GEOLOGICAL SURVEY OF CLAIMS
S515447 to S515452 incl.
S538599 to S538609 incl.
S538611 to S538614 incl.

EDEN TOWNSHIP
DISTRICT OF SUDbury
SUDbury MINING DIVISION
ONTARIO
(NTS: 41-I-6E)

RECEIVED
May 26 1982
MINING LANDS SECTION

by,

G. A. Harron
DU PONT OF CANADA EXPLORATION LIMITED
102 - 1550 Alberni Street
Vancouver, BC
V6G 1A5

April 1982
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I. INTRODUCTION

1. Purpose of Survey

The purpose of the survey was to map the bedrock geology of the area extending south from the former Long Lake gold mine. It was thought that a detailed examination of the bedrock might indicate other areas of gold mineralization.

2. Location and Access

The claims are located in the southwestern quarter of Eden Twp. in the vicinity of Lake Lake. The location of the claims is shown on the location map, Figure 1.

Secondary roads extending southwestward from the junction of provincial highway 69 and the Tilton Lake road provide vehicle access to within 1.5 miles of the centre of the claims. The remainder of the distance can be traversed on foot following trails in the vicinity of the former Long Lake gold mine.

3. Property

The 21 claims described in this report are part of a larger contiguous block of claims now owned by Du Pont of Canada Exploration Limited. The unpatented claims described in this report are as follows:

S515447 to S515452 inclusive 6
S528599 to S538609 inclusive 11
S538611 to S538614 inclusive 4

21 claims

4. Previous Work

A combined magnetometer and VLF-EM survey was completed on the subject claims and submitted for assessment work credits in 1981 (file 2.4061). There are no other records of previous work performed on these claims in the assessment work files of the Sudbury Resident Geologist's office. However, the claims may have been previously prospected as the former Long Lake mine is located north and west of the subject claims.

The geology of the area has been reported in Geological Report 124, by the Ontario Division of Mines (Card et al., 1975).

5. Personnel and Survey Dates

The claims were geologically mapped by Mr. D. J. Mossman (Ph.D.) with the assistance of Mr. S. Palomaki in the period 1981 July 1-31. Verification of the geology was undertaken on various days in the months of September and October 1981 by Mr. G. A. Harron.

6. Survey Method

Geological mapping was undertaken utilizing cutlines, with a line spacing of 400 feet and a station interval of 100 feet. A total of 17.5 miles of line were traversed on the subject claims.
II. GEOLOGY

The geology of the claims is presented on four maps (in pocket) at a scale of 1"=200 feet. Figure 2 shows the location of these geology maps in relation to the claim numbers. Appendix 1 lists the abbreviations shown on the geology maps.

1. Regional Geology

According to the published geological map of the area (Card et al., 1975) the claims are underlain by metasedimentary rocks of the Huronian Supergroup which are intruded by mafic and felsic intrusions. The metasedimentary rocks are variously identified as Serpent, Espanola, Bruce and Mississagi formations. All felsic and some gabbro-diorite intrusions have been termed Eden Lake Intrusions, while other gabbroic intrusives are thought to be "Nipissing-type" intrusions.

The metasediments generally strike NE, dip SE and are considered to be a roof pendant within the Eden Lake intrusions.

The Wallingford fault passes through the southwest corner of the claims, and an ENE trending branch of this fault traverses the southern part of the claim group.

The former Long Lake gold mine is within the metasedimentary roof pendant adjacent to the Wallingford fault.

2. Table of Lithological Units

The following table includes only rock types found on the subject claims, and shows some dissimilarities to the published geology map (Card et al., 1975).

