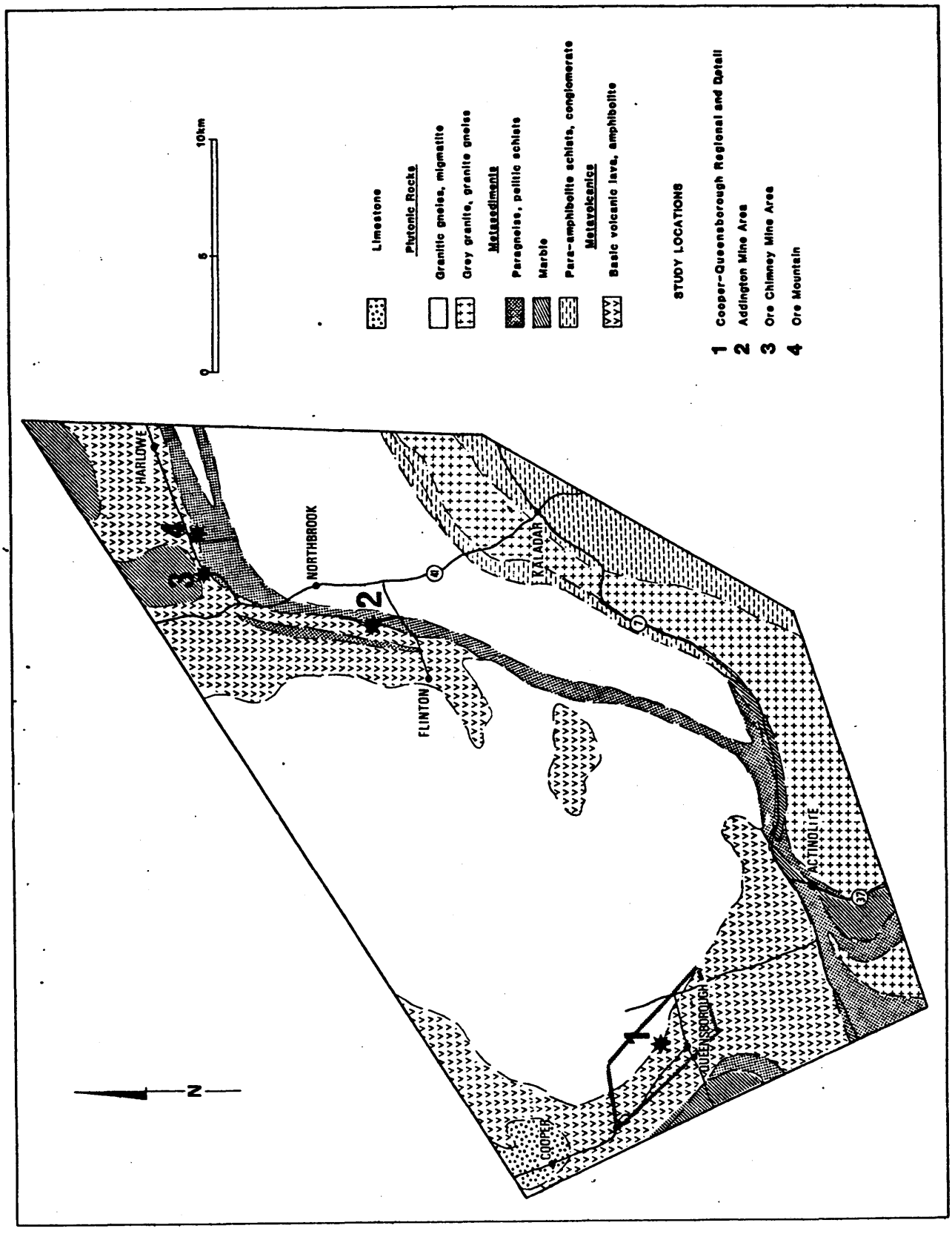


Figure 1: Location of gold study areas within their geologic setting.

