REPORT ON THE
1988 DIAMOND DRILLING PROGRAM
SIOUX NARROWS PROPERTY
WILLINGDON TOWNSHIP, ONTARIO
N.T.S. 52E/8

PREPARED FOR
WILLINGDON RESOURCES LTD.

DERRY, MICHENER, BOOTH & WAHL

Jens J. Mayer, B.Sc.
William N. Pearson, Ph.D.

Toronto, Ontario
November 18, 1988

Ref: 88-117

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TABLE OF CONTENTS

SUMMARY (l)
INTRODUCTION 1
PROPERTY LOCATION AND ACCESS 1
REGIONAL GEOLOGY 2
  Structure 2
  Mineralization 3
REGIONAL EXPLORATION HISTORY 4
PROPERTY EXPLORATION HISTORY 5
CURRENT PROGRAM 7
EXPLORATION RESULTS 7
  Surface Mapping 7
  Diamond Drilling 8
CONCLUSIONS AND RECOMMENDATIONS 9
REFERENCES 12
CERTIFICATES OF QUALIFICATION 14
  Jens J. Mayer, B.Sc.
  William N. Pearson, Ph.D. 15
APPENDIX A: DIAMOND DRILL LOGS
APPENDIX B: CERTIFICATES OF ANALYSIS

LIST OF TABLES

Table 1: PHASE II BUDGET ESTIMATE
**LIST OF FIGURES**

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figure 1:</td>
<td>Property Location Map</td>
<td>1</td>
</tr>
<tr>
<td>Figure 2:</td>
<td>Claim Map</td>
<td>1</td>
</tr>
<tr>
<td>Figure 3:</td>
<td>Regional Geology</td>
<td>2</td>
</tr>
<tr>
<td>Figure 4:</td>
<td>Property Geology and Drill Hole Location Map</td>
<td>6</td>
</tr>
<tr>
<td>Figure 5:</td>
<td>Geology and Sample Plan of Road Cut</td>
<td>7</td>
</tr>
<tr>
<td>Figure 6:</td>
<td>Cross Section of WRL-88-1 and WRL-88-2</td>
<td>8</td>
</tr>
<tr>
<td>Figure 7:</td>
<td>Cross Section of WRL-88-3 and WRL-88-4</td>
<td>9</td>
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</table>
SUMMARY

This report summarizes the results of the 1988 exploration program conducted on Willingdon Resources Ltd.'s property located in Willingdon Township near the town of Sioux Narrows, Ontario. The program consisted of limited surface mapping and diamond drilling of four holes totalling 926.5 ft.

Significant results of 0.17 oz. Au/ton over 2.0 ft. from a sample of surface outcrop and 0.697 oz. Au/ton over 1.0 ft. in hole WRL-88-2 from 142.5 to 143.5 ft. were returned from a northwest trending shear zone which hosts abundant quartz/carbonate veining and associated sulphide mineralization in a sequence of interbedded mafic and intermediate metavolcanics. The majority of other samples taken from both outcrops and diamond drill core returned 100 ppb to 500 ppb anomalous gold values.

Based on these encouraging results, a second phase of diamond drilling totalling 3,000 ft. is recommended for the property. This drilling will focus on extending the known mineralization along strike and down-dip northwest under Long Bay (Lake of the Woods). The total budget for the second phase of exploration is estimated at $100,000.
INTRODUCTION

This report, prepared by Derry, Michener, Booth & Wahl (DMBW) on behalf of Willingdon Resources Ltd., summarizes the exploration program carried out between August 29, 1988 and October 19, 1988 on the Willingdon Township property located near the Town of Sioux Narrows, Ontario. The program consisted of limited surface mapping, rock sampling and 926 ft. of diamond drilling in three holes.

PROPERTY LOCATION AND ACCESS

The Sioux Narrows property is located in Willingdon Township, Kenora mining district, approximately 3 km east-northeast of Sioux Narrows, Ontario (Figure 1). The property consists of seven contiguous unpatented mining claims listed below and illustrated on Figure 2.

K842098
K842099
K842100
K842101
K842102
K897784
K897786

Access to the property can easily be gained via provincial Highway #71, which skirts the southern boundary of the claims. Additional access to the property can be obtained by gravel roads and by boat from Lake of the Woods.

DMBW has not examined title to the claims nor substantiated their physical boundaries and, accordingly, expresses no opinion as to validity of title and property description.
FIGURE 1
WILLINGDON RESOURCES LTD
Sioux Narrows Gold Property
PROPERTY LOCATION MAP

JJM NOV 1988
DERRY, MICHENER, BOOTH & WAHL
FIGURE 2
WILLINGDON RESOURCES LTD
Sioux Narrows Gold Property
CLAIM MAP

DERRY MICHENER BOOTH & WAHL
NOV 1988
REGIONAL GEOLOGY

Bedrock in Willingdon Township and surrounding area consists of volcanic, sedimentary and intrusive rocks of Archean age which form part of the Wabigoon Belt, a major subdivision of the Superior Province of the Canadian Shield. These Archean rocks occur in two geologically distinct terrains separated by the major northwest trending Pipestone-Cameron Fault (Figure 3). All rocks have been metamorphosed to lower greenschist facies with local grade increases near the contacts of large intrusive bodies (Fraser, 1943).

The two distinct geological terrains separated by the Pipestone-Cameron Fault are the Warclub sediments to the northeast and the Snake Bay volcanics to the southwest (Trowel et al., 1980). The Warclub sediments consist of a complex sequence of interbedded sedimentary and pyroclastic rock units of varying composition. The Snake Bay Formation is composed of a sequence of coeval interbedded mafic volcanic flows and intermediate tuffs. Conformably overlying the Warclub sediments are intermediate to felsic metavolcanics of the Berry Complex (Davis and Edwards, 1982).