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<td>Hornblende Gabbro (Early Mafic Intrusions)</td>
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<td>14</td>
<td>Gabbro [dykes or small sills] (Eden Lake Intrusions)</td>
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Metasedimentary Rocks

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<td>Arkose (Mississagi Fm)</td>
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<td>Quartz vein stockworks</td>
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<td>4</td>
<td>Protoconglomerate (Bruce Fm)</td>
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<tr>
<td>5</td>
<td>Schist (Espanola Fm)</td>
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</table>
3. Metasedimentary Rocks

a. Quartzite

Three recognizable varieties of quartzite (rock units la, lb, lc) were mapped. The three units are interbedded, with gradational contacts between the massive (la) and slightly micaceous, arkosic (lb) varieties. Sharp contacts exist between the slightly micaceous, arkosic (lb) type and the argillitic, micaceous type (lc) of quartzite.

Massive quartzite (la) is light grey to white-coloured, with grain size ranging from fine through coarse. Typically the rock is composed of 85% rounded quartz grains, 5% orthoclase, and 5% muscovite. Angularity of feldspars and muscovite is thought to be due to metamorphic recrystallization. In outcrop the quartzite is massively bedded, but occasionally shows planar cross-bedding.

Micaceous arkosic quartzite is the most common variety of quartzite encountered on the claims. It is a mottled, light pink colour on both fresh and weathered surfaces. The rock is fine to medium grained and is composed of 80% rounded quartz grains, 10% orthoclase and potassium feldspar, and 10% sericitic micas. The pyrite content is variable, averaging 0.2 to 0.5%, but ranging up to 3% in some hand specimens. Texturally, the beds are predominantly festoon cross-bedded, with sericitic micas accentuating these features.

Argillitic quartzite is a dark grey colour, showing sharp bedding contacts and recessive weathering in relation to the other varieties of quartzite. The rock is fine-grained and composed of 70% rounded quartz grains, 15-20% biotite, and 10% orthoclase. Commonly, this rock unit is less than 1 foot thick and interbedded with the other quartzite varieties. The best exposures are located on the north boundary of claim S515452, and the central portion of claim S538609.

b. Arkose

The massive bedded arkose units are interlayered with the quartzites. Contacts with the quartzite are distinct. The arkose is light pink in colour, and is fine to medium grained. The composition is approximately 80% quartz, 10% microcline and 10% sericitic micas. Regional metamorphic effects have resulted in a partial destruction of the detrital texture of the rock. The best exposures of this rock unit are located in the east central part of claim S538607, and on the common boundary of claims S538612-538613. In these localities, the arkose shows interbedding with both the underlying quartzites and the overlying protoconglomerate.

c. Quartz Vein Stockworks

Schematically shown on the geology map are areas of quartz veining. These are diffuse areas of quartzite containing greater than 25% white quartz occurring as matrix fill around angular blocks of
host rock. As the host rocks are not severely disoriented, these quartz accumulations appear to have formed by hydrothermal fracturing. Sulphide minerals are not associated with the introduction of the quartz.

Spatially, all of these quartz vein stockworks occur in rocks on the hangingwall side of a large gabbro-diorite sill.

d. Protoconglomerate

This rock unit is dark grey and contains about 50% clasts in a fine grained greywacke matrix. The clasts are up to 3" in diameter, average about 1/2 inch, and are composed of quartz, quartzite, and mafic intrusive clasts. Pyrite in amounts of 1-2% are ubiquitous in the matrix. The clasts are matrix supported and exhibit an incipient bedding. Spatially this unit occurs in the southwestern part of the claim group, and is best exposed on claims S538605 and S538607. It is correlated with the Bruce Fm (Card et al, 1975).

e. Schist

This rock type occurs in areas mapped as Espanola Fm. by Card et al, 1975. However, it may be a contact metamorphosed greywacke in consideration of its composition and migmatitic appearance. The rock is a light tan colour and fine to medium grained. Compositionally the rock is composed of 70% quartz, 20% oligoclase, 10% biotite-muscovite, and minor amounts of almandine garnet. In most outcrop bedding is indicated by compositional layering which is highly contorted. This rock type is best exposed on claims S515451, S538605, and on the common boundary of claims S538601-538603.

