

GEOLOGICAL SURVEY OF CANADA



COMMISSION GÉOLOGIQUE DU CANADA

DEPARTMENT OF ENERGY, MINES AND RESOURCES
MINISTÈRE DE L'ÉNERGIE DES MINES ET DES RESSOURCES

Airborne Geophysical Survey
of the
Hemlo – Marathon Area
Ontario
1990

NTS 42D/9, 42D/15, 42D/16 and parts of 42C/12 & 13

Contents include gamma ray spectrometric, VLF and magnetic
colour maps, flight path, SAR and geology maps
and accompanying stacked profiles

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 Energy, Mines and
Resources Canada

Energie, Mines et
Ressources Canada

Canada

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2516

GEOLOGICAL SURVEY OF CANADA
COMMISSION GÉOLOGIQUE DU CANADA
OTTAWA

AIRBORNE GEOPHYSICAL SURVEY

In 1990 a multi-parameter geophysical survey was flown by the Geological Survey of Canada in the Hemlo-Marathon area of Ontario. The area surveyed is shown on the index map. Gamma ray spectrometric, VLF electromagnetic and total field magnetic data were recorded.

All data were sampled at one second intervals. The airborne radiometric measurements were made using a 256 channel spectrometer, with twelve 102x102x406 mm NaI(Tl) detectors. A Geometrics proton precession airborne magnetometer model G-803 and a Hertz Totem 1A VLF unit were installed as ancillary equipment. The GSC Skyvan was flown at a mean terrain clearance of 125 m with average ground speed of 190 km/h. The survey grid was flown with a north-south flight line direction and 1000 meter line spacing.

Data are presented as a set of colour maps at 1 : 250 000 scale and as stacked profiles at 1 : 150 000 scale. Profile data include the seven radiometric parameters, radar terrain clearance, magnetic total field and VLF total field and quadrature components for each flight line. The colour maps include : eight gamma ray spectrometric maps (exposure rate, potassium, equivalent uranium and equivalent thorium concentrations, the eU/eTh, eU/K, eTh/K ratios and a Ternary Radioelement map); a magnetic total field colour map, a calculated magnetic vertical gradient colour map; two GRIDDED VLF total field colour maps (one superimposed with VLF total field PROFILE data the other with quadrature PROFILE data) and a flight path map.

Gamma Ray Spectrometric Data

Potassium is measured directly from the 1.46 MeV gamma ray photons emitted by ⁴⁰K, whereas uranium and thorium are measured indirectly from gamma ray photons emitted by daughter products in their decay chains. Uranium is monitored by means of gamma ray photons at approximately 1.76 MeV from ²³⁵U, and thorium, from 2.62 MeV photons emitted by ²³²Th. The energy windows used are as follows:

| | | |
|-----------|-------------------|----------------|
| Potassium | ⁴⁰ K | 1.36– 1.56 MeV |
| Uranium | ²³⁵ U | 1.66– 1.86 MeV |
| Thorium | ²³² Th | 2.41–2.81 MeV |

Uranium, thorium and potassium counts have been corrected for dead time, ambient temperature changes, background radiation, spectral scattering and deviations of terrain clearance from the planned survey altitude. The data as presented represent an average surface concentration which is influenced by varying amounts of outcrop, overburden, vegetation, soil moisture and surface waters. As a result, the concentrations as shown are usually lower than the actual concentrations in the bedrock.

Factors for converting the airborne measurements to concentrations were determined by relating the airborne count rates to the known ground concentrations of a test strip in the Ottawa area. The factors used to convert the airborne measurements to ground concentrations are:

| | |
|-----------|----------|
| 1 % K | 91.0 cps |
| 1 ppm eU | 9.1 cps |
| 1 ppm eTh | 7.0 cps |

The exposure rate, in micro Roentgens per hour (μ R/h) has been computed from the measured concentrations of potassium, uranium and thorium (Grasty, R.L., Carson, J.M., Charbonneau, B.W., and Holman, P.B., 1984, Natural Background Radiation in Canada, Geol. Sur. Can., Bull. 360). To compare these data with earlier total count maps expressed in Units of Radioelement concentrations (Ur), the conversion factor is 1μ R/h = 1.67 Ur.

VLF Data

The primary electromagnetic field is generated by VLF communication stations. For this survey, the receiving coils were tuned to station NAA in Cutler Maine, which transmits at a frequency of 24.0 kHz.

Anomalies reflect distortions in the primary field caused by a secondary electromagnetic field generated by eddy currents flowing in geological and man-made conductors. Anomalies produce positive peaks on the total field trace and are of the cross-over type (negative to positive) on the quadrature trace. Both parameters are plotted with positive deflections toward west. The profiles presented are the total field value (vector sum of the horizontal and vertical components) and the quadrature value (out-of-phase component). The mean value or line average of the total field and quadrature component were removed along each flight line. The resultant values are plotted with a two second lag. The quadrature, which depends on the flight line direction, was inverted for lines flown from north to south. A five point weighted average filter was applied to both total field and quadrature PROFILE data for final presentation. A twenty one point triangular filter was applied to the line data and the resultant was then subtracted before the data was gridded. This effectively removed the long wave length response created by changing field strength, altitude effects, etc.

Magnetic Data

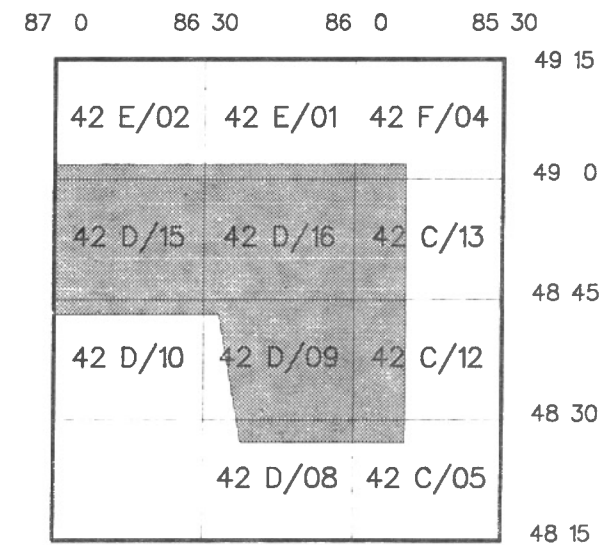
The low resolution aeromagnetic data were acquired using an instrument with one (1) nT sensitivity. Digital processing of the magnetic data supplemented with manual editing was used to remove obvious errors caused by spikes, heading effects or diurnal variations.

Information regarding Open File 2516 may be obtained from: Geological Survey of Canada, 601 Booth St., Ottawa, Ontario, K1A 0E8. Tel. : (613)995-4342.

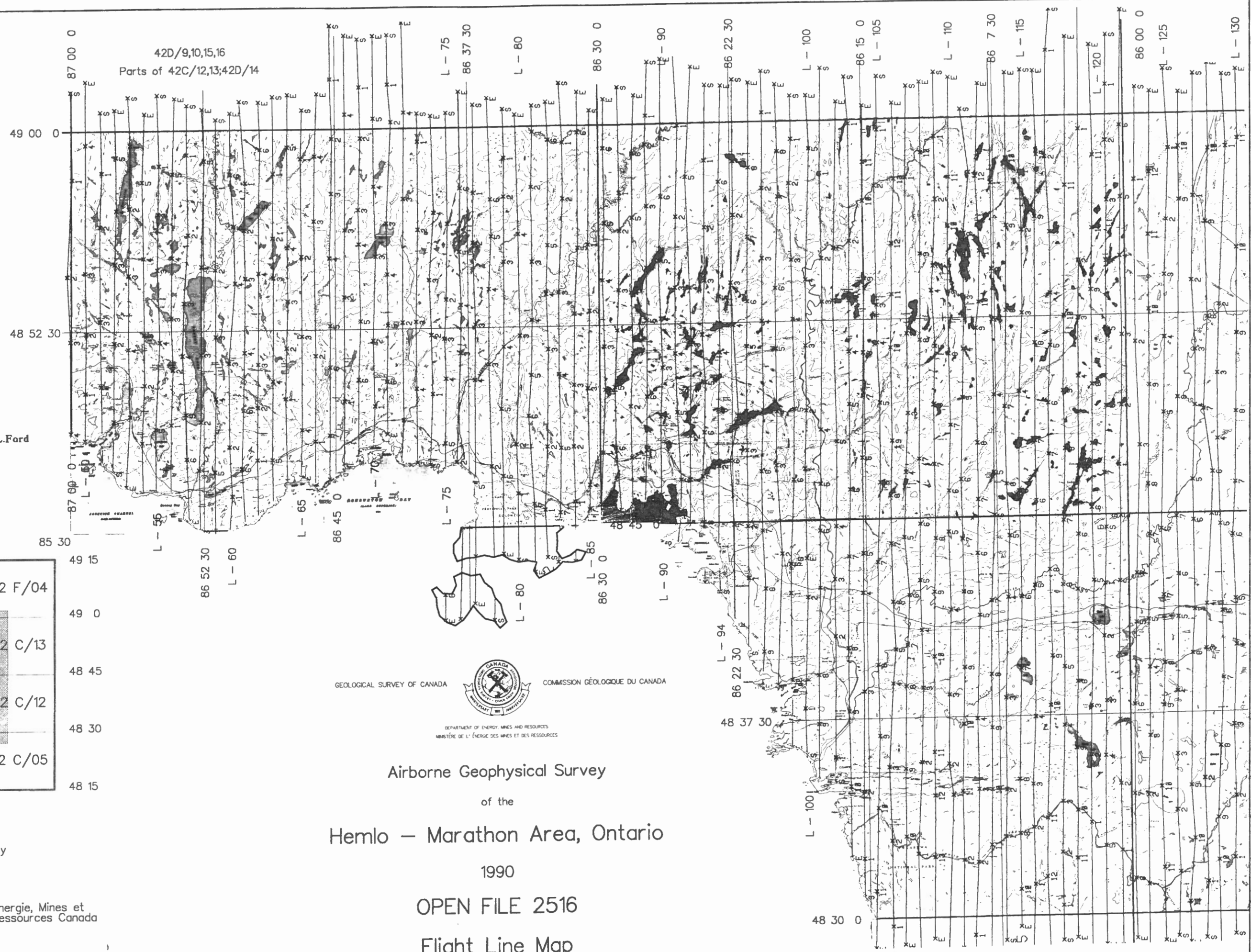
Base map material supplied by Surveys and Mapping Branch

Cartography by Geological Survey of Canada

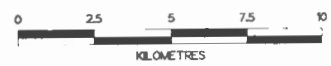
Airborne gamma ray spectrometer, VLF and magnetic survey flown, compiled and funded by Geological Survey of Canada



INDEX MAP



42D/9,10,15,16
Parts of 42C/12,13;42D/14



Scale = 1:250 000
Line spacing = 1000 metres
Survey compiled by R.J. Hetu & K.L.Ford

| | | |
|---------|---------|---------|
| 42 E/02 | 42 E/01 | 42 F/04 |
| 42 D/15 | 42 D/16 | 42 C/13 |
| 42 D/10 | 42 D/09 | 42 C/12 |
| | 42 D/08 | 42 C/05 |

INDEX MAP

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MINISTÈRE DE L'ÉNERGIE, DES MINES ET DES RESSOURCES

Airborne Geophysical Survey
of the
Hemlo – Marathon Area, Ontario
1990

OPEN FILE 2516
Flight Line Map

Survey flown, compiled and funded by
Airborne Geophysics Section
Mineral Resources Division
Geological Survey of Canada

Energy, Mines and Resources Canada
Energie, Mines et Ressources Canada



Airborne Synthetic Aperture Radar (SAR) Data

The SAR map is included as part of GSC Open File 2516 for a joint CCRS STOREFRONT project.

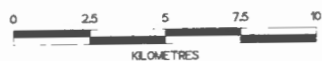
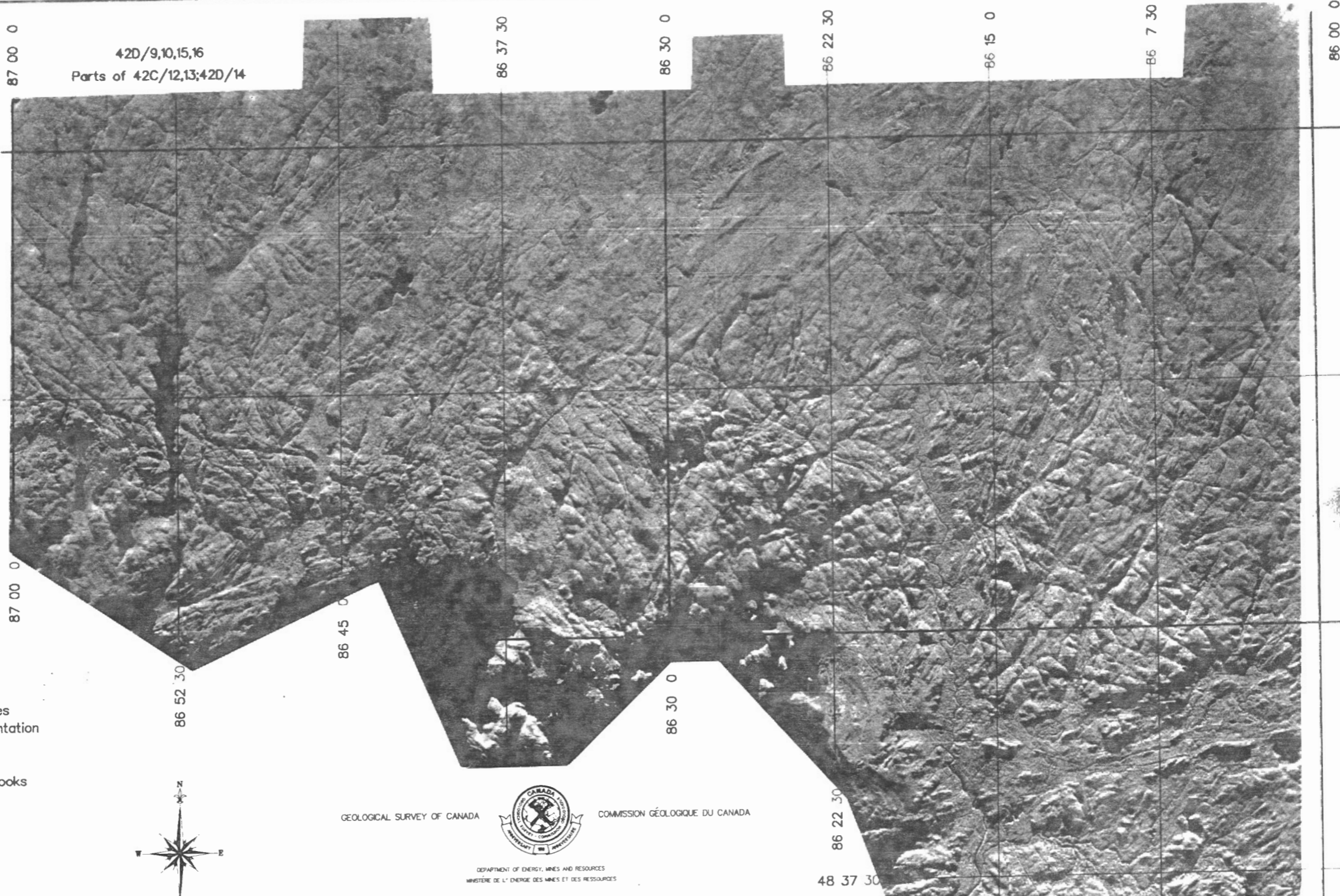
The Airborne SAR Data is acquired using the CCRS Convair 580 aircraft, operated by the Data Acquisition Division, (DAD) of CCRS. The CCRS SAR is an experimental system used for applications and sensor development within the Centre.

The radar system is described in the following reference:

Livingstone C.E. et al.(1987). CCRS C-band Airborne Radar-System Description and Test Results. Paper prepared for the 11th Canadian Symposium on Remote Sensing, Waterloo, Ontario, June 22-25, 1987. 32 pages

Digital and/or photographic data can be ordered directly from the Canada Centre for Remote Sensing by calling (613) 991-5532. Pertinent information for this project is listed below.

CCRS AIRBORNE C-BAND SAR
PROJECT number 90-48.
Flight Date 23-Jul-90
Swath Mode: Wide
... Incidence Angle Range: from 45 to 85 degrees
... Images Recorded with a Ground Range Presentation
... Swath Width: 64 km
Polarization: HH
Resolution (Azimuth, Range): 20 x 10 m at 7 looks
Master Negative Image Scale: 1 : 304 000



Scale = 1:250 000
Line spacing = 1000 metres
Radiometric data compiled by R.J. Hetu & K.L.Ford, GSC
SAR data compiled by D.F. Graham, INTERA/CCRS

GEOLOGICAL SURVEY OF CANADA



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Airborne Geophysical Survey of the Hemlo — Marathon Area, Ontario 1990

OPEN FILE 2516

Airborne SAR Data

Courtesy of the Canada Centre for Remote Sensing (CCRS)

Energy, Mines and Resources Canada
Energie, Mines et Ressources Canada



48 30 0

Map 2232

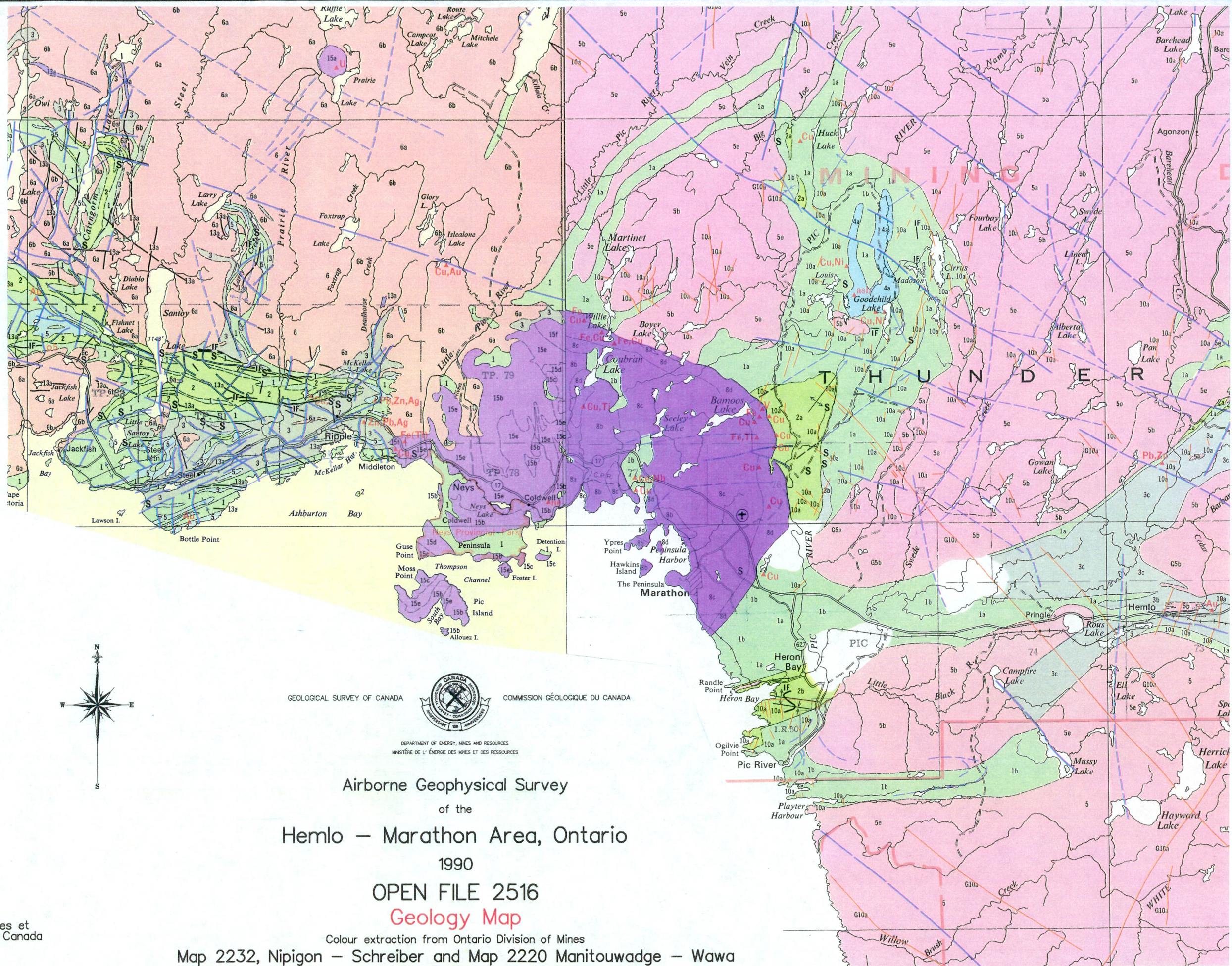
METAL AND MINERAL REFERENCE

| | |
|-----------------------|-------------------|
| Ag.....Silver | hem.....Hematite |
| agate.....Agate | Li.....Lithium |
| amethyst.....Amethyst | ma.....Marl |
| As.....Arsenic | Mo.....Molybdenum |
| Au.....Gold | ne.....Nepheline |
| ba.....Barite | Ni.....Nickel |
| Be.....Beryllium | Pb.....Lead |
| Cd.....Cadmium | py.....Pyrite |
| Cu.....Copper | Se.....Selenium |
| ep.....Epidote | st.....Stone |
| Fe.....Iron | Ti.....Titanium |
| fl.....Fluorite | U.....Uranium |
| gf.....Graphite | Zn.....Zinc |

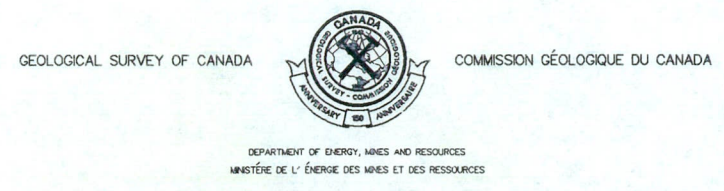
Map 2220

METAL AND MINERAL REFERENCE

| | |
|------------------|--------------------|
| Ag.....Silver | Mo.....Molybdenum |
| As.....Arsenic | Nb.....Niobium |
| asb.....Asbestos | Ni.....Nickel |
| Au.....Gold | neph.....Nepheline |
| be.....Beryl | Pb.....Lead |
| Cd.....Cadmium | py.....Pyrite |
| Ce.....Cerium | talc.....Talc |
| Cu.....Copper | Ti.....Titanium |
| Fe.....Iron | V.....Vanadium |
| Li.....Lithium | W.....Tungsten |
| Mn.....Manganese | Zn.....Zinc |



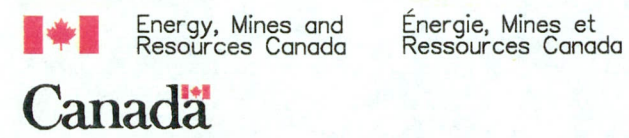
Scale = 1 : 253 440



Airborne Geophysical Survey
of the
Hemlo – Marathon Area, Ontario
1990
OPEN FILE 2516
Geology Map

Colour extraction from Ontario Division of Mines
Map 2232, Nipigon – Schreiber and Map 2220 Manitouwadge – Wawa
Geological Compilation Series, Thunder Bay District

Survey flown, compiled and funded by
Airborne Geophysics Section
Mineral Resources Division
Geological Survey of Canada

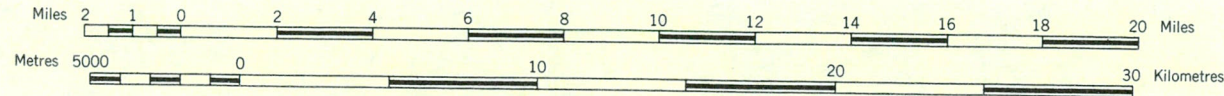


NIPIGON-SCHREIBER

Geological Compilation Series

THUNDER BAY DISTRICT

Scale 1:253,440 or 1 Inch to 4 Miles



LEGEND

CENOZOIC

QUATERNARY

PLEISTOCENE AND RECENT
Sand, gravel, clay.

UNCONFORMITY

PRECAMBRIAN

LATE PRECAMBRIAN

KEWEENAWAN

CARBONATITE-ALKALIC COMPLEXES

- 15a Carbonatite, urtite, ijolite.
- 15b Nepheline syenite, augite-nepheline syenite, hastingsite-nepheline syenite, augite syenite, augite-oligoclase syenite, trachyte.
- 15c Nordmarkite.
- 15d Syenodiorite.
- 15e Augite syenite (larvikite).
- 15f Gabbro, olivine gabbro, nepheline-olivine gabbro.
- 15g Lamprophyre.

CONTACT INDETERMINATE

LATE FELSIC IGNEOUS ROCKS

- 14 Quartz porphyry, felsite.

INTRUSIVE CONTACT

LATE MAFIC IGNEOUS ROCKS^a

- 13a Diabase (dikes), lamprophyre.
- 13b Gabbro, anorthositic gabbro, anorthosite, pyroxenite, peridotite, diorite, granophyre.

INTRUSIVE CONTACT

OSLER GROUP^b

- 12 Porphyritic rhyolite or dacite, quartz porphyry, felsite.^c
- 11 Unsubdivided.
- 11c Diabase (sills and flows).
- 11b Basalt (flows) and minor pyroclastic rocks.
- 11a Conglomerate, sandstone.

CONTACT INDETERMINATE

MAFIC IGNEOUS ROCKS^d

- 10 Diabase (dikes and sheets).

INTRUSIVE CONTACT

SIBLEY GROUP^b

- 9 Unsubdivided.
- 9e Red and purple shale.
- 9d Chert and stromatolitic rock.
- 9c Red, sandy and limy sandstone.
- 9b Sandstone.
- 9a Conglomerate.

UNCONFORMITY

MIDDLE PRECAMBRIAN

ANIMIKIE

Rove Formation

- 8 Argillite, shale, greywacke, minor volcanic rocks.

- Gunflint Formation
- 7 Unsubdivided.
- 7a Upper Gunflint: ferruginous carbonate, chert-carbonate, jasper, argillite-tuff.^e
- 7b Lower Gunflint: conglomerate, ferruginous carbonate, chert, algal chert, chert-carbonate, taconite, hematite iron formation, argillite-tuff.^e

EARLY PRECAMBRIAN (ARCHEAN) FELSIC IGNEOUS AND METAMORPHIC ROCKS

- 6 Unsubdivided.
- 6a Granite, quartz monzonite, granodiorite, trondhjemite, alaskite, pegmatite, aplite, syenite, monzonite, quartz diorite.
- 6b Granite gneiss, metasedimentary migmatite, hybrid rocks.
- 6c Quartz porphyry, quartz-feldspar porphyry, feldspar porphyry.^f

INTRUSIVE CONTACT

MAFIC AND ULTRAMAFIC IGNEOUS ROCKS

- 5 Metagabbro, serpentinite, hornblende, amphibolite.

INTRUSIVE CONTACT

METAVOLCANICS AND METASEDIMENTS^g

- 4 Conglomerate, greywacke, arkose, quartzite, argillite, slate, mica schist, limestone.

METASEDIMENTS^h

- 3 Conglomerate, greywacke, arkose, quartzite, slate, argillite, mica schist and gneiss, hornblende schist.

METAVOLCANICSⁱ

- 2 Felsic to intermediate metavolcanics: rhyolite, pillow lava, porphyritic lava, tuff, agglomerate and derived schists.

- 1 Intermediate to mafic metavolcanics: massive lava, schistose lava, pillow lava, porphyritic lava, amygdaloidal lava, tuff, agglomerate and derived schists.

- IF Iron formation^k
- S Sulphide mineralization.

^a Some of these intrusions may be equivalent in age to unit 10. Others may be pre-Unit 10 in age.

^b This rock assemblage is listed stratigraphically.

^c May include intrusions of post-Osler age.

^d Formerly classified as Logan intrusions. May include some intrusions of Middle Precambrian and possibly Early Precambrian age.

^e Argillite-tuff in places shown separately on map.

^f Possible high level, subvolcanic intrusions.

^g Formerly classified as Windigokan (or in places as Keewatin but lithologically similar and showing same relationships as rocks mapped as Windigokan).

^h Formerly classified as Coutchiching, Keewatin.

^j Formerly classified as Keewatin, Windigokan.

^k Iron formation (associated with formations of stratigraphic units 1, 2 and 3).

The letter "G" preceding a rock unit number, for example "G6", indicates interpretation from geophysical data in drift-covered areas.

Where in places a formation is too narrow to show colour, and must be represented in black, a short black bar appears in the appropriate legend block.

SYMBOLS

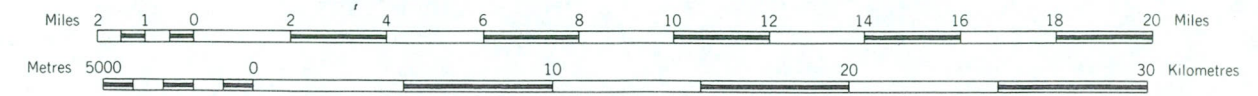
- Geological boundary.
- Synclinal axis.
- Anticlinal axis.
- Fault.
- Lineament.
- Altitude in feet above mean sea level.
- Railway with station or flag stop.
- Provincial highway.
- Motor road.
- Other road.
- Aircraft landing facilities.
- Larger community.
- Smaller community.
- Past producing mine.
- Mineral occurrence.
- International boundary.
- Township boundary, base or meridian line.
- Township boundary, unsurveyed.
- Line of section.

MANITOUWADGE-WAWA SHEET

Geological Compilation Series

ALGOMA, COCHRANE, SUDBURY AND THUNDER BAY DISTRICTS

Scale 1:253,440 or 1 Inch to 4 Miles



LEGEND

CENOZOIC

PLEISTOCENE AND RECENT^a

Sand, gravel, clay.

UNCONFORMITY

PALEOZOIC

CAMBRIAN

- 11 11a Jacobsville Formation.^b sandstone, conglomerate, shale.

UNCONFORMITY

PRECAMBRIAN

MIDDLE TO LATE PRECAMBRIAN (PROTEROZOIC)

MAFIC IGNEOUS ROCKS

- 10 10a Diabase (dikes).^c

INTRUSIVE CONTACT

GAMITAGAMA LAKE COMPLEX^d

- 9a Granite, quartz monzonite, granodiorite, monzonite, syenite.
- 9b Gabbro, olivine gabbro, anorthosite, norite, diorite.

CONTACT INDETERMINATE

LATE PRECAMBRIAN

CARBONATITE-ALKALIC COMPLEXES

- 8a Nepheline syenite.
- 8b Hornblende syenite, syenite pegmatite.
- 8c Augite syenite.
- 8d Gabbro, olivine gabbro, anorthositic gabbro.
- 8e Intrusive calcite, dolomite, fenitized rock and lamprophyre.

CONTACT INDETERMINATE

KEWEENAWAN

FELSIC IGNEOUS ROCKS^e

- 7a Quartz porphyry.
- 7b Microdiorite.

INTRUSIVE CONTACT

SEDIMENTARY AND VOLCANIC ROCKS

- 6a Mafic volcanic rocks.
- 6b Felsic volcanic rocks.
- 6c Conglomerate, sandstone, shale.

UNCONFORMITY

EARLY PRECAMBRIAN (ARCHEAN) FELSIC IGNEOUS AND METAMORPHIC ROCKS^f

- 5 Unsubdivided metamorphic and felsic intrusive rocks.
- 5a Massive granitic rocks.
- 5b Massive granodiorite and quartz monzonite.
- 5c Massive syenite.
- 5d Quartz porphyry, feldspar porphyry.
- 5e Granitic, granodioritic, dioritic and trondhemitic gneisses.
- 5f Mafic amphibolitic gneisses.
- 5g Migmatite.

INTRUSIVE CONTACT MAFIC AND ULTRAMAFIC IGNEOUS ROCKS^g

- 4 Mafic intrusive rocks, unsubdivided.
- 4a Serpentinite.
- 4b Peridotite, pyroxenite, metapyroxenite.
- 4c Gabbro, metagabbro.
- 4d Diorite.
- 4e Massive amphibolite.

INTRUSIVE CONTACT

METASEDIMENTS^h

- 3 Unsubdivided metasediments.
- 3a Conglomerate.
- 3b Greywacke, shale, arkose, quartzite.
- 3c Quartzo-feldspathic schists and gneisses.
- 3d Garnet quartzo-feldspathic schists and gneisses.
- 3e Cordierite quartzo-feldspathic schists and gneisses.
- 3f Sillimanite quartzo-feldspathic schists and gneisses.

METAVOLCANICSⁱ

FELSIC METAVOLCANICS

- 2a Felsic volcanic rocks.
- 2b Felsic volcanic rocks with interbedded sedimentary and (or) mafic volcanic rocks.

MAFIC METAVOLCANICS

- 1a Mafic volcanic rocks.
- 1b Mafic volcanic rocks with interbedded sedimentary and (or) felsic volcanic rocks.

- IF Iron formation.^k

S Sulphide mineralization.

^a Not shown on this map.

^b Formerly classed as Lake Superior Sandstone.

^c Several ages of dikes are included.

^d Ages uncertain. May be intrusive equivalent of Keewenawan lavas or older.

^e Recognized only on Michipicoten Island, intrusive into Keewenawan lavas. Presence in other parts of the map area uncertain.

^f Formerly classed as Algoman. Contacts between rocks of this unit are largely interpretive.

^g Ages uncertain. Individual intrusives may be any age younger than unit 3. Formerly classed as Haileyburian.

^h In part, formerly classed as Timiskaming.

^j In part, formerly classed as Keewatin.

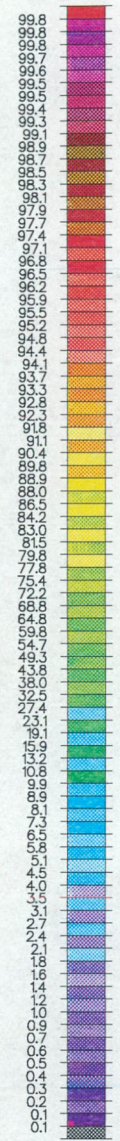
^k Iron formation (associated with formations of stratigraphic units 1, 2 and 3).

The letter "G" preceding a rock unit number, for example "G10a", indicates interpretation from geophysical data (in large drift covered, or unmapped areas).

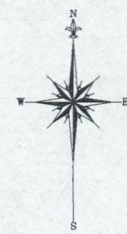
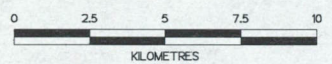
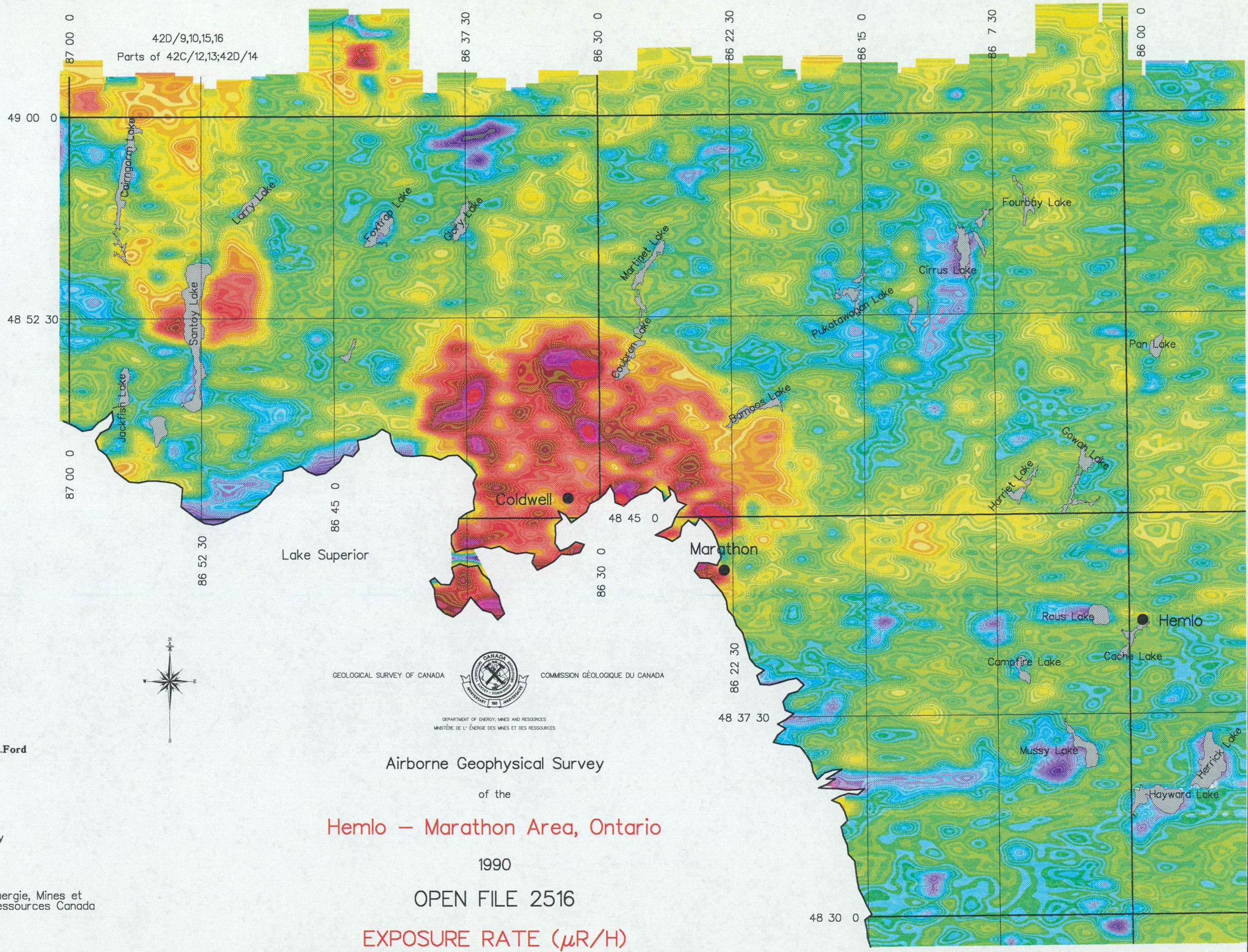
SYMBOLS

- Geological boundary.
- Synclinal axis.
- Anticlinal axis.
- Fault.
- Lineament.
- Altitude in feet above mean sea level.
- Railway with station or flagstop.
- Provincial highway.
- Motor road.
- Other road.
- Aircraft landing facilities.
- Larger community.
- Smaller community.
- Past producing mine.
- Past producing mine.
- Mineral occurrence.
- THUNDER BAY Mining Division with boundary.
- International boundary.
- District boundary.
- Township boundary, base or meridian line.
- Township boundary, unsurveyed.
- Line of section.