Two large batholiths and one small stock intrude the entire metavolcanic and metasedimentary sequence in the area. The Dryberry Batholith intrudes the Warclub sediments and Berry Complex volcanics northeast of the Pipestone-Cameron Fault and the Aulnear Batholith complex and the Regina Bay Stock intrude the Snake Bay volcanics southwest of the fault (Figure 3). Associated with the three intrusive bodies are intermediate to felsic dykes and sills which are common to all three metasedimentary and metavolcanic sequences. More mafic dykes are also found in the area but are generally restricted to the Pipestone-Cameron Fault Zone (Johns and Davison, 1982).

Structure

The metavolcanic and metasedimentary sequence in Willingdon Township and surrounding areas is structurally complex due to the intrusion of the two
major batholith complexes, as well as the presence of the major northwest trending Pipestone-Cameron Fault.

The Snake Bay metavolcanics which underlie the Sioux Narrows property and occur southwest of the Pipestone-Cameron Fault are the least deformed sequence in the area and strike uniformly southeast and dip steeply to the northeast (Johns and Davison, 1983).

The Warclub and Berry Complex metasediments and metavolcanics are more structurally complex with at least two generations of folding recognized. The primary generation of folding consists of large scale westerly trending antiforms and synforms and a secondary generation consists of low amplitude west-northwest trending interference folds (Johns and Richey, 1982). The entire sequence northeast of the Pipestone-Cameron Fault forms a southerly facing homoclinal sequence.

The regional northwest trending Pipestone-Cameron Fault has caused intense shearing and alteration in the units immediately adjacent to the fault zone and less intense parallel to subparallel shearing throughout the entire sequence in the area (Johns and Davison, 1983).

**Mineralization**

Both gold and base metal mineralization is found in the Willingdon Township area. To date the focus of exploration has been on gold; however, recent exploration of some electromagnetic conductors suggests that the area has base metal potential as well.

Gold mineralization in the Willingdon Township area is mainly associated with quartz/carbonate veining in mineralized shear zones. Although the gold is not restricted to the quartz/carbonate veining within the shear zones, gold values generally tend to be higher in the shear zones when veining is present. Less commonly gold mineralization is also found in quartz-feldspar porphyry dykes.
Gold showings associated with the quartz-feldspar porphyry dykes can be found approximately 20 km south of Sioux Narrows (Johns and Davison, 1983).

More recently, exploration of electromagnetic conductors in the area has found base metal mineralization associated with pyrite-, pyrrhotite- and graphite-rich horizons in sediments which host minor amounts of chalcopyrite and sphalerite. Johns and Davison (1983) reported that a sample taken from such a mineralized zone contained 0.24% Cu, 0.09% Zn, 15 ppb gold as well as traces of lead, nickel and molybdenum.

REGIONAL EXPLORATION HISTORY

The following is adapted from Johns and Davison, 1983:

Gold has been the focus of exploration in the Lake of the Woods region since the turn of the century and there are many past producers and prospects. Within Willingdon Township, two properties underwent underground development (Figure 3). The Regina Mine, located 3.2 km southeast of Sioux Narrows, has a 550 ft. deep shaft and 3,000 ft. of lateral development, and operated sporadically from 1895 to 1943 (Beard and Garratt, 1976). The Neda Occurrence, south-southeast of the Regina Mine, had a 40 ft. shaft sunk on a 1,000 ft. long shear zone in mafic metavolcanics (Assessment Files, Resident Geologist's Office, Ontario Ministry of Natural Resources, Kenora).

The northern contact between the tonalitic Regina Bay Stock and the mafic metavolcanics has been prospected for gold since before 1940. R. Bouska trenched and sampled shear zones west of the Sioux Narrows Provincial Park between Regina Bay and Long Bay (Assessment Files, Resident Geologist's Office, Ontario Ministry of Natural Resources, Kenora). The Gaudry Occurrence located east of the Provincial Park between Regina Bay and Highway #71, was trenched and sampled by Mr. Gaudry prior to 1960. These claims were then optioned to Strathcona Mines Limited, who, between 1960 and 1962, mapped, trenched, and diamond drilled two holes. Through 1980 and 1981, Sherritt Gordon Mines Limited...
completed a magnetometer survey over the Gaudry Occurrence. A gold-bearing fluorite showing is found along the northern shore of Lobstick Bay. This showing, originally owned by J. M. Thrasher, was inspected by Robert Thomson, Resident Geologist, Ontario Department of Mines, in 1945. In 1963 and 1964, two trenches were blasted on this showing and six holes totalling 687 ft. were diamond drilled for C. Karaj (Assessment Files, Resident Geologist's Office, Ontario Ministry of Natural Resources, Kenora).

Canadian Nickel Company Limited completed three diamond drill holes in the Lobstick Bay area between 1969 and 1972. Hudson Bay Exploration and Development Company Limited explored a large area around and to the northwest of Sioux Narrows; in 1972, an airborne magnetic and electromagnetic survey was done, with ground magnetic and electromagnetic follow-up surveys being completed by 1975. In 1976, diamond drilling was carried out east of Rendezvous Point in MacQuarrie Township and southeast of Berry Lake (Assessment Files Research Office, Ontario Geological Survey, Toronto).

In 1973, Amax Exploration Incorporated diamond drilled one hole along the western part of Lobstick Bay. Selco Mining Corporation Limited explored a large area between Sioux Narrows and Dryden; in 1978, an Input survey was flown and in 1979, the claims in the present area had ground magnetic and electromagnetic surveys completed on them. In 1979 and 1980, diamond drilling was used to check some of the anomalies (Assessment Files Research Office, Ontario Geological Survey, Toronto). In 1981, Teck Exploration Limited diamond drilled one hole west of Whitefish Narrows and a single hole on the western end of Long Point Island.