4. Intrusive Rocks

Intrusive rocks comprise about 60% of the outcrops mapped, and range in composition from aplite to hornblende gabbro. The felsic varieties tend to occur as irregular shaped intrusions and as lit-par-lit injections. Compositional variations in the felsic intrusives occur over short distances, thus the fourfold division of these rocks into granite, monzonite, trondhjemite, and granodiorite. Mafic igneous rocks generally occur as dykes or sills and are divisible into diorite, gabbro and diabase.

a. Aplite

Aplite does not occur on the subject claims, but is restricted to a minor occurrence hosted in hornblende gabbro on claim S1101.

b. Diabase

Scattered, but not numerous outcroppings of fine grained diabasic rocks occur throughout the claims, and appear to be small sills. Contact relationships with other rock types were not observed on the subject claims, thus the relative age of the diabase is obscure. However, as the rock appears to be little altered, it is assumed to be younger than other mafic intrusions (units 12, 13)
c. Granite

Outcrops of pink granite predominate in the southeastern part of the claim group. The granite is medium to coarse grained, and is composed of 25% quartz, 70% potassium feldspar, 5% biotite, and minor amounts of almandine garnets. Characteristically, the granite contains numerous xenoliths of metasedimentary rocks, some of which exhibit "granitized" contacts. On claim 588626 (off subject claims) the granite intrudes gabbro (unit 13) implying that the granite is younger.

This granite correlates with the Eden Lake Intrusions and is dated at 1430 Ga, (Card et al, 1975).

d. Monzonite

The only occurrence of monzonite on the subject claims occurs on claim 538606, at the assumed contact between granodiorite and hornblende gabbro. Thus the monzonite may represent alkali metasomatism along the contact of the hornblende gabbro, rather than a distinct intrusive rock type. The rock is pink in colour, coarse grained, and non-porphyritic. The composition is approximately 40% potassium feldspars, 50% plagioclase, and 10% hornblende and biotite occurring interstitially to the feldspars.

e. Trondhjemite

Irregular shaped bodies of trondhjemite intrude the metasediments commonly with lit-par-lit contact relationships, such as on claim 538607. Spatially, the majority of outcrops occur on claims 515452, 538600 to 538602, and are considered as a phase of the Eden Lake Intrusions. The trondhjemite is light grey in colour and is medium to coarse grained. The composition is approximately 70% oligoclase and 30% quartz, with accessory amounts of biotite.

f. Granodiorite

Granodiorite is slightly darker grey than trondhjemite, partially foliated, and is also considered as a phase of the Eden Lake Intrusions. Large masses of granodiorite occur throughout claims 515448, 515449 and 538611. These occurrences are probably dykes, and show chilled margin contact relations with the enclosing metasediments. The composition of this rock is approximately 70% plagioclase, 30% quartz, with accessory amounts of biotite and occasionally small almandine garnets.

g. Hornblende Diorite

Hornblende diorite characteristically occurs near the roof of the layered mafic intrusion centred on Luke Lake as dykes and diffuse masses intruding the overlying metasediments. In the main portion of the layered mafic sill, the distinction between gabbro and diorite is by mineral composition, thus no clear lithological boundaries could be defined.
Hornblende diorite is medium to coarse grained, and dark grey to greenish on fresh and weathered surfaces. The composition of the rock is about 70% andesine-oligoclase, 30% green hornblende, with minor amounts of biotite, magnetite and pyrite. Texturally, most outcrops are of uniform grain size, and occasionally granophyric outcrops were noted.

b. Hornblende Gabbro

The main mass of the layered mafic intrusion centred on Luke Lake is composed of hornblende gabbro. Several distinct poikilitic hornblende zones (3-10’ thick) are located near the base of the intrusion. Elsewhere, the intrusion exhibits gravitational rhythmic layering.

The rock is dark green to dark grey on both fresh and weathered surfaces. Commonly, the rock is coarse grained with only minor granophytic textures present. Compositionally, the gabbro consists of about 30% andesine-labradorite, 70% green hornblende, and accessory amounts of biotite, magnetite, and up to 1% disseminated pyrite.

i. Gabbro Dykes and Small Sills

An outcrop of gabbro exhibiting chilled margins occurs on claim 8538607. This gabbro may represent a late or second phase of gabbro intrusion genetically related to the layered mafic intrusion (units 12, 13). Compositionally, it is identical to the main mass of gabbro previously described.