Cumulative Frequency



Exposure Rate ($\mu\text{R}/\text{h}$)



Scale = 1:250 000
 Line spacing = 1000 metres
 Survey compiled by R.J. Hetu & K.L.Ford

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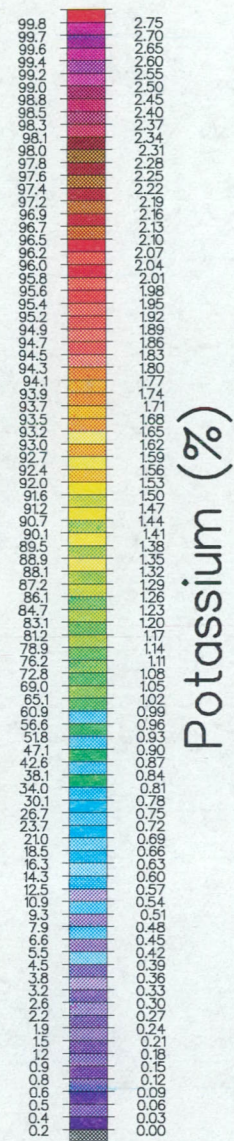
EXPOSURE RATE ($\mu\text{R}/\text{H}$)

Survey flown, compiled and funded by
 Airborne Geophysics Section
 Mineral Resources Division
 Geological Survey of Canada

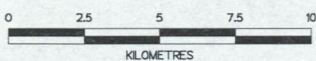
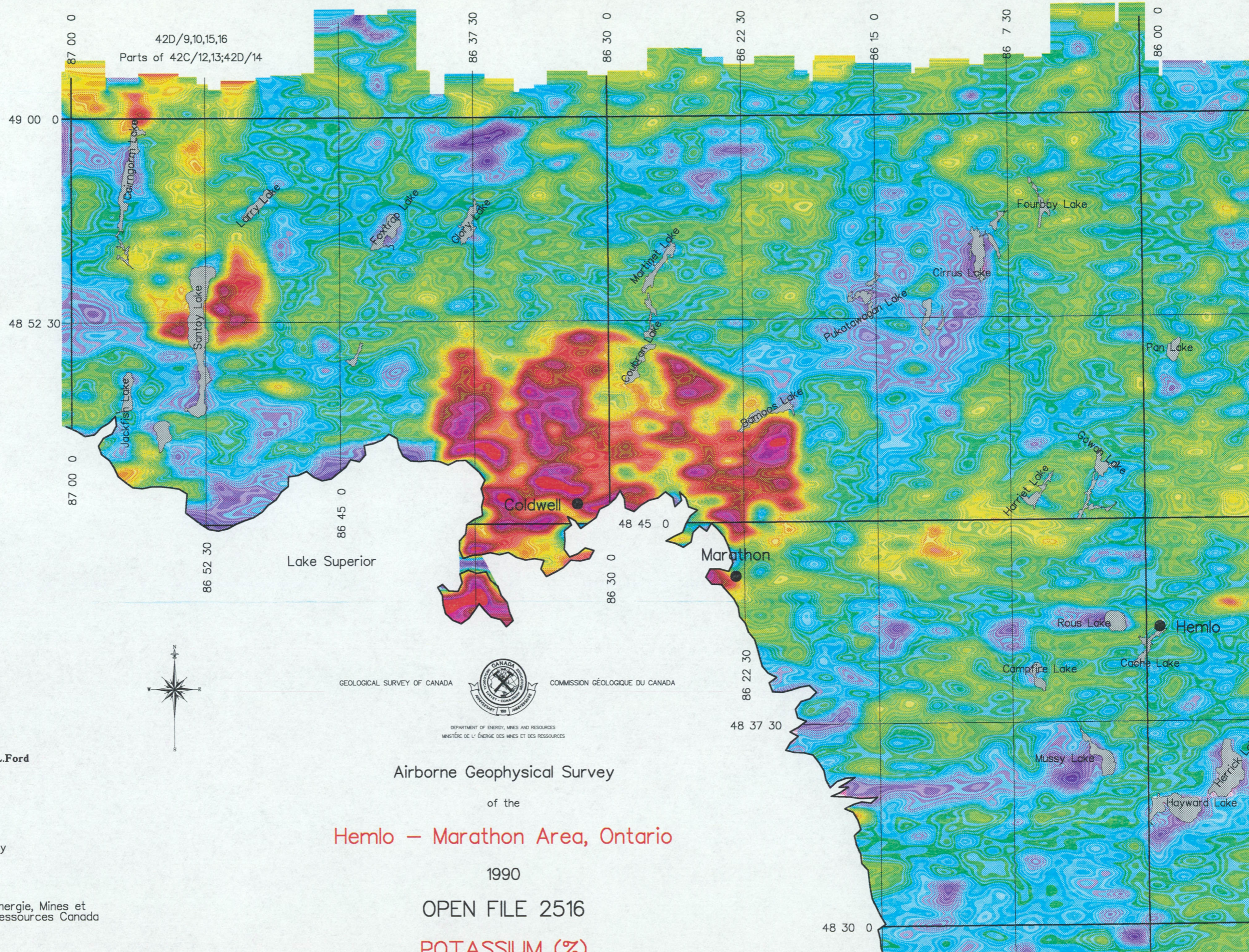
Energy, Mines and Resources Canada
 Énergie, Mines et Ressources Canada

Canada

Cumulative Frequency



Potassium (%)



Scale = 1:250 000
Line spacing = 1000 metres
Survey compiled by R.J. Hetu & K.L.Ford



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Hemlo – Marathon Area, Ontario

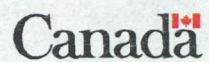
1990

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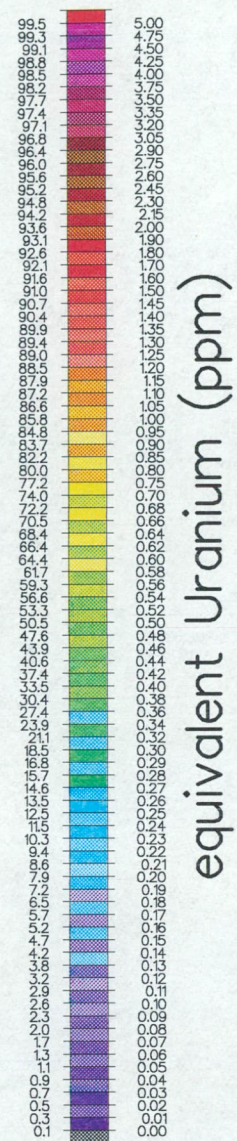
POTASSIUM (%)

Survey flown, compiled and funded by
Airborne Geophysics Section
Mineral Resources Division
Geological Survey of Canada

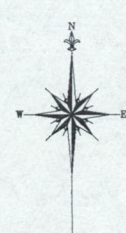
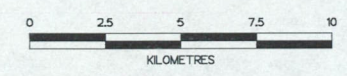
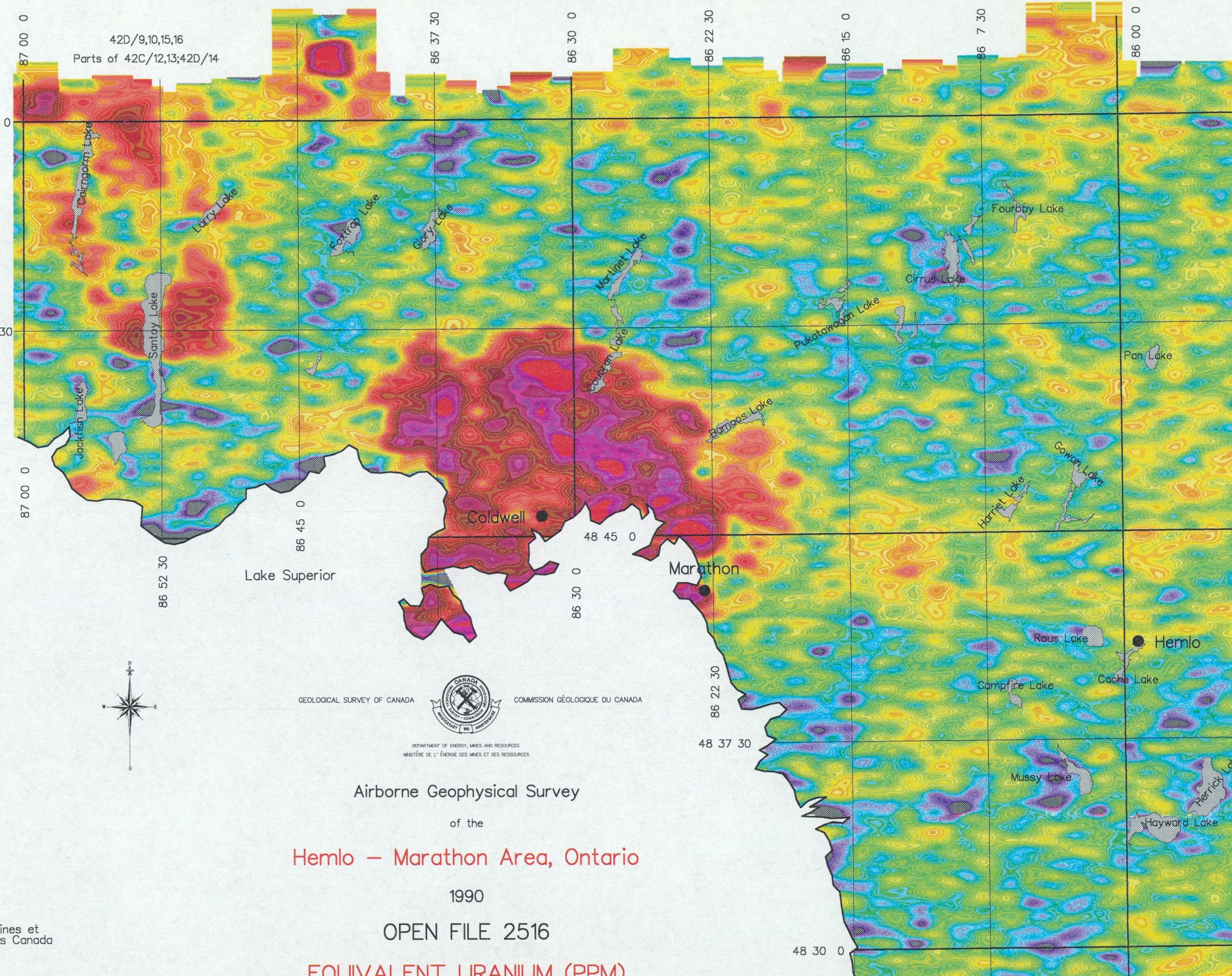
Energy, Mines and Resources Canada
Énergie, Mines et Ressources Canada



Cumulative Frequency



equivalent Uranium (ppm)



Scale = 1:250 000
 Line spacing = 1000 metres
 Survey compiled by R.J. Hetu & K.L.Ford

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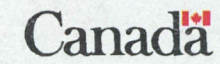
Airborne Geophysical Survey
 of the
Hemlo – Marathon Area, Ontario

1990
 OPEN FILE 2516

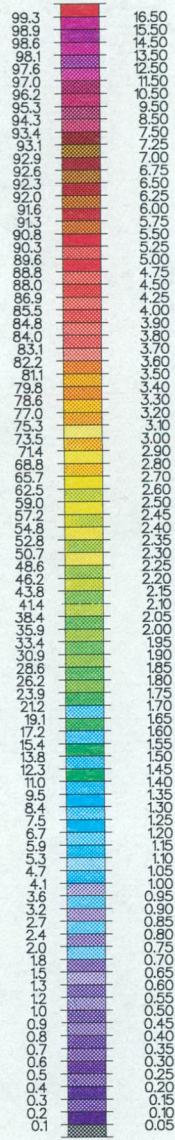
EQUIVALENT URANIUM (PPM)

Survey flown, compiled and funded by
 Airborne Geophysics Section
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 Geological Survey of Canada

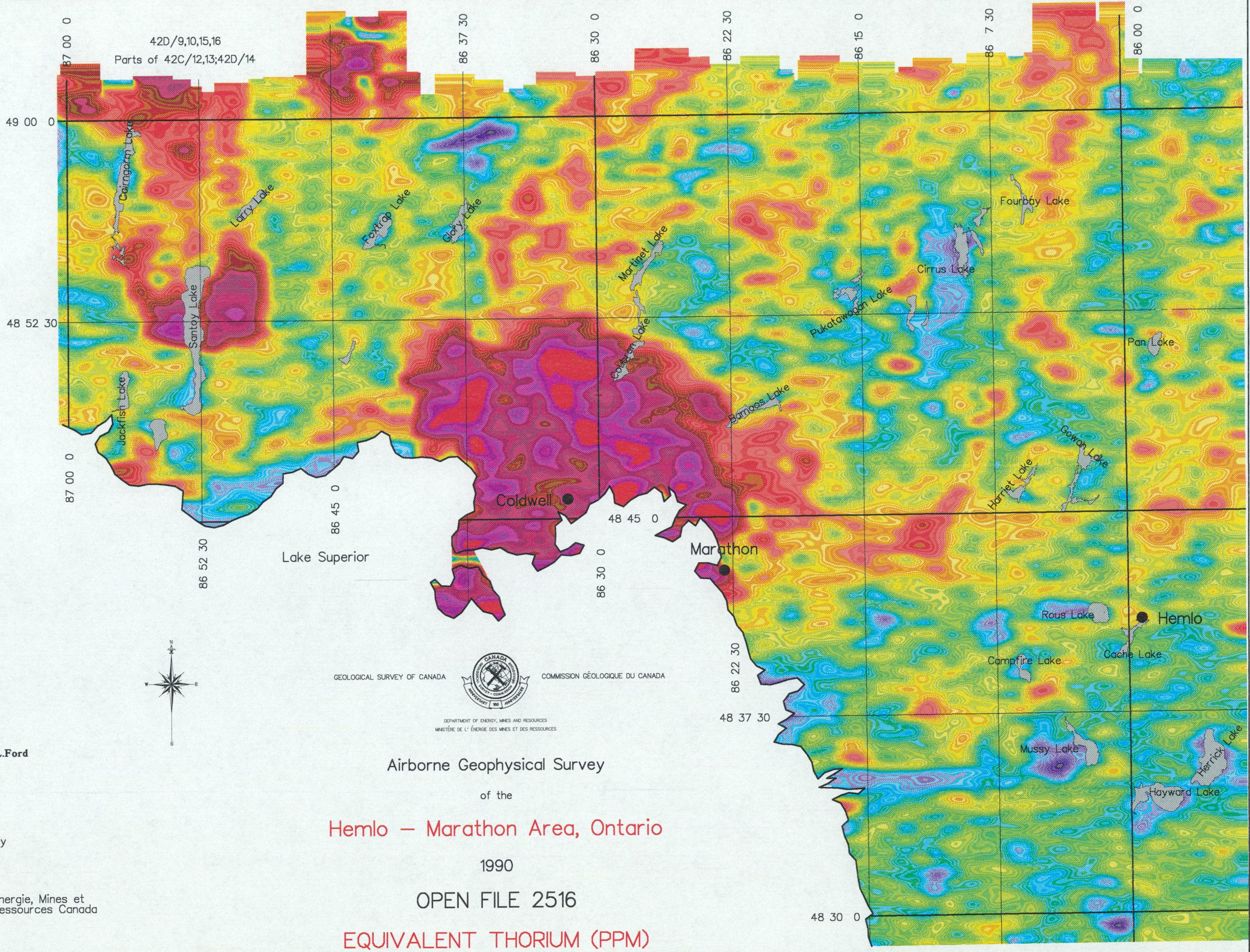
Energy, Mines and Resources Canada
 Énergie, Mines et Ressources Canada



Cumulative Frequency



equivalent Thorium (ppm)



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Scale = 1:250 000
 Line spacing = 1000 metres
 Survey compiled by R.J. Hetu & K.L.Ford

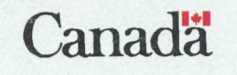
Airborne Geophysical Survey
 of the
Hemlo – Marathon Area, Ontario
 1990

OPEN FILE 2516

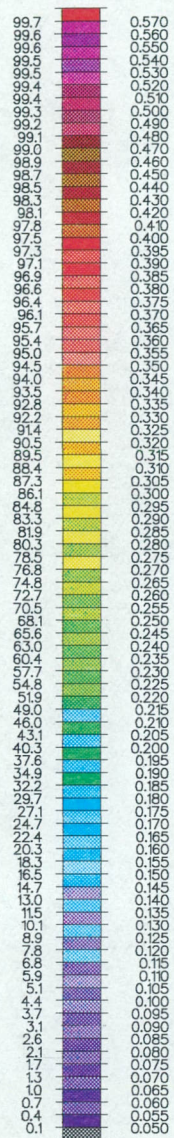
EQUIVALENT THORIUM (PPM)

Survey flown, compiled and funded by
 Airborne Geophysics Section
 Mineral Resources Division
 Geological Survey of Canada

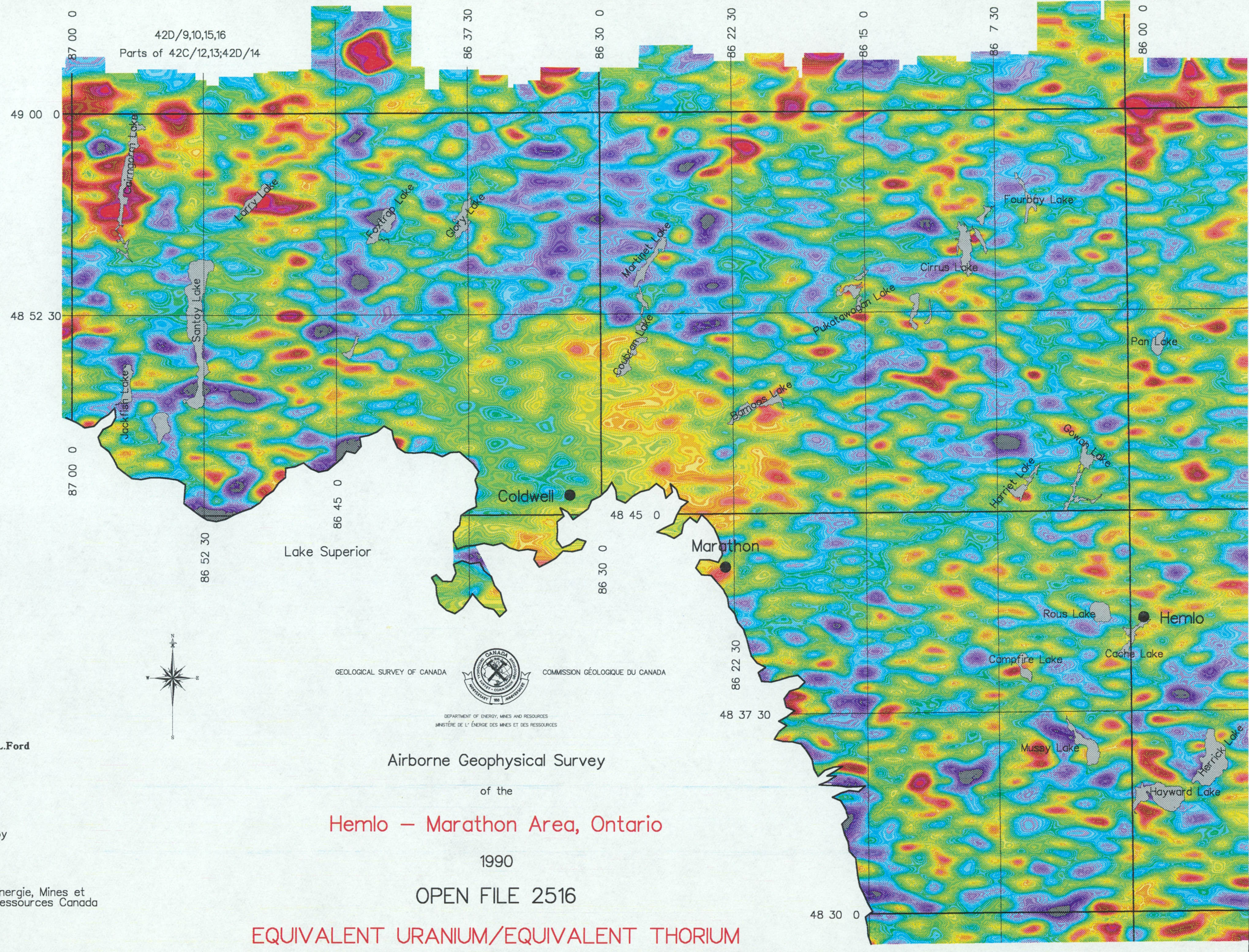
Energy, Mines and Resources Canada
 Énergie, Mines et Ressources Canada



Cumulative Frequency



equivalent Uranium/Thorium



Scale = 1:250 000
Line spacing = 1000 metres

Survey compiled by R.J. Hetu & K.L.Ford



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Airborne Geophysical Survey

of the

Hemlo – Marathon Area, Ontario

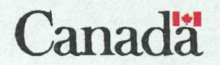
1990

OPEN FILE 2516

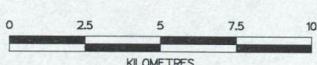
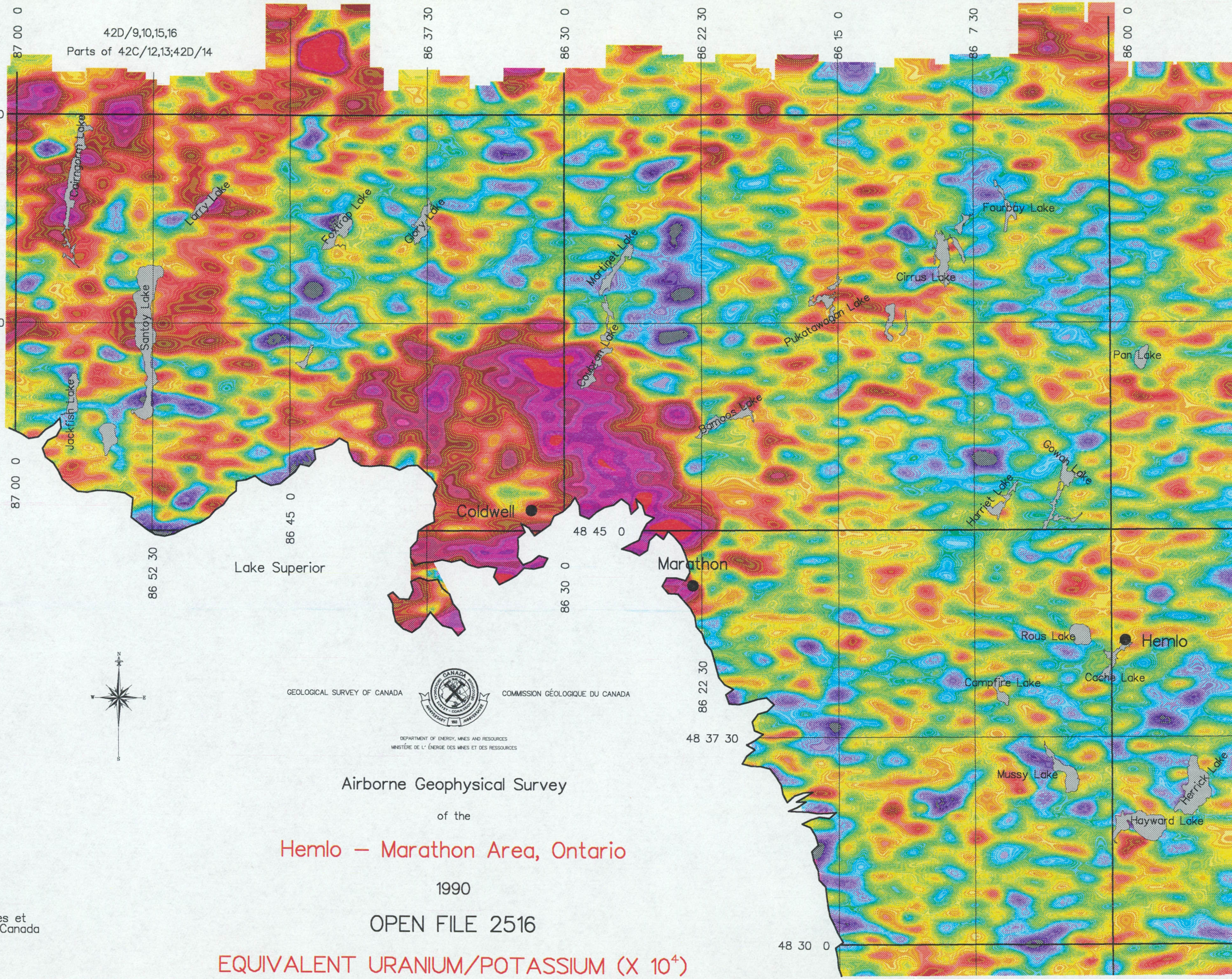
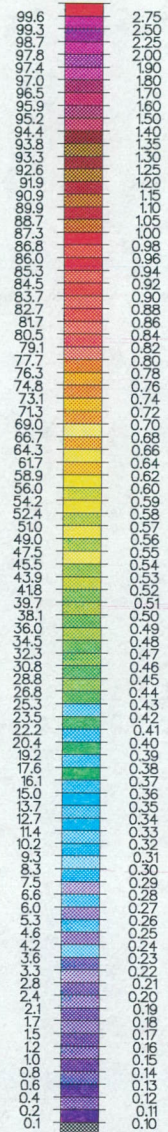
EQUIVALENT URANIUM/EQUIVALENT THORIUM

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Cumulative Frequency
 equivalent Uranium/Potassium ($\times 10^4$)



Scale = 1:250 000
 Line spacing = 1000 metres
 Survey compiled by R.J. Hetu & K.L.Ford

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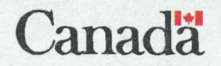
Airborne Geophysical Survey
 of the
Hemlo - Marathon Area, Ontario
 1990

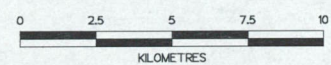
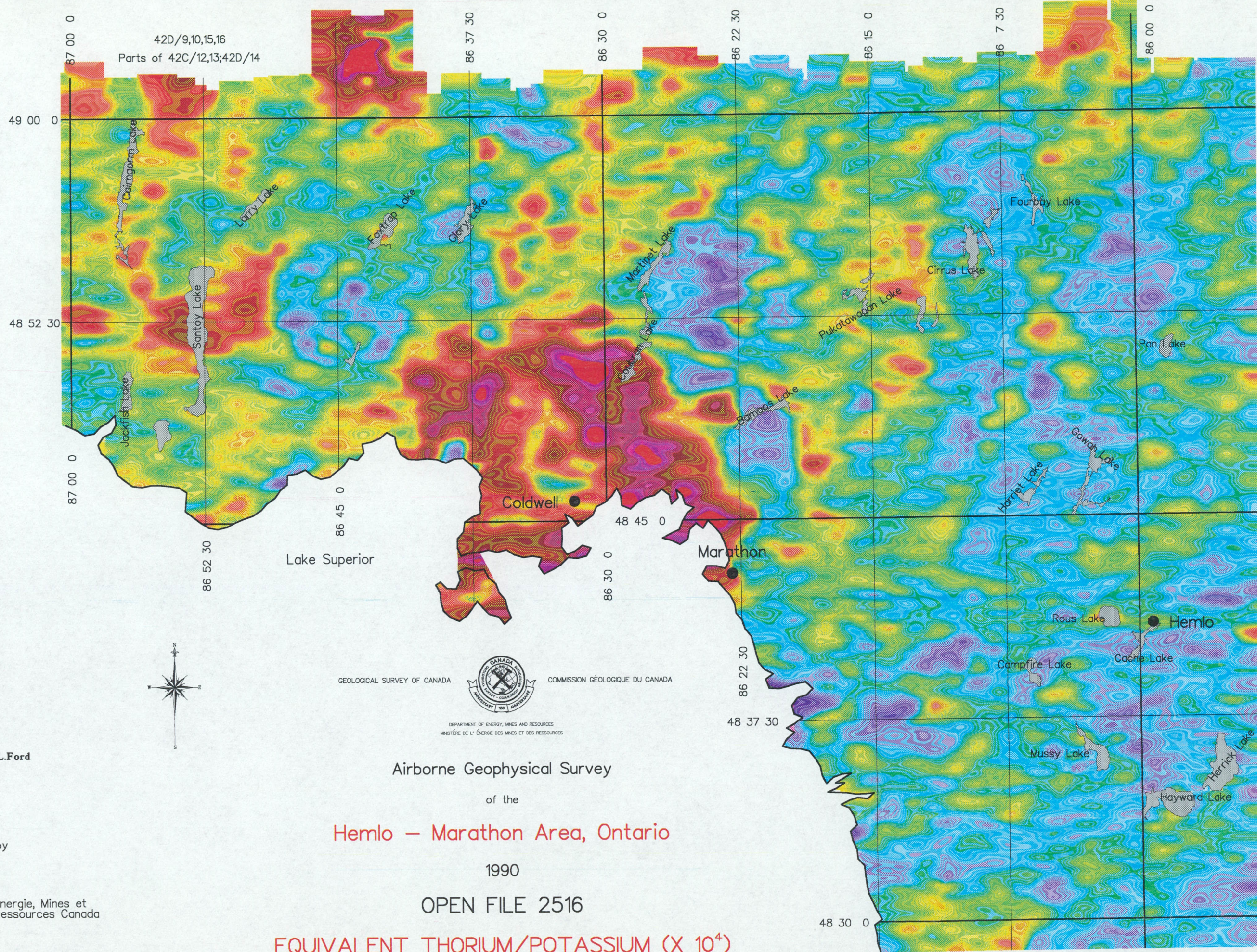
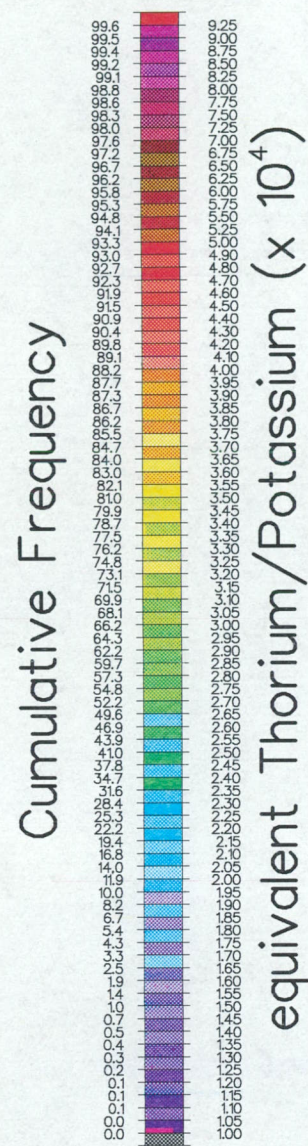
OPEN FILE 2516

EQUIVALENT URANIUM/POTASSIUM ($\times 10^4$)

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Scale = 1:250 000
 Line spacing = 1000 metres
 Survey compiled by R.J. Hetu & K.L.Ford

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Airborne Geophysical Survey
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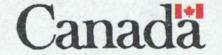
1990

OPEN FILE 2516

EQUIVALENT THORIUM/POTASSIUM (X 10⁴)

Survey flown, compiled and funded by
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Energy, Mines and Resources Canada
 Énergie, Mines et Ressources Canada

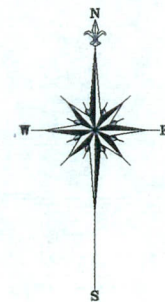
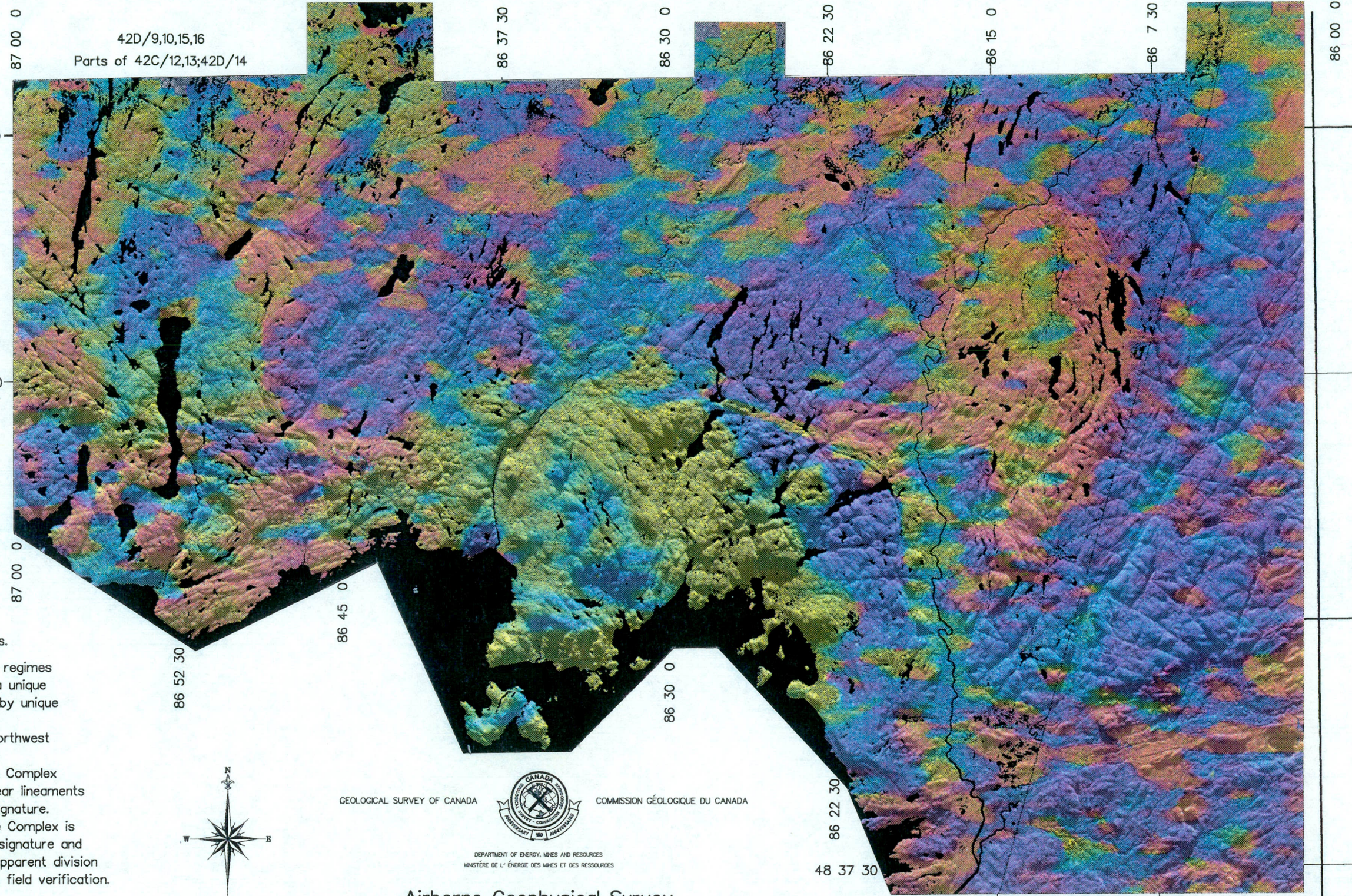


Three Component Radiometric SAR map

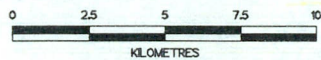
An Intensity, Hue and Saturation (IHS) algorithm has proven to be one of the most effective techniques for combining diverse geological data for use in reconnaissance field mapping (Harris et al, 1990 **). In this IHS enhancement, the airborne SAR data has been used to modulate image intensity while the gamma-ray spectrometer data (eU = RED, eTh = GREEN and K% = BLUE) provides the hue information. Saturation has been set to a constant value to create a proportionate mix between the radar and radiometric data. Landsat Thematic Mapper (TM) data is density sliced to create a land/water file which has been applied to the image to enhance data information.

The following features of this integrated image should be noted:

- 1 ... Radiometric patterns can be directly compared with the geology map when the land/water TM information is superimposed on the radiometric data.
- 2 ... The side-looking geometry of radar data provides a pseudo 3-D presentation of the ground surface, enhancing structural features.
- 3 ... The Coldwell Complex can be divided into 3 regimes based on this image. Each region not only has a unique radiometric signature, but is also characterized by unique geographic features apparent on the radar data
 - ... The eastern region is dominated by a northwest - southeast lineament set.
 - ... The northern and eastern portion of the Complex is characterised by continuous curvilinear lineaments and an abrupt change in radiometric signature.
 - ... The northern and western portion of the Complex is delineated by a change in radiometric signature and associated radar image texture. This apparent division is still uncertain and requires follow-up field verification.



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Scale = 1:250 000

Line spacing = 1000 metres

Radiometric data compiled by R.J. Hetu & K.L.Ford, GSC
 SAR data compiled by D.F. Graham, INTERA/CCRS

The airborne SAR data is part of the programme of experimental flights, organized by the Non-Renewable Resources Team of the Radar Data Development Programme (RDDP), Applications Division, CCRS.

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 of the
 Hemlo - Marathon Area, Ontario
 1990

OPEN FILE 2516

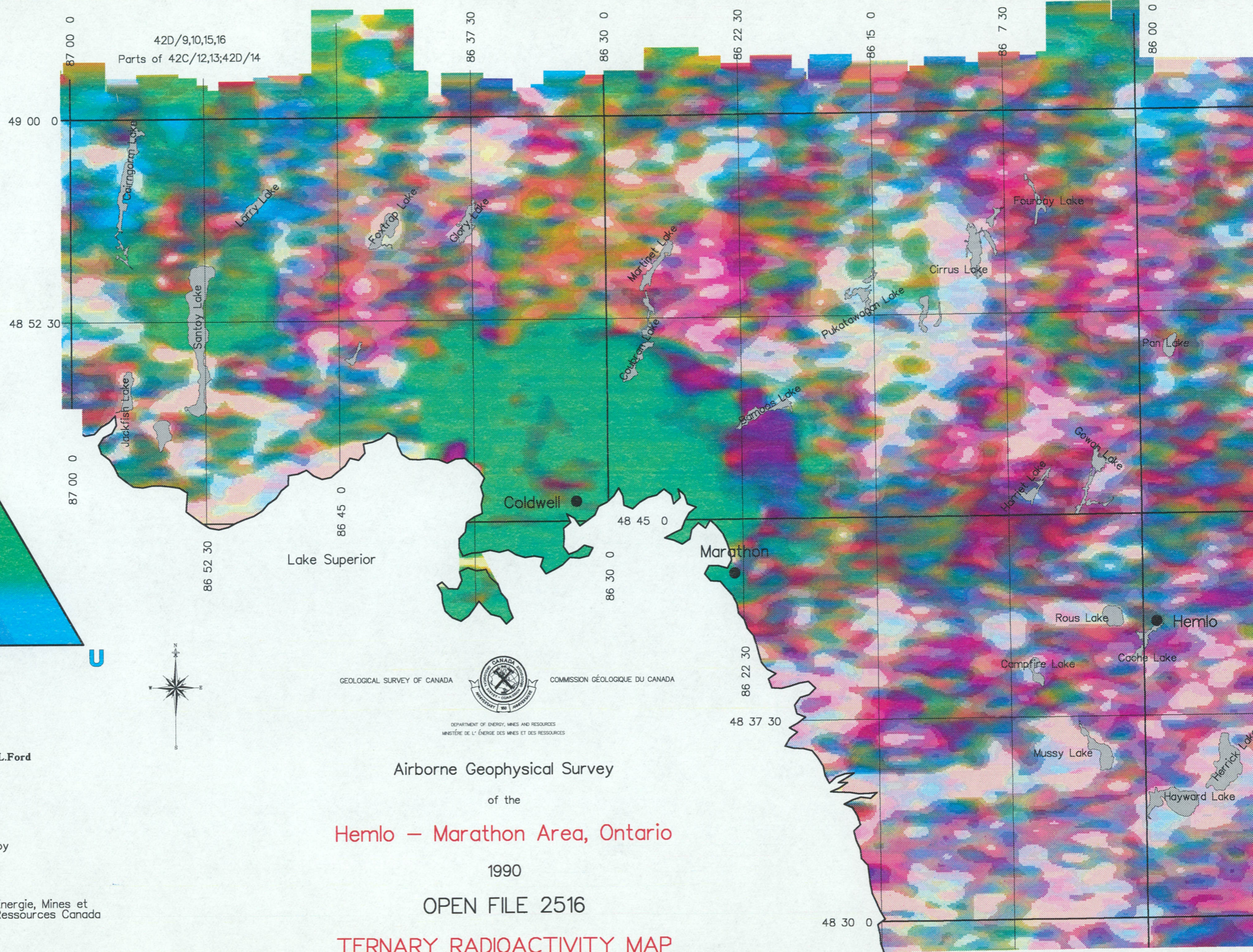
Airborne SAR Data

Courtesy of the Canada Centre for Remote Sensing (CCRS)

Reference

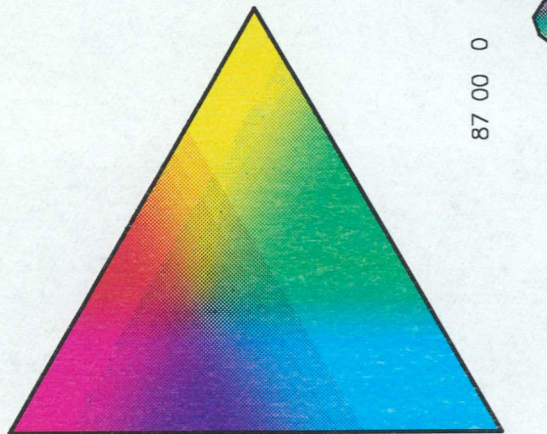
** J. Harris and R. Murray (1990). IHS Transform for the Integration of Radar Imagery with other Remotely Sensed Data. Photogrammetric Engineering and Remote Sensing, Vol.56, No.12, pp 1631-1641

48 30 0



42D/9,10,15,16
Parts of 42C/12,13;42D/14

Th



K U

0 2.5 5 7.5 10
KILOMETRES

Scale = 1:250 000
Line spacing = 1000 metres
Survey compiled by R.J. Hetu & K.L.Ford



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of the
Hemlo – Marathon Area, Ontario
1990
OPEN FILE 2516
TERNARY RADIOACTIVITY MAP

Survey flown, compiled and funded by
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Mineral Resources Division
Geological Survey of Canada

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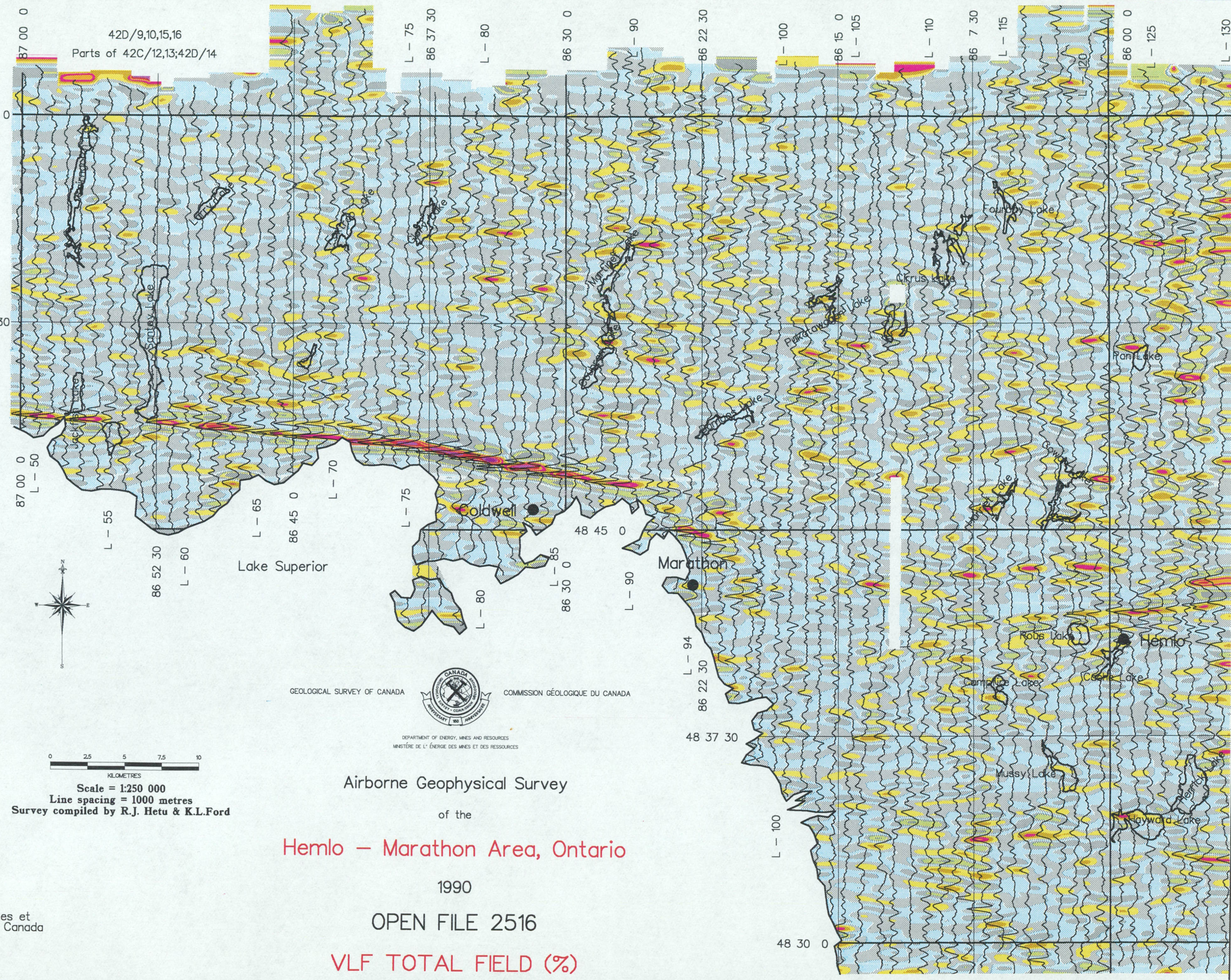
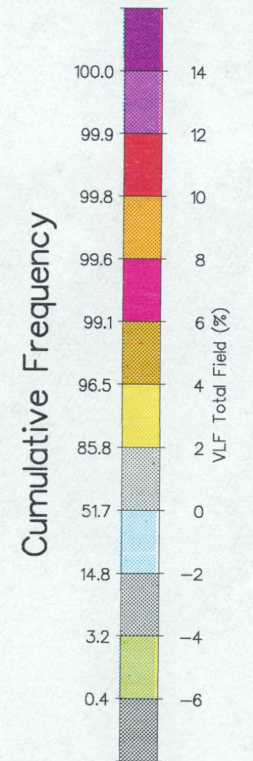
Canada

Total field VLF response
 Réponse VLF du champ total

West Ouest
 East Est

% relative signal change
 % changement relatif du signal

The profile scale = 150 %/cm
 The receiving coils were tuned at station NAA at Cutler Maine which transmits at a frequency of 24.0 k Hz.