PROPERTY EXPLORATION HISTORY

To date, only limited exploration has been conducted on the Sioux Narrows property held by Willingdon Resources Ltd. Prospecting within the current claim block likely occurred as early as the turn of the century when the Regina Mine was discovered 5 km to the south. The earliest recorded work
LEGEND

- Shear zone implied
- Shear zone observed
- Breccia zone
- Existing drill hole
- Proposed drill hole
- \(80^\circ\) Shearing with dip

**WILLINGDON RESOUR**
Sioux Narrows Gold Pr

Oliver Severn Gold Mines Ltd's 1937 diamond drill holes
(hole No 1 location same as WRL-88-1)

HIGHWAY 71 ROADCUT
(interbedded intermediate and mafic volcanics which host numerous thin mineralized shear zones)
conducted on the claims occurred in 1937 when the ground was held by Oliver Severn Gold Mines Ltd.

Oliver Severn Gold Mines Ltd. drilled three shallow diamond drill holes to follow mineralization found in a rock cut which is now the southern boundary of current claim 842102 (Figure 4). All three drill holes intersected well mineralized shear zones which host quartz/carbonate veining; however, none of the samples taken from the holes returned anomalous gold values although visible gold was reported in Hole #3 (now located within the boundaries of the Sioux Narrows Provincial Park).

Limited surface prospecting conducted by William Hammerstrom at the time of the Severn Gold Mine above drilling also located a northeasterly trending sulphide mineralized shear/breccia zone (Figure 4). This zone appears to intersect the northwest trending shear zone drill tested at that time. The projected intersection of these two structures is on current claim 842101 which Mr. Hammerstrom considered to be an excellent exploration target.

No further work was conducted on the claims by Oliver Severn Gold Mines Ltd. following completion of the drilling and the property remained essentially dormant until 1983 when the ground was staked by Serge Dallaine of Rouyn, Quebec. No assessment work was recorded by Mr. Dallaine and all interest in the claims was transferred to John Ross Moses in 1984.

In 1985, G. W. Felderhof of A.C.A. Howe International wrote a geological report on the Willingdon Township claims and recommended a two-phase exploration program consisting of a preliminary geological mapping program followed by a contingent diamond drill program. The recommended exploration work was not conducted.

In 1986, two ground geophysical surveys were completed over the property; a magnetometer survey and a VLF-Electromagnetic survey. This work was completed under the supervision of Robert Reukl of Cobalt, Ontario, and was successful in outlining a number of magnetic anomalies, as well as some conductive horizons. Again a geological mapping and contingent diamond drill program was recommended for the claims.
No further work was conducted on the claims until the current 1988 exploration program.

**CURRENT PROGRAM**

The 1988 exploration program conducted on Willingdon Resources Ltd.'s Sioux Narrows property between August 29, 1988 and October 19, 1988 consisted of limited surface mapping and four diamond drill holes totalling 926.5 ft. Each hole was logged and split in Kenora and all samples were analyzed for gold by Bell-White Laboratories in Haileybury, Ontario.

The limited surface mapping conducted on the property focussed on the rock cut on the south side of Highway #71 at the southern margin of claim 842102 (Figure 4). A detailed map of the outcrop is given on Figure 5. A total of 21 samples was taken from the road cut including two samples from a small suboutcrop from the north side of Highway #71.

The purpose of the four holes totalling 926.5 ft. was to find the extension of the structure and mineralization noted in the Highway #71 road cut. All 4 holes were drilled northwest of the road cut in groups of two (2 holes per set-up). The location of the drill holes are given on Figure 4; drill logs are given in Appendix A; and, detailed cross sections are given in Appendix B.

Signed certificates of analysis are given in Appendix C.

**EXPLORATION RESULTS**

**Surface Mapping**

Surface mapping and sampling of the rock cut along Highway #71 (see Figure 4) at the southern boundary of claim 842102 was conducted to confirm previously reported anomalous gold assays and to establish the structural trend of the shear zones present to aid in spotting drill holes along strike.
LY PRECAMBRIAN SHEARED UNITS

Chlorite schist
Chlorite-sericite schist
Volcanic flows & tuffs
Mafic basalt flow

--- Observed contact
--- Dotted contact of shear zone
py Pyrite
tr Trace

122/80 Orientation of shearing

SCALE 1:480

FEET
Mapping of the rock cut revealed a stratigraphic sequence of mafic volcanic flows, intermediate pyroclastics and intermediate to felsic intrusives which are locally sheared at a strike of 120°-122° and dip of 75°-80° northeast (see Figure 5). Several of the sheared zones display intense alteration and host significant pyrite, pyrrhotite and chalcopyrite mineralization in association with discontinuous quartz/carbonate veining. Sampling of these zones returned values to 0.17 oz. Au/ton over 2.0 ft.

Two grab samples taken from a sheared basalt in outcrop immediately across from the rock cut on the north side of the highway returned anomalous gold values to 823 ppb.

Diamond Drilling

The four holes totalling 926.5 ft. were drilled in two groups of two holes at positions 135 ft. and 285 ft. northwest of the rock cut along Highway #71 in order to trace the northwest trending shearing and mineralization found (see Figure 4). All holes were drilled at an azimuth of 219° and at each drill station a -45° and -60° dip hole was completed.