III. STRUCTURAL GEOLOGY

In the quartzitic rocks, which make up the bulk of the metasediments, the structure is relatively simple. Younging directions evidenced by cross bedding indicate tops to the east, northeast or southeast. Contorted folding occurs in areas underlain by protoconglomerate (unit 4) and schist (unit 5).

The influence of the Grenville Front is noted in the eastern part of the subject claims. Rodding structures plunging southeast were noted in several outcrops, which according to Card et al, 1975 are characteristic of Grenvillian tectonics. On claims 8538604, the strongly developed northeast trend of foliation in the granite is considered to show the influence of the Grenville Front.

Two major faults shown on the regional map (Card et al, 1975) are present on the claims. However, detailed mapping failed to reveal any direct evidence of their presence.

IV. ECONOMIC GEOLOGY

A study of the gold mineralization exposed in the open pit of the former Long Lake gold mine, suggested that the gold was associated with concentrations of pyrite-pyrrhotite-arsenopyrite occupying fractures in the metasediments. Similar zones of sulphide mineralization were searched for during the course of the geological mapping. As a result, three rock samples were collected from the subject claims and analyzed for gold. The location of these samples are shown on the geology maps. The results are as follows:
CONCLUSIONS AND RECOMMENDATION

The geological mapping indicated that approximately 60% of the subject claims were underlain by intrusive rocks related to the Eden Lake Intrusions and early mafic intrusions (Card et al., 1975). Metasedimentary rocks are dominantly quartzites with intercalations of arkose and quartz-feldspathic schist, overlain by protoconglomerate. These metasediments can be tentatively correlated with the Mississagi, Bruce and Espanola formations, as shown in the table of lithological units. Structural data indicated that all metasedimentary units young to the east, thus no major folds were identified. No direct evidence of the Wallingford and subsidiary faults were noted in the outcrops. Recognition of geological environments analogous to the mineralization exposed in the former Long Lake Mine suggested three areas of which two contain geochemically anomalous gold values.

It is recommended that induced polarization surveys be undertaken to define possible sulphide concentrations not evident to direct geological observation.

REFERENCE


QUALIFICATIONS

I, Gerald A. Harron, do hereby certify that:

1. I am a geologist residing at 2810 Sechelt Drive, North Vancouver, British Columbia and employed by Du Pont of Canada Exploration Limited.

2. I am graduate of the University of Western Ontario with a M.Sc. degree in geology.

3. I am a registered Professional Engineer in the Province of Ontario.

4. I have practised my profession in geology continuously for the past 13 years in various provincial jurisdictions in Canada.

APPENDIX I

LIST OF ABBREVIATIONS USED ON GEOLOGY PLANS

A. Act - Actinolite
   Alk - Alkaline
   Altrn - Alteration
   Arg - Argillite, Argillaceous
   Ark - Arkose, Arkosic
   Arsd - Arsenide
   Asmin - Assimilation
   Aspy - Arseno-pyrite

B. Bccd - Brecciated
   Bd - Bedded
   Bdg - Bedding
   Bld(s) - Boulder(s)
   Bt. - Biotite, Biotitic

C. C.g. - Coarse-grained
   Cgl - Conglomerate, conglomeritic
   Chld - Chilled
   Chlr - Chlorite
   Chldr - Chloritized
   Clsts - Clasts
   Cntd - Contorted
   Cntmd - Contaminated
   Ct(s) - Contact(s)

D. db - Diabase
   dbsc - Diabasic
   Dfmd - Deformed
   Dfmn - Deformation
   Diss - Dissemination
   Dsc - Discordant

E. Elgt - Elongated
   Epte - Epidote

F. f.g. - Fine-grained
   Fldd - Folded
   Fldg - Folding
   Flsc - Felsic
   Flw(s) - Flows
   Fm - Formation
   Foltd - Foliated
   Foltn - Foliation
   Frac(s) - Fracture(s)
   Frag(s) - Fragment(s)
   Fsp - Feldspar
   Ft - Float
Cont'd