These rocks are predominantly massive, fine-grained, equigranular, dark to medium grey-green amphibolites. They are composed of hornblende and plagioclase with minor chlorite and biotite and traces of pyrite and magnetite. Carbonate, up to 10% of the rock, occurs as smears along cleavage or foliation planes.

Close to the contact with the Flinton Group a gneissic to schistose variety of the amphibolite occurs which shows segregation of mafic and felsic components into thin (<1mm) discontinuous lenses and layers. These rocks are fine grained and composed predominantly of hornblende, plagioclase and minor biotite.

The Tudor Formation is intruded by a series of granodiorite-trondhjemite plutons. The Elzevir batholith, which outcrops east of the immediate study area, is a medium-grained biotite granodiorite to quartz monzonite which shows granoblastic to gneissic texture. The Northbrook-Cross Lake pluton, exposed both north and east of the area, consists of a medium-grained biotite-trondhjemite to biotite-granodiorite.

Within the study area metavolcanic rocks of the Tudor Formation are overlain unconformably by metasedimentary rocks of the Flinton Group whose basal members are the Bishop Corners Formation and above it the Lessard Formation (Moore and Morton 1980; Thompson 1982; Moore and Thompson 1980. The basal unit, the Bishop Corners Formation, consists of feldspathic quartzite and quartzite-pebble conglomerate.

The Lessard Formation above it comprises calcareous meta-arkose and gritty quartz-pebble conglomerate. Both units will be discussed in more detail in association with the property descriptions.

Close to the basal Flinton unconformity is the controversial Ore Chimney Formation (Moore and Thompson 1980). This unit which lies at, above or below the unconformity is a dark grey to black, well foliated, medium to fine grained hornblende-biotite-garnet schist.The mineralized quartz vein systems at the Addington, Ore Chimney and Ore Mountain properties lie conformably within this unit.

## REGIONAL STRUCTURE

The properties mapped lie within the Flinton syncline, shown on the Kaladar map sheet (OGS Map 2432, Wolff 1982). In general a thin wedge of metaclastic Flinton Group is synclinally infolded into the thicker sequence of mafic metavolcanic rocks, the Hermon Group. Two large intrusive bodies east and west of the area may have controlled the provenance and basin structure during Flinton sedimentation resulting in the trough-like distribution of lithologies. Subsequent regional movement resulted in major synclinal folding and shearing which are in evidence today.

linear shear structure providing the permeable system into which mineralizing solutions migrated and finally deposited their base metals and gold.

It appears that the key to extensive shearing and subsequent quartz veining and sulphide-gold mineralization is the development of the Ore Chimney Formation at the Tudor-Flinton contact. The location of this unit should be first priority in exploration programs for these vein-type gold occurrences.

## The Ore Chimney Mine: Lot 35, Concession I, Barrie Township

### Introduction

The Ore Chimney Mine is located in Lot 35, Concession I, Barrie Township. The property is accessible via a small gravel road which runs north of the Harlowe road approximately 1.8 kilometre east of Highway 41 (NTS 31C/14).

### History of Development

Gold mineralization was originally discovered in the mine area in 1902. In 1909, the Ore Chimney Mining Company was formed to acquire the property. Between 1911 and 1916 a vertical two-compartment shaft was sunk to a depth of 405 feet and lateral work was conducted on levels at 108, 150, 250, 332 and 400 feet. In 1915 a 20-stamp mill was erected but little ore was treated and none was shipped.

Between 1917 and 1922 the property lay idle. The workings were dewatered in 1923 and limited development was carried out in 1924. From 1925 to 1926 the mine was dewatered again, a 125 foot winze was driven below the 400 foot level and minor drifting was undertaken on the 500 foot level.

In 1928, the Bey Mines Limited acquired the property from the Ore Chimney Mining Company. In 1929 they drilled three holes from surface, totalling 2372 feet, one of which cut, at a depth of 605 feet, 7 feet (3.5 foot true width) assaying 0.158 oz/ton Au, 7.8 oz/ton Ag, 3.2% Pb and 1.9% Zn. The mine was dewatered and thoroughly re-sampled in 1932. A cross cut was driven 100 feet south from the vein on the 400 foot level from where 1000 feet of drilling was completed in three holes.