Drill holes WRL-88-1 (-45°) and WRL-88-2 (-60°) were completed from the first set-up 135 ft. northwest of the Highway #71 rock cut (see Figure 4) at the exact position that Oliver Severn Gold Mines Ltd. drilled their Hole #1 in 1937 (the casing for Hole #1 is still present). Hole WRL-88-1 (-45°) is a repeat of Oliver Severn Gold Mines Ltd.'s Hole #1 and was drilled in order to check the well mineralized shear zones noted in the log by William Hammerstrom that, suspiciously, never returned anomalous gold values at the time. Sampling of the same zones in Hole WRL-88-1 commonly assayed much higher than background and a best value of 0.049 oz. Au/ton over 1.3 ft. from 83.9 ft. to 85.2 ft. were obtained (Figure 6; Appendix A and Appendix B).
**PRECAMBRIAN (ARCHEAN)**

**SHEARED AND BRECCIATED UNITS**
- Chlorite schist
- Sericite schist
- Chlorite/sericite schist
- Chlorite/iron-carbonate schist
- Breccia zone

**VOLCANIC FLOWS AND TUFFS**
- Mafic basalt flow
- Intermediate basalt flow
- Intermediate feldspar lapilli tuff
- Intermediate to felsic feldspar lapilli tuff

**INTRUSIVES**
- Intermediate dyke
- Intermediate feldspar porphyry

**ERS**
- Sheared basalt
- Shear orientations
- Quarts veins
- Silicified zone

**FIGURE 6**

WILLINGDON RESOURCES LTD
Hole WRL-88-2 (-60°) was drilled immediately below WRL-88-1 and intersected similar mineralized shear zones hosting quartz/carbonate veining. Again anomalous gold values are common throughout the shear zones intersected and an assay of 0.697 oz. Au/ton over 1.0 ft. was obtained from a quartz vein from 142.5 ft. to 143.5 ft. (see Figure 6; Appendix A and Appendix B).

Drill holes WRL-88-3 (-45°) and WRL-88-4 (-60°) were completed from the second set-up 285 ft. northwest of the Highway #71 rock cut (Figures 4 and 7). Both holes intersected a sheared zone up to 20.6 ft. wide which hosts minor quartz/carbonate veining and associated pyrite and pyrrhotite mineralization. Assays from samples taken from the zones in both holes were commonly higher than background and an assay of 960 ppb Au was obtained from 86.2 ft. to 98.2 ft. in hole WRL-88-3 (Figure 7; Appendix A and Appendix B).

CONCLUSIONS AND RECOMMENDATIONS

The 1988 exploration program, conducted on Willingdon Resources Ltd.'s Sioux Narrows property located in Willingdon Township, Ontario, consisted of 926.5 ft. of diamond drilling in four holes as well as limited surface mapping. The holes were designed to test the on-strike and down-dip extension of the mineralized zones found in the rock-cut along Highway #71 which assayed to 0.17 oz. Au/ton over 2.0 ft.

All four holes intersected significant shearing, quartz-carbonate veining and associated sulphide mineralization and assayed as high as 0.697 oz. Au/ton from 142.5 ft. to 143.5 ft. in hole WRL-88-2. Most other samples taken from the sheared zones assayed significantly higher than normal background values for the area.

A second phase of exploration is recommended for the Sioux Narrows property which will consist of 3,000 ft. of diamond drilling. This exploration will focus on extending the mineralized shear zones found in the rock cut along Highway #71 and in drill holes WRL-88-1 to WRL-88-4 both along strike and
PRECAMBRIAN (ARCHEAN)

SHEARED AND BRECCIATED UNITS

- Chlorite schist
- Sericite schist
- Chlorite/sericite schist
- Chlorite/iron-carbonate schist
- Breccia zone

VOLCANIC FLOWS AND TUFFS

- Mafic basalt flow
- Intermediate basalt flow
- Intermediate feldspar lapilli tuff
- Intermediate to felsic feldspar lapilli tuff

INTRUSIVES

- Intermediate dyke
- Intermediate feldspar porphyry

FIGURE 7

WILLIAMS DON RESOURCES
down-dip. As the mineralized zones encountered in the current drilling appear to continue northwest under Long Bay (Lake of the Woods) drilling will also be conducted from either the ice on the bay or shoreline of one of the islands located within the claim block. The recommended drilling is illustrated on Figure 4 and the hole locations and targets are given as follows:

<table>
<thead>
<tr>
<th>Proposed Hole</th>
<th>Claim No.</th>
<th>Length(ft.)</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>WRL-88-5</td>
<td>842102</td>
<td>400</td>
<td>Down-dip extension of northwest trending shear zone</td>
</tr>
<tr>
<td>WRL-88-6</td>
<td>842102</td>
<td>400</td>
<td>Down-dip extension of northwest trending shear zone</td>
</tr>
<tr>
<td>WRL-88-7</td>
<td>842102</td>
<td>400</td>
<td>Down-dip extension of northwest trending shear zone</td>
</tr>
<tr>
<td>WRL-88-8</td>
<td>897784 and 842101</td>
<td>900</td>
<td>Northwest on-strike extension of the northwest trending shear zone and northeast trending breccia zone reported by William Hammerstrom</td>
</tr>
<tr>
<td>WRL-88-9</td>
<td>897784 and 842101</td>
<td>900</td>
<td>Northwest on-strike extension of the northwest trending shear zone with the northeast trending breccia zone reported by William Hammerstrom</td>
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TOTAL 3,000
The program is estimated to cost $100,000 including an 8% contingency as detailed in Table 1:

### Table 1

**PHASE II BUDGET ESTIMATE**

<table>
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<tr>
<th>Item</th>
<th>Estimate</th>
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<tr>
<td>Basic drilling cost - 3,000 ft. @ $16/ft.</td>
<td>$48,000</td>
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<tr>
<td>Mobilization/Demobilization</td>
<td>5,000</td>
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<tr>
<td>Core boxes - 200 @ $5/box</td>
<td>1,000</td>
</tr>
<tr>
<td>Ice reinforcement</td>
<td>10,000</td>
</tr>
<tr>
<td>Assays - 300 @ $12.50/assay</td>
<td>3,750</td>
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<tr>
<td>Core shack rental</td>
<td>1,000</td>
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<tr>
<td>Travel and vehicle</td>
<td>3,000</td>
</tr>
<tr>
<td>Supervision</td>
<td>10,000</td>
</tr>
<tr>
<td>Accommodation and meals</td>
<td>3,000</td>
</tr>
<tr>
<td>Reporting</td>
<td>7,000</td>
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<tr>
<td>Telephone, telex, courier, shipping</td>
<td>1,000</td>
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<tr>
<td><strong>Subtotal</strong></td>
<td><strong>$92,750</strong></td>
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<tr>
<td><strong>Contingency (8%)</strong></td>
<td><strong>7,250</strong></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$100,000</strong></td>
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</tbody>
</table>
REFERENCES

Beard, R. C. and Garratt, G. L.
1976: Gold Deposits of the Kenora-Fort Frances Area, Districts of Kenora and Rainy River; Ontario Division of Mines, Mineral Deposits, Circular 16, 46 p. Accompanied by Chart A, scale 1:253,440 or 1 inch to 4 miles.