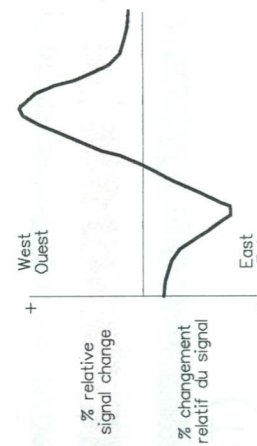
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Scale = 1:250 000
 Line spacing = 1000 metres
 Survey compiled by R.J. Hetu & K.L.Ford

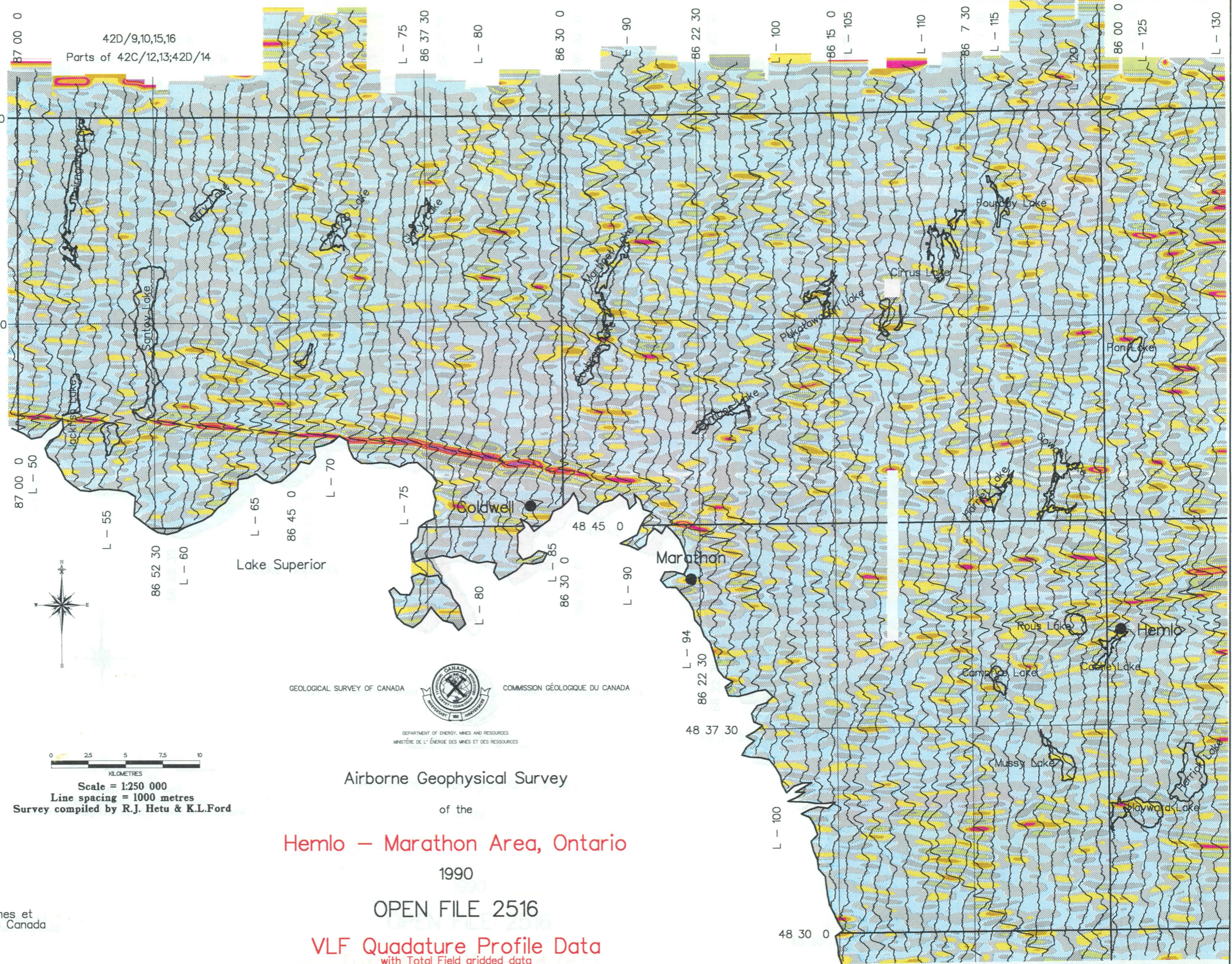
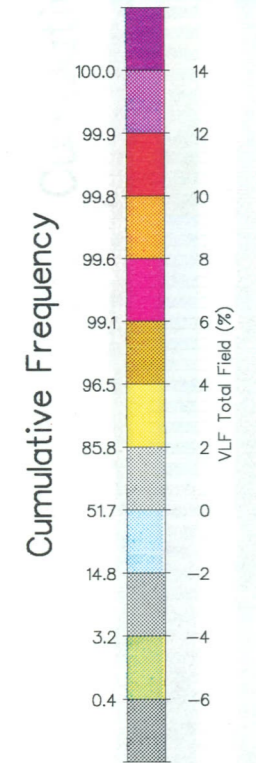
Airborne Geophysical Survey
 of the
Hemlo – Marathon Area, Ontario
 1990
 OPEN FILE 2516
VLF TOTAL FIELD (%)

Survey flown, compiled and funded by
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Quadrature VLF response
Reponse Quadrature VLF



The profile scale = 150 %/cm
The receiving coils were
tuned to station
NAA at Cutler Maine
which transmits at a
frequency of
24.0 k Hz.



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Scale = 1:250 000
Line spacing = 1000 metres
Survey compiled by R.J. Hetu & K.L.Ford

Airborne Geophysical Survey
of the
Hemlo - Marathon Area, Ontario
1990

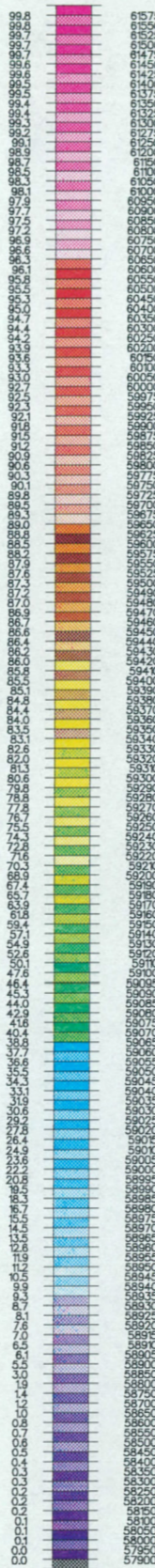
OPEN FILE 2516
VLF Quadrature Profile Data
with Total Field gridded data

Survey flown, compiled and funded by
Airborne Geophysics Section
Mineral Resources Division
Geological Survey of Canada

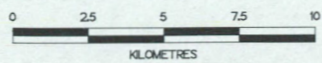
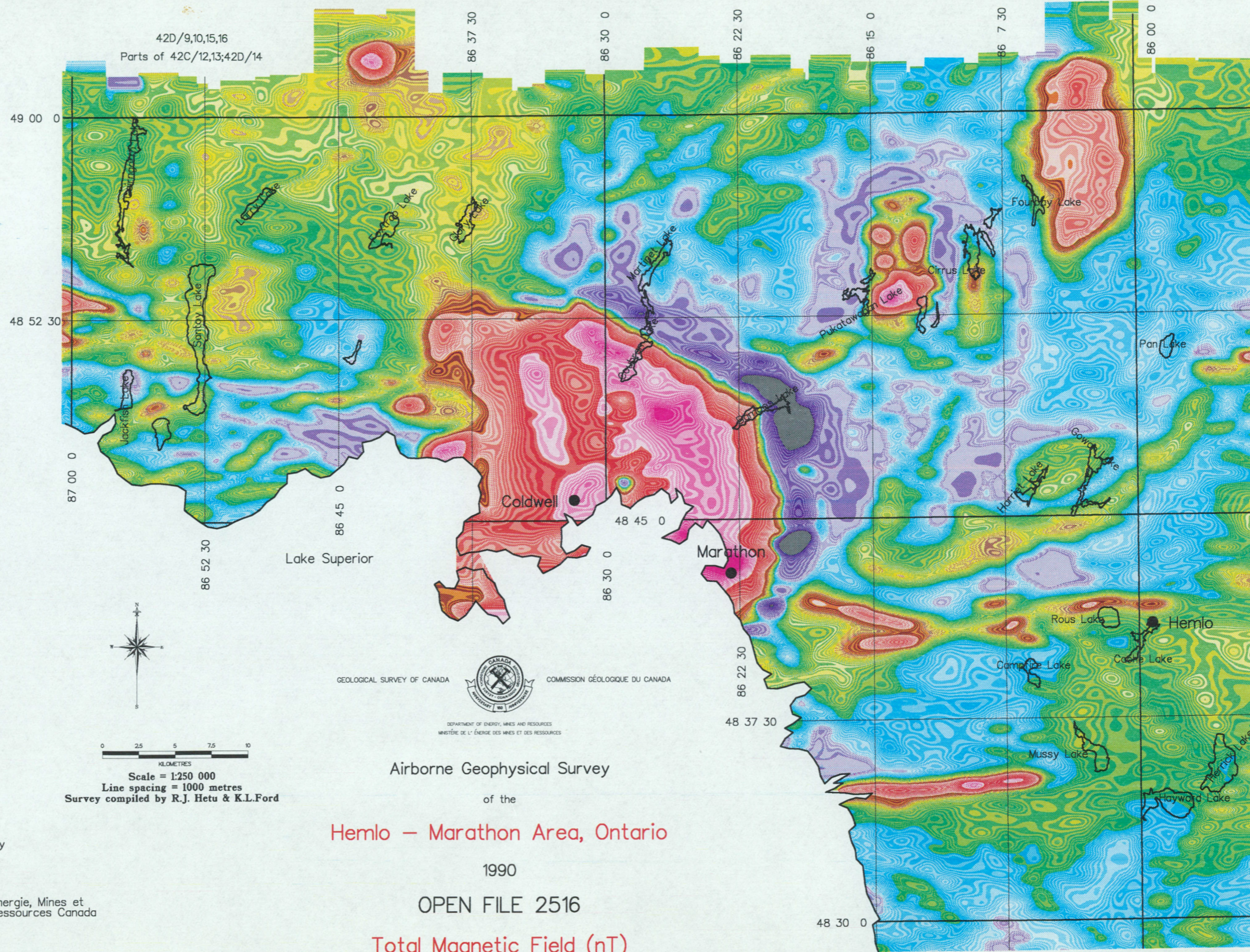
Energy, Mines and Resources Canada
Énergie, Mines et Ressources Canada



Cumulative Frequency



Total Magnetic Field (nT)



Scale = 1:250 000
 Line spacing = 1000 metres
 Survey compiled by R.J. Hetu & K.L.Ford

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Airborne Geophysical Survey
 of the

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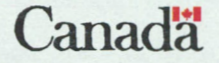
1990

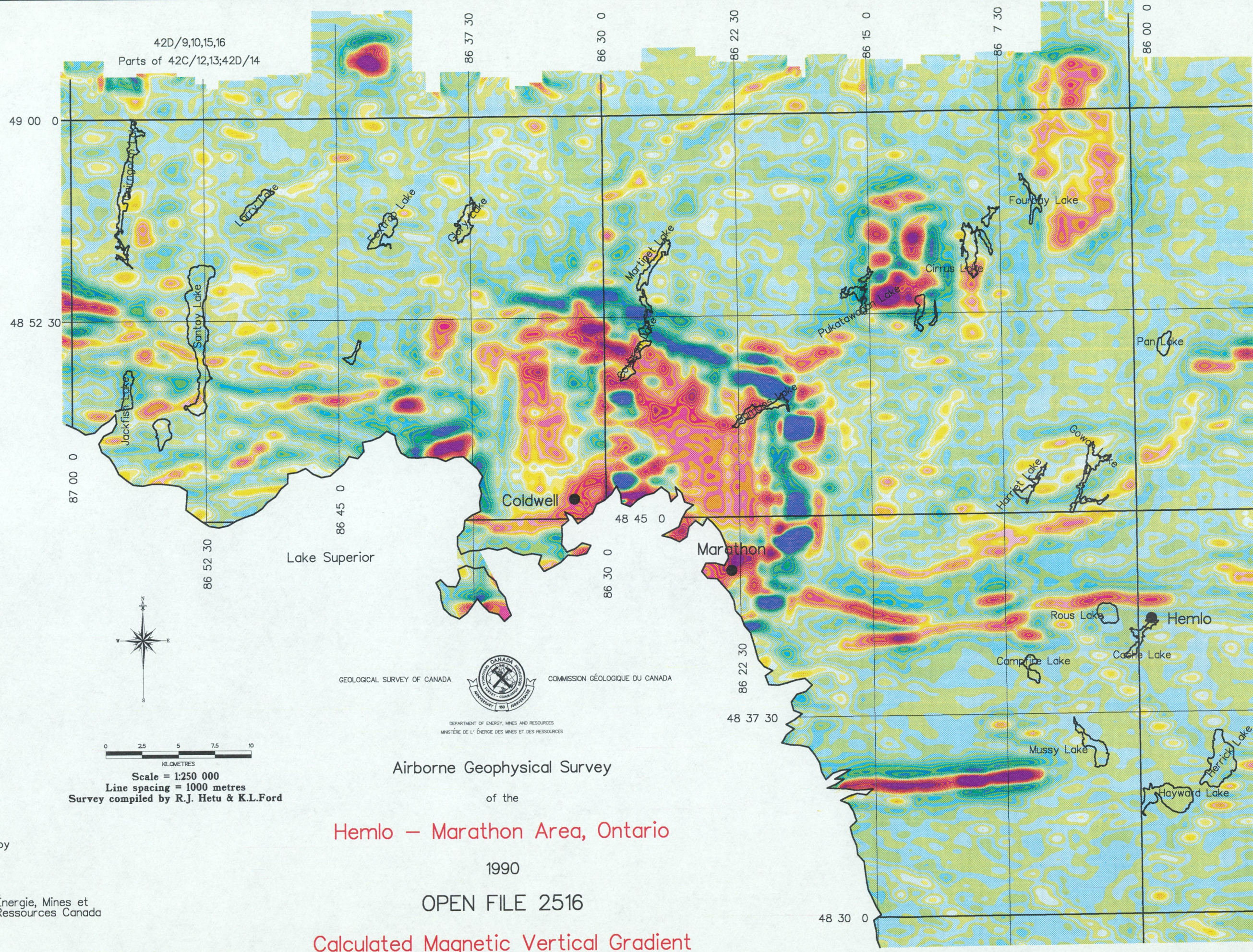
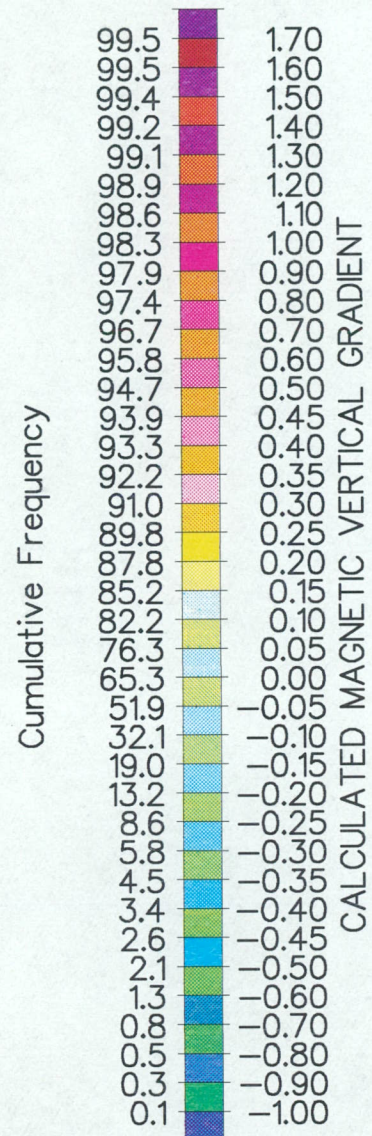
OPEN FILE 2516

Total Magnetic Field (nT)

Survey flown, compiled and funded by
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Airborne Geophysical Survey
of the
Hemlo – Marathon Area, Ontario

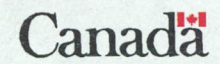
1990

OPEN FILE 2516

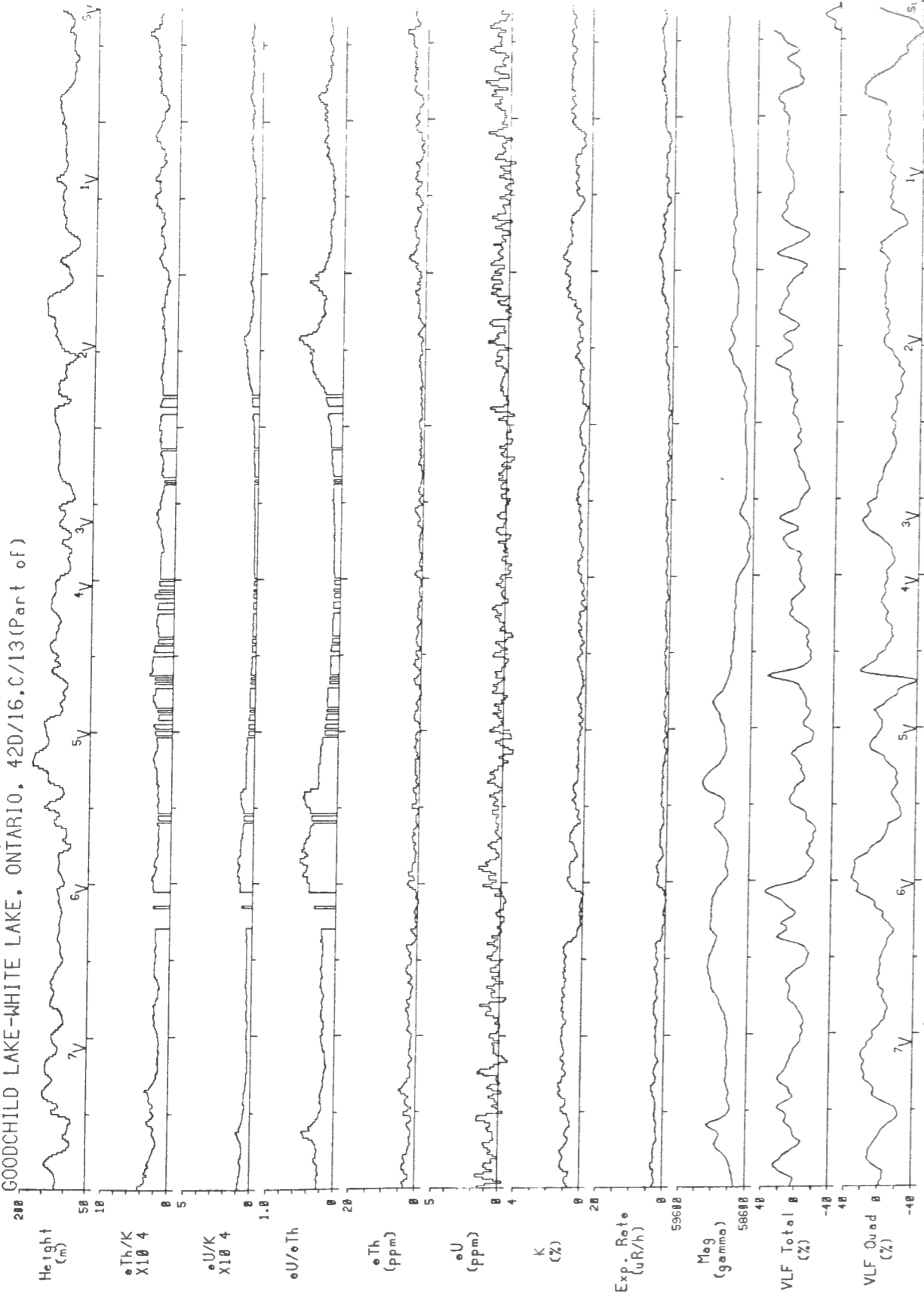
Calculated Magnetic Vertical Gradient

Survey flown, compiled and funded by
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Énergie, Mines et Ressources Canada

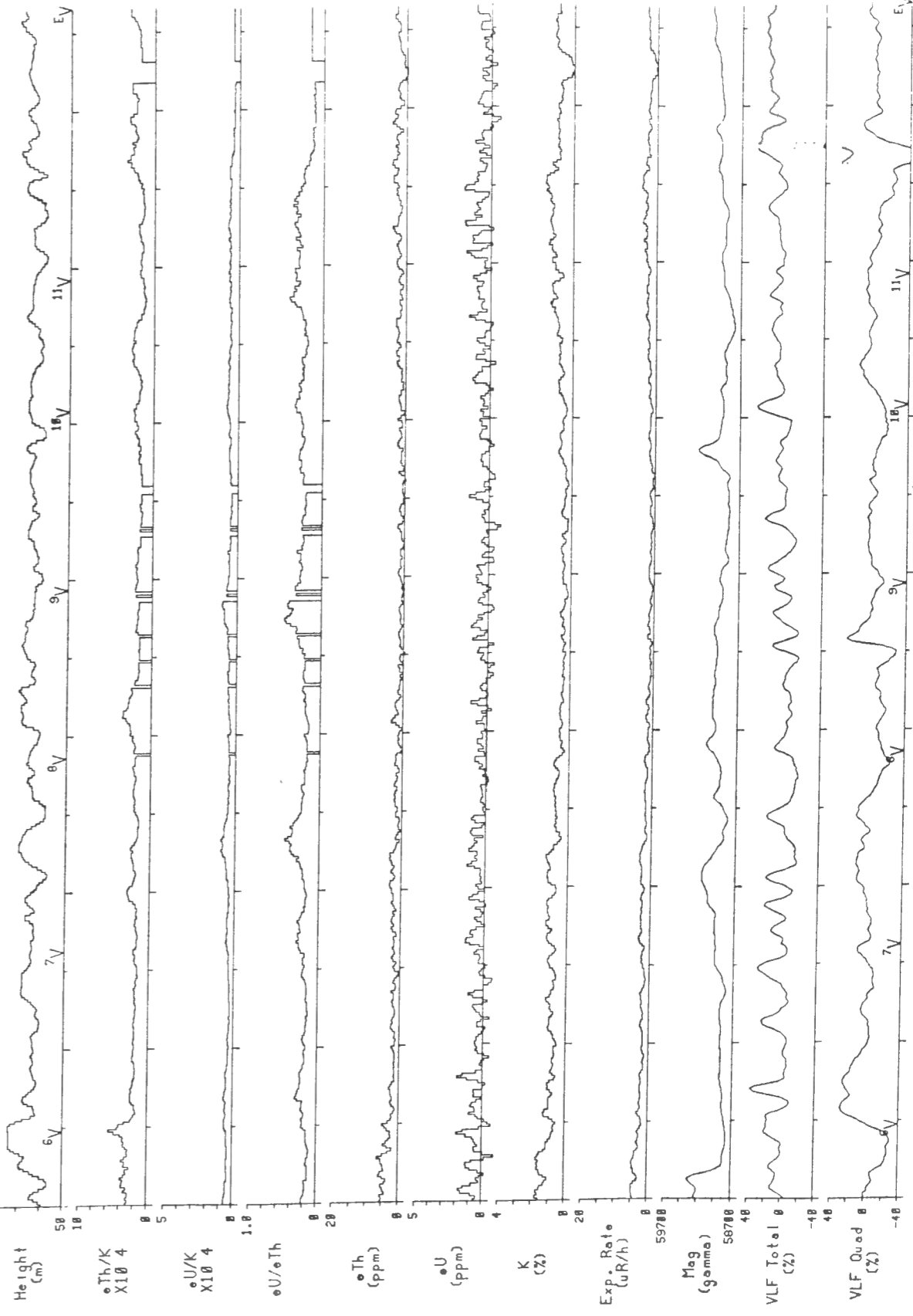


Hemlo-Schreiber Area, Ontario, 1990.
GOODCHILD LAKE-WHITE LAKE, ONTARIO, 42D/16.C/13 (Part of)



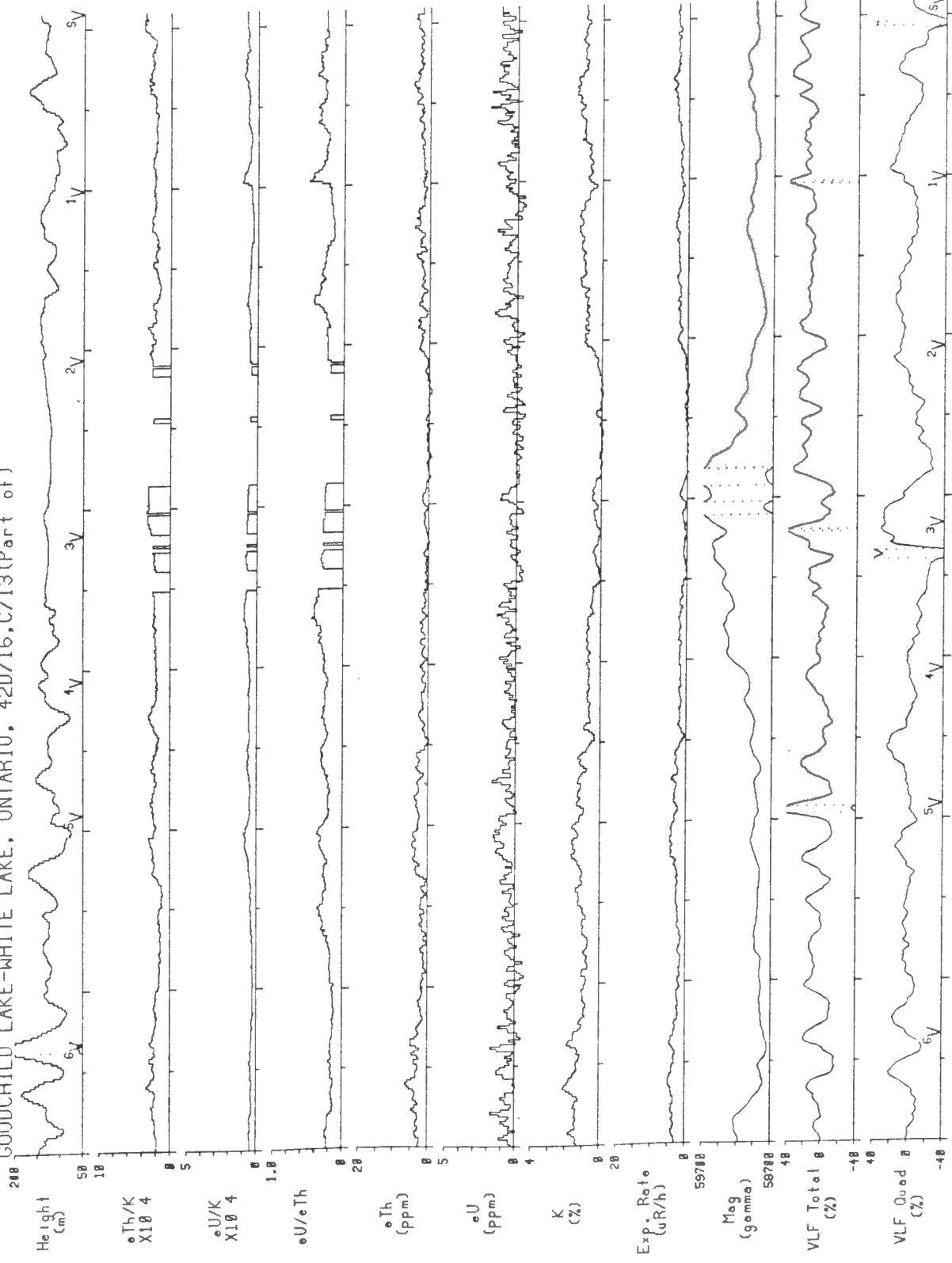
Line 109 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
GOODCHILD LAKE-WHITE LAKE, ONTARIO, 42D/16.C/13 (Part of)



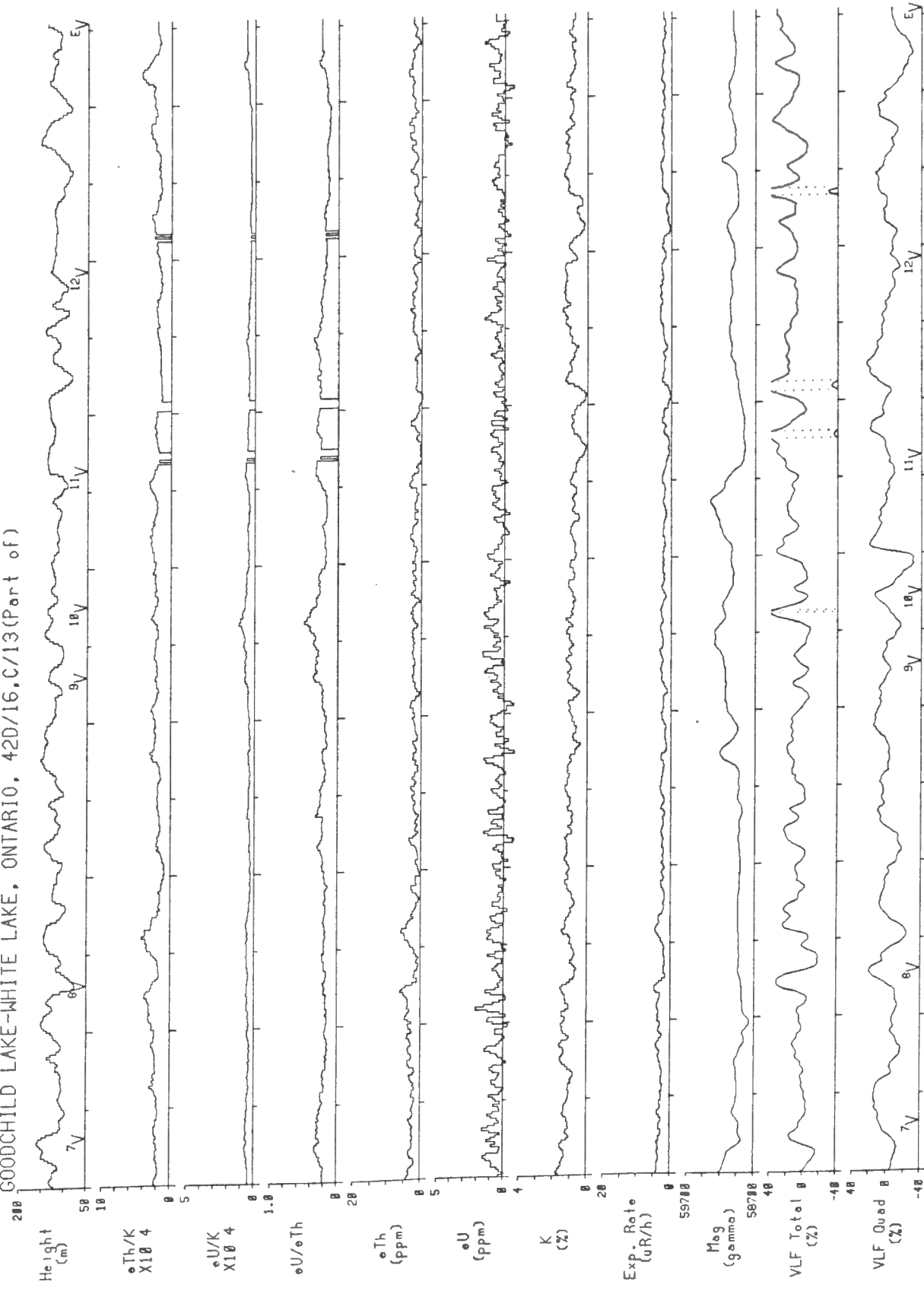
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Hemlo-Schreiber Area, Ontario, 1990.
 GOODCHILD LAKE-WHITE LAKE, ONTARIO, 42D/16.C/13(Part of)



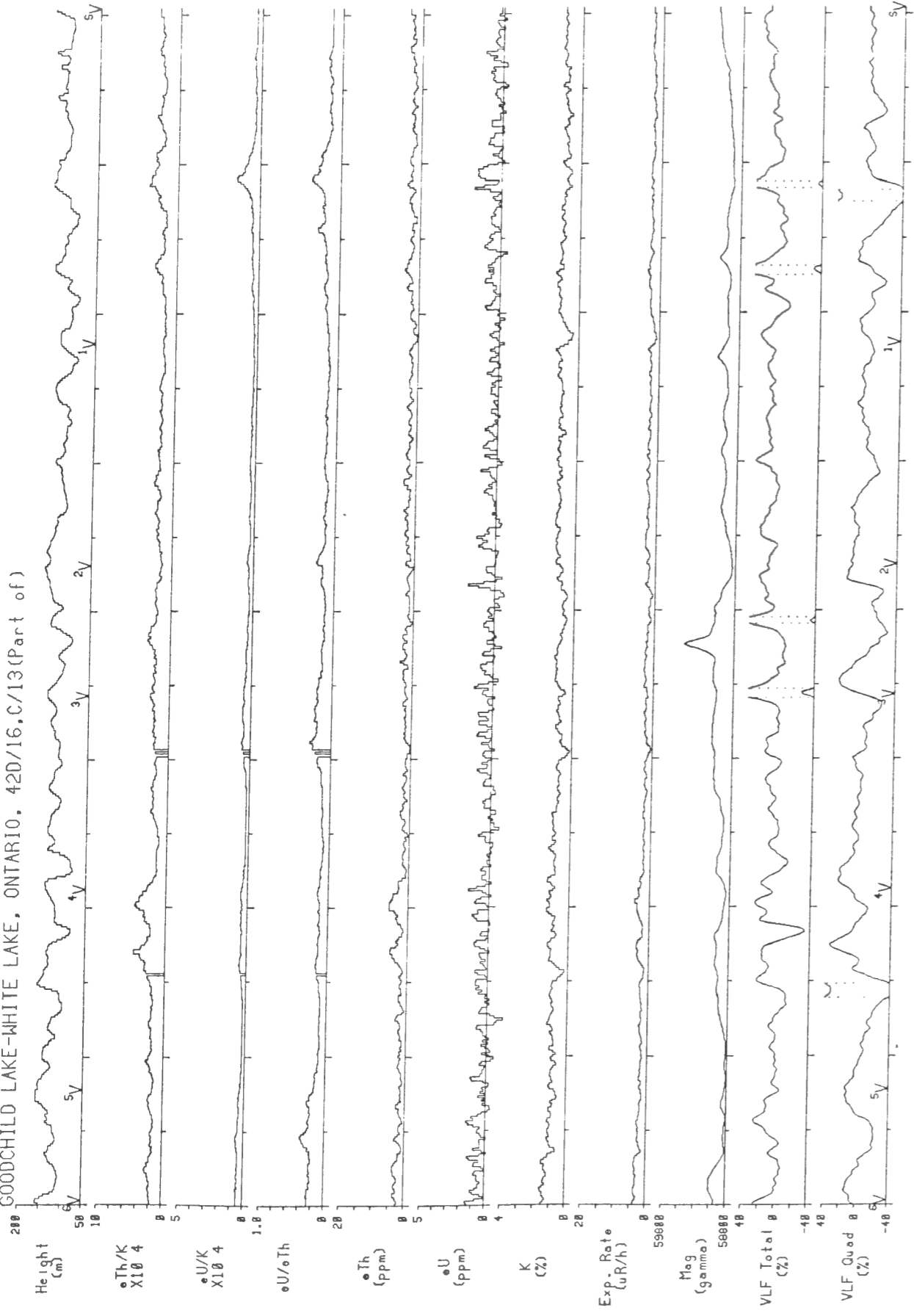
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Hemlo-Schreiber Area, Ontario, 1990.
 GOODCHILD LAKE-WHITE LAKE, ONTARIO, 42D/16.C/13(Part of)



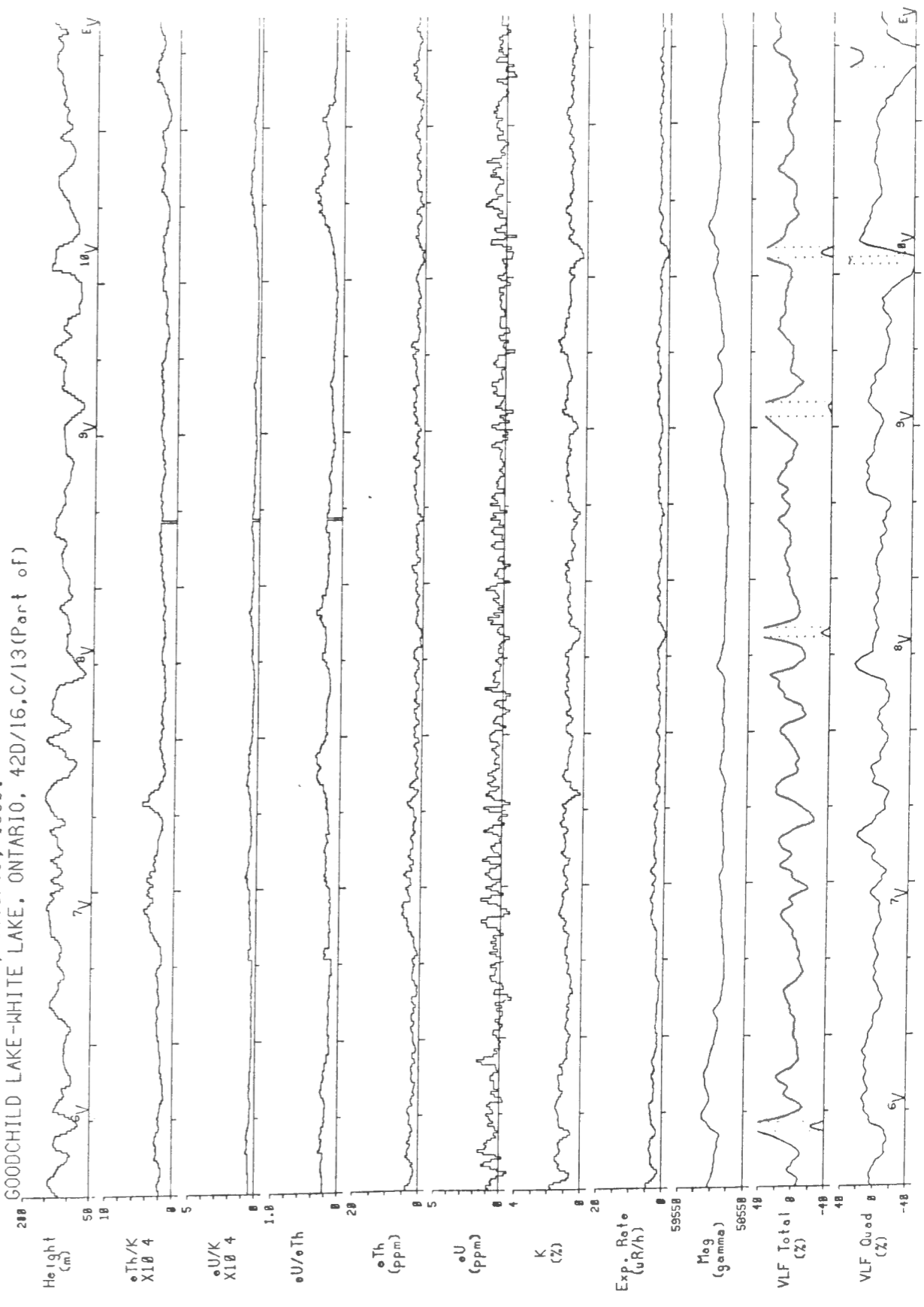
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Hemlo-Schreiber Area, Ontario, 1990.
GOODCHILD LAKE-WHITE LAKE, ONTARIO, 42D/16.C/13(Part of)



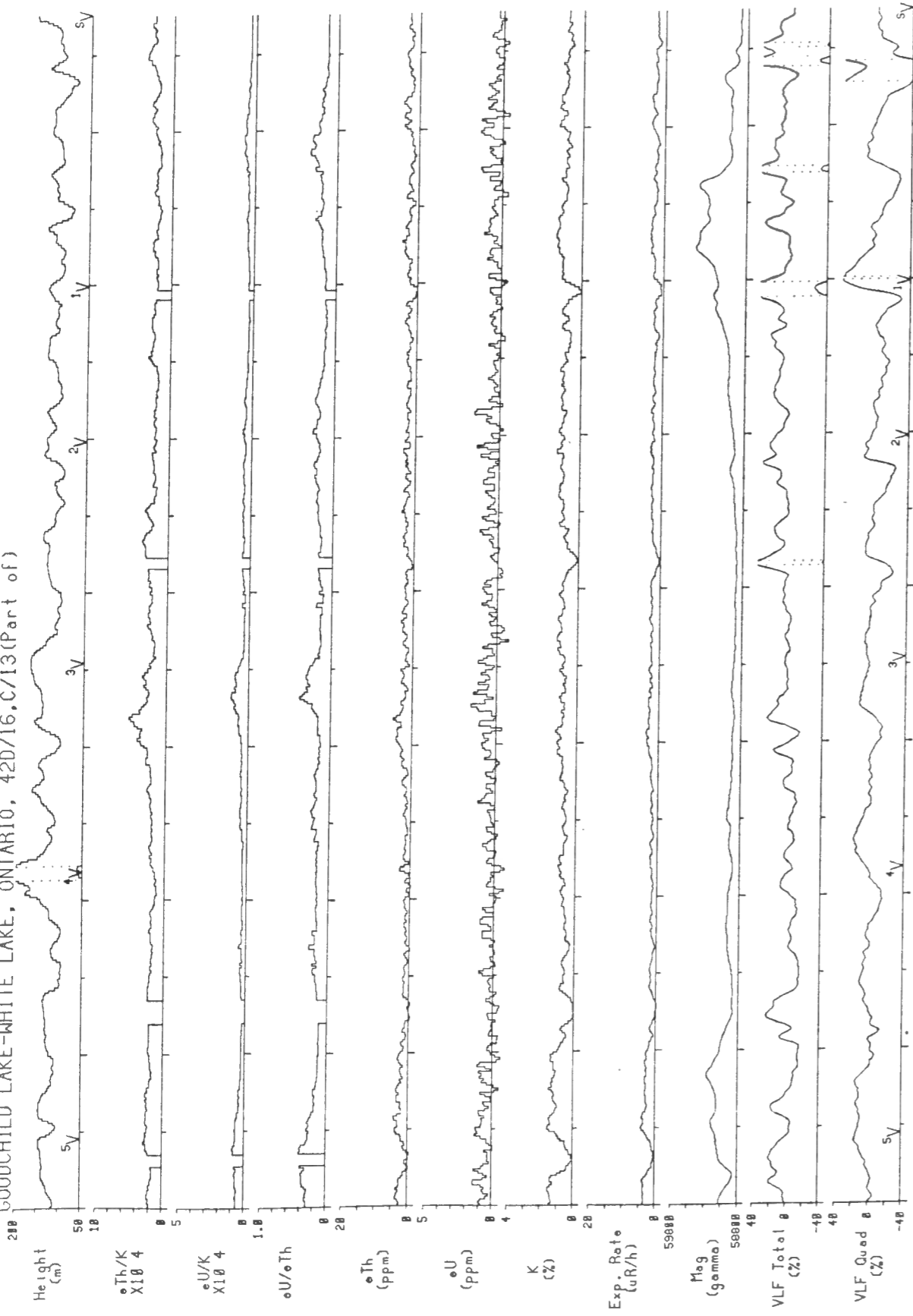
Line 113 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
GOODCHILD LAKE-WHITE LAKE, ONTARIO, 42D/16.C/13(Part of)