As of 1932 development work in the form of crosscuts, drifts and winzes totalled 2554 feet (779 m) and estimated ore reserves totalled 11,000 tons grading 0.20 oz/ton Au and 5.64 oz/ton Ag between the 100 and 500 foot levels (Source Mineral Deposit Files, Ontario Geological Survey, Toronto).

Mr. R.W. Clark acquired the property via a mortgage foreclosure on the Bey Mines in 1941 and during the period 1941 to 1943 the Webbwood Copper Mining Syndicate Limited, by arrangement in Mr. Clark, unsuccessfully attempted to dispose of the lead and zinc from the mine dump. East Webb Mines Limited was formed in 1944 to acquire title to the

property. Little work was carried out until 1956 when the assets of East Webb Mines were acquired by the Cavalier Mining Company Limited who drilled 8 surface diamond drill holes totalling 4667 feet in an attempt to intersect the north east extension of the vein. Three of these holes were cross cut core lengths of 2.0 feet or less of material carrying values of interest.

In 1961 the charter of Cavalier Mining Company was cancelled and little is known of the disposition of the property until 1977 when a Mr. Gale brought the property to lease. At the present time the Ore Chimney Mine property is owned by Mr. A. Banner of Cloyne, Ontario. During 1983 Mr. Banner dewatered the workings to the 150 foot level to resample. This level was briefly open for inspection during August 1983.

Detailed Geology

The gold-silver-copper-lead-zinc mineralization occurring at the Ore Chimney Mine is hosted in a quartz-vein system localized within sheared hornblende-biotite-garnet schist (Ore Chimney Formation) near the contact between underlying mafic metavolcanics of the Tudor Formation and unconformably overlying quartzite and quartz-pebble conglomerate of the Bishop Corners Formation, Flinton Group.

During the present survey a 600 m strike length of the area in the immediate vicinity of the shaft was mapped at

1:2000 scale on 50 m spaced lines. A base line was run in along strike within mafic metavolcanics north of the shaft and cross lines were run south from the base line across the contact and well into the overlying metasediments.

The general geology of the Ore Chimney property (Figure 4) shows mafic metavolcanics to the northwest overlain by mafic metasediments, quartzite and quartzite-pebble conglomerate to the southeast. The central part of the volcanic-sediment contact zone forms an S-shaped pair of folds whose axial plane appears parallel to the regional foliation trend. The main shaft of the property is situated near the apex of this fold (Figure 4).

All rocks exposed on the property are moderately to well-foliated on planes trending 050° to 085° and dipping steeply (075° to 090°) to the north. Primary structures have been preserved particularly in pillowed mafic metavolcanics and well cross-bedded quartzites. Pillow structures northwest of the shaft indicate flow tops face to the northwest. Cross-bedding preserved within Flinton Group meta-quartzites indicate tops to the southeast, so that across the unconformity the units are back to back.

Minor S-folding occurs within metasedimentary units in the south part of the property. Their axial planes trend parallel to the regional foliation directions trending 050 to 085° and they plunge steeply (065 to 080°) to the northeast. No faulting was observed to offset units on the