Davis, Donald W. and Edwards, Garth R.

Felderhof, G. W.

Fraser, N. H. C.

Johns, G. W. and Davison, J. G.

Johns, G. W. and Richey, Scott

Reukl, R.
REFERENCES (cont'd.)

Trowell, N. F.; Blackburn, C. E. and Edwards, G. R.

DERRY, MICHEMER, BOOTH & WAHL
CERTIFICATE OF QUALIFICATION

I, Jens J. Mayer, of 101 Donwoods Drive, Toronto, Ontario, do hereby certify that:-

1. I am an exploration geologist working as an outside consultant for Derry, Michener, Booth & Wahl, Consulting Geologists and Engineers, of Toronto.

2. I am a graduate of Brock University, St. Catharines, Ontario, in Honours Geology with the degree of B.Sc. in 1985.

3. I have been practising my profession since 1984 and full time since graduating in 1985.

4. I have not received, nor do I expect to receive, any interest, directly or indirectly, in the properties or securities of Willingdon Resources Ltd.

5. The statements contained in this report and the conclusions and recommendations made are based upon my review of all data available. I have visited the property and supervised the 1988 exploration program.

6. I hereby consent to the use of this report in a Statement of Material Facts of the Company for the preparation of a prospectus for submission to the Ontario Securities Commission and other regulatory authorities.

Jens J. Mayer, B.Sc.

Toronto, Ontario
November 18, 1988
CERTIFICATE OF QUALIFICATION

I, William N. Pearson, of 55 Bradbeer Crescent, Thornhill, Ontario, do hereby certify that:

1. I am an exploration geologist and associate of Derry, Michener, Booth & Wahl, Consulting Geologists and Engineers of Toronto.

2. I am a graduate of the University of British Columbia in Honours Geology with the degree of B.Sc. in 1974, and of Queen's University, Kingston, Ontario with the degree of M.Sc. in 1977 and Ph.D. in 1980.

3. I have been practising my profession since graduation.

4. I have not received, nor do I expect to receive, any interest, directly or indirectly, in Willingdon Resources Ltd.

5. This report, and the conclusions and recommendations made, are based on examination of all available data. I have not visited the property.

6. I hereby consent to the use of this report in a Statement of Material Facts of the Company and for the preparation of a prospectus for submission to the Ontario Securities Commission and other regulatory authorities.

Toronto, Ontario
November 18, 1988

W. N. Pearson, Ph.D.
APPENDIX A

DIAMOND DRILL LOGS
Acid Dip Tests

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>from to (ft.)</th>
<th>Length (ft.)</th>
<th>AU (ppb)</th>
<th>AU (oz/ton)</th>
</tr>
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<tr>
<td>D6901</td>
<td>32.00-34.00</td>
<td>2.00</td>
<td>4</td>
<td>n/a</td>
</tr>
<tr>
<td>D6902</td>
<td>34.00-36.40</td>
<td>2.40</td>
<td>77</td>
<td>n/a</td>
</tr>
<tr>
<td>D6903</td>
<td>36.40-38.80</td>
<td>2.40</td>
<td>412</td>
<td>n/a</td>
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<tr>
<td>D6904</td>
<td>38.80-40.80</td>
<td>2.00</td>
<td>19</td>
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<td>D6905</td>
<td>81.90-83.90</td>
<td>2.00</td>
<td>7</td>
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<td>D6906</td>
<td>83.90-85.20</td>
<td>1.30</td>
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<td>D6907</td>
<td>85.20-88.00</td>
<td>2.80</td>
<td>188</td>
<td>n/a</td>
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**28.00 98.10 MAFIC BASALT FLOW**

- Dark olive green, very fine grained to fine grained, massive, moderately chloritic mafic volcanic flow.
- Moderately fractured with minor quartz-carbonate material infilling along partings.
- Trace to 1% very fine grained pyrite throughout.
- Lower contact sharp.
- Moderate chloritization, weak epidote halos around fractures.
- Lower contact ?, upper contact at 46 degrees to core axis.
- 34.00-38.80 Moderately sheared zone at 47 degrees to core axis.
- 37.50-38.50 Highly siliceous aplite dyke at 46 degrees to core axis.
- 83.90-85.20 Highly sheared zone at 56 degrees to core axis with abundant quartz stringers sub-parallel to shearing.
- 85.20-88.00 Weak to moderate shearing decreasing in intensity towards 88.0 ft at 55 degrees to the core axis.
<table>
<thead>
<tr>
<th>From</th>
<th>To</th>
<th>Description</th>
</tr>
</thead>
</table>
| 98.10| 108.90| **INTERMEDIATE FELDSPAR LAPILLI TUFF**  
Light to medium grey-green, intermediate fine grained, weakly chloritic and sericitic matrix with 20-30% 1-2mm corroded feldspar lapilli. Trace to 1% pyrite disseminated throughout with local increases. Lower contact abrupt but not sharp. Weak chloritization, weak to moderate sericitization, weak silicification. Upper contact at 46 degrees to core axis, lower contact ?, weak shearing at 44 degrees to core axis. |
|      |      | **CHLORITE/SERICITE SCHIST**  
Alternating light and dark green bands up to 2mm wide of chlorite and sericite. Numerous very thin quartz stringers cut shear zone parallel to schistosity, 1-2% disseminated pyrite. Contacts abrupt but not sharp. High chloritization, high sericitization, moderate silicification, weak carbonatization. Upper contact ?, lower contact ?, intense shearing at 50 degrees to core axis.  
| 108.90| 119.30| Quartz vein with no visible mineralization.  
109.40 109.80 Quartz vein with no visible mineralization.  
117.90 118.20 Quartz vein with no visible mineralization.  
118.70 119.30 Quartz vein with no visible mineralization. |
| 119.30| 127.50| **INTERMEDIATE TO FELSIC FELDSPAR LAPILLI TUFF**  
Light to medium grey-green with mottled light creamy green. Same as earlier 98.1 to 108.9 except: trace pyrite throughout, very rare quartz stringers at random angles. Contacts sharp. Weak chloritization, weak to moderate sericitization, weak silicification. Upper contact ?, lower contact at 53 degrees to core axis, very weak shearing at 58 degrees to core axis. |
<table>
<thead>
<tr>
<th>Sample No.</th>
<th>from (ft.)</th>
<th>to (ft.)</th>
<th>Length (ft.)</th>
<th>Au (ppb)</th>
<th>Au (oz/ton)</th>
</tr>
</thead>
<tbody>
<tr>
<td>D6915</td>
<td>133.60</td>
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<td>n/a</td>
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<tr>
<td>D6916</td>
<td>135.60</td>
<td>137.70</td>
<td>2.10</td>
<td>960</td>
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<td>D6917</td>
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<td>169.90</td>
<td>2.00</td>
<td>10</td>
<td>n/a</td>
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</table>