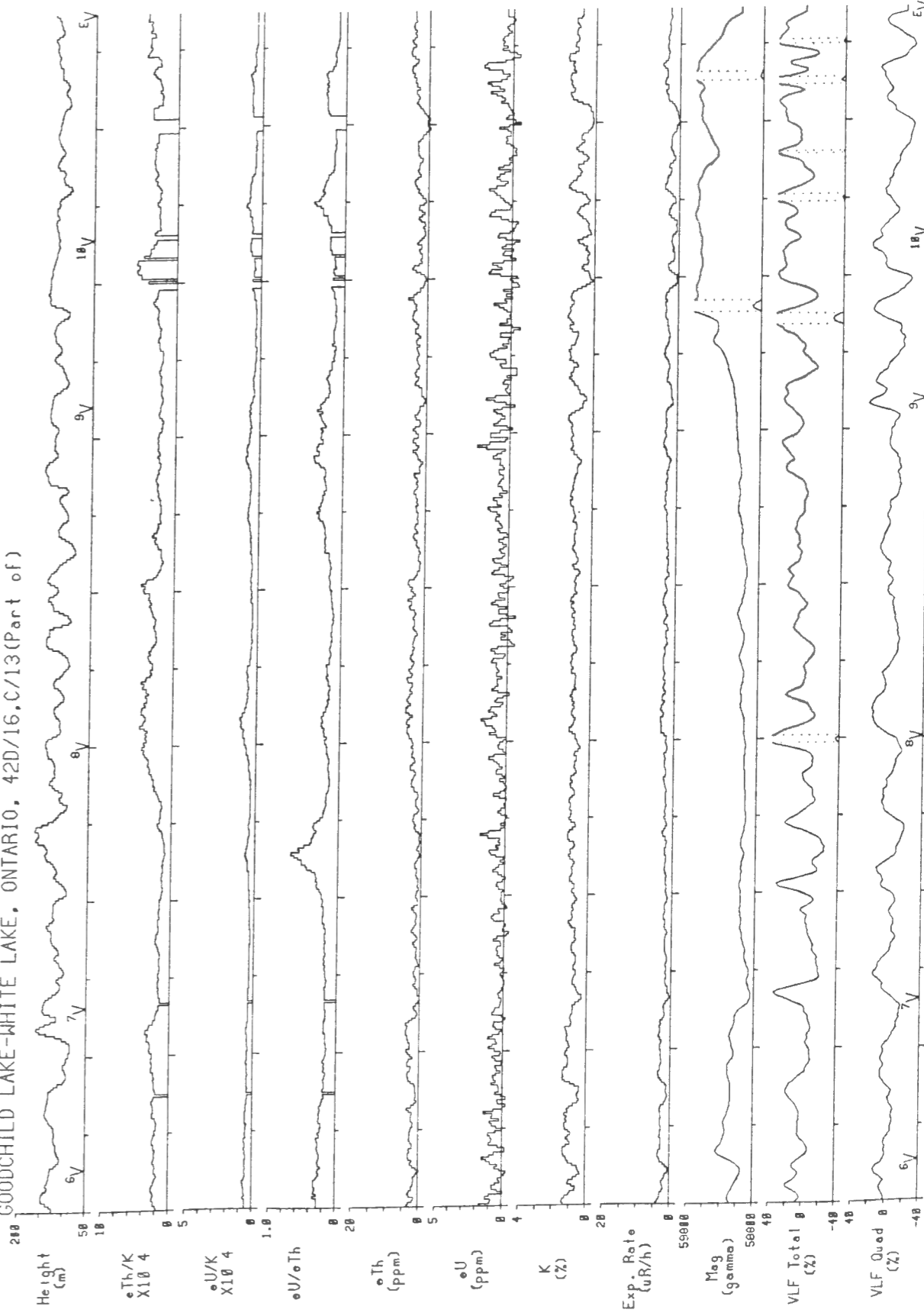


Line 114 | 2 km | Scale 1:150000

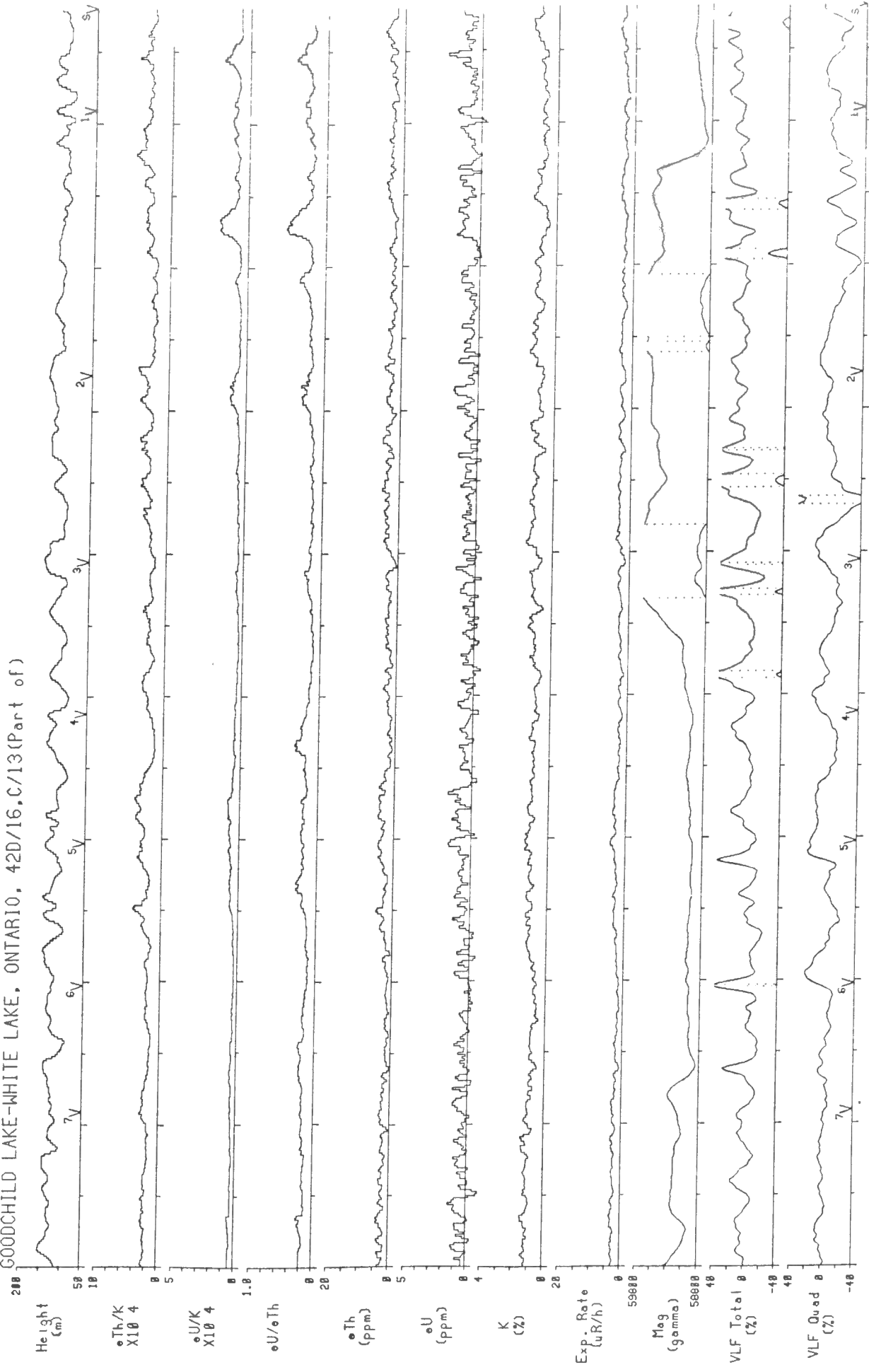
Hemlo-Schreiber Area, Ontario, 1990.
GOODCHILD LAKE-WHITE LAKE, ONTARIO, 42D/16.C/13(Part of)



Hemlo-Schreiber Area, Ontario, 1990.
GOODCHILD LAKE-WHITE LAKE, ONTARIO, 42D/16.C/13(Part of)

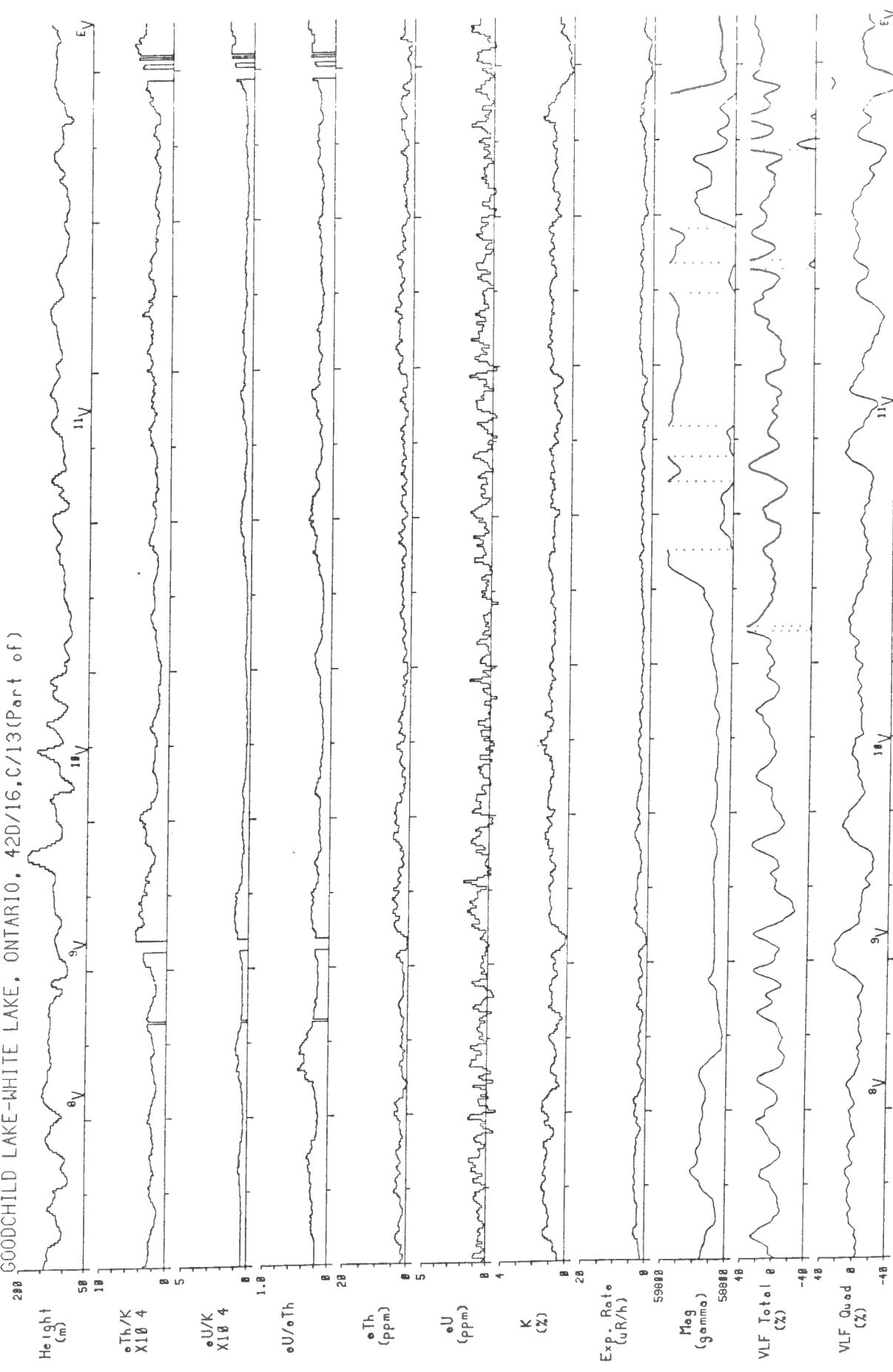


Hemlo-Schreiber Area, Ontario, 1990.
 GOODCHILD LAKE-WHITE LAKE, ONTARIO, 42D/16.C/13(Part of)



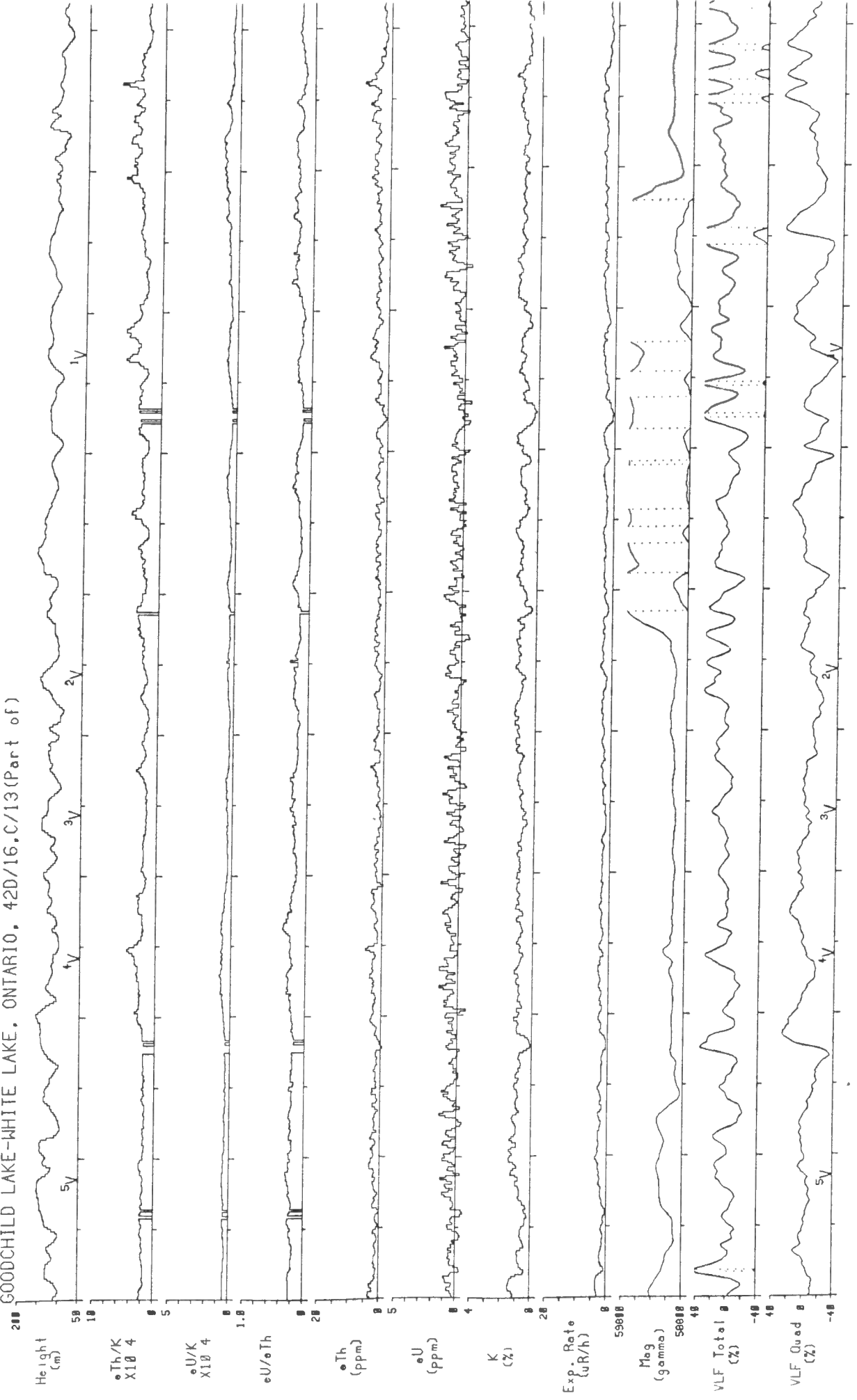
Line 117 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
 GOODCHILD LAKE-WHITE LAKE, ONTARIO, 42D/16.C/13(Part of)



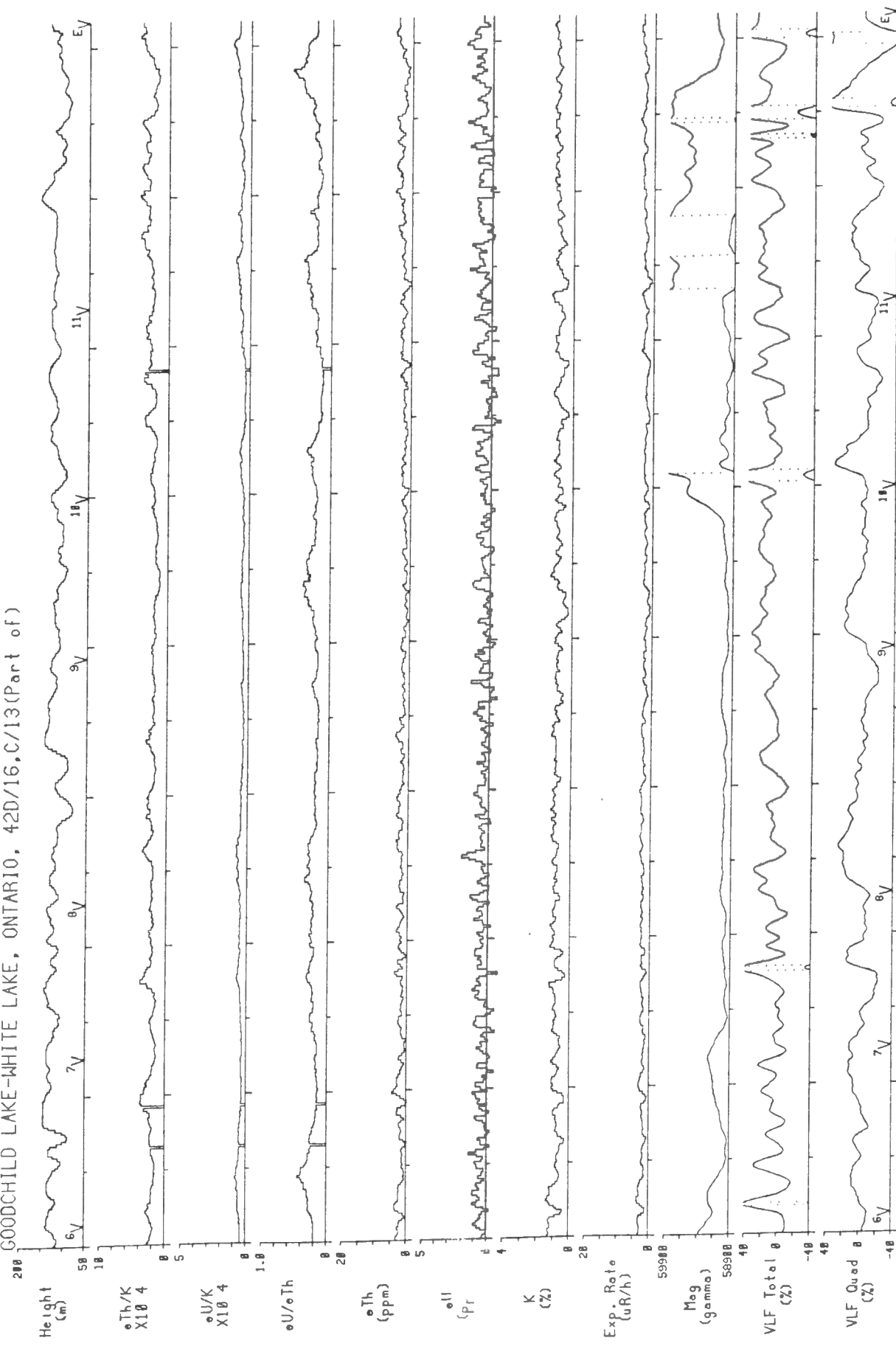
Line 118 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
 GOODCHILD LAKE-WHITE LAKE, ONTARIO, 42D/16.C/13(Part of)



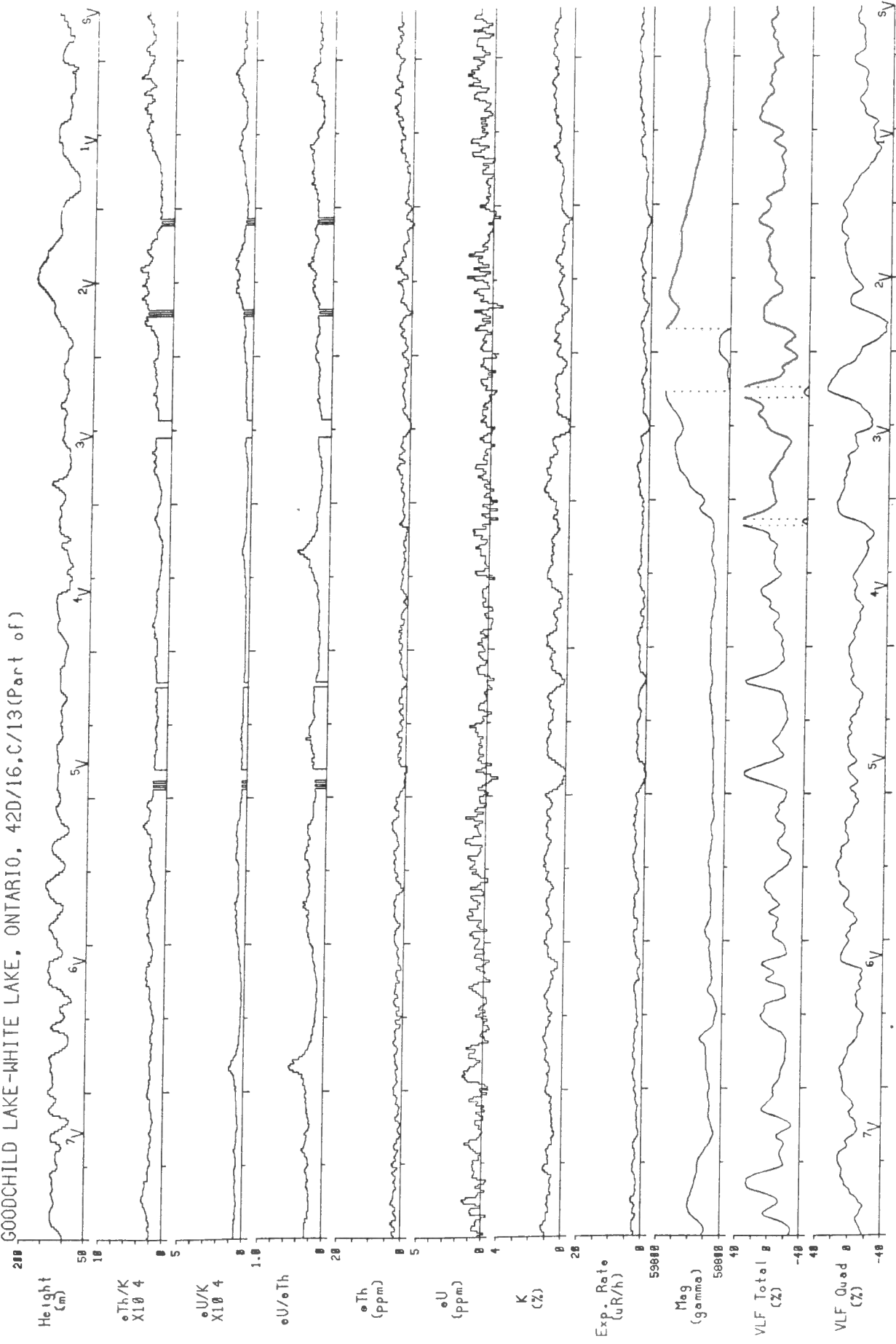
Line 119 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
 GOODCHILD LAKE-WHITE LAKE, ONTARIO, 42D/16.C/13(Part of)



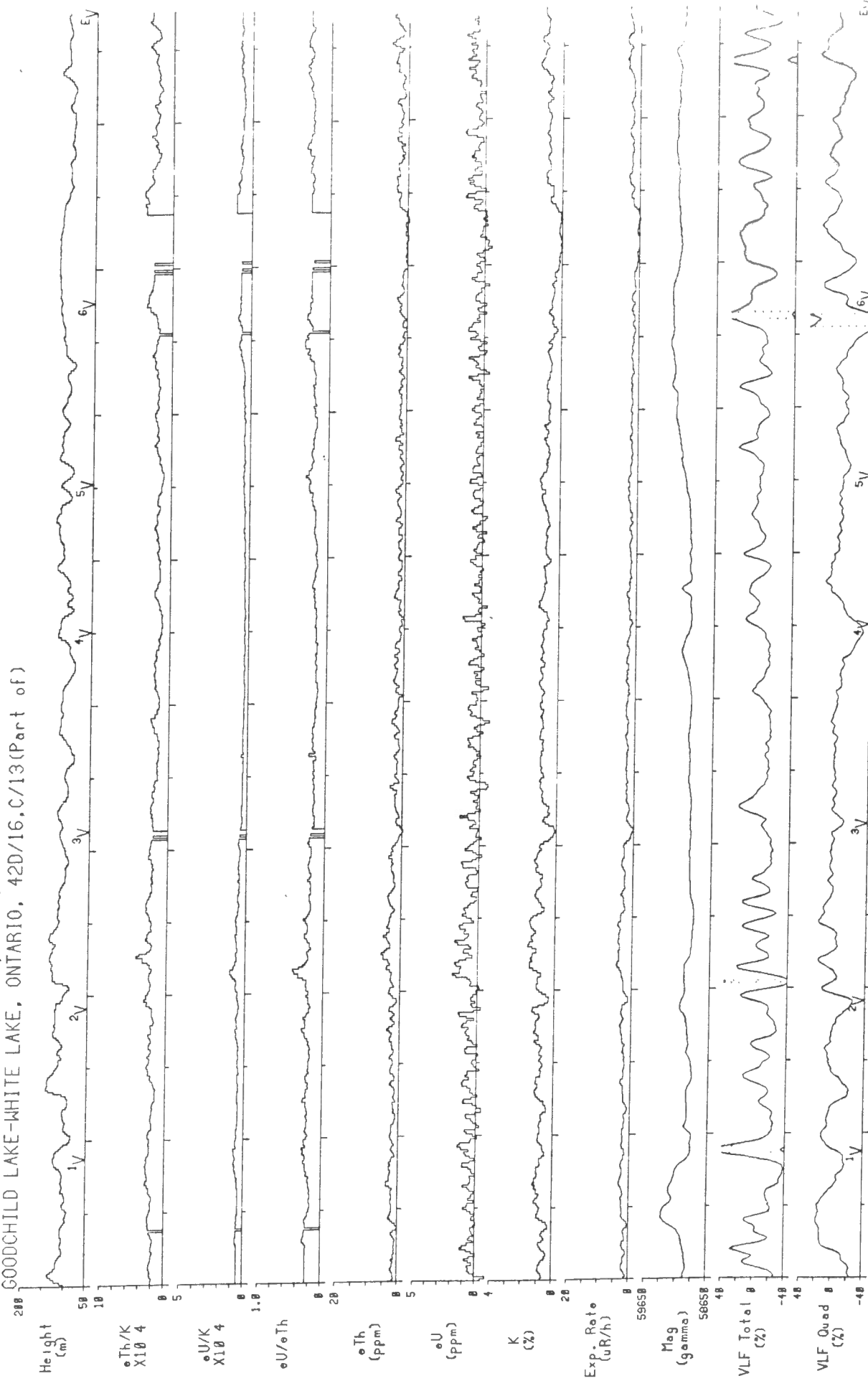
Line 120 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
GOODCHILD LAKE-WHITE LAKE, ONTARIO, 42D/16.C/13 (Part of)



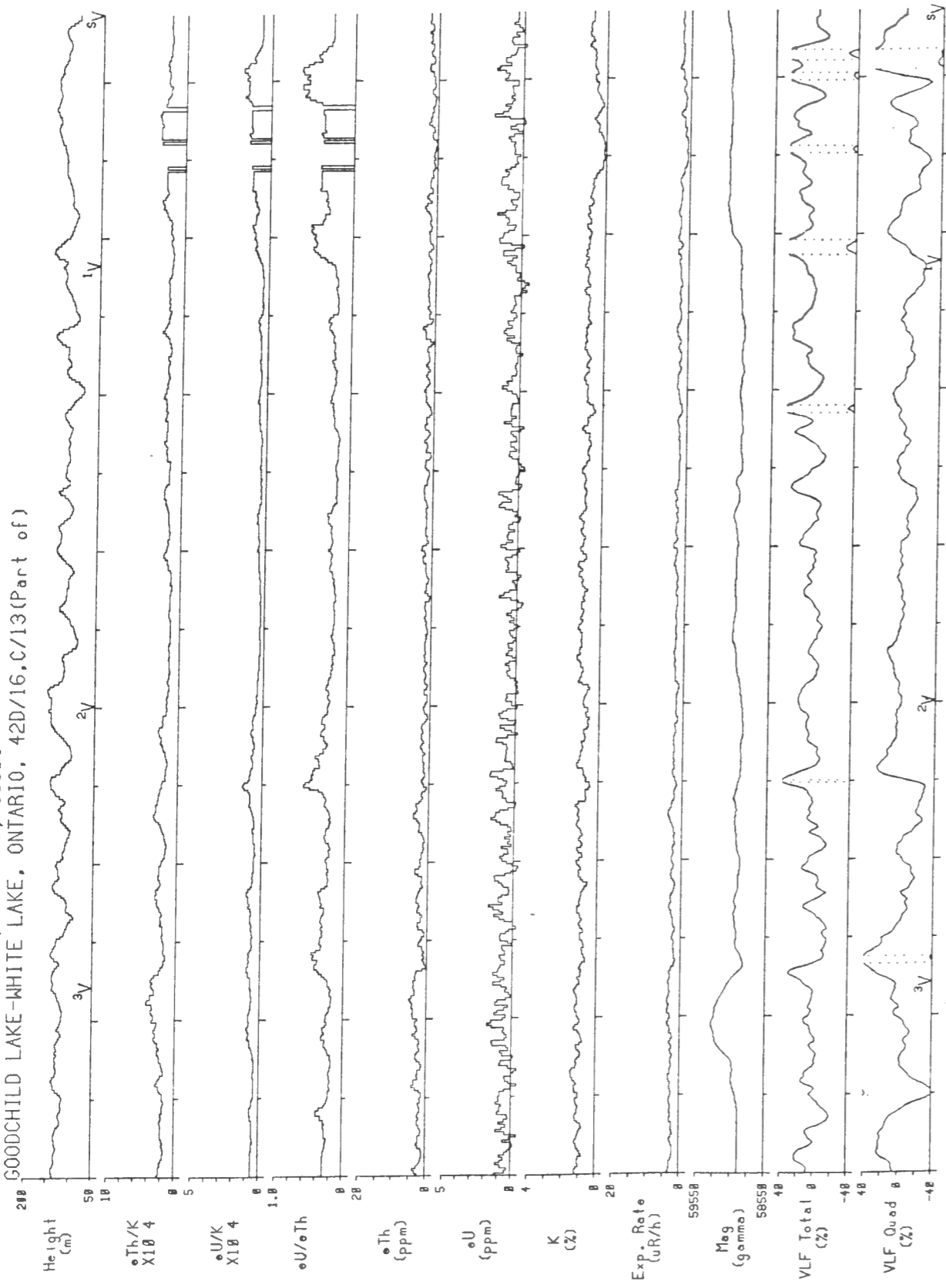
Line 121 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
GOODCHILD LAKE-WHITE LAKE, ONTARIO, 42D/16.C/13 (Part of)

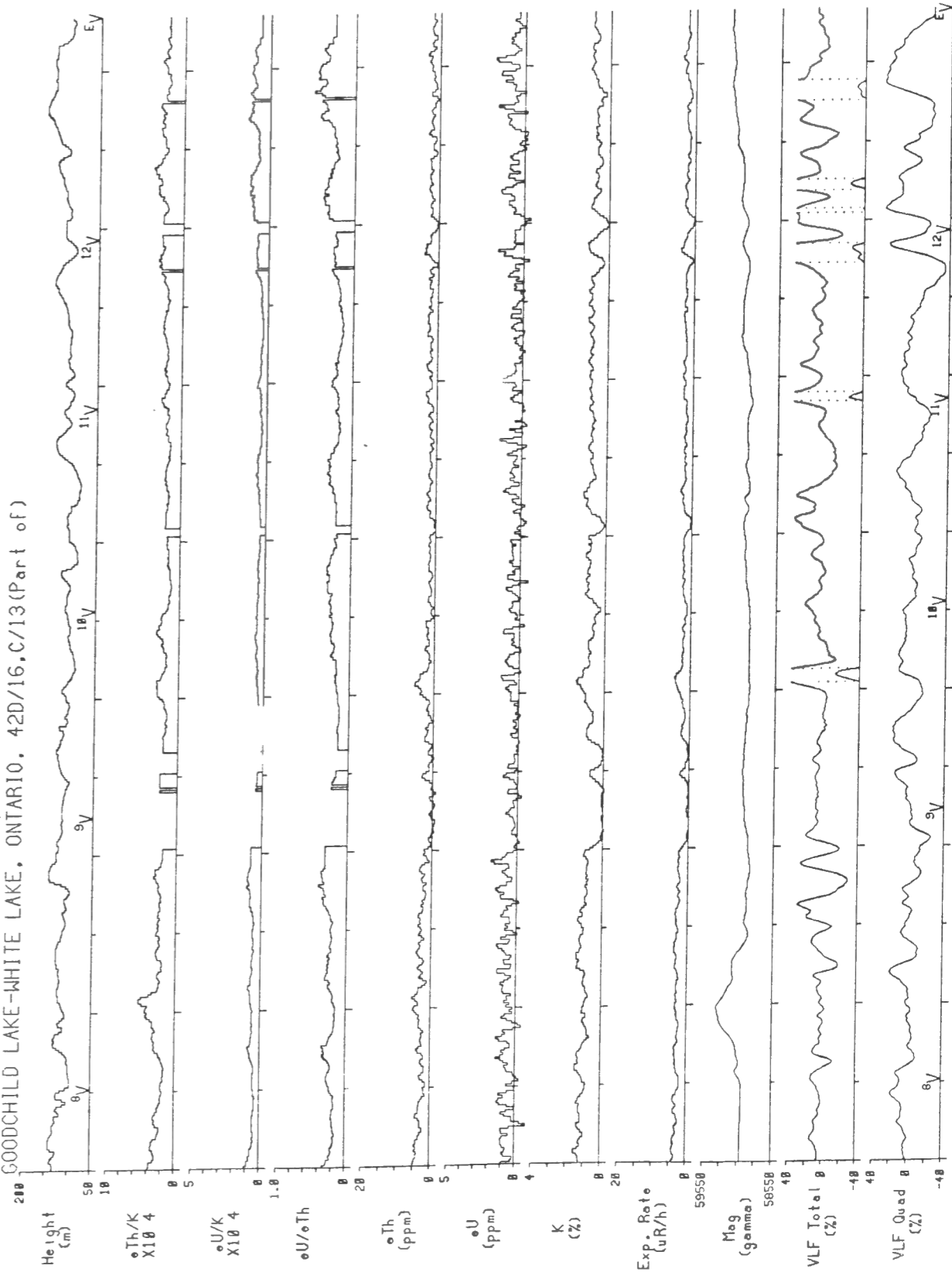


Line 122 | 2 km | Scale 1:150000

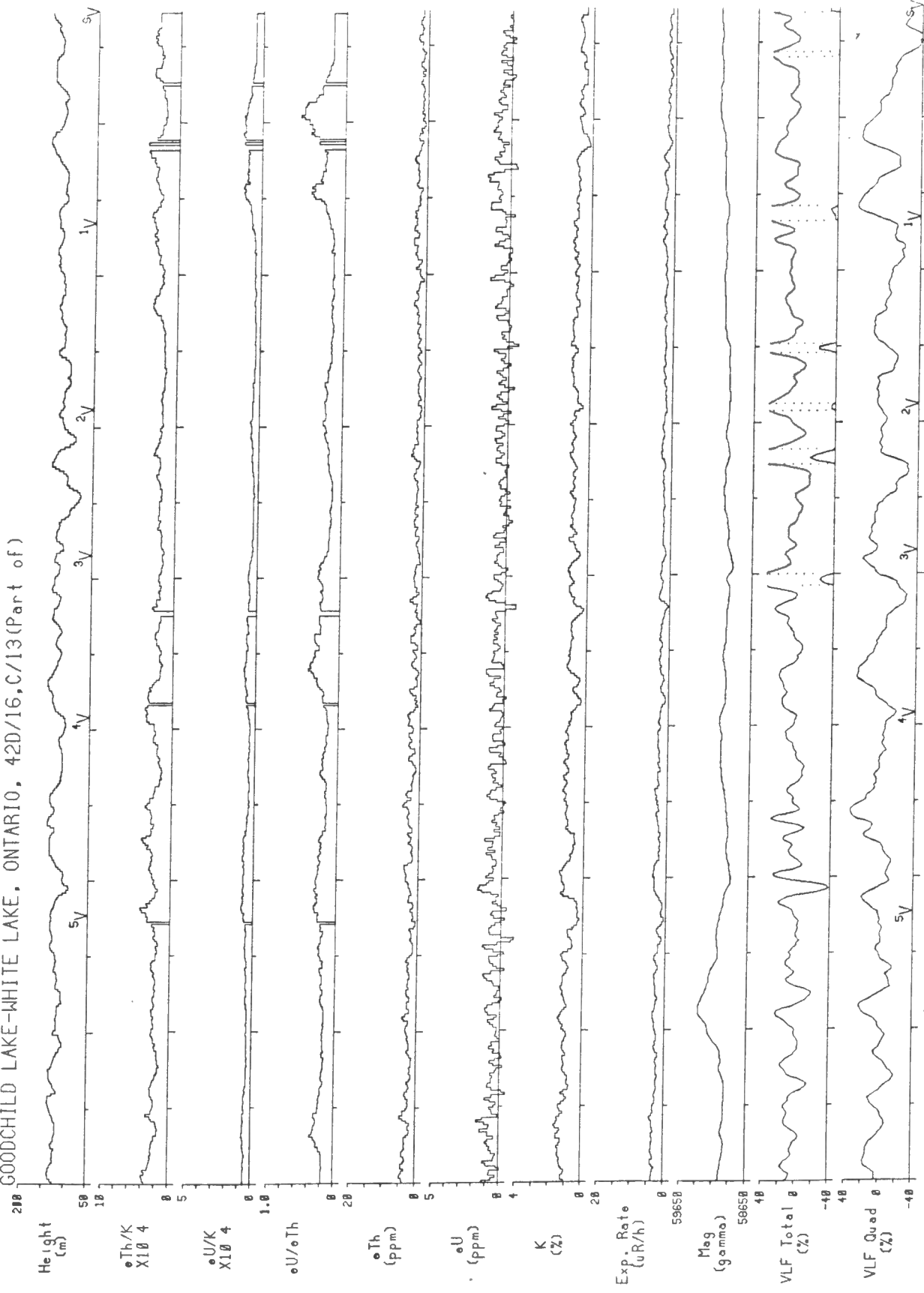
Hemlo-Schreiber Area, Ontario, 1990.
 GOODCHILD LAKE-WHITE LAKE, ONTARIO, 42D/16.C/13(Part of)



Hemlo-Schreiber Area, Ontario, 1990.
 GOODCHILD LAKE-WHITE LAKE, ONTARIO, 42D/16.C/13(Part of)

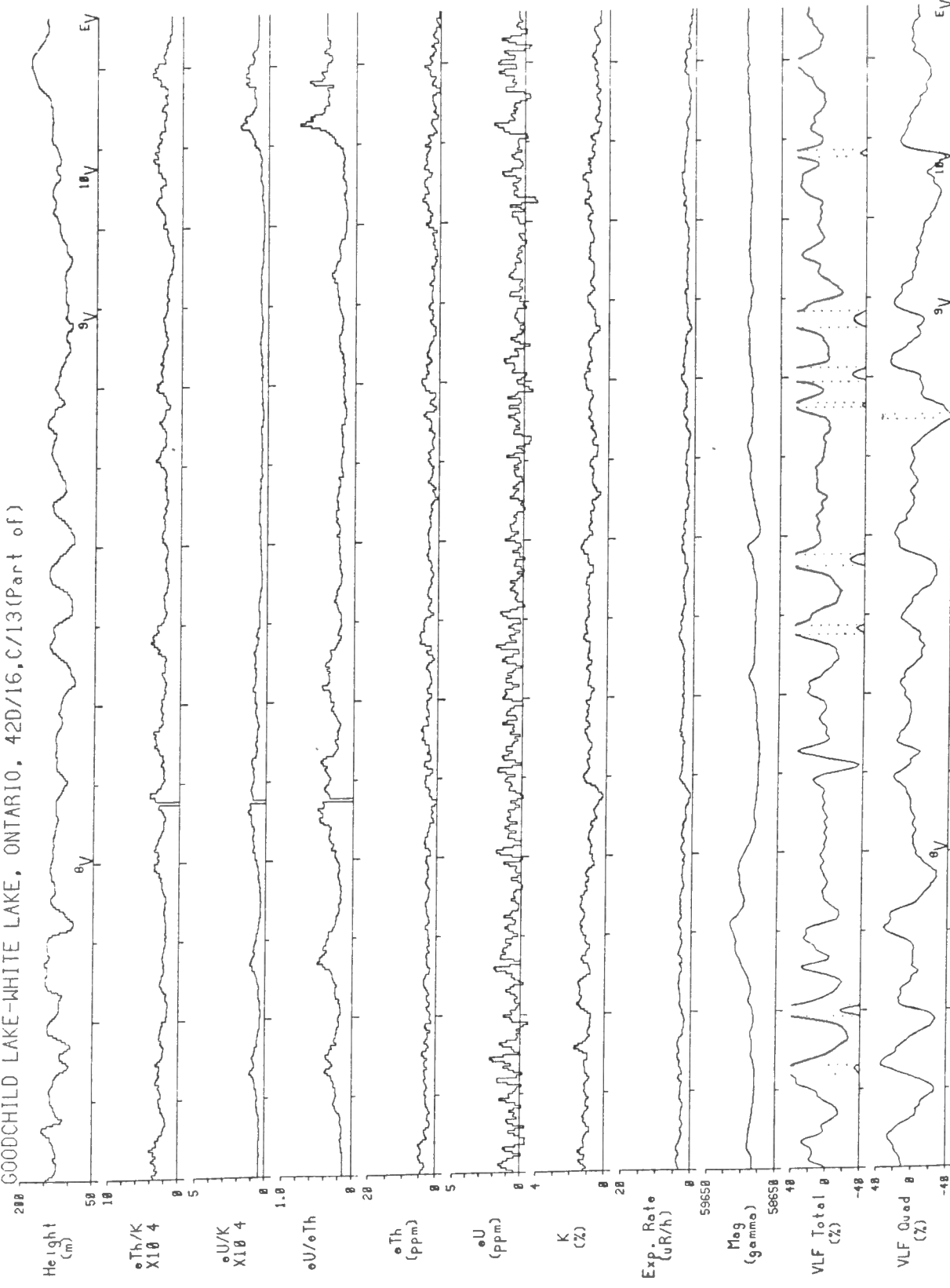


Hemlo-Schreiber Area, Ontario, 1990.
 GOODCHILD LAKE-WHITE LAKE, ONTARIO, 42D/16,C/13(Part of)



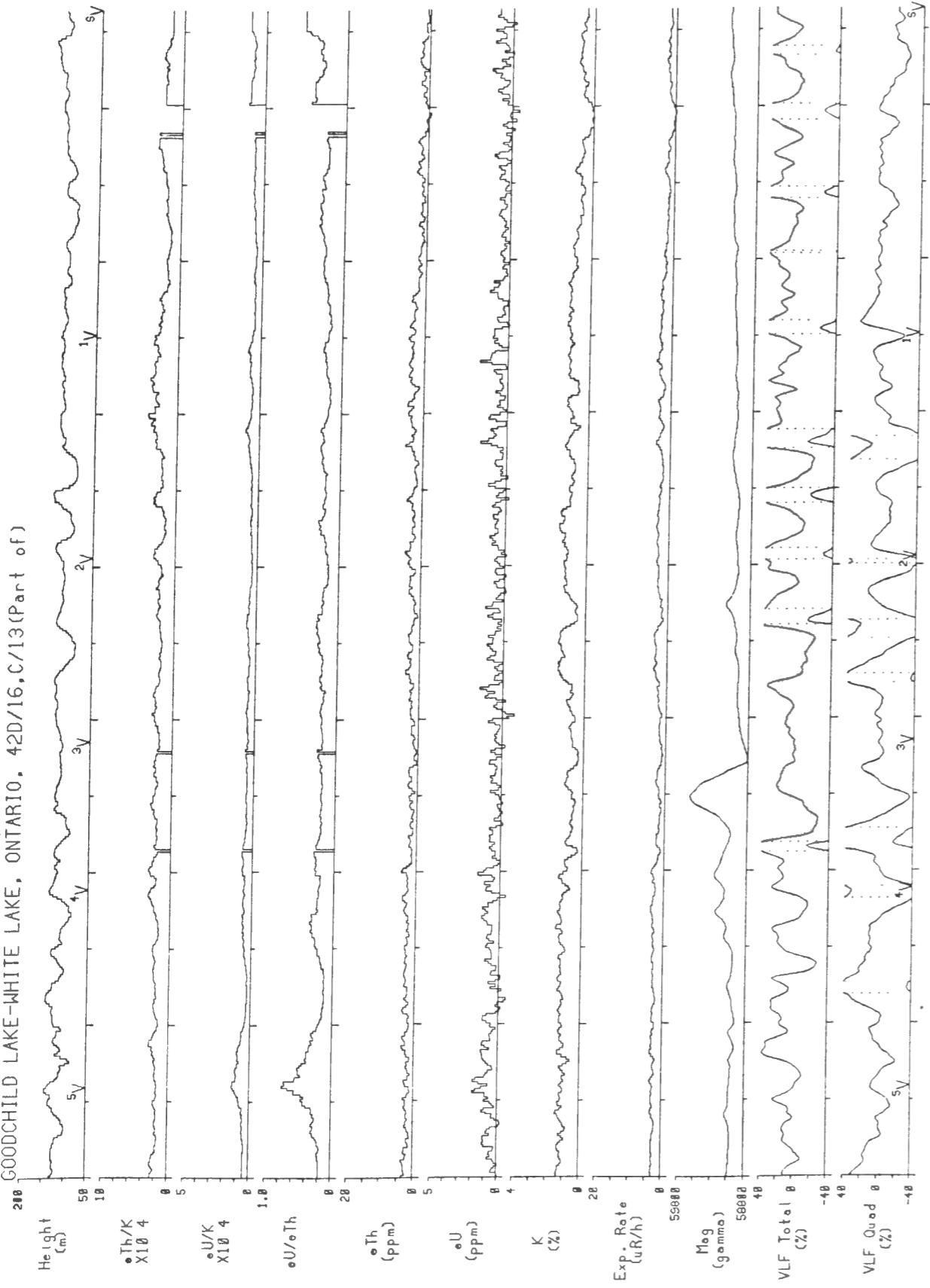
Line 125 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
 GOODCHILD LAKE-WHITE LAKE, ONTARIO, 42D/16,C/13(Part of)