G.  Gar - Garnet-Garnet-bearing
    Gke - Greywacke
    Gn - Gneiss, Gneissoid

H.  Hb - Hornblende
    Hmt - Hematite

I.  Ign - Igneous
    Imbet - Imbricate
    Incl(s) - Inclusion(s)
    Intr(s) - Intrusion(s)
    Irr. - Irregular

L.  Leuc - Leucocratic
    Lntn - Lineation
    l-p-l - Lit-par-lit
    Lyrd - Layered

M.  Mass - Massive
    Mfc - Mafic
    Mgt - Magnetite
    m.g. - Medium grained
    Mig - Migmatite, migmatized
    Mntn - Mineralization
    Mr - Minor
    Mtmphd - Metamorphosed
    Msds - Metasediments
    Mt - matrix
    Musc - Muscovite

N.  N-cfmy - Non-Conformity

O.  Oc - Outcrop
    Oph - Ophitic
    Oxd - Oxide, Oxidization

P.  Peg - Pegmatitic, pegmatized
    Pk - Pink
    Poik - Poikilitic
    Perblsts - Porphyroblasts
    Porphtc - Porphyritic
    Poss - Possible
    Prmt - Prominent
    Prob - Probable, Probably
    Projn - Projection
    Py - Pyrite, pyritic
    Pyrr - Pyrrhotite

Q.  q-n-v - Quartz-net-veins
    Qte - Quartzite
    Qv - Quartz veins
Cont'd

R. Resc - Recessive
    Rex'd - Recrystalized
    Rutld - Rutilated

S. Scatd - Scattered
    Schl - Schlieren
    Schtse - Schistose
    Sed - Sediment, sedimentary
    Segn(s) - Segregation(s)
    Serctc - Sericitic
    Shr - Shear
    Shrd - Sheared
    Shrg - Shearing
    Silfd - Silicified
    Sl - Slight
    Slts - Siltstone
    Sm - Small
    Spd - Sulphide
    Stng - Staining
    Syndpl - Syndepositional

T. Tr - Trace
    Trm - Tourmaline
    Trmt - Tremolite

U. Umfc - Ultramafic

V. VG - Visible Gold
    Vgs - Vugs
    Vgy - Vuggy
    Vnd - Veined
    Vns - Veins, veinlets
    Vrt - Vertical

W. Wk - Weak, weakly

X. x-bd - cross-bedded
    Xen(s) - Xenolith(s)
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Expenditures (excludes power stripping)

Type of Work Performed: **Geological**

Perform on Claims: ALL L.S.A.M.S.

Calculation of Expenditure Day Credits

Total Expenditure $ = Total Days Credits $ + 15

Instructions

Total Days Credits may be apportioned at the claim holder's choice. Enter number of days credits per claim selected in columns at right.
Dear Sir:

Please find enclosed 2 copies of:

Geological Survey of Claims

S515447 to S515452 incl.
S538599 to S538609 incl.
S538611 to S538614 incl.

Eden Township, District of Sudbury

The Report of Work was recorded 1982 April 7. Please note that in variance with the report of work, no assessment work credit is applied for claim S538610.

Sincerely yours,

G. A. Harron
Senior Geologist

encls.

GAA/krl
Dear Sir:

We have received reports and maps for a Geological Survey submitted under Special Provisions (credit for Performance and Coverage) on Mining Claims S 515447 et al, in the Township of Eden.

This material will be examined and assessed and a statement of assessment work credits will be issued.

Yours very truly,

E.F. Anderson  
Director  
Land Management Branch  
Whitney Block, Room 6450  
Queen's Park  
Toronto, Ontario  
M7A 1W3  
Phone: 416/965-1316

J. Skura/amc

cc: Du Pont of Canada Exploration Limited  
Vancouver, B.C.
For additional information see maps:

EDEN-0016 #1 2 3 4