**127.50 - 135.60 MAFIC BASALT FLOW**

Dark olive green, same as earlier 28 to 98.1 except: weak shearing near top contact
1% Fine grained pyrite disseminated throughout.
Lower contact abrupt.
Moderate chloritization, weak carbonatization.
Upper contact at 53 degrees to core axis, lower contact ?, weak shearing at top contact at 58 degrees to core axis.

**135.60 - 137.70 CHLORITE/SERICITE SCHIST**

HIGHLY SILICEOUS.
Alternating bands of light and dark green, similar to earlier 108.9 to.
119.3 Ft except: mainly sericite schist, numerous discontinuous quartz stringers up to 1 cm wide cut zones sub-parallel to shearing.
8-10% pyrite, 2% chalcopryite and 1% sphalerite disseminated throughout.
Contacts abrupt.
High sericitization, moderate chloritization, high silicification.
Upper contact ?, lower contact ? is intense shearing at 76 degrees to core axis.

**137.70 - 195.50 MAFIC BASALT FLOW**

Dark olive green, same as earlier 28.0 to 98.1 except: trace to 1% disseminated pyrite, rare thin carbonate stringers at random angles throughout.
Moderate chloritization, weak to moderate carbonatization, very weak epidotization.
Upper contact ?, lower contact ?, weak shearing at lower contact at 62 degrees to core axis.

195.5 END OF HOLE.
**Acid Dip Tests**

<table>
<thead>
<tr>
<th>from (ft.)</th>
<th>to (ft.)</th>
<th>Description</th>
<th>Sample No.</th>
<th>from (ft.)</th>
<th>to (ft.)</th>
<th>Length (ft.)</th>
<th>Au (ppb)</th>
<th>Au (oz/ton)</th>
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<tr>
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<td></td>
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<td>BM casing removed.</td>
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<tr>
<td>22.00</td>
<td>44.00</td>
<td>MAFIC BASALT FLOW</td>
<td>D6921</td>
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<tr>
<td></td>
<td></td>
<td>Dark olive green, fine grained, massive, moderately chloritic mafic volcanic flow. Weakly fractured with minor quartz-carbonate material infilling. Thin epidote altered halos around fractures. Trace to 1% pyrite disseminated throughout. Weak shearing developed towards lower contact. Lower contact gradational. Moderate chloritization, weak to moderate carbonatization, weak epidotization locally. Upper contact ?, lower contact ? to core axis, weak shearing towards lower contact at 52 degrees to core axis.</td>
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<tr>
<td>44.00</td>
<td>53.00</td>
<td>MAFIC BASALT FLOW SHEAR ZONE</td>
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<td>.07</td>
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<td></td>
<td></td>
<td>Highly fractured and moderately sheared.</td>
<td>D6923</td>
<td>47.00</td>
<td>50.00</td>
<td>3.00</td>
<td>137</td>
<td>n/a</td>
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<tr>
<td></td>
<td></td>
<td>Light and dark green, highly altered and weakly to moderately sheared mafic volcanic with 20-30% quartz flooding throughout. Zone is highly fractured containing highly 'bleached' fragments. 2-3% pyrite, 1-2% pyrrhotite and trace</td>
<td>D6924</td>
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<td>3.00</td>
<td>870</td>
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<td>Length (ft.)</td>
<td>Au (ppb)</td>
<td>Au (oz/ton)</td>
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</tr>
</tbody>
</table>

from to ---Description---

197.9 ft except: upper contact to 187.9 ft.

Moderately developed shearing locally.

Lower contact gradational.

Moderate chloritization, moderate sericitization, intense bleaching.

Upper contact ?, lower contact ? to core axis, moderate shearing developed locally at 33 degrees to core axis.

129.70 131.20 Quartz vein with no visible mineralization.

Upper contact ?, lower contact ? to core axis, weak to moderate foliation at 53 degrees to core axis.

183.00 185.00 Silicified and bleached zone at 50 degrees to core axis with no associated mineralization visible.

230.00 231.40 Three parallel 1-2 inch quartz veins at 48 degrees to core axis with 2% pyrite and 1-2% pyrrhotite.

233.20 234.20 Quartz ‘flooded’ zone at 48 degrees to core axis with 1-2% pyrite and 1% pyrrhotite.