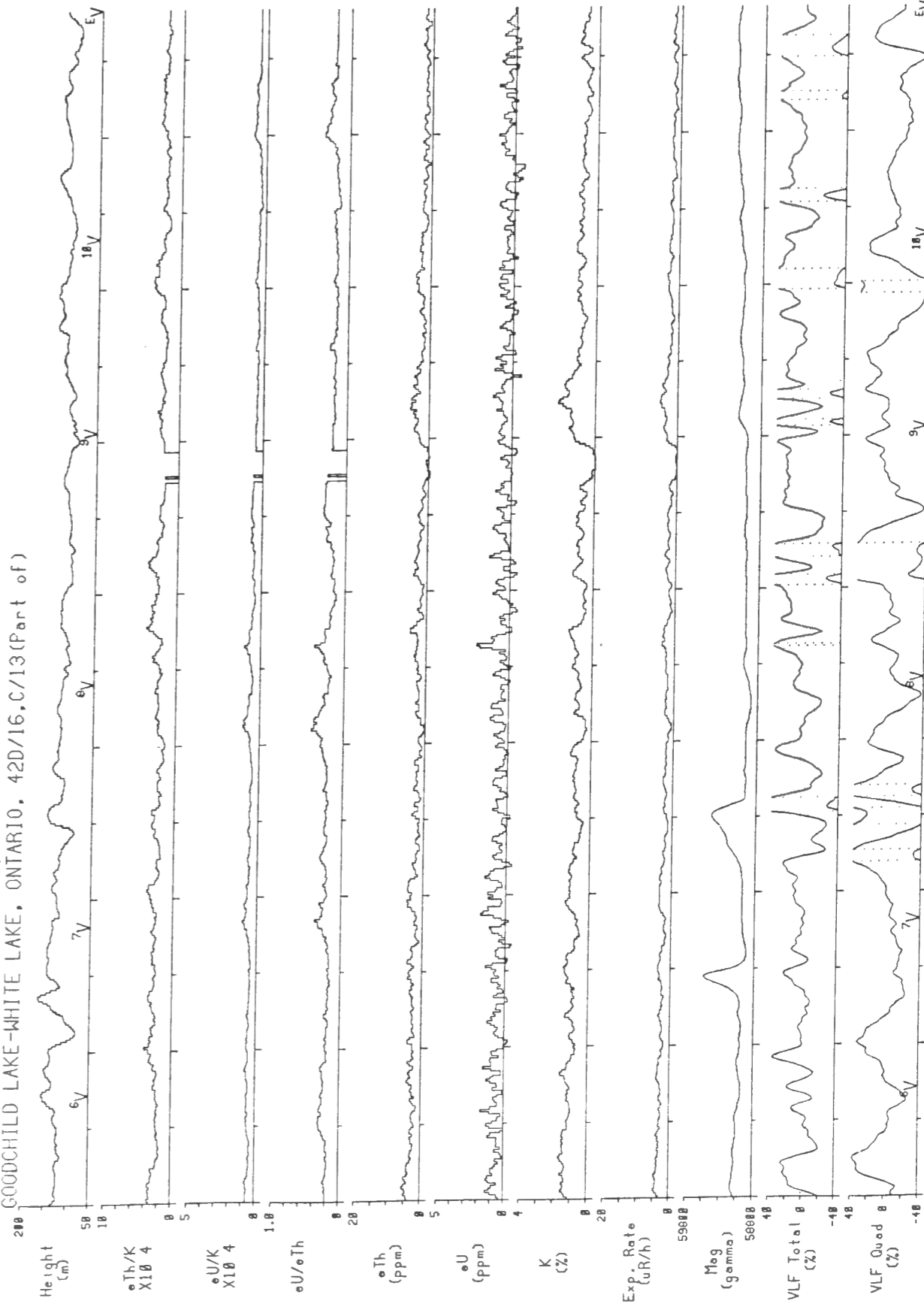
Line 126 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
GOODCHILD LAKE-WHITE LAKE, ONTARIO. 42D/16.C/13(Part of)

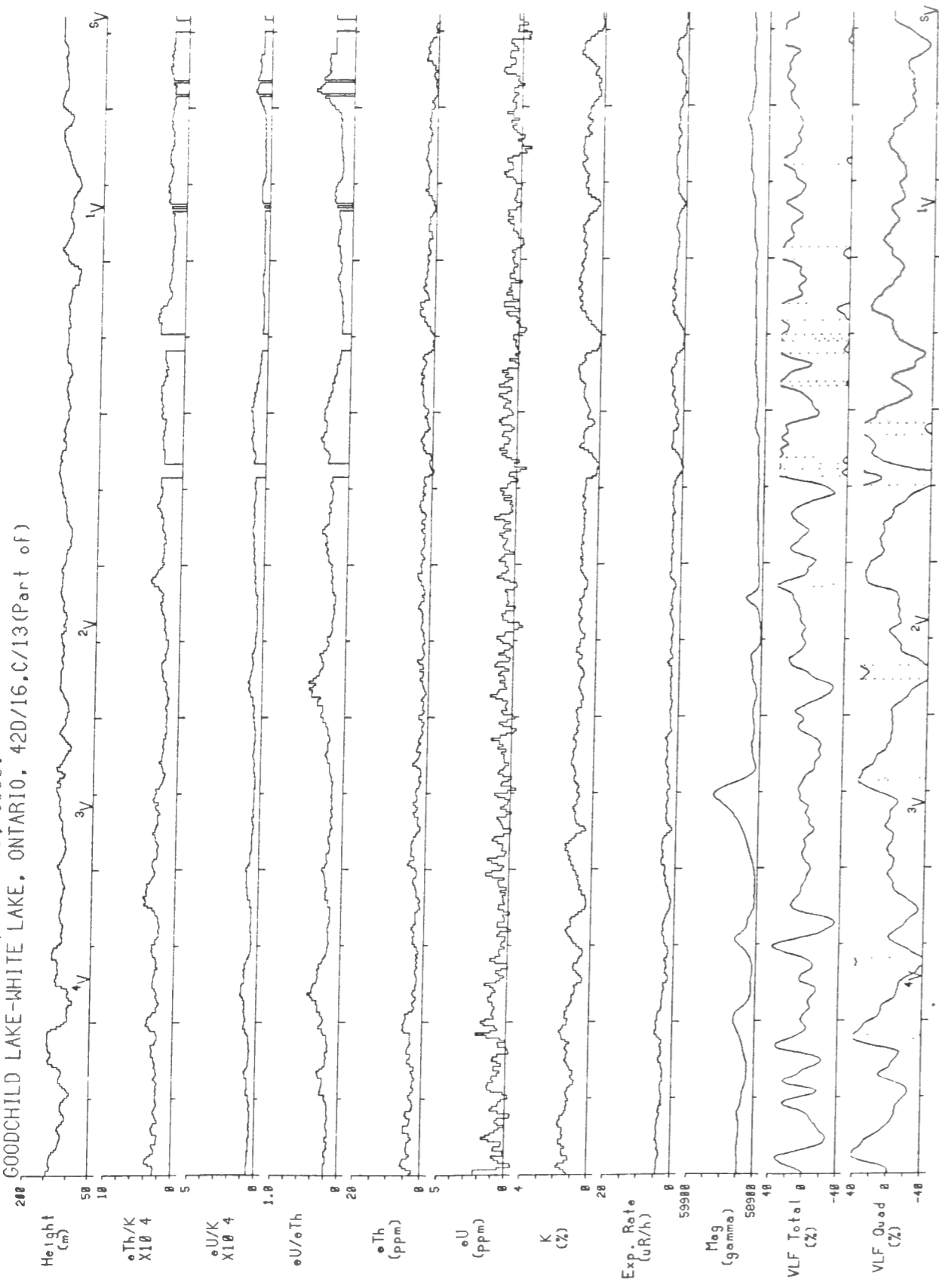


Line 127 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
GOODCHILD LAKE-WHITE LAKE, ONTARIO. 42D/16.C/13(Part of)

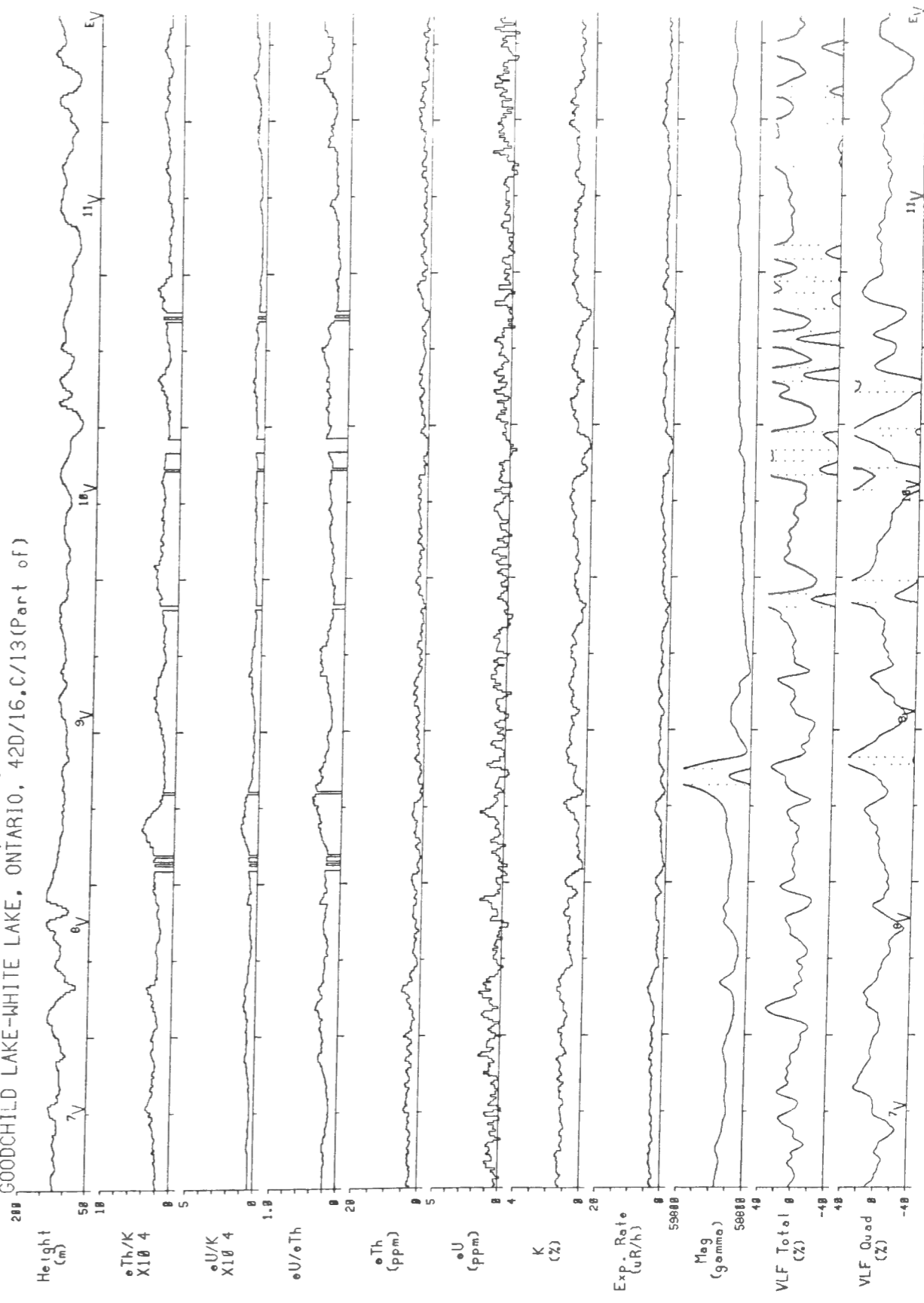


Hemlo-Schreiber Area, Ontario, 1990.
GOODCHILD LAKE-WHITE LAKE, ONTARIO, 42D/16.C/13(Part of)



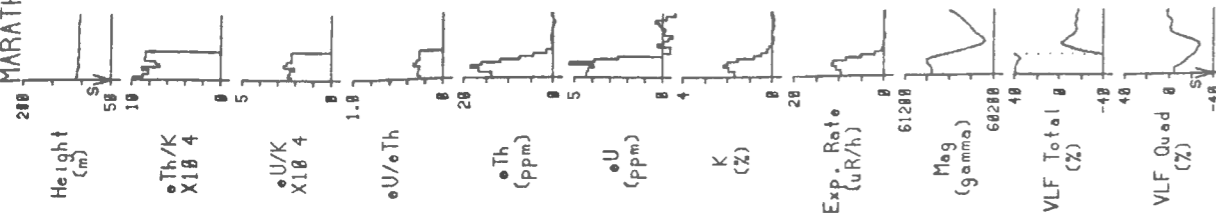
Line 129 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
GOODCHILD LAKE-WHITE LAKE, ONTARIO, 42D/16.C/13(Part of)



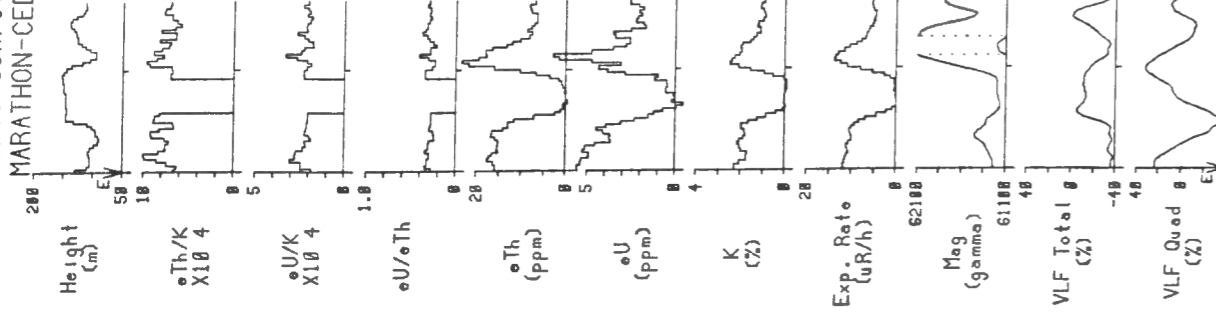
Line 130 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
 MARATHON-CEDAR LAKE, ONTARIO, 42D/9.C/12(Part of)



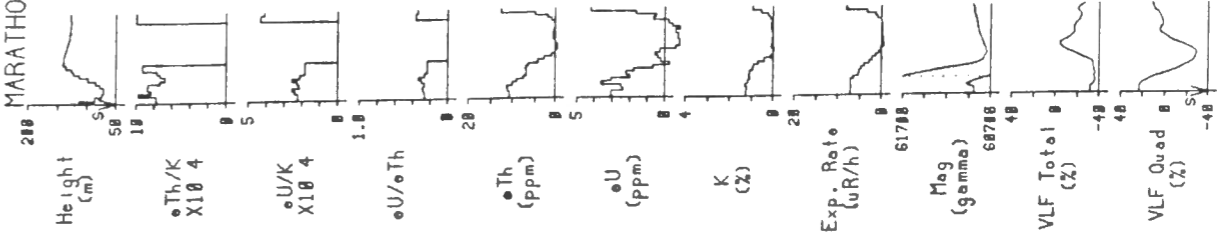
Line 90 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
 MARATHON-CEDAR LAKE, ONTARIO, 42D/9.C/12(Part of)



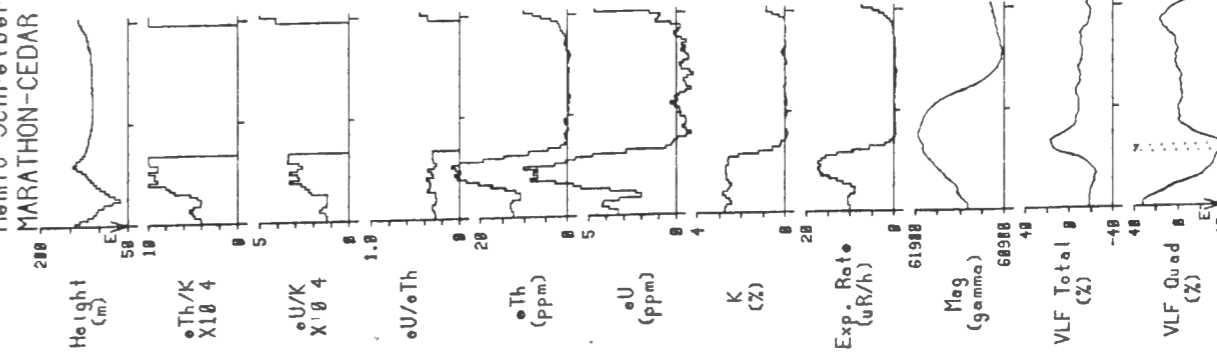
Line 91 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
 MARATHON-CEDAR LAKE, ONTARIO, 42D/9.C/12(Part of)



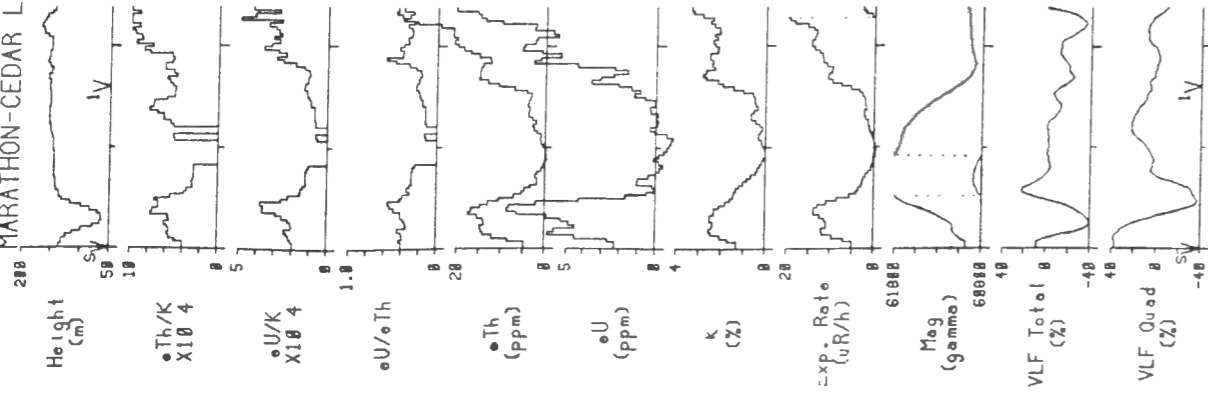
Line 92 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
 MARATHON-CEDAR LAKE, ONTARIO, 42D/9.C/12(Part of)



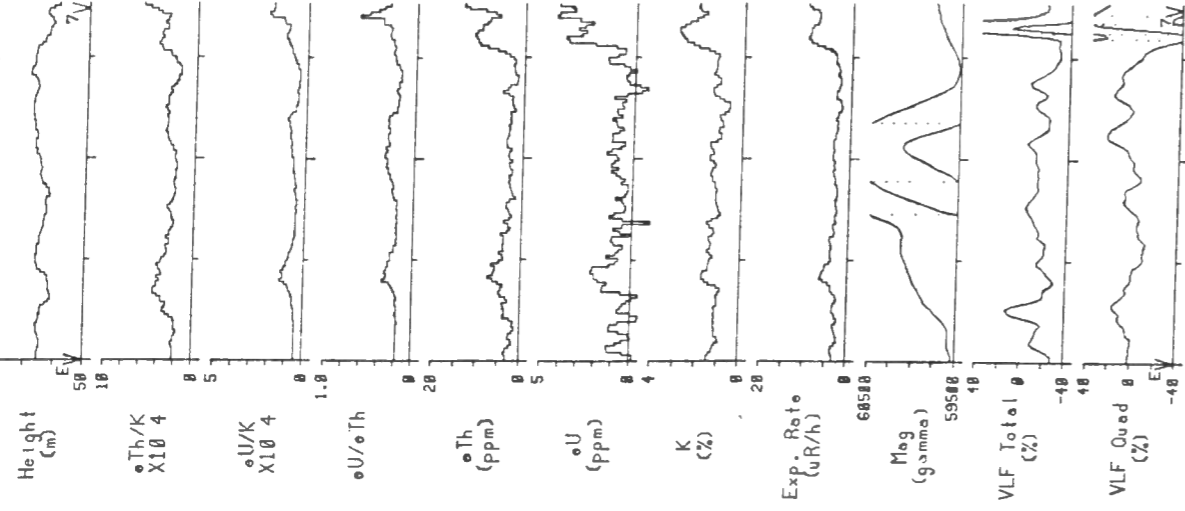
Line 93 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
MARATHON-CEDAR LAKE, ONTARIO, 42D/9.C/12(Part of)



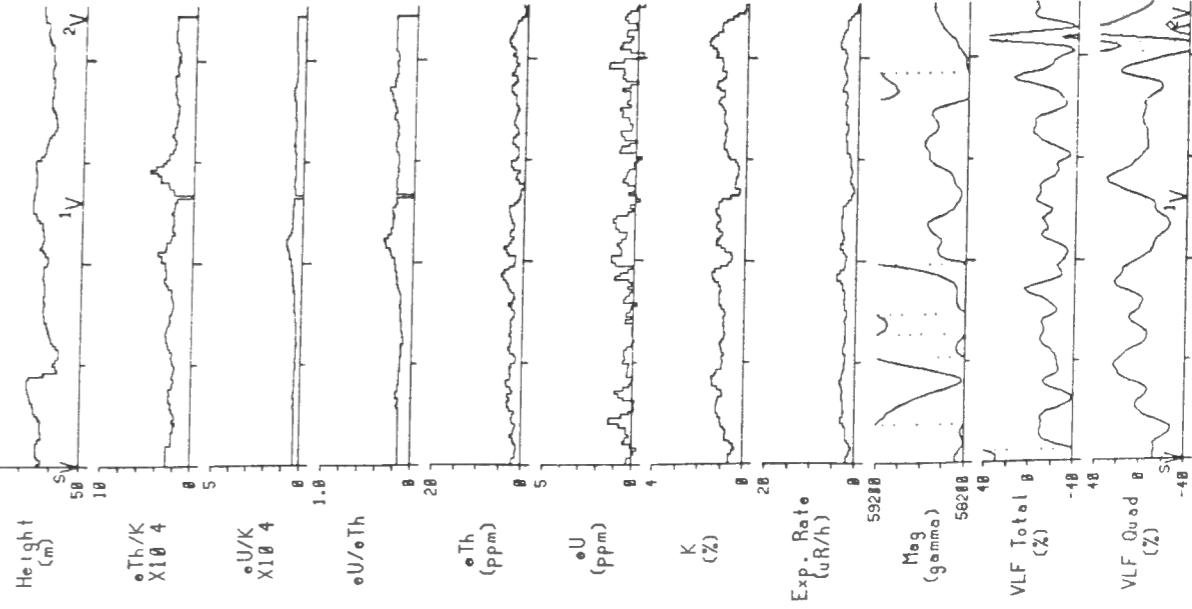
Line 94 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
MARATHON-CEDAR LAKE, ONTARIO, 42D/9.C/12(Part



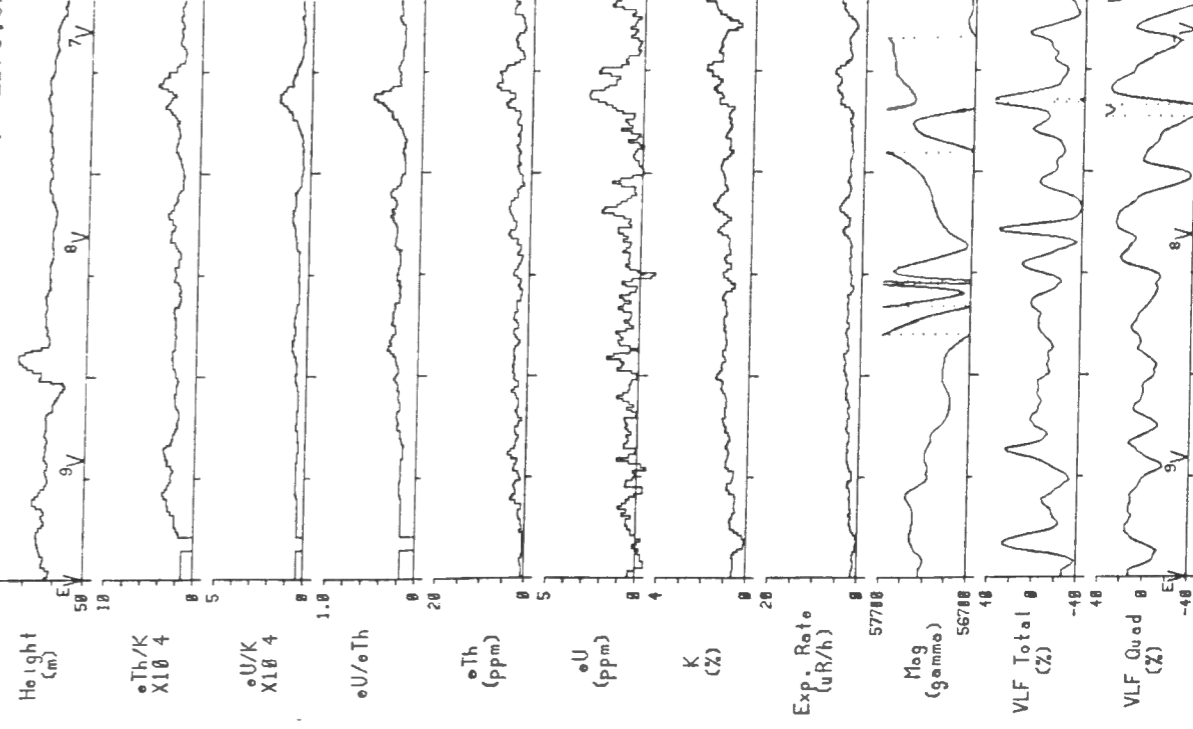
Line 95 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
MARATHON-CEDAR LAKE, ONTARIO, 42D/9.C/12(Part of)



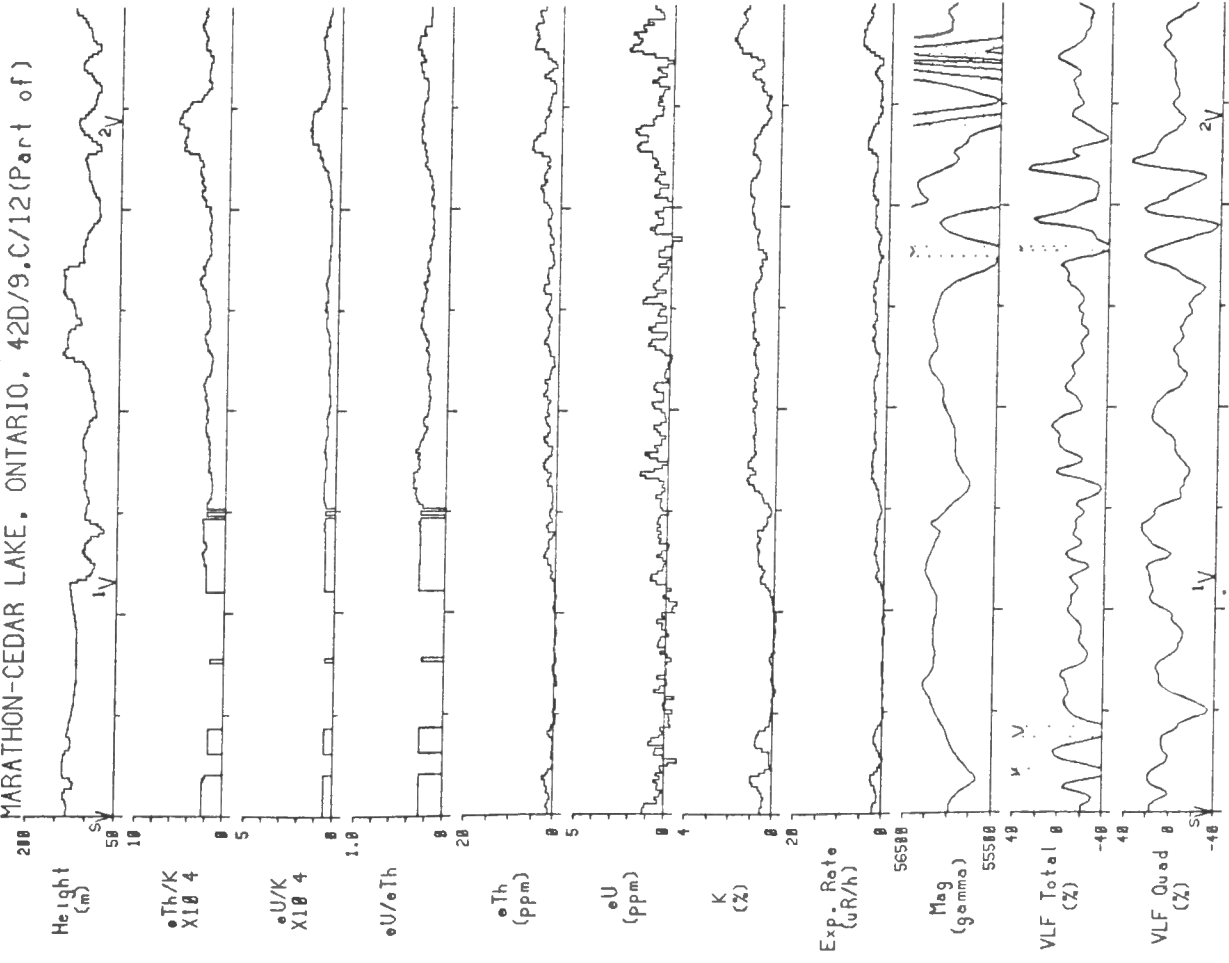
Line 96 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
MARATHON-CEDAR LAKE, ONTARIO, 42D/9.C/12(Part o



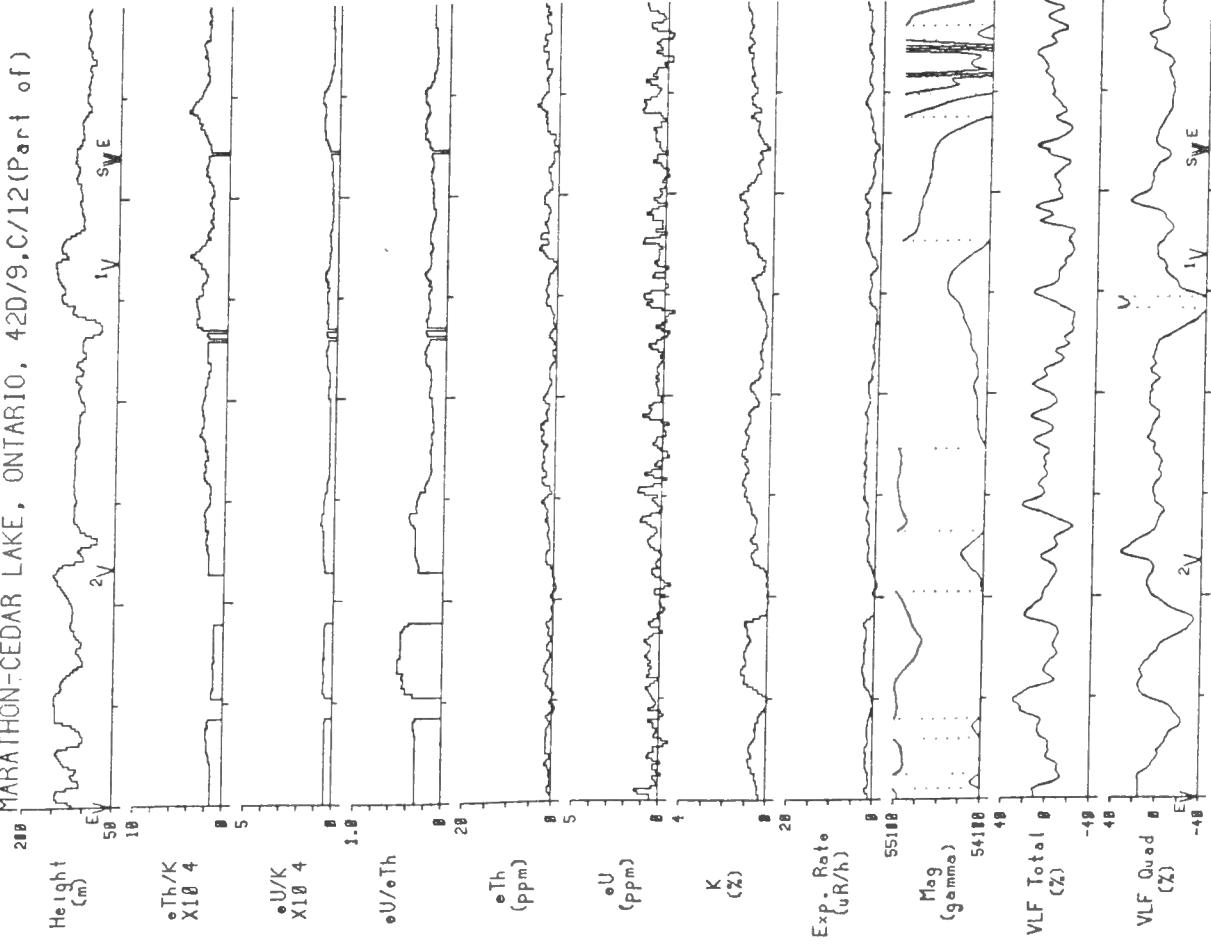
Line 97 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
 MARATHON-CEDAR LAKE, ONTARIO, 42D/9.C/12 (Part of)



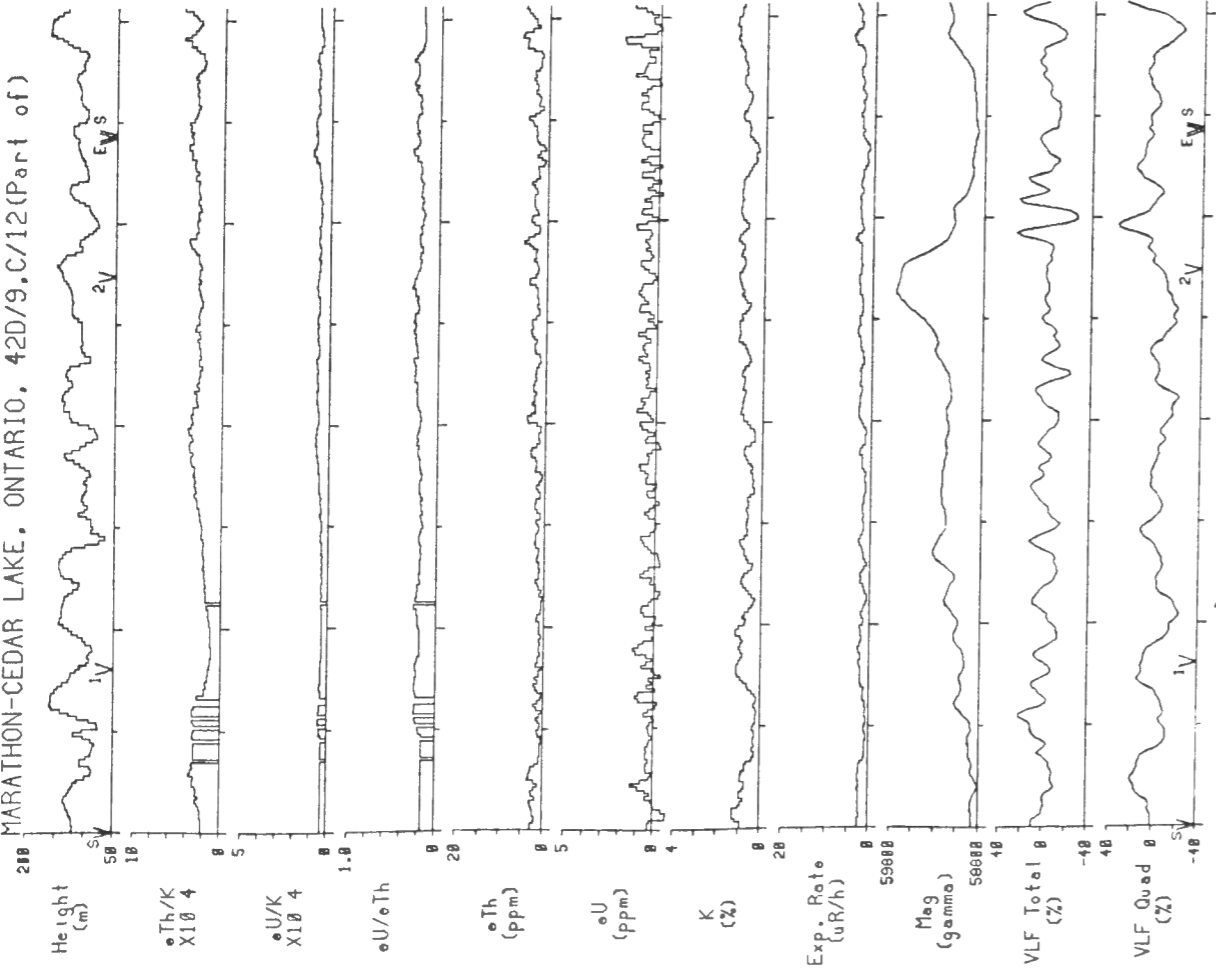
Line 98 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
 MARATHON-CEDAR LAKE, ONTARIO, 42D/9.C/12 (Part of)



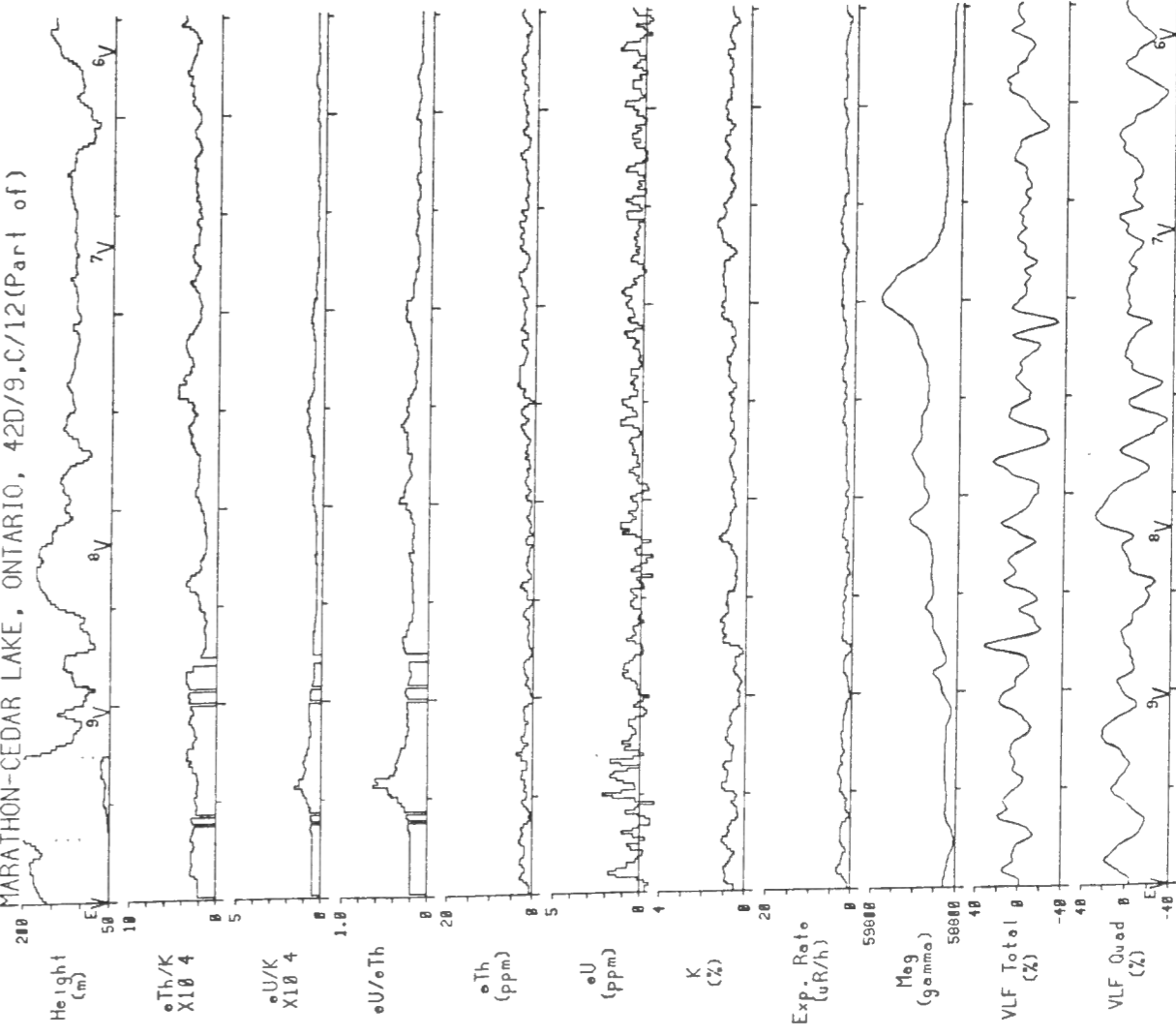
Line 99 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
 MARATHON-CEDAR LAKE, ONTARIO, 42D/9,C/12 (Part of)