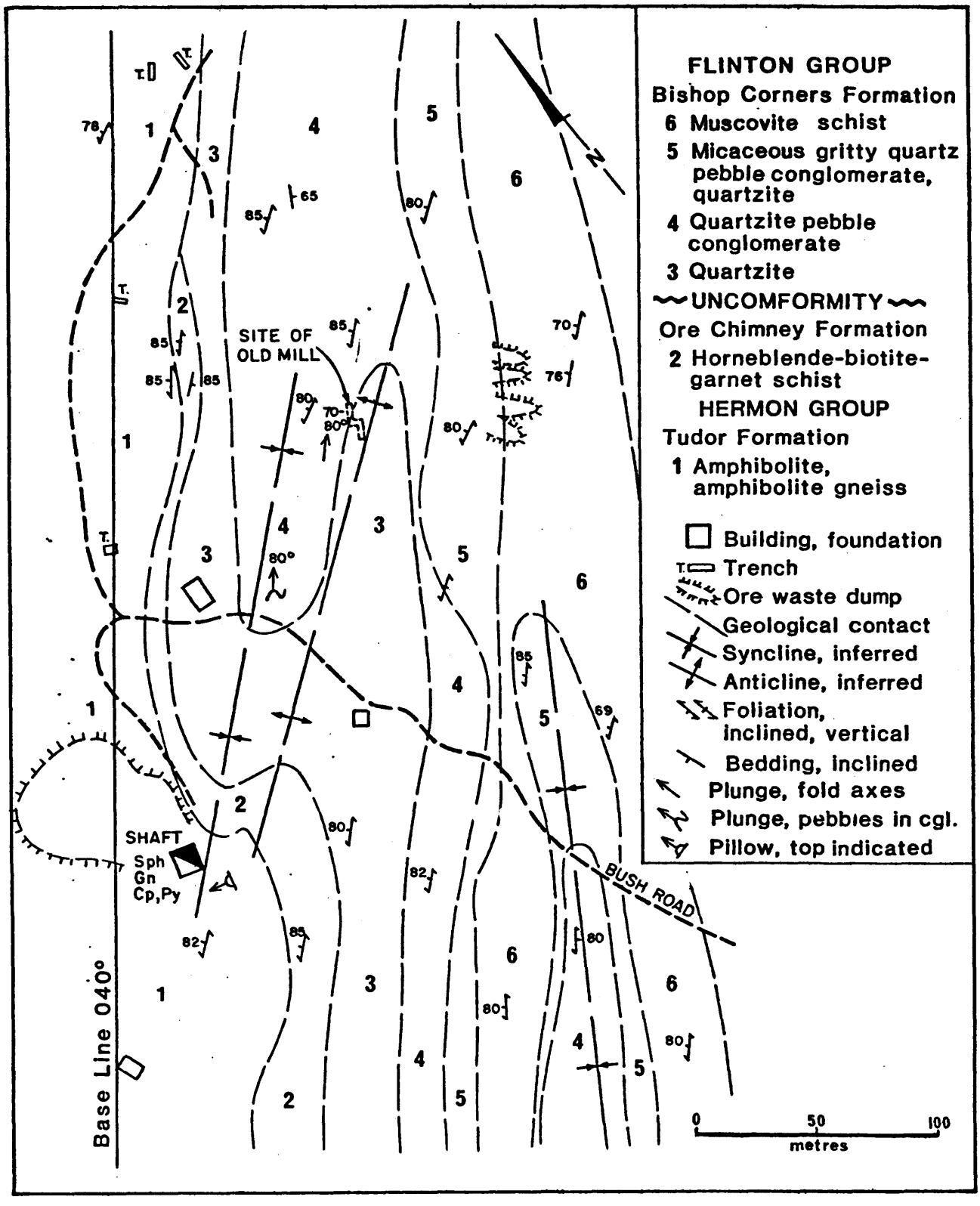


Figure 4: Geology of the Ore Chimney Mine Area, Barrie Township, Southeastern Ontario.

property. Swampy ground in the west central part of the property obscures the contact relationships between the volcanics and clastic rocks.

Description of Units

a. Tudor Formation

The mafic metavolcanic rocks exposed on the Ore Chimney mine property are fine-grained, dark green-grey to black, moderately well foliated to fissile amphibolites. Occasional pillow structures are seen stretched parallel to the regional foliation direction (Plate 4).

Top directions face northwest. One to two metre interbeds of andesitic tuffaceous material, within the predominantly mafic volcanic section, appear light to medium-grained-grey and are laminated parallel to foliation. Moore and Morton (1980) report lapilli tuff horizons within the volcaniclastic rocks however no fragments were observed during the present survey.