268 END OF HOLE.
WILLINGDON RESOURCES  

Hole No.: WRL-88-03  

Property: SIOUX NARROWS  

Logged by: J.J. MAYER  
Date Logged: OCT. 19, 1988

Azimuth: 219  
Dip: -45  
Core Size: BQ  
Length: 191.00

Acid Dip Tests  
191.00 -47.0

<table>
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<th>from (ft.)</th>
<th>to (ft.)</th>
<th>Description</th>
<th>Sample No.</th>
<th>from (ft.)</th>
<th>to (ft.)</th>
<th>Length (ft.)</th>
<th>Au (ppb)</th>
<th>Au (oz/ton)</th>
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<tr>
<td>0.00</td>
<td>10.00</td>
<td>OVERBURDEN</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.00</td>
<td>14.20</td>
<td>MAFIC BASALT FLOW</td>
<td>Dark olive green - fine grained moderately chloritic massive mafic volcanic flow - weakly fractured with very minor quartz carbonate material infilling - trace to 1% pyrite disseminated throughout - lower contact sharp - moderate chloritization - weak carbonatization - patchy very weak epidotization - lower contact 38 degrees to core axis.</td>
<td></td>
<td>14.20</td>
<td>16.20</td>
<td>2.00</td>
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</tr>
<tr>
<td>14.20</td>
<td>21.10</td>
<td>INTERMEDIATE FELDSPAR LAPILLI TUFF</td>
<td>Medium grey green with mottled light creamy green - fine grained weakly chloritic matrix with 20-30%, 0.1 to 0.2 inch corroded feldspar lapilli - trace to 1% fine grained pyrite disseminated throughout - weak shearing at contacts as well as minor quartz/carbonate stringers - weak chloritization - upper contact 38 degrees, lower contact 26 degrees to core axis - weak shearing at upper contact at 37 degrees to core axis - weak shearing at lower contact 25 degrees to core axis.</td>
<td>6950</td>
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<td>16.20</td>
<td>2.00</td>
<td>12</td>
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<td></td>
<td>6951</td>
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<td>Au (oz/ton)</td>
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<td>48.50</td>
<td>21.10</td>
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<td>108.80</td>
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</tbody>
</table>

- **21.10 48.50 MAFIC BASALT FLOW**
  Dark olive green - same as earlier 10.0 to 14.2 ft except trace pyrite throughout - rare thin compressions locally related to shear zone lower in hole - contacts sharp - moderate chloritization - weak carbonatization - upper contact 26 degrees, lower contact 60 degrees to core axis.

- **48.50 62.00 INTERMEDIATE FELDSPAR LAPILLI TUFF**
  Medium grey/green - same as earlier 14.2 to 21.0 ft except weakly fractured but no quartz/carbonate material infilling - trace pyrite disseminated throughout - contacts sharp - weak chloritization - upper contact 60 degrees, lower contact 52 degrees to core axis.

- **62.00 86.20 MAFIC BASALT FLOW**
  Dark olive green - same as earlier 10.0 to 14.2 ft except trace pyrite disseminated throughout - very rare and thin quartz/carbonate stringers at random angles, moderate chloritization - weak to moderate carbonatization - lower contact 52 degrees to core axis - weak shearing at lower contact at 52 degrees to core axis.

- **86.20 99.00 CHLORITE/SERICITE SCHIST**
  Alternating dark and light green 0.1 to 0.2 inch bands of chlorite (60-70%) and sericite (20-30%) schist - 10% iron carbonate bands less than 0.2 inches wide throughout zone - rare thin quartz/carbonate stringers parallel to shearing - 1-2% pyrite disseminated throughout - lower contact sharp - high chloritization - high sericitization - weak carbonatization - lower contact 56 degrees to core axis - intense shearing at 56 degrees to core axis.

- **99.00 108.80 INTERMEDIATE DYKE**
  Medium grey - fine grained moderately siliceous weakly chloritic massive
intrusive unit - no visible mineralization - contacts are sharp and are not sheared - very weak chloritization - upper contact 58 degrees, lower contact 63 degrees to core axis.

108.80 191.00 MAFIC BASALT FLOW
Dark olive green - same as earlier 10.0 to 14.2 ft except - weak shearing at upper contact - trace pyrite disseminated throughout - moderate chloritization - weak carbonatization - upper contact 63 degrees to core axis.

144.40 144.90 Quartz flooded zone @ 46 degrees to core axis with 1-2% pyrite, 1% pyrrhotite and trace chalcopyrite.

167.80 168.60 Fine grained siliceous dyke @ 52 degrees to core axis with minor pyrite and pyrrhotite at contacts.

173.00 173.20 Fine grained siliceous dyke @ 57 degrees to core axis.

186.20 187.20 5% combined pyrite, pyrrhotite, chalcopyrite and sphalerite in thin stringers 191.0 END OF HOLE.
Azimuth: 219
Dip: -60
Length: 272.00

Acid Dip Tests
272.00 -61.0

<table>
<thead>
<tr>
<th>from (ft.)</th>
<th>to (ft.)</th>
<th>Description</th>
<th>Sample No.</th>
<th>from (ft.)</th>
<th>to (ft.)</th>
<th>Length (ft.)</th>
<th>Au (ppb)</th>
<th>Au (oz/ton)</th>
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<tr>
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<td>BW casing removed.</td>
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</tr>
</tbody>
</table>

6.50 20.50 MAFIC BASALT FLOW
Dark olive green - fine grained moderately chloritic massive flow with rare thin quartz/carbonate stringers at random angles - trace to 1% pyrite disseminated throughout - weak foliation at random angles developed throughout - lower contact sharp - moderate chloritization weak carbonatization - upper contact 30 degrees to core axis - weak foliation developed throughout from 10-60 degrees to core axis.