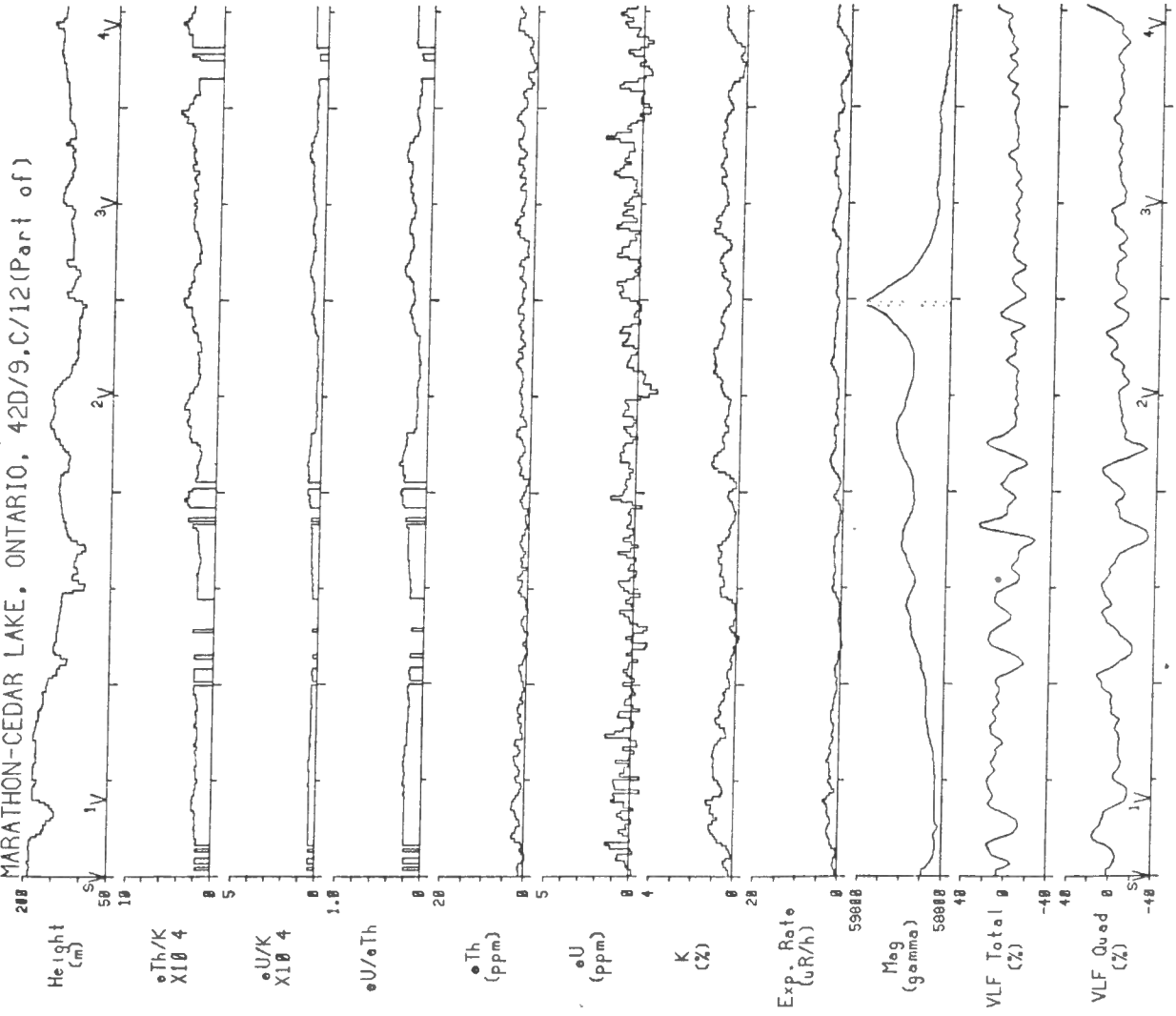
Line 100 2 km Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
 MARATHON-CEDAR LAKE, ONTARIO, 42D/9,C/12 (Part of)



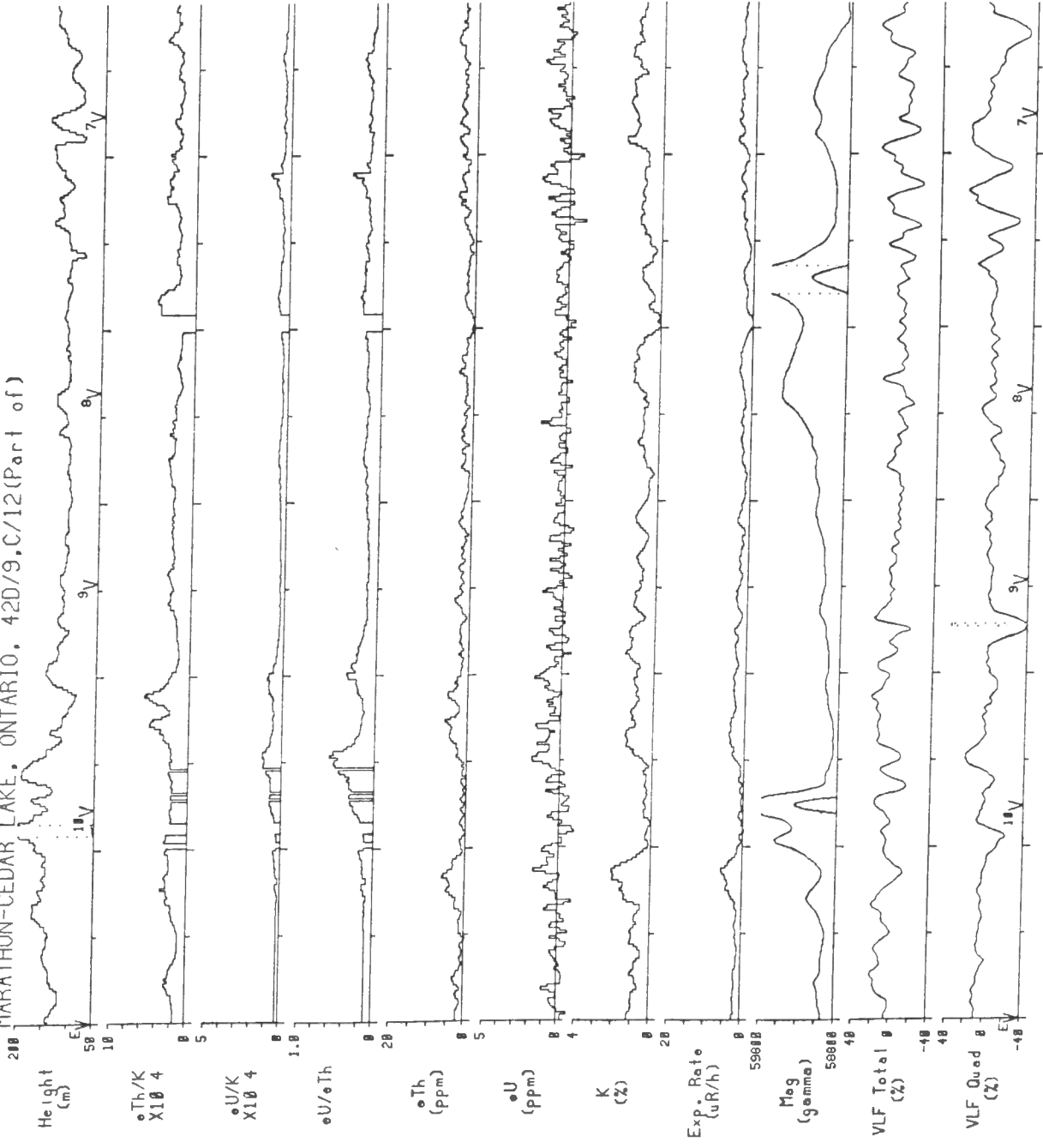
Line 101 2 km Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
 MARATHON-CEDAR LAKE, ONTARIO, 42D/9,C/12(Part of)



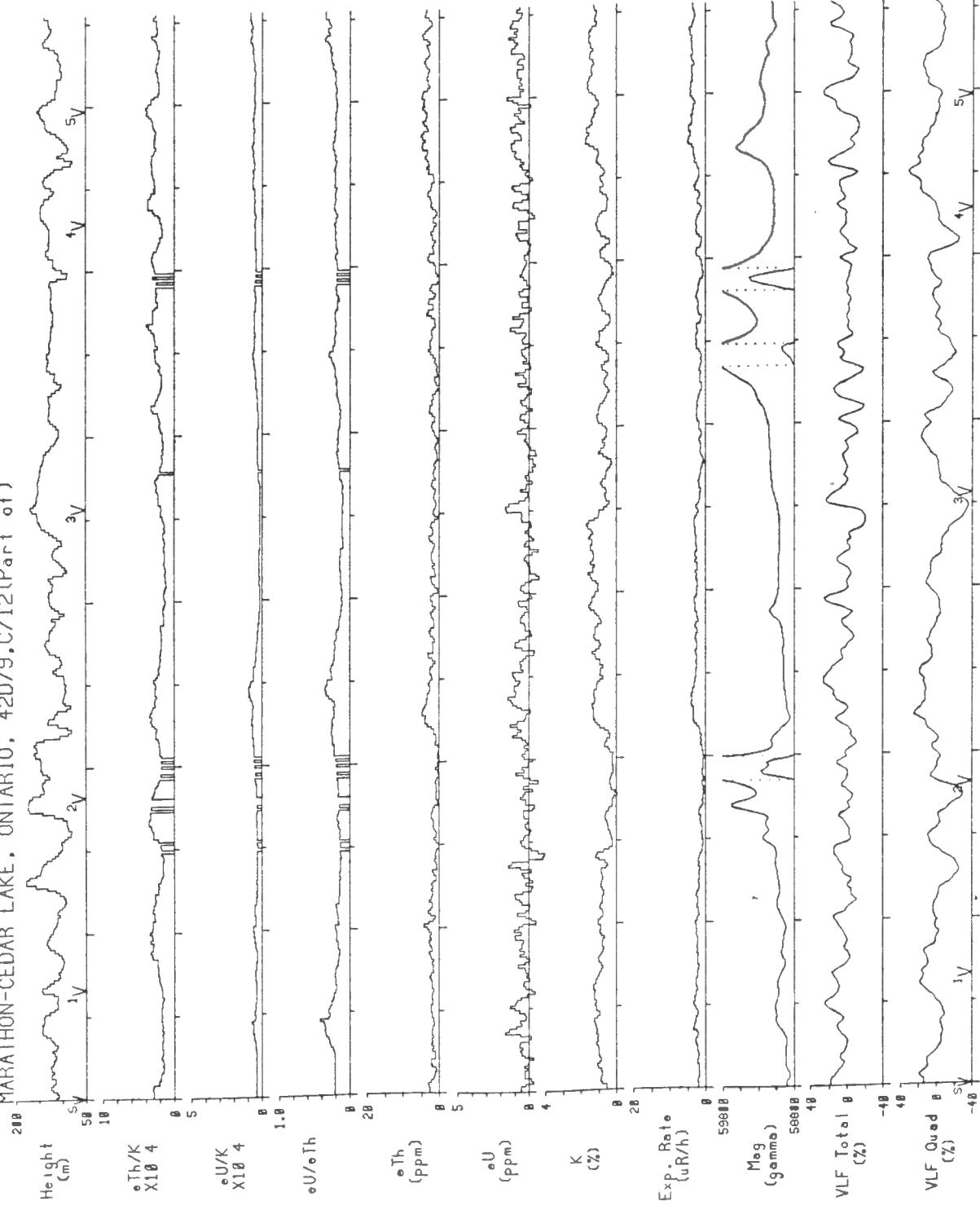
Line 102 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
 MARATHON-CEDAR LAKE, ONTARIO, 42D/9,C/12(Part of)



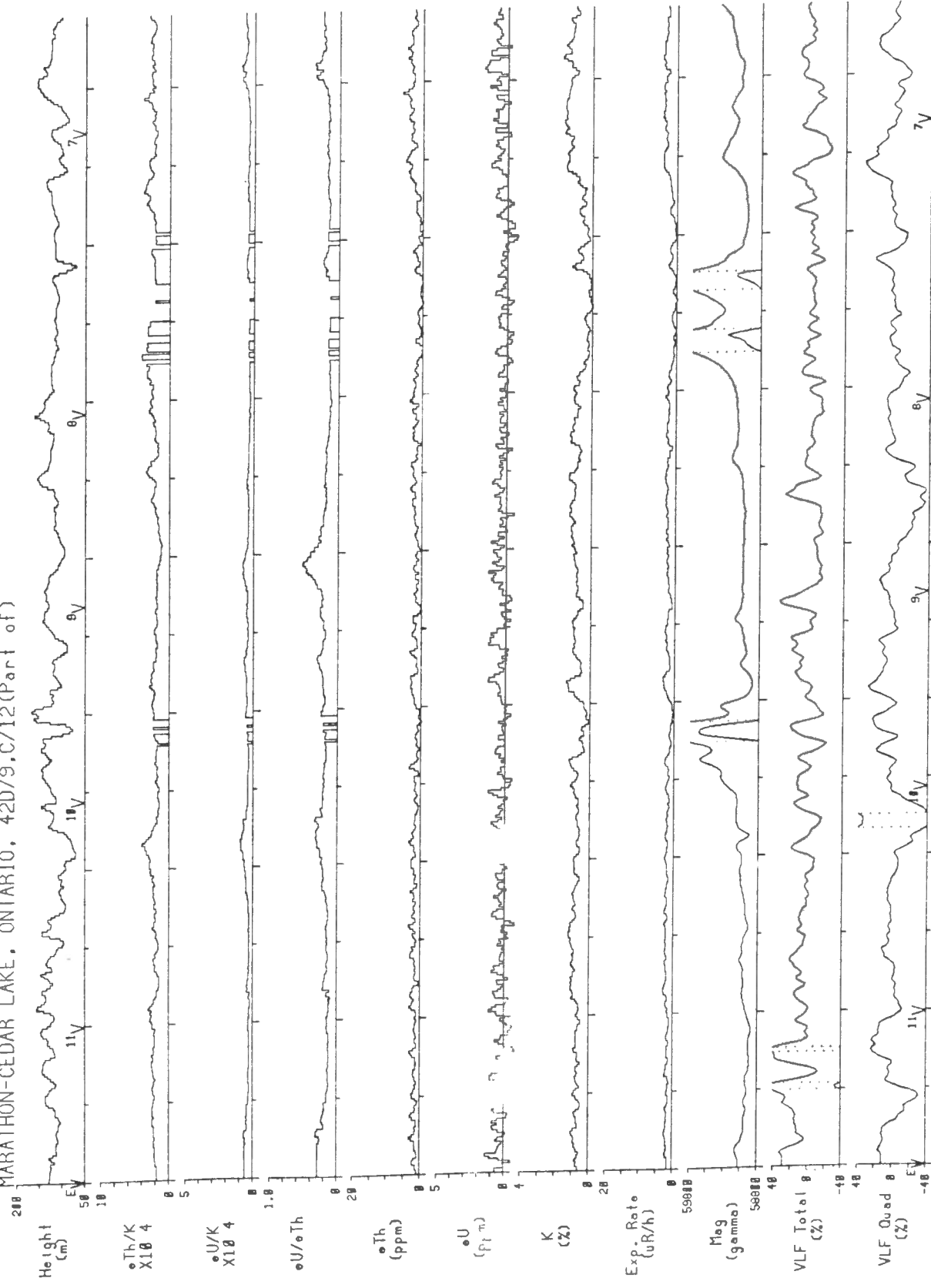
Line 103 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
 MARATHON-CEDAR LAKE, ONTARIO, 42D/9.C/12(Part of)

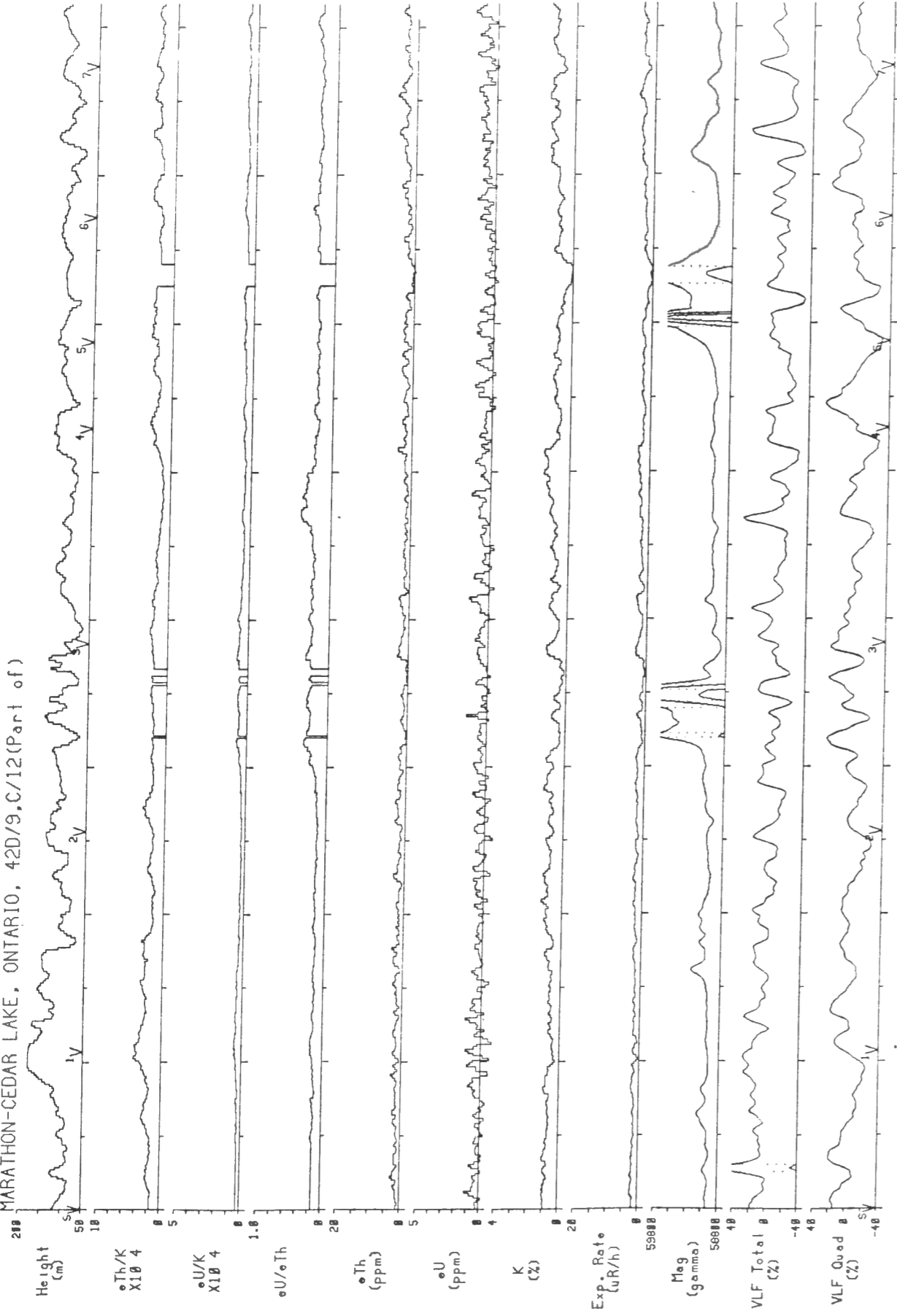


Line 104 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
 MARATHON-CEDAR LAKE, ONTARIO, 42D/9.C/12(Part of)

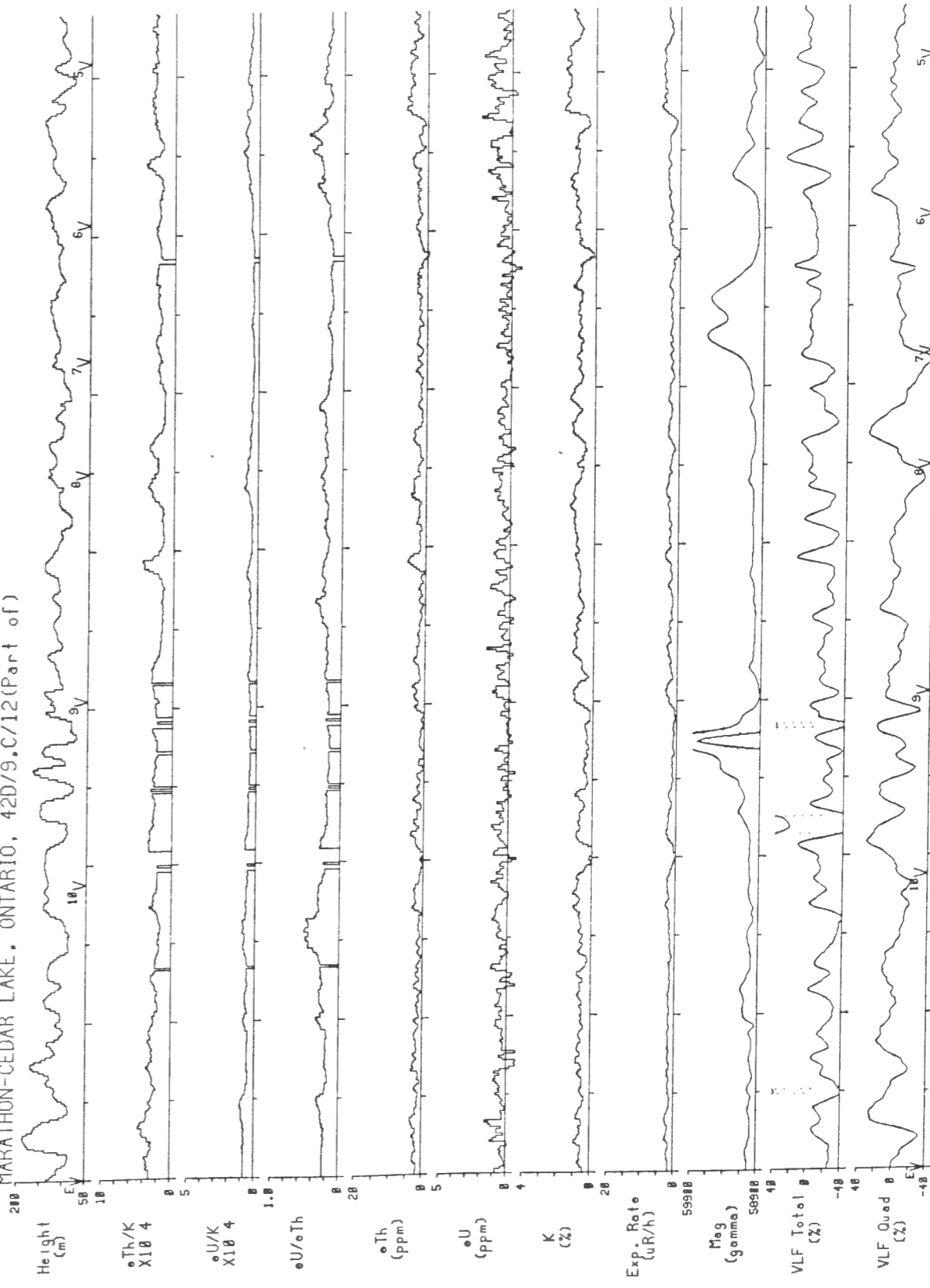


Hemlo-Schreiber Area, Ontario, 1990.
 MARATHON-CEDAR LAKE, ONTARIO, 42D/9.C/12(Part of)



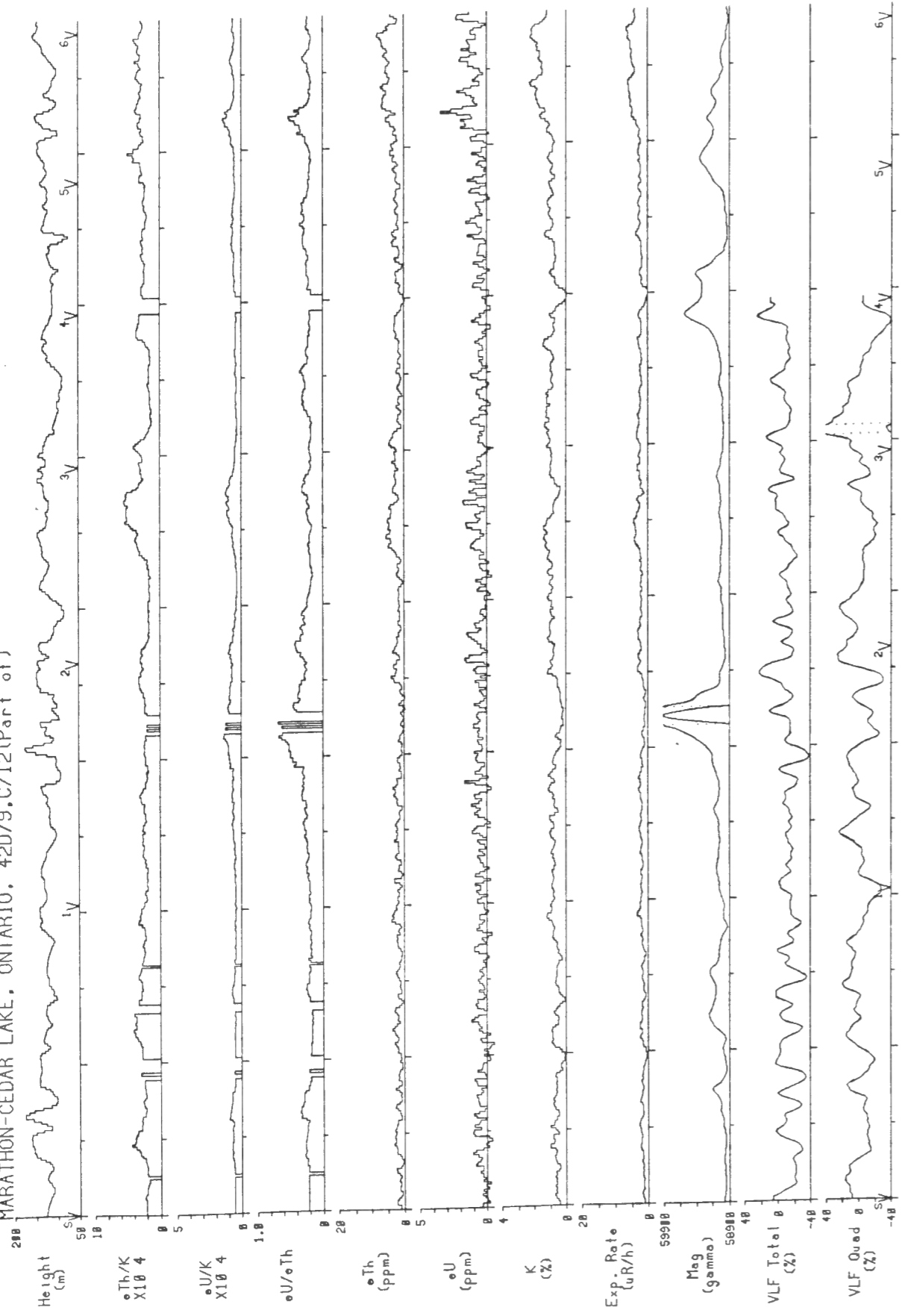
Line 106 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
 MARATHON-CEDAR LAKE, ONTARIO, 42D/9.C/12(Part of)



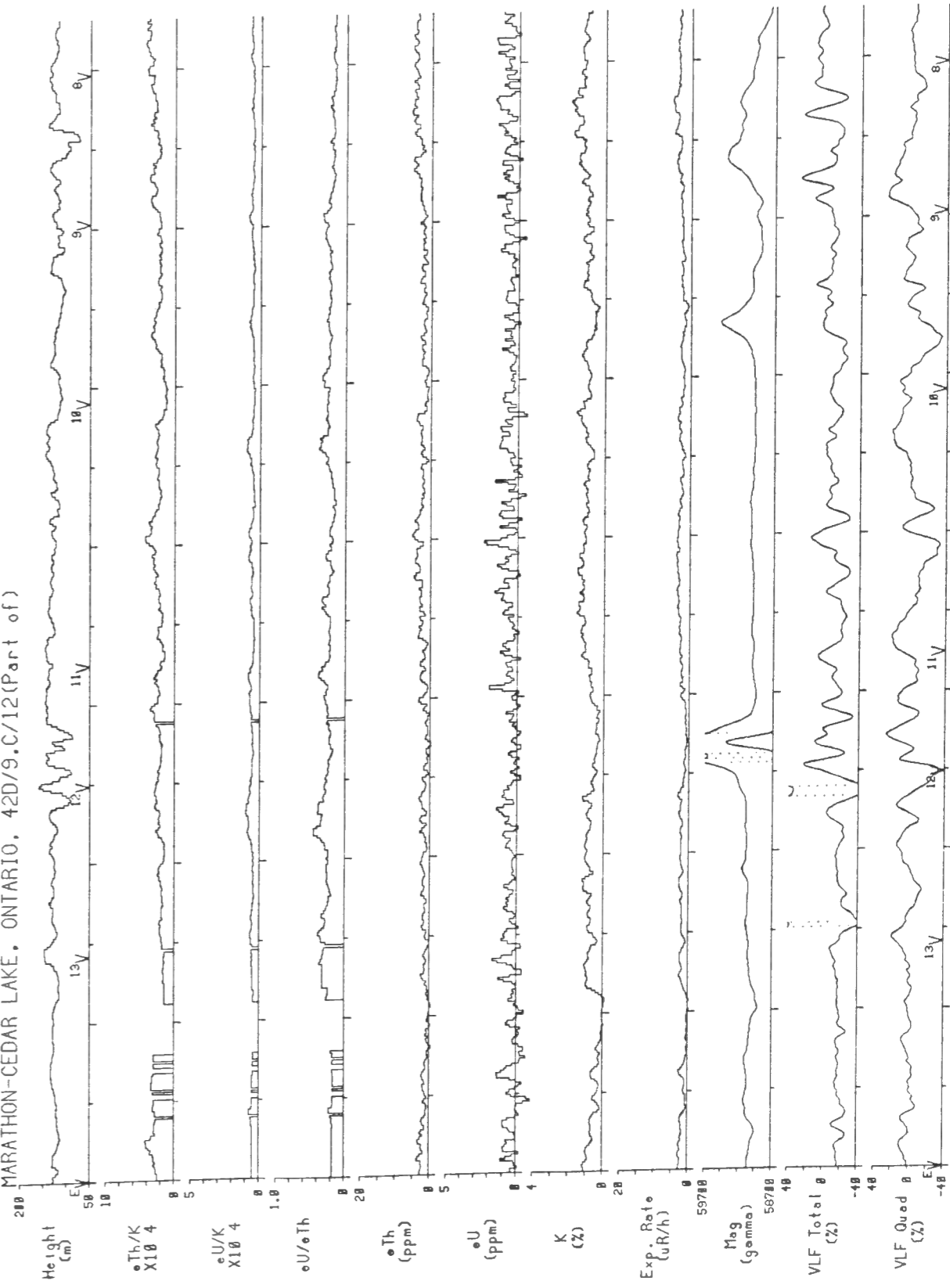
Line 107 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
 MARATHON-CEDAR LAKE, ONTARIO, 42D/9.C/12 (Part of)



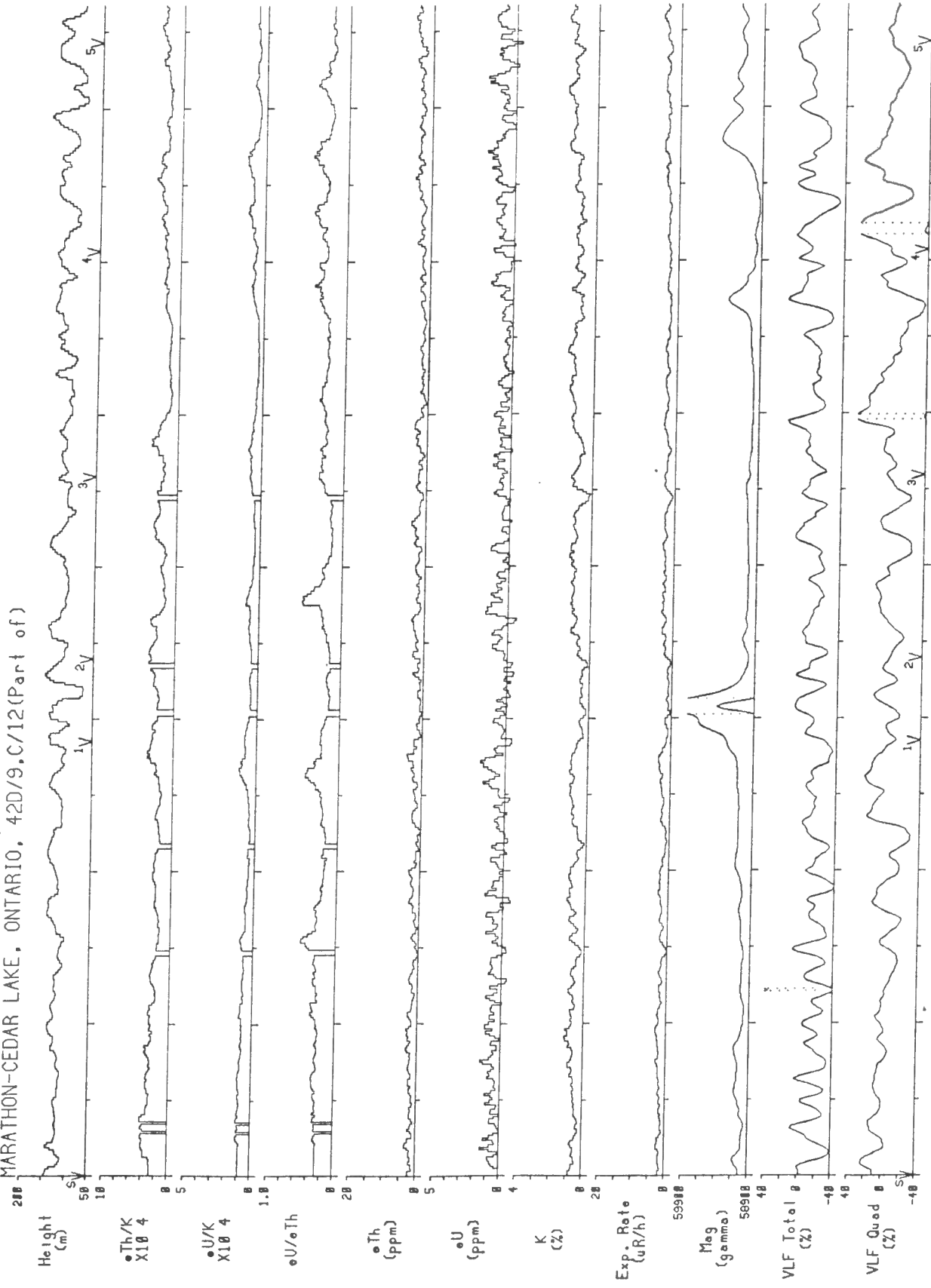
Line 108 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
 MARATHON-CEDAR LAKE, ONTARIO, 42D/9.C/12 (Part of)



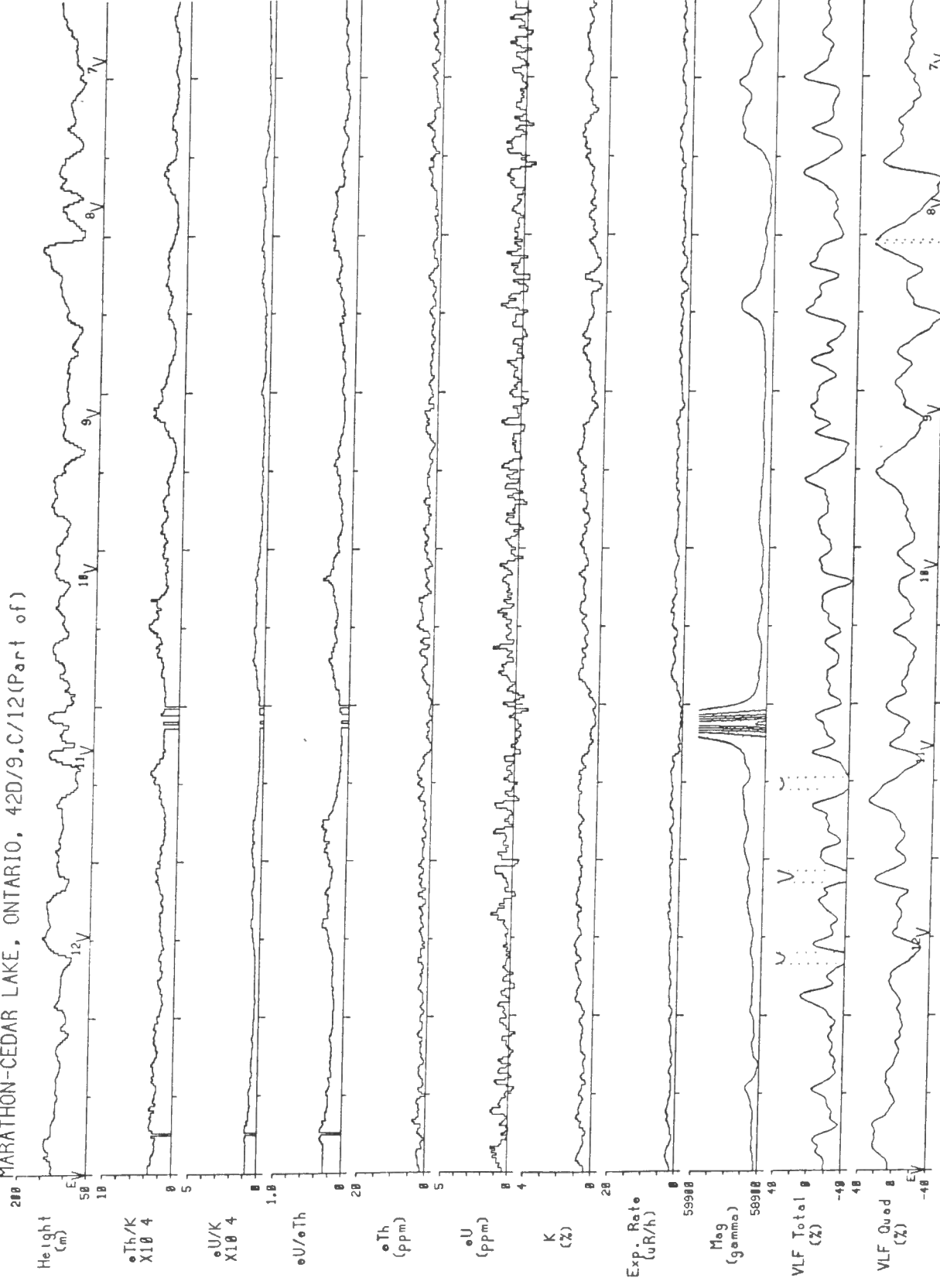
Line 109 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
 MARATHON-CEDAR LAKE, ONTARIO, 42D/9.C/12(Part of)



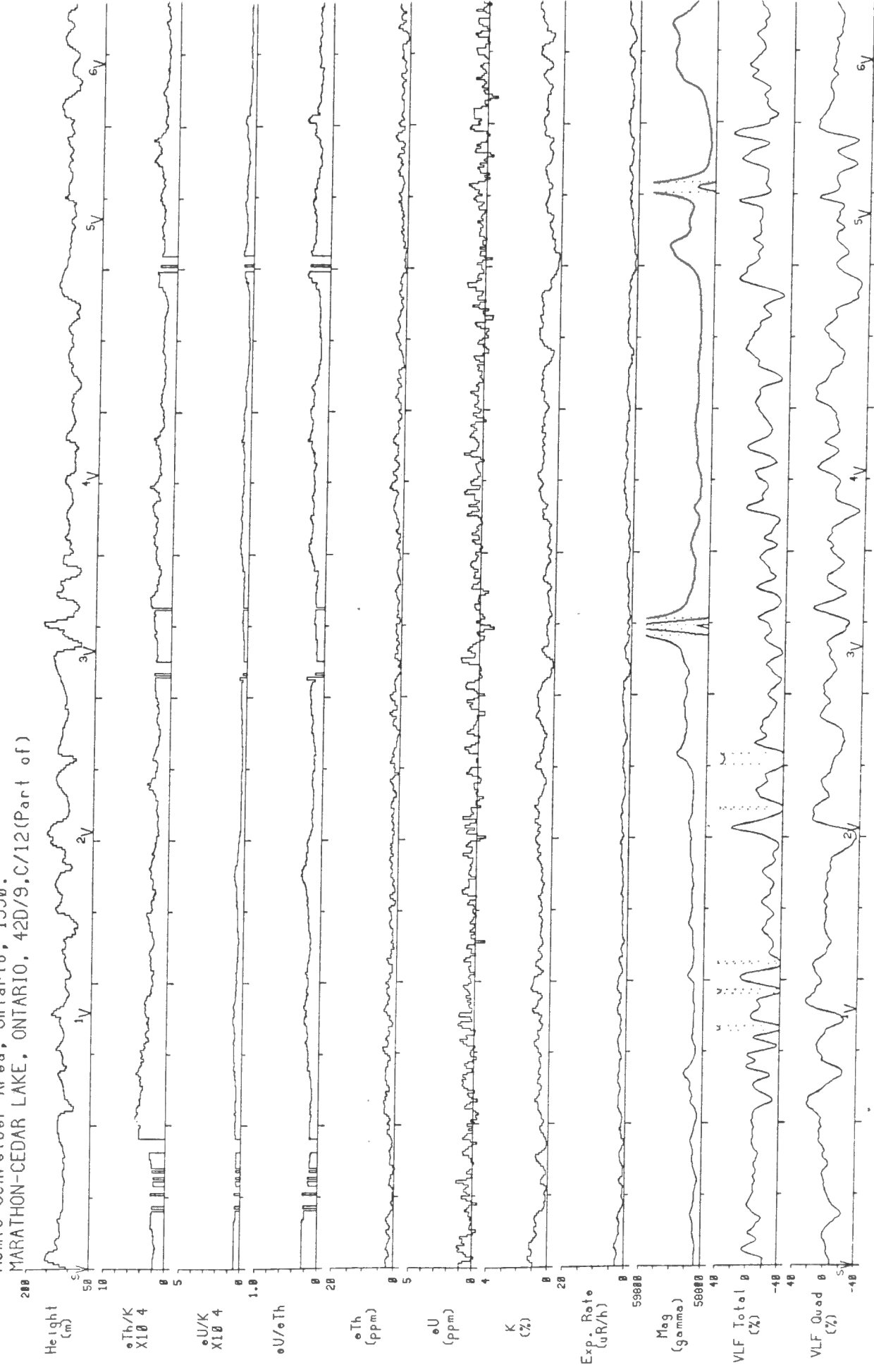
Line 110 2 km Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
 MARATHON-CEDAR LAKE, ONTARIO, 42D/9.C/12(Part of)



Line 111 2 km Scale 1:150000

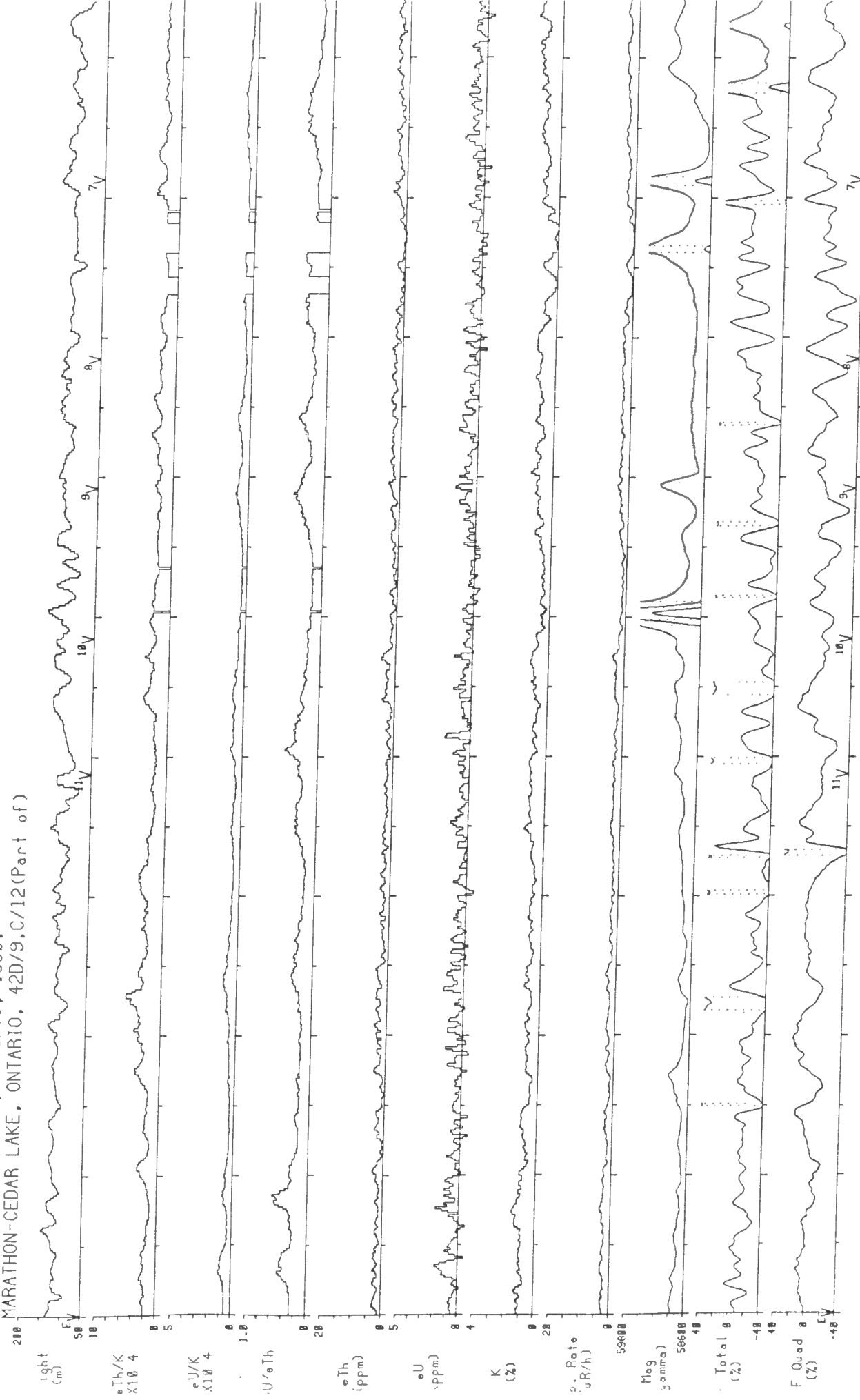
Hemlo-Schreiber Area, Ontario, 1990.
 MARATHON-CEDAR LAKE, ONTARIO, 42D/9.C/12(Part of)