The mafic metavolcanic rocks are often cut by fine (0.5 to 2 mm) cross fractures infilled with quartz and quartz-carbonate. Smears of carbonate occur along foliation planes particularly in the vicinity of the shaft. Accessory fine-grained disseminated pyrite and magnetite were observed sporadically within the amphibolites.

Plate 4: Pillows in mafic metavolcanics of the Tudor Formation, Ore Chimney Property.

b. Ore Chimney Formation

At or near the contact with the overlying Flinton Group metaclastic rocks is a 0.5 to 4 m wide zone of magnetic biotite-garnet schist (Ore Chimney Formation, Moore and Morton 1980). This unit, which hosts the gold-base metal quartz veins on the property, is poorly exposed on surface and its distribution is approximated from minor exposures south of the main shaft and from underground (150 feet level, 10 m east of the shaft and along the 150 drift to the west). This unit is fine to medium grained, dark grey to black and is composed of well foliated to sheared biotite with 2-10% disseminated (<1 mm) magnetite grains and 5-10%, -.2 to 1 cm red garnet porphyroblasts. Minor constituents include quartz, plagioclase, carbonate and hornblende. Minor chloritization of biotite was observed.

c. Bishop Corners Formation, Flinton Group

Unconformably overlying the Tudor and Ore Chimney Formations is a sequence of quartzite and quartzite-pebble conglomerate. The base of this metaclastic sequence is a 5-10 m thickness of medium-grained buff tan to light grey, well laminated and massive quartzite. Well preserved cross beds are characteristic, indicated by dark reddish-grey laminations marking cross bed forsets (Plate 5). This unit is composed almost entirely of medium grained quartz with minor accessory muscovite, kyanite, hematite and tourmaline (Moore and Morton 1980).

In sharp contact with and immediately overlying the quartzite is a thick section of quartzite-pebble conglomerate with minor interbeds of quartzite and micaceous quartzite. The conglomerate contains 60 to 80% quartzite, quartz and black chert clasts (2-25 cm long) in a buff-tan micaceous quartzite matrix. Most of the clasts are buff tan to light grey quartzite with fine hematitic laminations and relict cross-beds similar to the underlying quartzite. Auxiliary clasts include white "vein" or massive quartz, black fine-grained cherty quartzite and rarely dark green to black amphibolite fragments. The conglomerate is well foliated and the clasts are elongated (in plan) parallel to the regional foliation direction (Plate 6). In section the clasts within the conglomerate have their longest dimension plunging steeply to the north east to east. They both parallel the foliation trend and plunge parallel with minor fold structures on the property.

The conglomerate unit is 40 to 100 m thick. To the south and east, up section, it is interbedded with increasing amounts of micaceous quartzite, muscovite schist and a gritty quartz-pebble conglomerate. The latter two units appear to overlie the conglomerate in the mine area. The gritty conglomerate contains 10 to 30% quartzite and quartz pebbles (1-3 cm long) in a medium-grained micaceous quartzite matrix.

Contacts between all metaclastic units are sharp and detailed facies relationships are unclear.

Plate 6: Stretched pebbles in Bishop Corners Formation conglomerate, Ore Chimney Property.

Mineralization

The mineralized shear zone at the Ore Chimney mine is not exposed at surface however dump material and exposure in the main drift at the 150 foot level underground were examined. Further data on ore zone dimensions and grades have been summarized from old company files (John Malczak, Ontario Geological Survey, 1984).

The mineralization at the Ore Chimney mine occurs in a system of quartz stringer veins hosted in sheared garnet-biotite schist, the Ore Chimney Formation. Inspection of the underground workings (150 feet level) has shown the mineralization to be associated with narrow (1-10 cm) discontinuous quartz-carbonate stringers within a sheared biotite schist. Sulphide mineralization occurs as dissemination and pods concentrated along quartz vein margins and disseminated within host rocks between quartz stringers. Minor short discontinuous cross-fractures, trending 300 to 320°, appear to offset the quartz stringers a few centimetres. Sulphide minerals observed within the mineralized shear zone include pyrite, sphalerite, galena and chalcopyrite. Trace amounts of tetrahedrite were observed in mineralized dump material. Gold is reported to occur free in quartz gangue (Meen 1942).