6966 14.50 17.50 3.00 19 n/a
6967 17.50 20.50 3.00 11 n/a

20.50 37.20 INTERMEDIATE FELDSPAR PORPHYRY
Medium grey with mottled whitish green - fine grained moderately siliceous unit with 20-30%, 0.1 to 0.2 inch corroded feldspar crystals - unit is massive - weakly to moderately fractured but no quartz/carbonate material infilling - trace pyrite throughout - contacts sharp - weak chloritization - upper contact 30 degrees, lower contact 46 degrees to core axis.
<table>
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<th>Sample No.</th>
<th>from (ft.)</th>
<th>to (ft.)</th>
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<th>Au Au</th>
<th>Description</th>
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<td>67.40</td>
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<td>82.50 - 87.60</td>
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<tr>
<td></td>
<td>67.40</td>
<td>82.50</td>
<td>82.50 - 87.60</td>
<td>3.00</td>
<td>MAFIC BASALT FLOW</td>
</tr>
<tr>
<td></td>
<td>87.60</td>
<td>97.00</td>
<td>87.60 - 97.00</td>
<td>5.40</td>
<td>MAFIC BASALT FLOW</td>
</tr>
</tbody>
</table>

**67.40 MAFIC BASALT FLOW**

- Dark olive green - same as earlier 6.5 to 20.5 ft except - no foliation developed - quartz/carbonate stringers at random angles throughout - trace pyrite throughout - contacts sharp - moderate chloritization - weak to moderate carbonatization - upper contact 46 degrees, lower contact 48 degrees to core axis.

**67.40 - 67.60 INTERMEDIATE FLOW**

- Medium grey - fine grained intermediate volcanic flow with rare small less than 0.1 inch feldspar crystals - possibly a more massive intermediate feldspar lapilli tuff - trace pyrite throughout - rare quartz/carbonate stringers at random angles throughout - contacts sharp.
- Weak chloritization - upper contact 48 degrees, lower contact 40 degrees to core axis.

**87.60 MAFIC BASALT FLOW**

- Dark olive green - same as earlier 37.2 to 67.4 ft except - 2% pyrite and 1% pyrrhotite at lower contact - contacts sharp - moderate chloritization - weak carbonatization - upper contact 46 degrees, lower contact 63 degrees to core axis.

**87.60 - 89.10 INTERMEDIATE DIKE**

- Medium grey - fine grained weakly to moderately siliceous dyke - weakly fractured but no quartz/carbonate material infilling - trace pyrite throughout - contacts sharp - moderate chloritization - upper contact 63 degrees, lower contact 62 degrees to core axis.

**89.10 MAFIC BASALT FLOW**

- Dark olive green - same as earlier 37.2 to 67.4 ft except - trace pyrite throughout - contacts sharp - moderate chloritization - upper contact 62 degrees, lower contact 56 degrees to core axis.
97.00 100.90 INTERMEDIATE FLOW
Light to medium grey - same as earlier 67.4 to 82.5 ft except - trace pyrite throughout - lower contact gradational with onset of shearing - weak chloritization - weak sericitization towards lower contact - upper contact 56 degrees to core axis - weak shearing at lower contact 8 45 degrees to core axis.

100.90 115.00 SERICITE SCHIST
Light grey/green - weakly silicified sericite schist with 20-30% iron carbonate - rare thin quartz/carbonate stringers sub-parallel to parallel to shearing - trace to 1% pyrite disseminated throughout - lower contact sharp - weak to moderate sericitization - weak silicification - weak carbonatization - lower contact 47 degrees to core axis - intense shearing 8 46 degrees to core axis.

115.00 121.50 CHLORITE/IRON CARBONATE SCHIST
Alternating dark green and beige - 70-80% 0.1 to 0.2 inch chlorite bands alternating with 20-30%, 0.1 to 0.2 inch iron carbonate bands - trace to 1% pyrite disseminated throughout - rare thin quartz/carbonate stringers parallel to shearing - contacts sharp - high chloritization moderate carbonatization - upper contact 47 degrees, lower contact 49 degrees to core axis - intense shearing 8 46 degrees to core axis.

121.50 129.00 INTERMEDIATE FLOW
DACITE.
Medium grey - same as earlier 67.4 to 82.5 ft. Except - weak foliation at upper contact - no visible mineralization - contacts sharp - weak chloritization - upper contact 49 degrees, lower contact 39 degrees to core axis - weak foliation at upper contact 8 47 degrees to core axis.
129.00 272.00 MAFIC BASALT FLOW

- Dark olive green - same as earlier 37.2 to 67.4 ft. Except - trace pyrite throughout
- patchy weak epidote alteration halos around fractures - massive featureless unit
- moderate chloritization - upper contact 39 degrees to core axis.

148.0 3 Inch quartz vein @ 50 degrees to core axis.

191.00 192.00 Siliceous dyke @ 40 degrees to core axis

272.0 END OF HOLE.
APPENDIX B

CERTIFICATES OF ANALYSIS
Certificate of Analysis

NO. 1476

SAMPLE(S) OF: Rock (22)

SAMPLE(S) FROM: Mr. Jens J. Mayer, D.M.B.W.

DATE: September 14, 1988

RECEIVED: September 1988

Project: WRL-101

<table>
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**ACCORDANCE WITH LONG-ESTABLISHED NORTH AMERICAN CUSTOM, UNLESS IT IS SPECIFICALLY STATED OTHERWISE GOLD AND SILVER VALUES REPORTED ON THESE SHEETS HAVE NOT BEEN ADJUSTED TO COMPENSATE FOR LOSSES AND GAINS INHERENT IN THE FIRE ASSAY PROCESS.

BELL-WHITE ANALYTICAL LABORATORIES LTD.
## Certificate of Analysis

**NO. 1710**

**DATE:** November 1, 1988

**SAMPLE(S) OF:** Core (81)

**RECEIVED:** October 1988

**SAMPLE(S) FROM:** Mr. Jens J. Mayer, Derry, Michener, Booth & Wahl

**Project:** WRL:101

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**Checked**

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According to North American Custom, unless it is specifically stated otherwise, gold and silver values reported on these sheets have not been adjusted to compensate for losses and gains inherent in the fire assay process.

Bell-White Analytical Laboratories Ltd.