Line 112 | 2 km | Scale 1:150000

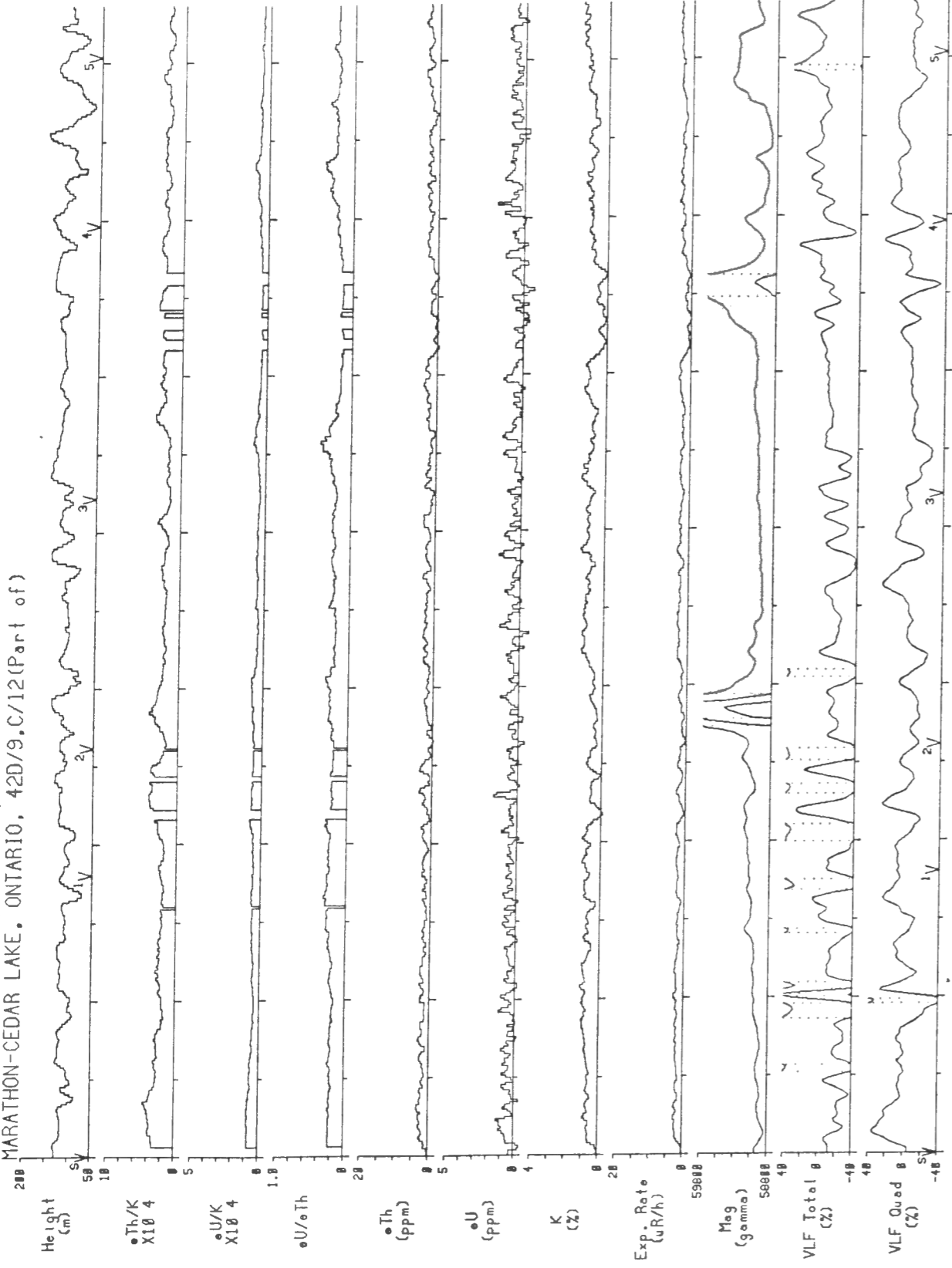
T

Hemlo-Schreiber Area, Ontario, 1990.
 MARATHON-CEDAR LAKE, ONTARIO, 42D/9.C/12(Part of)



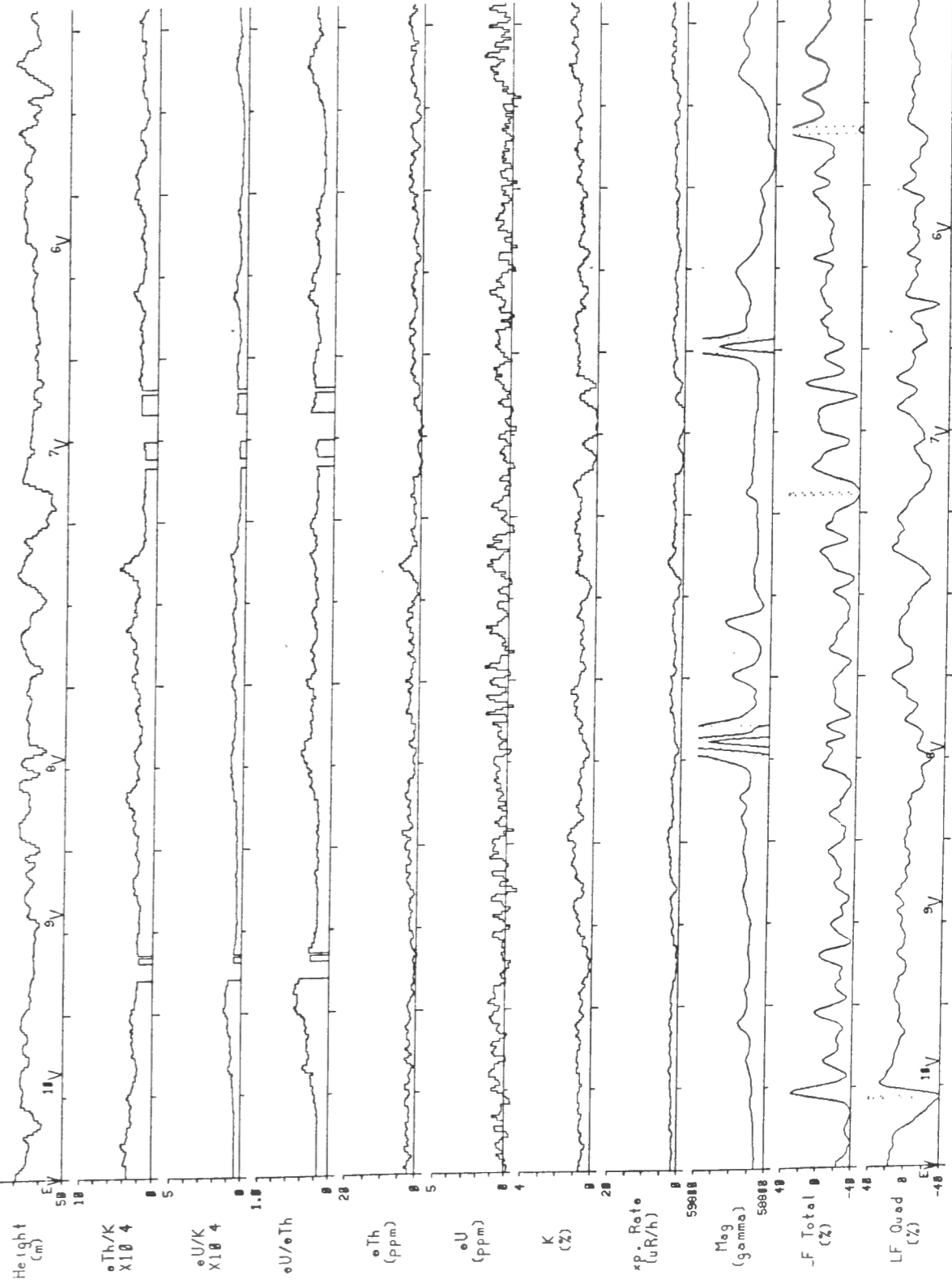
Line 113 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
 MARATHON-CEDAR LAKE, ONTARIO, 42D/9.C/12(Part of)



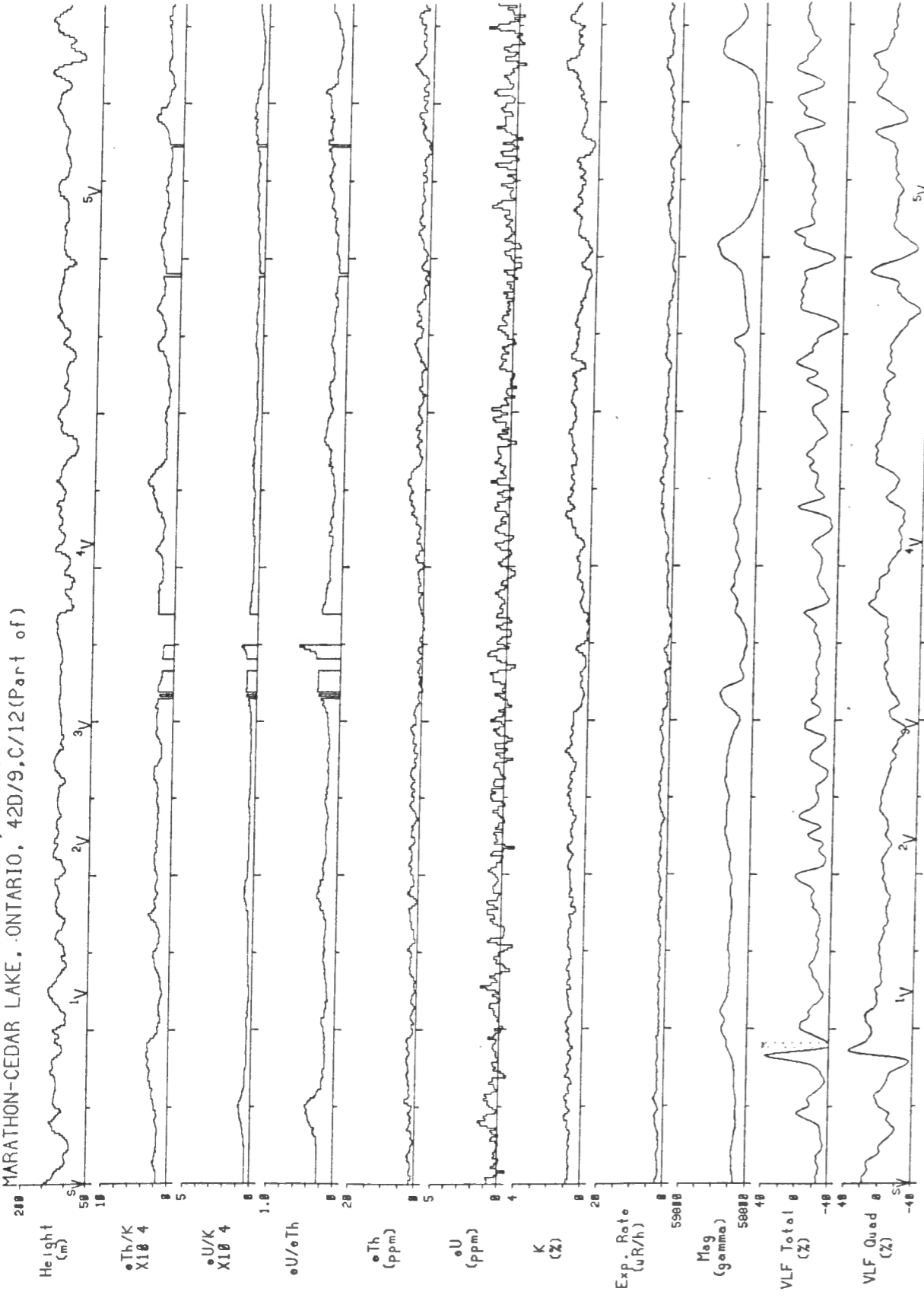
Line 114 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
 MARATHON-CEDAR LAKE, ONTARIO, 42D/9.C/12(Part of)



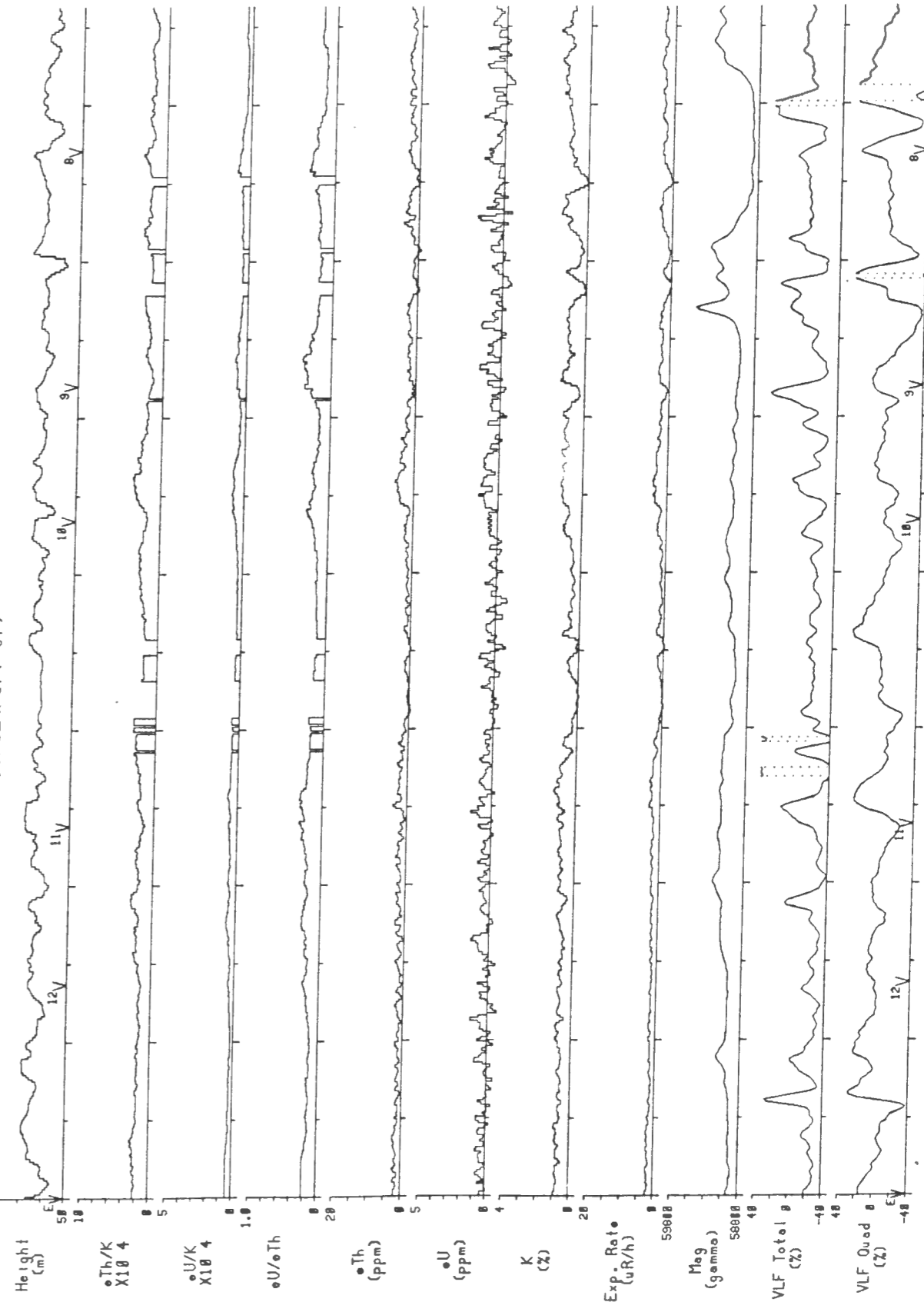
Line 115 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
 MARATHON-CEDAR LAKE, ONTARIO, 42D/9.C/12 (Part of)



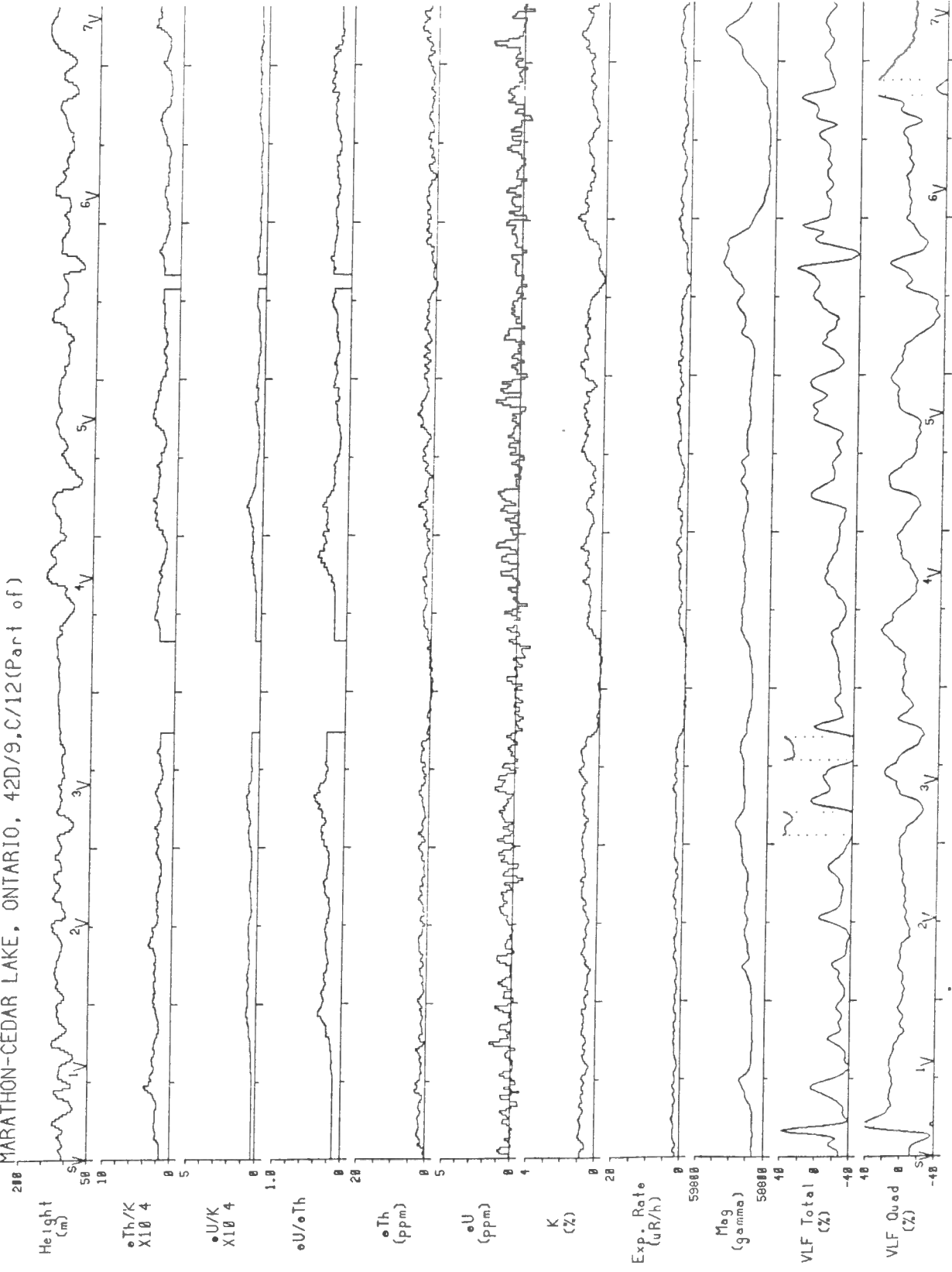
Line 116 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
 MARATHON-CEDAR LAKE, ONTARIO, 42D/9.C/12 (Part of)

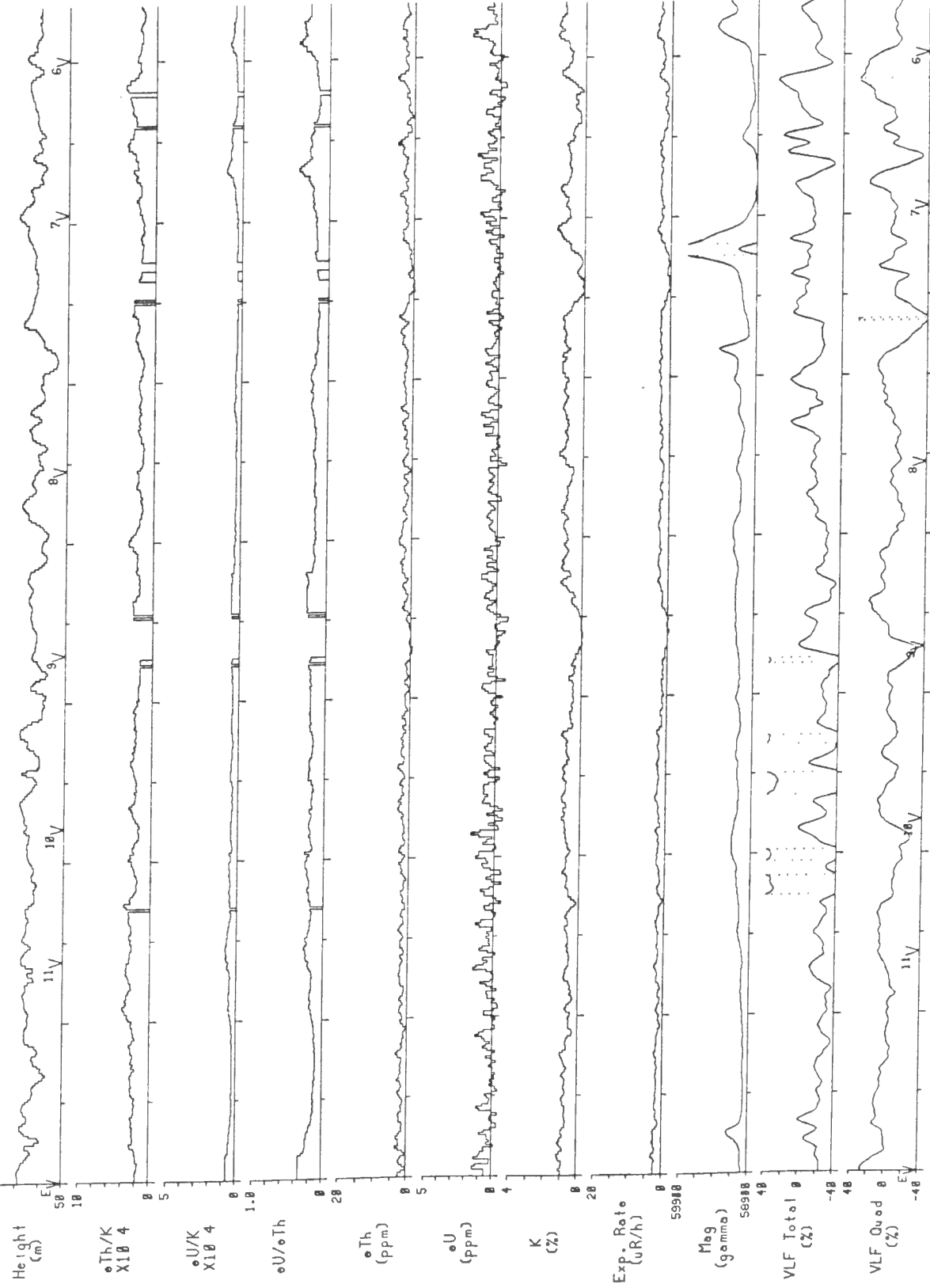


Line 117 | 2 km | Scale 1:150000

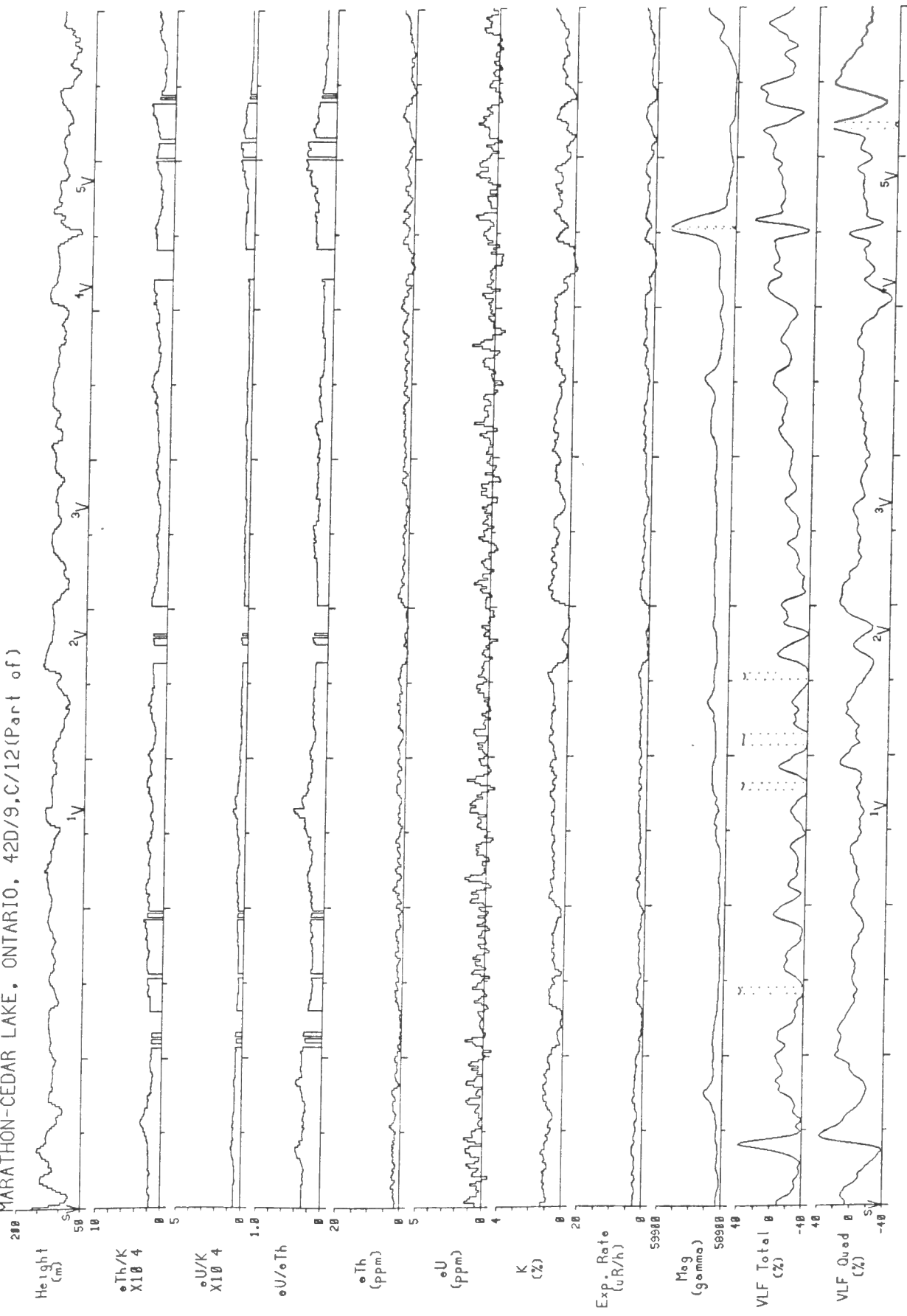
Hemlo-Schreiber Area, Ontario, 1990.
 MARATHON-CEDAR LAKE, ONTARIO, 42D/9.C/12 (Part of)



Hemlo-Schreiber Area, Ontario, 1990.
 MARATHON-CEDAR LAKE, ONTARIO, 42D/9.C/12 (Part of)

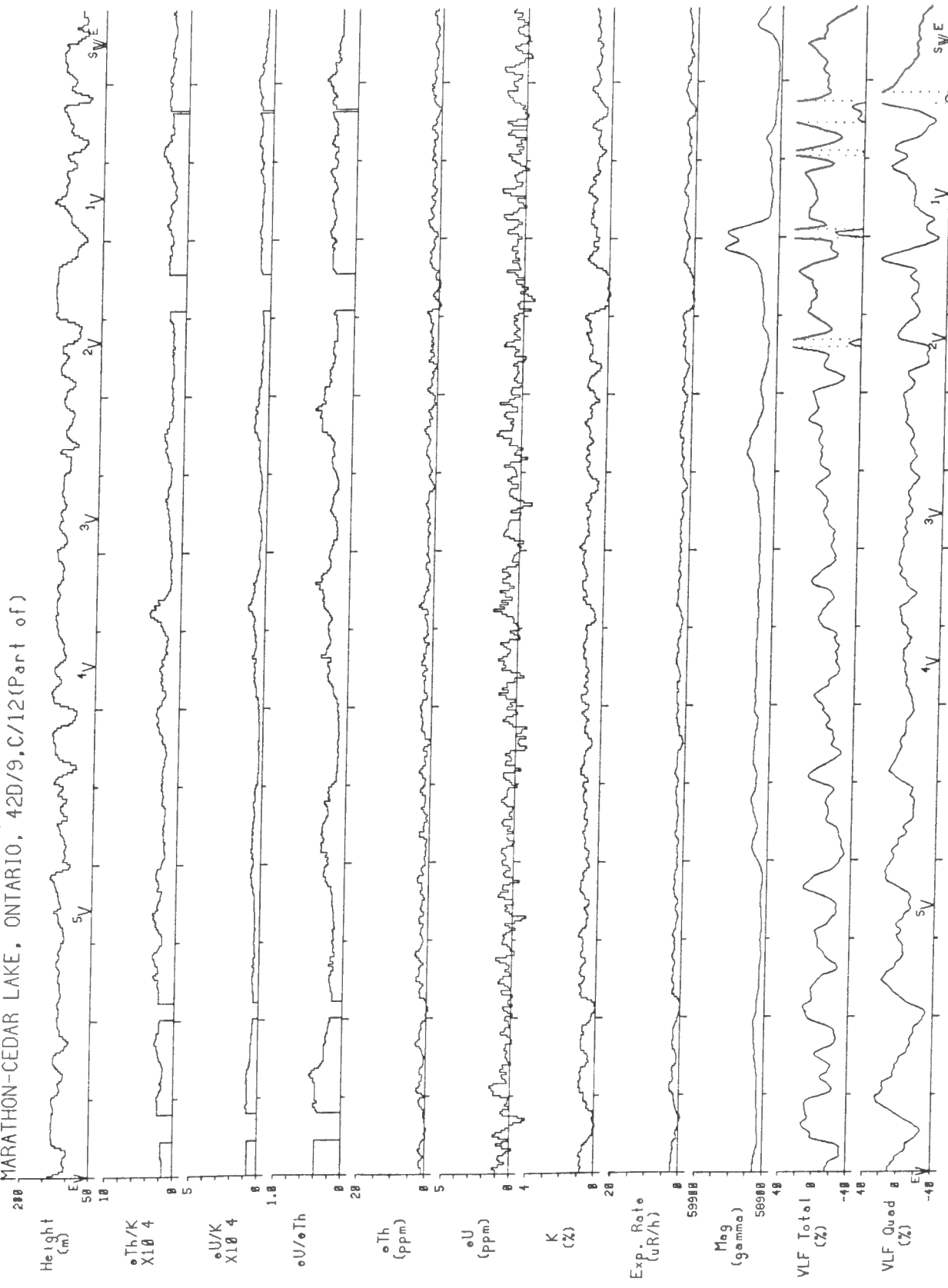


Hemlo-Schreiber Area, Ontario, 1990.
 MARATHON-CEDAR LAKE, ONTARIO, 42D/9.C/12 (Part of)



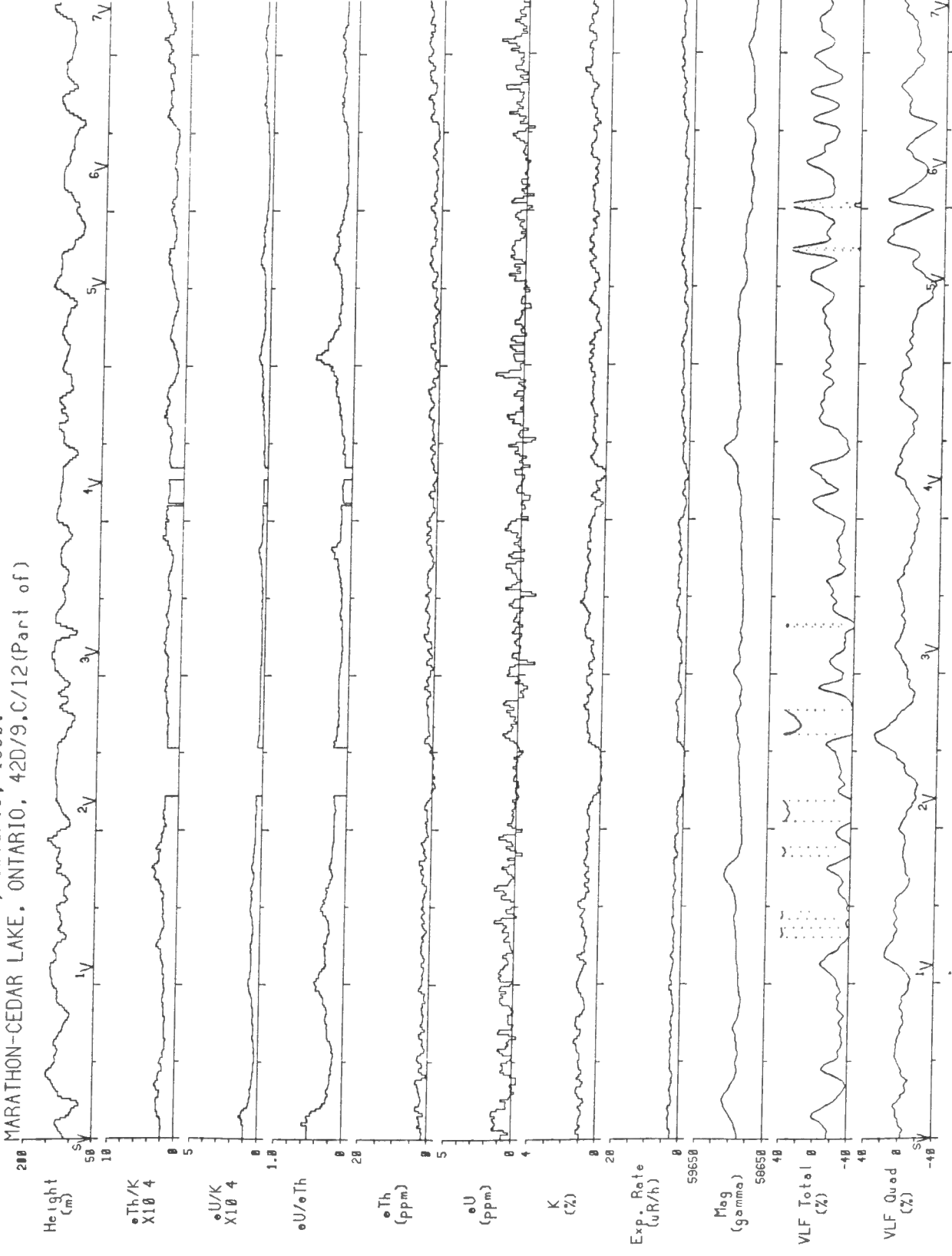
Line 120 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
 MARATHON-CEDAR LAKE, ONTARIO, 42D/9.C/12 (Part of)

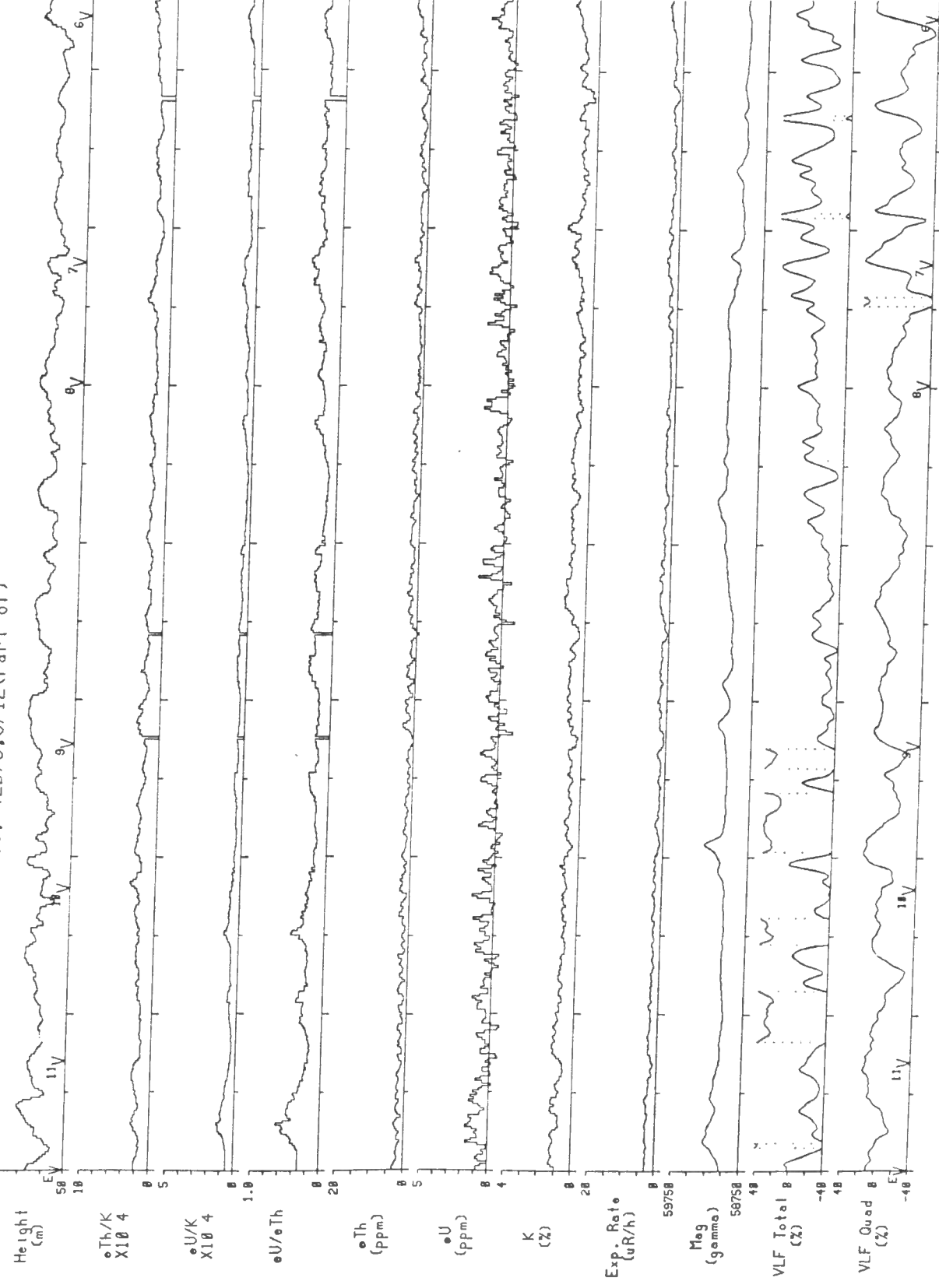


Line 121 | 2 km | Scale 1:150000

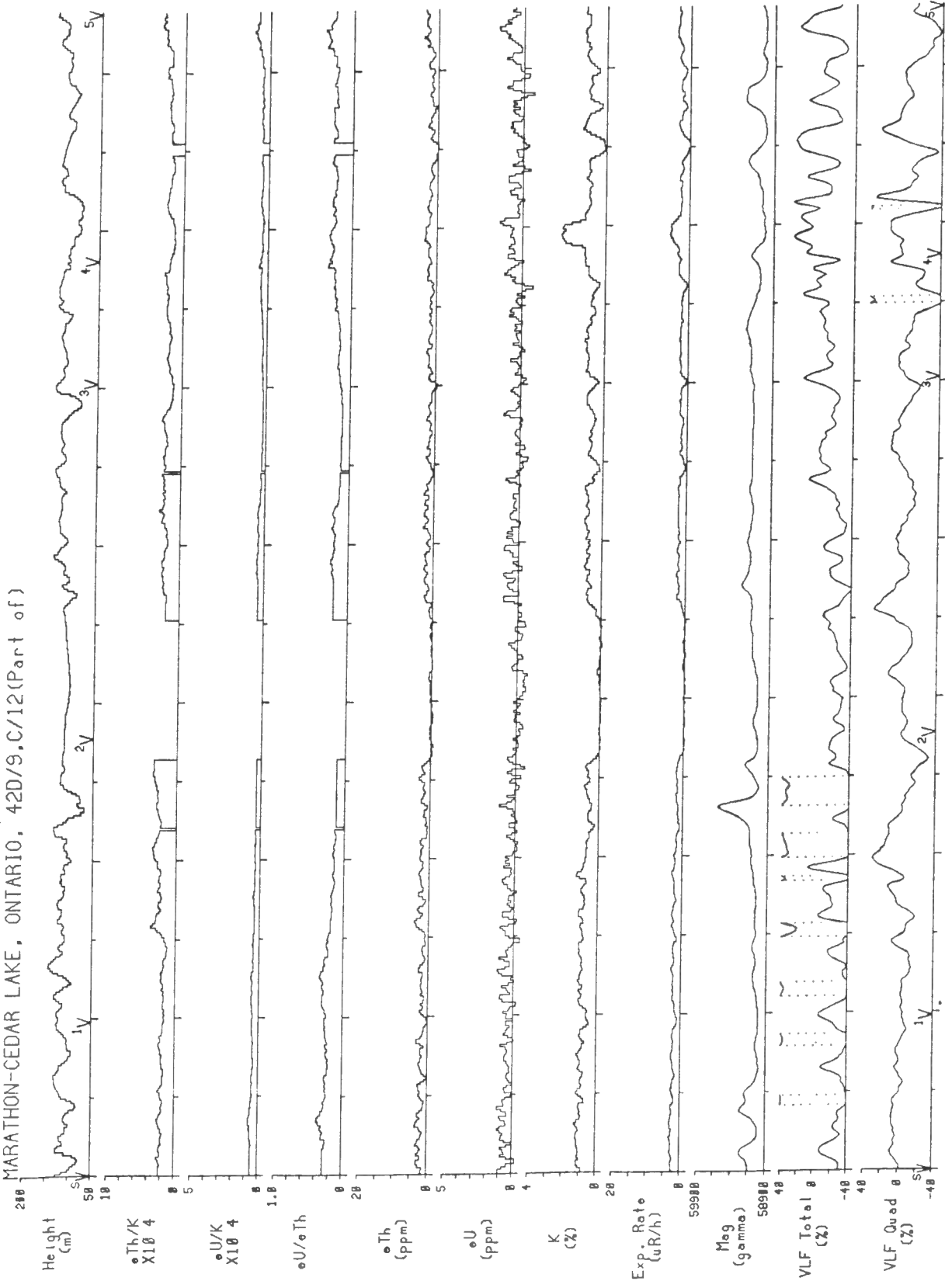
Hemlo-Schreiber Area, Ontario, 1990.
MARATHON-CEDAR LAKE, ONTARIO, 42D/9.C/12(Part of)