Table II is a summary of the dimensions and grade of the mineralization taken from the Prospectus of the Cavalier Mining Company (Campbell 1957).

TABLE II Summary of the Ore Shoot as indicated by underground samplings

| Mine Level | Length Feet | Width Feet | oz/ton Au | oz/ton Ag | % Pb | % Zn |
|---|---|---|---|---|---|---|
| 150 | 50 | 1.5 | 0.108 | 14.0 | - | - |
| 250 | 55 | 3.0 | 0.199 | 11.6 | - | 2.26 |
| 400 | 75 | 4.0 | 0.230 | 7.3 | 1.6 | 1.90 |
| 500 | 100 | 3.5 | 0.390 | 1.7 | - | - |
| Winze | - | 3.75 | 0.357 | 4.0 | - | - |
| 605' | DDH #3 | 3.25 | 0.158 | 7.8 | 3.2 | 1.90 |

This summary suggests that the ore zone is a vertical pipe or shoot which appears to increase in width and grade with depth. The intersection of good grade material over widths of 3.25 feet even at depths of 604 feet indicates a potentially untested depth extent to the ore shoot.

Estimates of ore reserves as of 1957 include 11000 tons grading 0.20 oz/ton Au and 5.64 oz/ton Ag from 50 feet above the 150 foot level to 50 feet below the 500 foot level (Campbell 1957).

Summary

The mineralized quartz vein system at the Ore Chimney mine is hosted in a shear zone which is conformable with the regional foliation trend but discordant to the Flinton stratigraphy and its basal unconformity. The shear zone has formed within a biotite-garnet schist unit, the Ore Chimney Formation, which lies below the unconformity. The quartz veins are conformable with the schistosity of the sheared biotite-garnet schist.

Sulphide mineralization in the form of pyrite, chalcopyrite, sphalerite and galena occurs as irregular pods and disseminations along quartz-vein boundaries and as disseminations within the biotite-garnet schist host rocks. Gold mineralization is reported to occur free in quartz-gangue (Meen 1942).

The outcrop distribution near the main shaft indicates the presence of a fold with the shaft having been sunk in mineralization at its closure. Poor surface and underground exposure of the mineralized shear zone provided insufficient data to determine the importance of this fold closure in concentrating the mineralization.

Descriptions of mineralization exposed in underground workings and data from assay plans and surface and underground diamond drilling indicate a flattened, lens-shaped mineralized zone conformable to the regional foliation trends. The known mineralized zone, containing an estimated 11000 tons grading 0.20 oz/ton Au and 5.64 oz/ton Ag, appears open at depth; gold values increase whilst silver values decrease with depth (Campbell 1957).

The bulk of the exploration and development work reported to have been undertaken on the property has been concentrated within a limited area northeast of the shaft site for a distance of 500 feet. Potential exists for further mineralization down dip from the main zone and within the favourable Ore Chimney Formation to the southwest and further north east of the main shaft.

zone in sheared amphibole-biotite schist of the Ore Chimney Formation just below the contact of the overlying Flinton Group. The structural and stratigraphic setting of this mineralization resembles that of the Addington and Ore Chimney properties although the extent of shear zone development, quartz vein formation and associated sulphide ± gold concentration appears to be less.

However, the brief investigation of the setting of the mineralization at the Ore Mountain property has provided further data on the favourability of the Ore Chimney Formation to host quartz vein systems and sulphide + gold mineralization. It appears more evident that this Formation, where it has become sheared, may be a regional metallogenetic target formation for exploration for Au+Ag base metal vein systems.

## GENERAL SUMMARY

The mineralized quartz vein systems at the Addington, Ore Chimney and Ore Mountain occurrences are hosted in a sheared biotite-garnet schist unit called the Ore Chimney Formation. This formation occurs at the base of the Flinton Group and commonly contains conformable quartz stringer veins which parallel the major post-Flinton regional foliation. Extensive shearing at the base of the Flinton Group, resulting from competency differences between the underlying metavolcanics and overlying quartzite and conglomerate, has created dilatant zones into

which metamorphically derived mineralizing solutions migrated and deposited quartzite veins, sulphides and Au. The dilatancy and shearing may have been enhanced by the presence of the Ore Chimney Formation along this contact or the Ore Chimney Formation may simply be the end product of the shearing itself.

Field and petrographic studies suggest to Moore and Morton (1980) that the Ore Chimney Formation is a separate stratigraphic unit which was laid down as a mafic sediment overlying the Tudor mafic metavolcanics prior to Flinton sedimentation. This formation has been mapped intermittently for over 40 kilometres along the base of the Flinton Group between Flinton and Bishop Corners (Moore and Morton 1980). During the present study, the Ore Chimney Formation was consistently observed at the Tudor-Flinton contact and appears to have been repeated across fold structures. Bell (1949) documented the presence of a biotite-garnet schist in outcrop around a small synclinal infold of Flinton clastics within the Tudor metavolcanics in the north central part of the Addington property. The present survey located intermittent outcrops of this formation in the same area. Bell (1979) also noted a thickening of the Ore Chimney Formation at the nose of this small syncline. This fact could not be substantiated during the present survey due to poor exposure in low swampy ground south of the small syncline.

Wherever exposed, the Ore Chimney Formation is extensively sheared and its thickness is extremely variable. In the main shear zone at the Addington property the Ore Chimney Formation varies from 2 to 10 m thick. The lensoid configuration of the formation could be due to extension during shearing so that any original variation in thickness has been obscured.

An alternative hypothesis regarding the development of the Ore Chimney Formation is that it is the result of extensive shearing along the Tudor-Flinton contact. The consistent location of the development of this biotite-garnet schist at or near the aforementioned contact, its well-developed schistosity which conforms to the major post-Flinton regional foliation and the consistent presence of quartz veins suggests that the Ore Chimney Formation's development may have coincided with the major post-Flinton regional metamorphic event.

The intersection of this unit within Lower Flinton Group micaceous quartzites in drill holes transecting the Tudor/Flinton contact further suggests that this Formation is not a distinct stratigraphic unit but is the result of extensive shearing and alteration near the Tudor-Flinton contact during regional metamorphism (Wayne Johnson, Consultant Geologist, Addington Mines Ltd., personal communication, 1984).

For exploration purposes we have two possible scenarios with which to model the formation of these deposits.

1) The Ore Chimney Formation was laid down as a mafic sediment resulting from the weathering of underlying mafic volcanics of the Tudor Formation. Metaclastic sediments of the Flinton Group were unconformably deposited above this formation and during post Flinton regional metamorphism extensive shearing due to a competency differential between the two units was localized along the Tudor-Flinton unconformity. The presence of the more ductile Ore Chimney Formation, permitted more extensive shearing and dilatancy. Metamorphically derived hydrothermal fluids migrated into this dilatant zone and deposited conformable quartz veins with associated base metals and gold, or 2). During post-Flinton regional metamorphism shear stress was dissipated along the Tudor-Flinton contact due to competancy differences between the two units. The upper part of the Tudor mafic metavolcanics became sheared and altered by metamorphically derived hydrothermal solutions which had migrated into dilatant zones formed along this deformation. Potassic alteration resulted in extensive biotite development which enhanced shearing and dilatancy. The conformable mineralized quartz veins were formed within dilatant zones resulting from shearing and alteration.

It is evident, from either scenario, that the major post-Flinton metamorphic and structural event resulted in the formation of these conformable quartz vein systems. At the Addington property the major shear zone system is host to 4 separate ore zones (Bell 1949). These zones are

pipe-like in shape with their long dimension on the down-dip direction and individual zones plunge steeply to the south (W. Johnson, Consultant Geologist, Addington Mines Ltd., personal communication, 1984). The long dimension of deformed quartz pebbles in the Flinton conglomerates and the axial traces of minor folds as indicated by deformed pebbles within the conglomerates also plunge steeply to the south. The concentration of zones of higher grade mineralization within a major linear shear structure suggests that additional structural controls were in effect during fluid migration and mineral deposition which has resulted in select areas of increased dilatancy and permeability. In cross section the plane of the shear zone dips more steeply than the bedding planes within the Flinton sediments. The intersection of these two planes roughly parallels the plunge of the ore zones which suggests that a certain component of the shear stress was dissipated in this direction resulting in the present pipe-like ore zone configuration. Detailed diamond drill hole information in the form of longitudinal and cross sections through the ore zones would be useful in fully defining the structural controls of these ore zones.

## CONCLUSIONS

The mineralized quartz veins exposed at the Addington Ore Chimney and Ore Mountain occurrences are conformable with the major post-Flinton regional foliation. As well,

minor gold bearing quartz veins occur within Flinton group clastic metasediments at the Addington Mine, thus suggesting that the mineralization formed in post-Flinton time. The localization of these shear zone hosted deposits near the basal Flinton unconformity is due to competency differences between lower Tudor metavolcanics and upper Flinton metaclastics whereby this contact has acted as a structural break along which shearing developed during post-Flinton regional metamorphism.

The association of the more extensive quartz vein systems within the biotite-garnet schist of the Ore Chimney Formation, has been well documented. Although the timing of the formation of this unit remains somewhat enigmatic, its presence appears to be critical for extensive quartz vein development. Detailed mapping of exposures of this unit should be of high priority in prospecting for these deposit types.

The almost ubiquitous association of fine-grained disseminated magnetite within this unit avails the use of regional and detailed ground magnetometer surveys in defining initial favourable exploration areas.

REFERENCES

Bell, L.V.
1949: Geological Report, Addington Mines Ltd., From Private Company Files, Cominco Ltd.

Campbell, C.A.
1957: Report to the President and Directors of the Cavalier Mining Corporation Ltd. on the Ore Chimney Property, Files of J. Malczak, Ontario Geological Survey.

Harding, W.D.
1942: Geology of the Kaladar and Kennebec Townships, Ontario Department of Mines, Vol. 51, Part 4, p.51-74.

Lumbers, S.B.
1969: Geology of Limerick and Tudor Townships; Ontario Department of Mines, Geological Report 67, 110p.

Malczak, J.
1984: Files of Base and Precious Metals Occurrences in the Kingston Sheet (NTS 31).

Meen, V.B.
1942: Geology of the Grimsthorpe-Barrie Area; Ontario Department of Mines, Vol. 51, Pt. 4, p.1-50.

Mineral Deposits Files, Ontario Geological Survey, 77 Grenville Street, Toronto.

Moore, J.M. Jr. and Morton, R.L.
1980: Geology of the Clarendon Lake Area,Counties of Frontenac and Lennox and Addington; Ontario Geological Survey, Open File Report 5316.

Moore, J.M., Jr. and Thompson, P.H.
1980: The Flinton Group: A Late Precambrian Metasedimentary Succession in the Grenville Province of Eastern Ontario; Canadian Journal of Earth Sciences, Vol. 17, p.1685 - 1707.

Springer, J.S.
1982: Gold and Base Metal Vein Deposits in Eastern Ontario - Structural Inferences and the Significance of Vein Mineralogy; Ontario Geological Survey, Miscellaneous Paper 106, 235p.

Sutherland, T.F, Collins, E.A., McMillan, J.G. and Bartlett, J.
1915: Mines of Ontario, Report on the Ore Mountain Property; Ontario Bureau of Mines, Vol. XXIV, Part 1, p.161.

Thompson, P.H.
1972: Stratigraphy, Structure and Metamorphism of the Flinton Group in the Bishop Corners - Madoc Area, Grenville Province, Eastern Ontario; Unpublished Ph.D. Thesis, Carleton University.

Wolff, J.M.
1982: Geology of the Kaladar Area, Frontenac and Lennox and Addington Counties; Ontario Geological Survey, Report 215, 94p. Accompanied by Map 2342, Scale 1:31680.


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