Hemlo-Schreiber Area, Ontario, 1990.
MARATHON-CEDAR LAKE, ONTARIO, 42D/9.C/12(Part of)

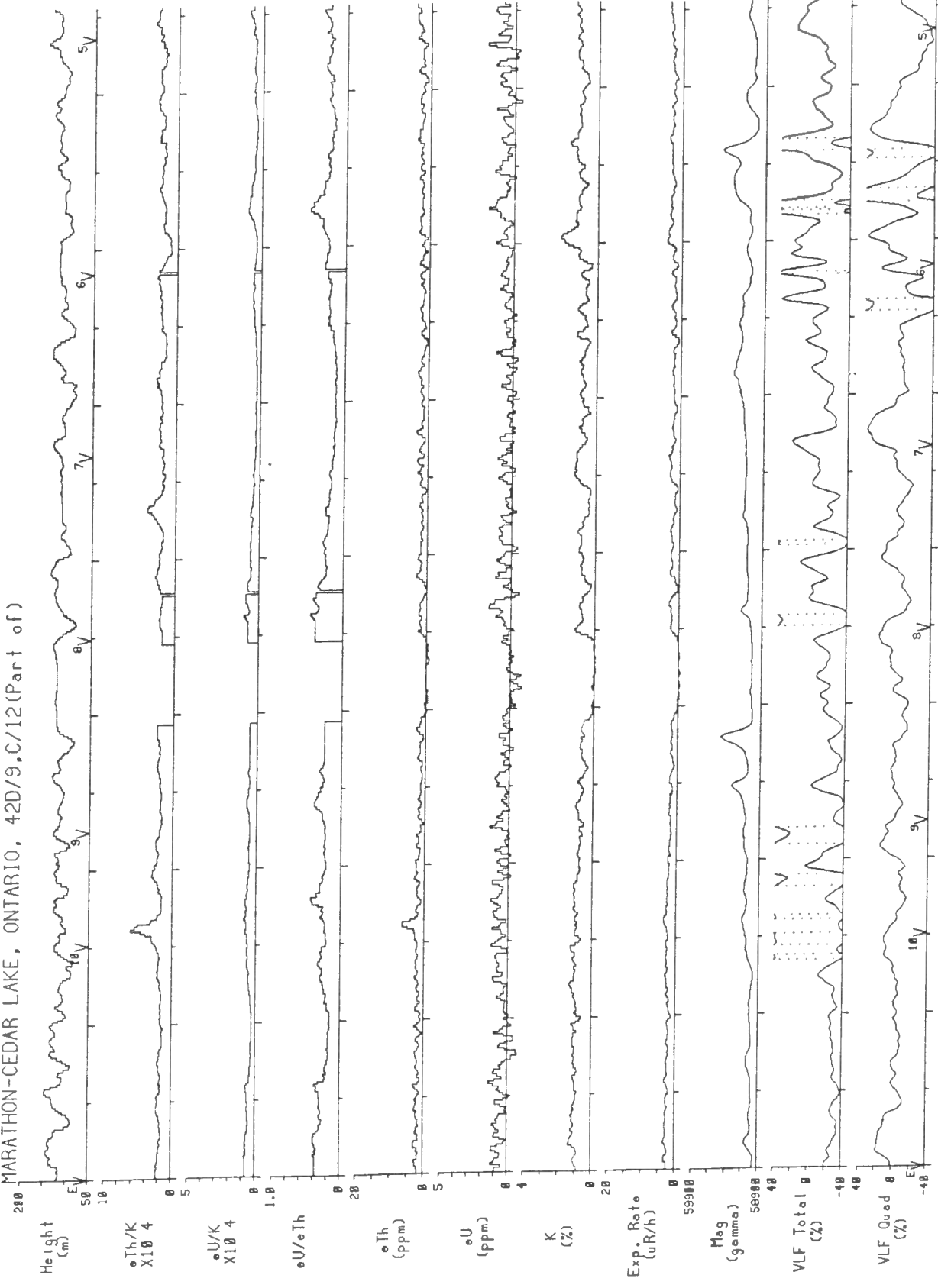


Hemlo-Schreiber Area, Ontario, 1990.
 MARATHON-CEDAR LAKE, ONTARIO, 42D/S,C/12(Part of)



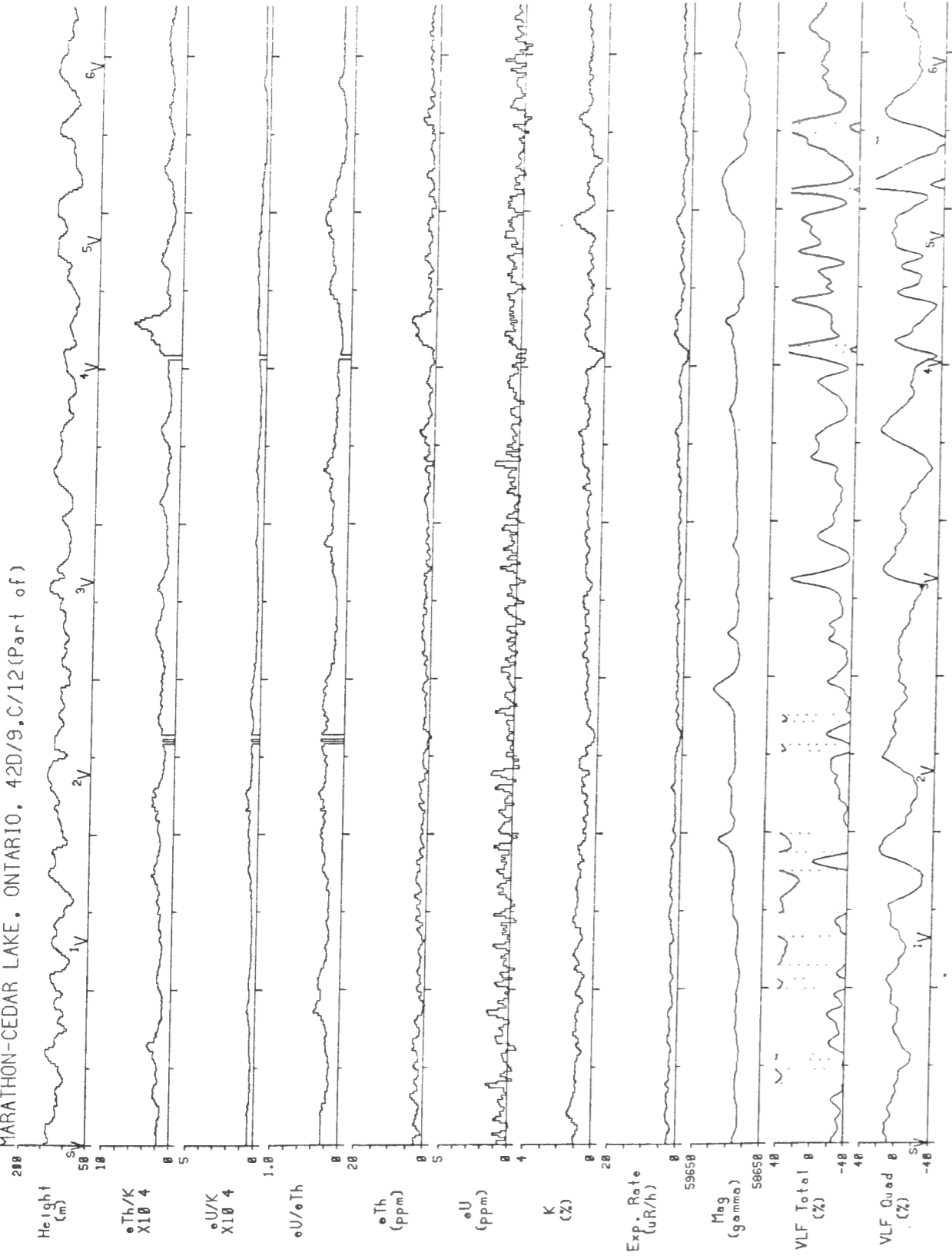
Line 128 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
 MARATHON-CEDAR LAKE, ONTARIO, 42D/S,C/12(Part of)



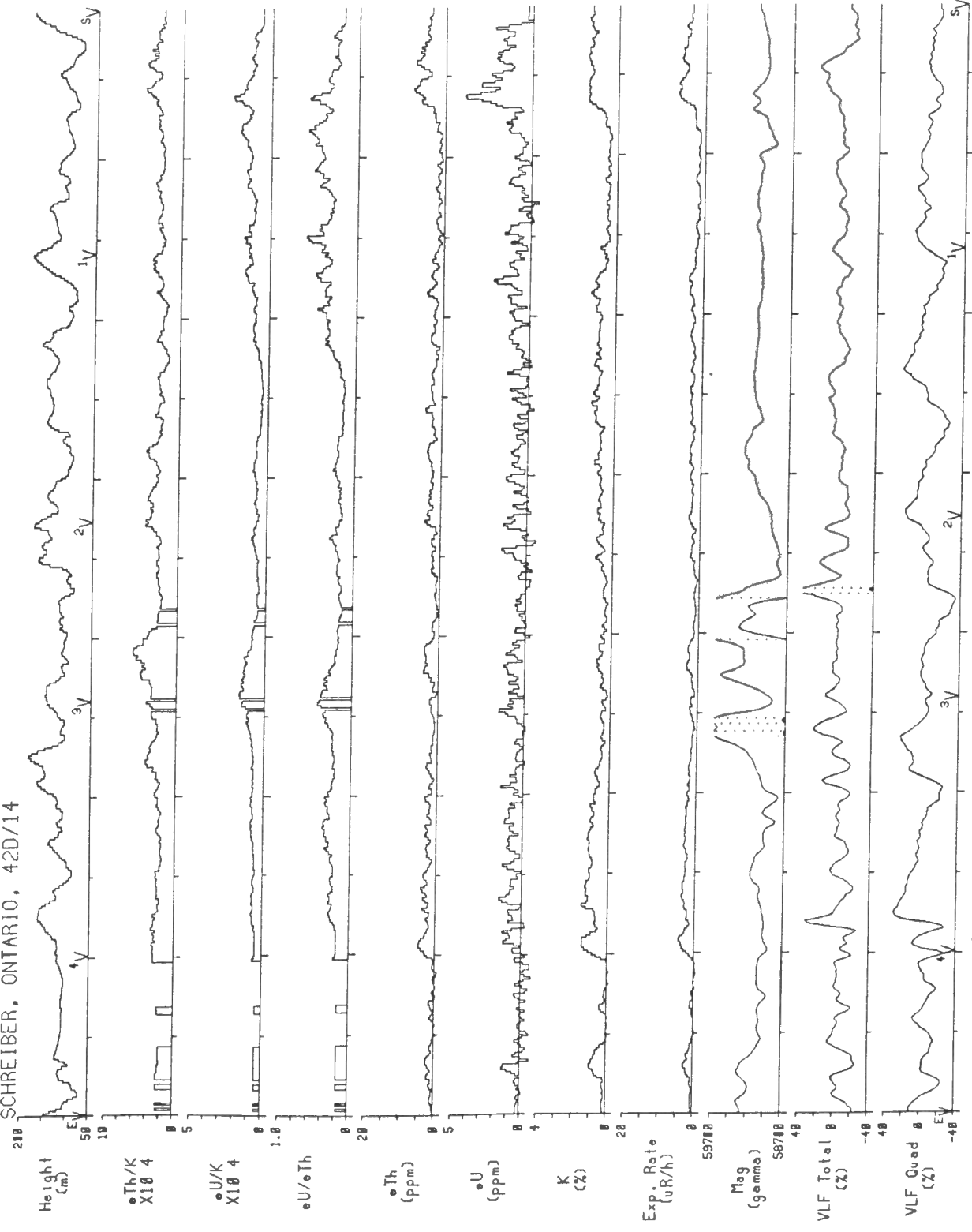
Line 129 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
MARATHON-CEDAR LAKE, ONTARIO, 42D/9.C/12(Part of)



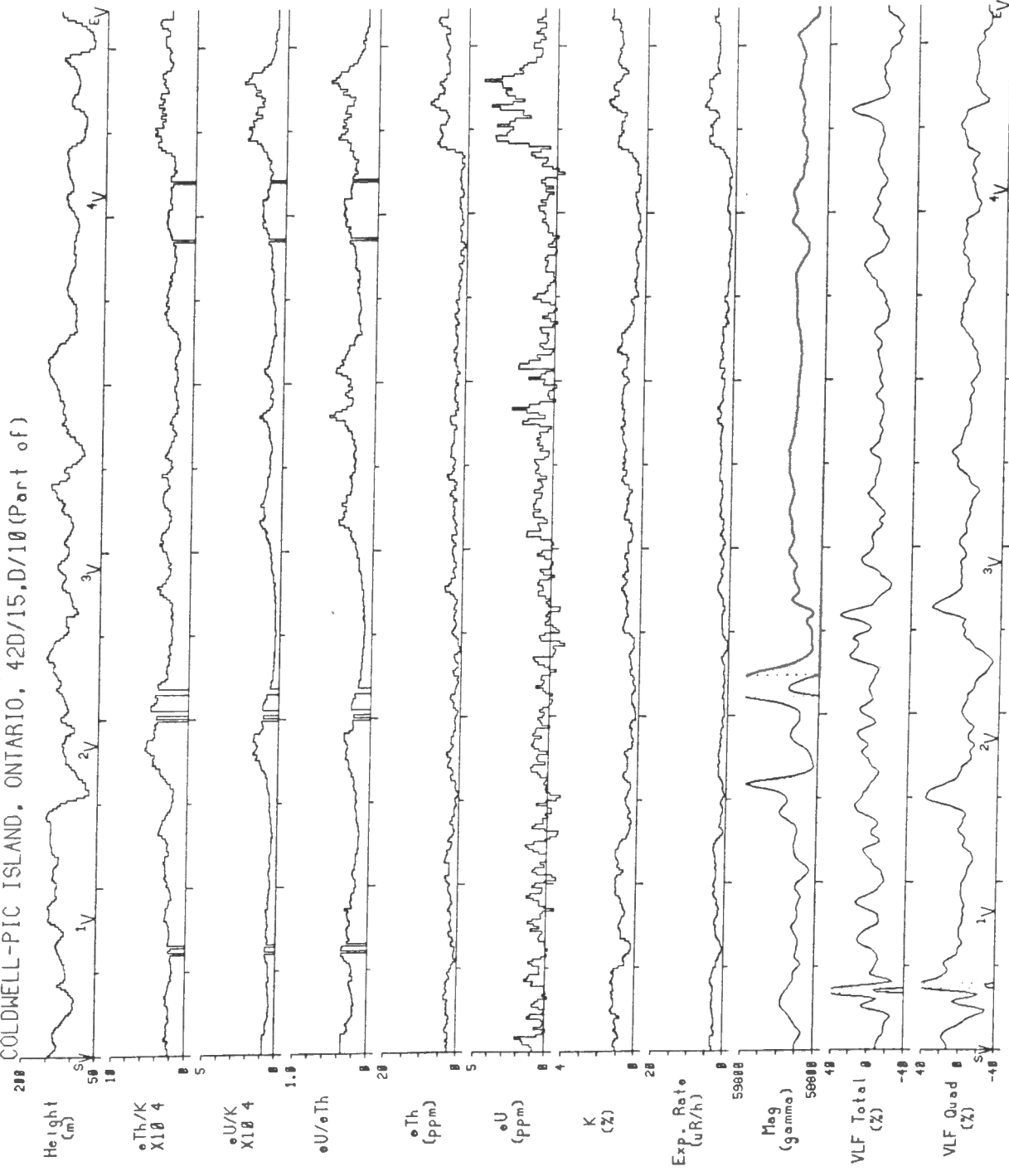
Line 130 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
SCHREIBER, ONTARIO, 42D/14



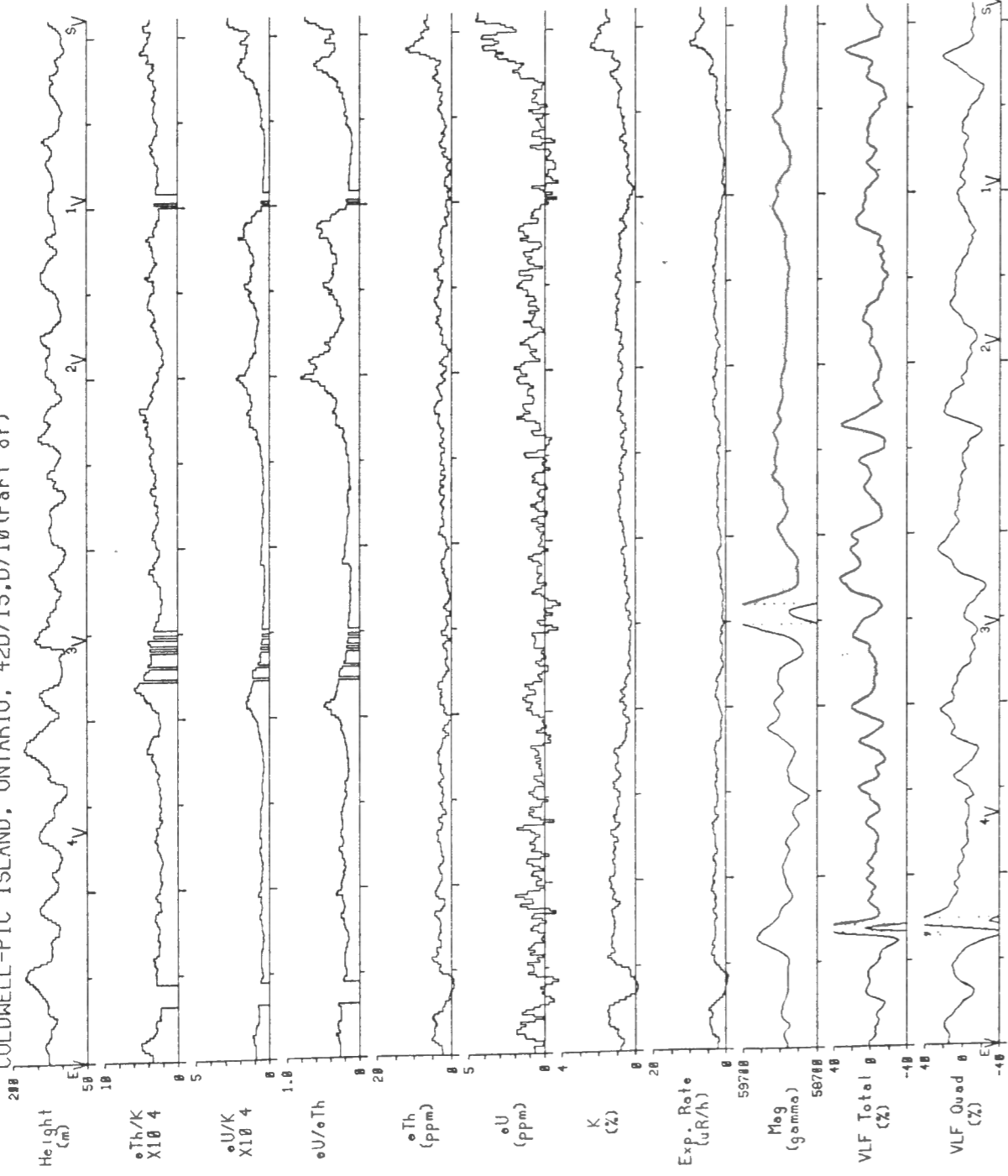
Line 49 2 km Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
COLDWELL-PIC ISLAND, ONTARIO, 42D/15,D/10 (Part of)



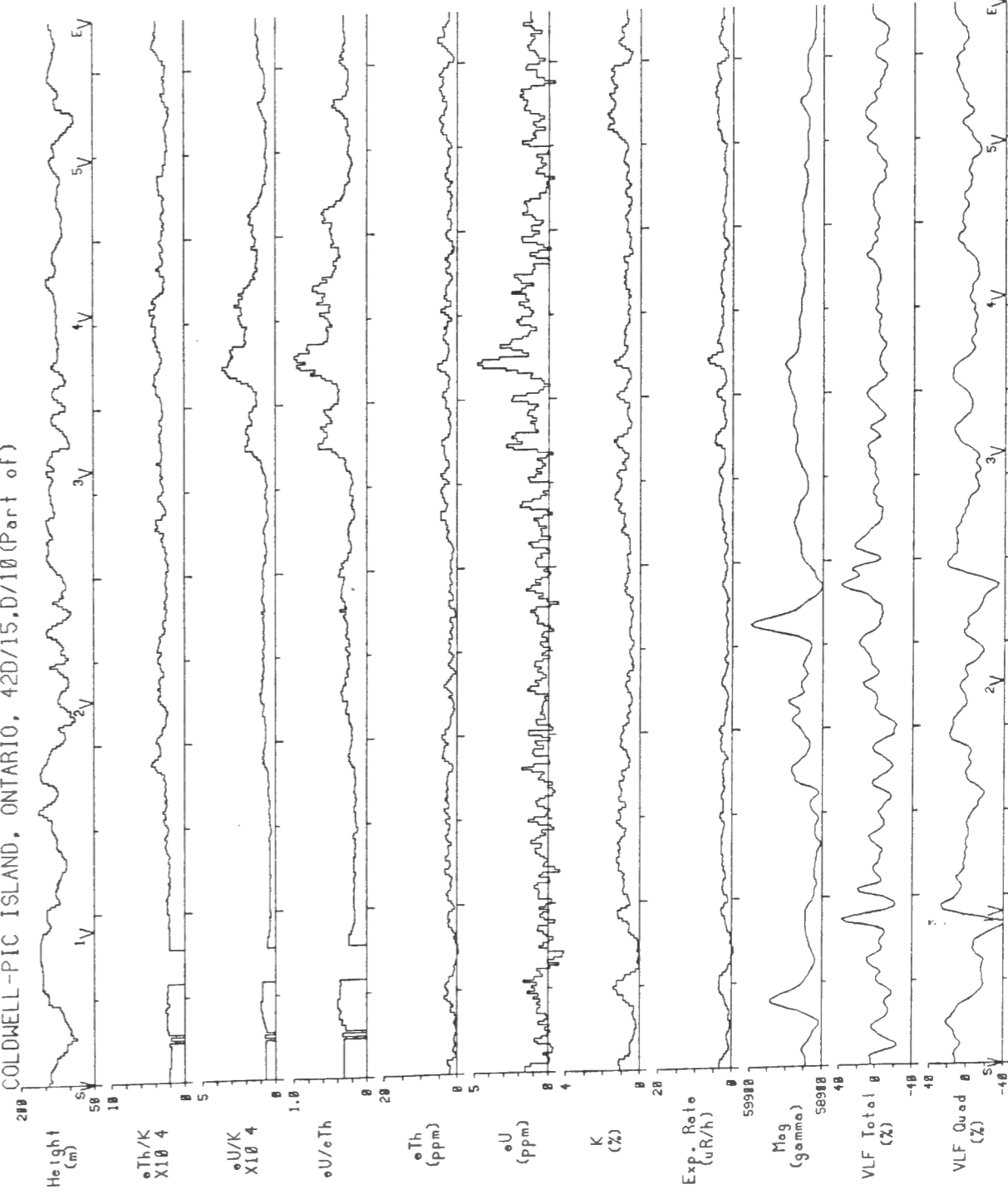
Line 50 2 km Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
COLDWELL-PIC ISLAND, ONTARIO, 42D/15.D/10 (Part of)



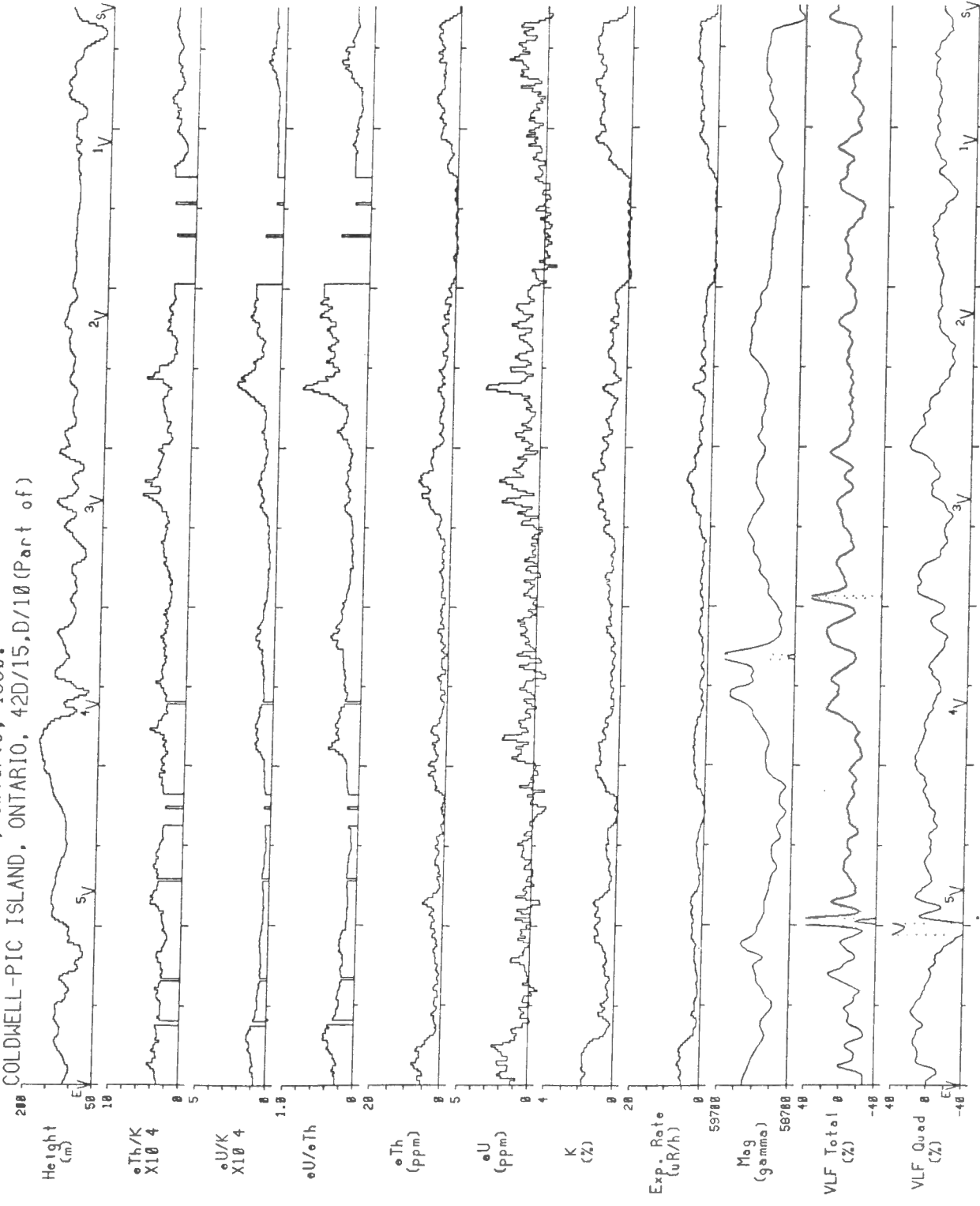
Line 51 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
COLDWELL-PIC ISLAND, ONTARIO, 42D/15.D/10 (Part of)



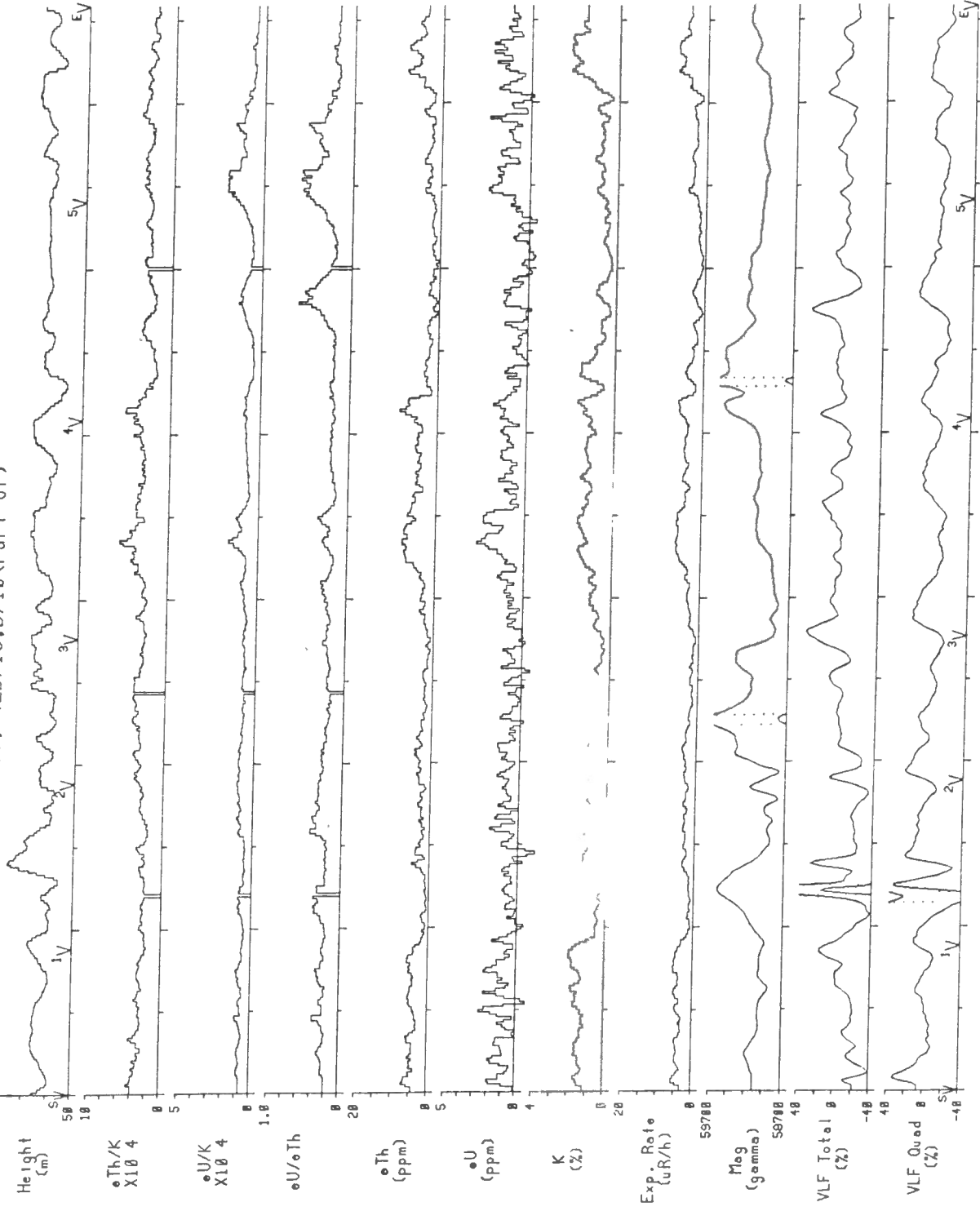
Line 52 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
COLDWELL-PIC ISLAND, ONTARIO, 42D/15.D/10 (Part of)



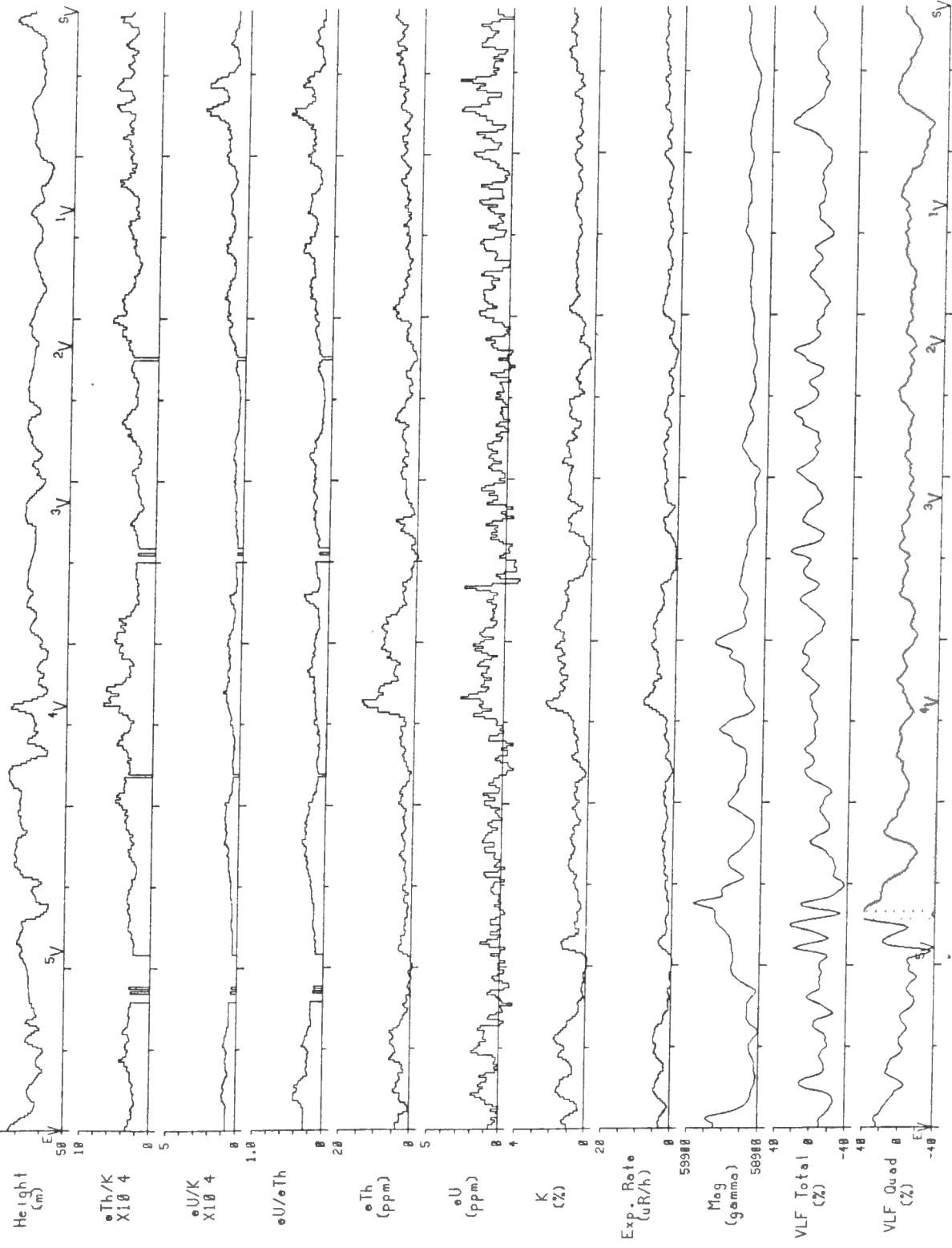
Line 53 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
COLDWELL-PIC ISLAND, ONTARIO, 42D/15.D/10 (Part of)

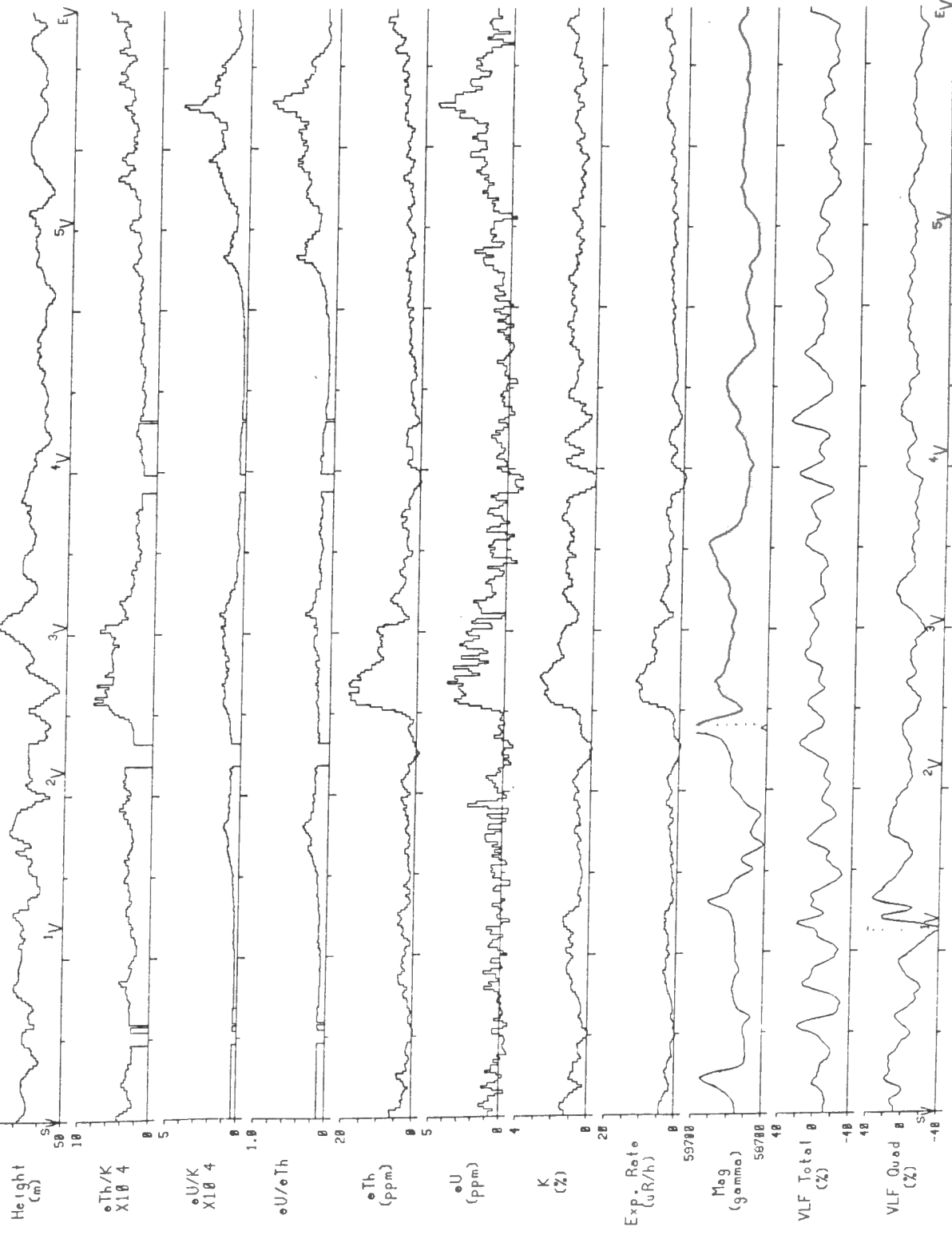


Line 54 | 2 km | Scale 1:150000

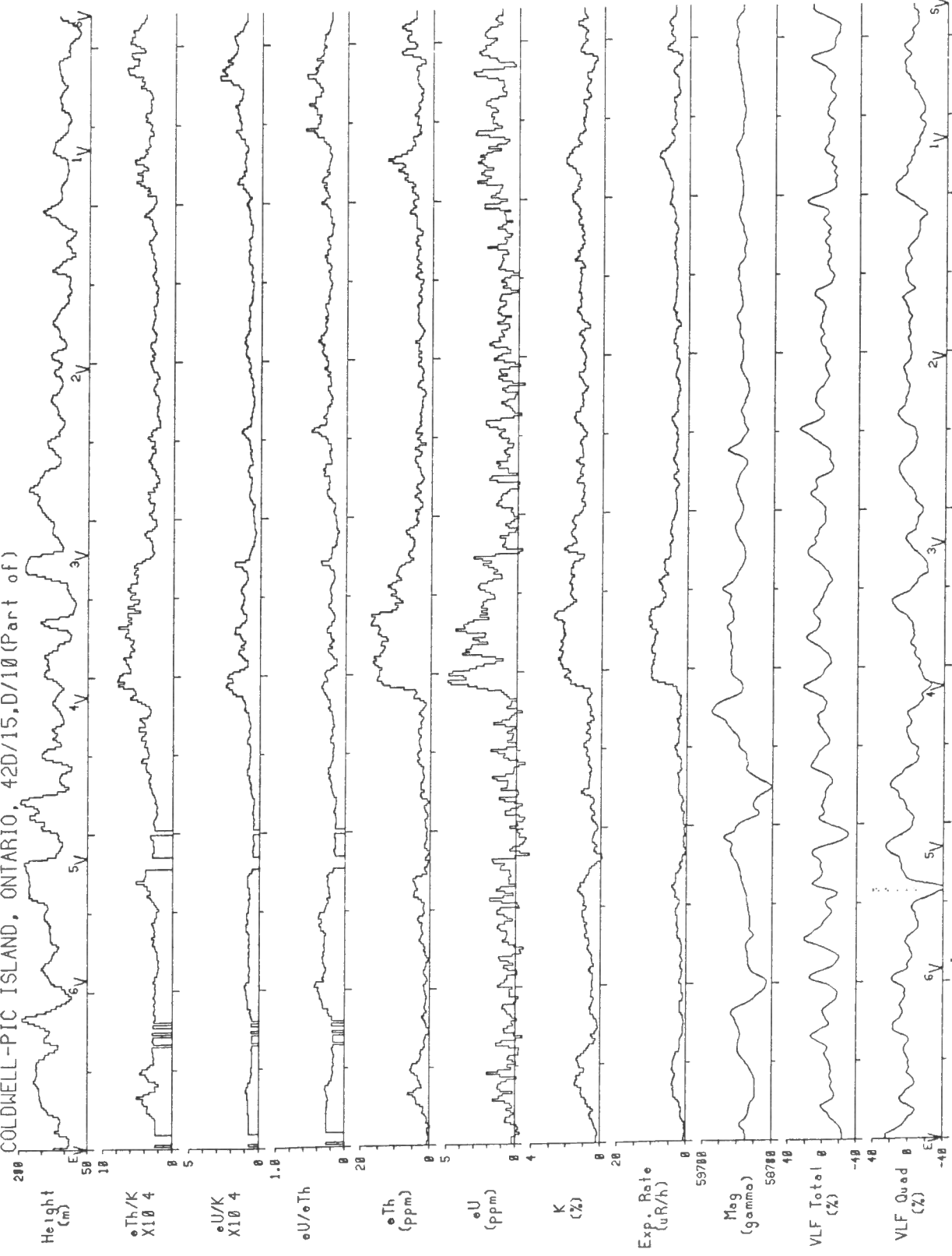
Hemlo-Schreiber Area, Ontario, 1990.
COLDWELL-PIC ISLAND, ONTARIO, 42D/15.D/10 (Part of)



Hemlo-Schreiber Area, Ontario, 1990.
COLDWELL-PIC ISLAND, ONTARIO, 42D/15.D/10 (Part of)

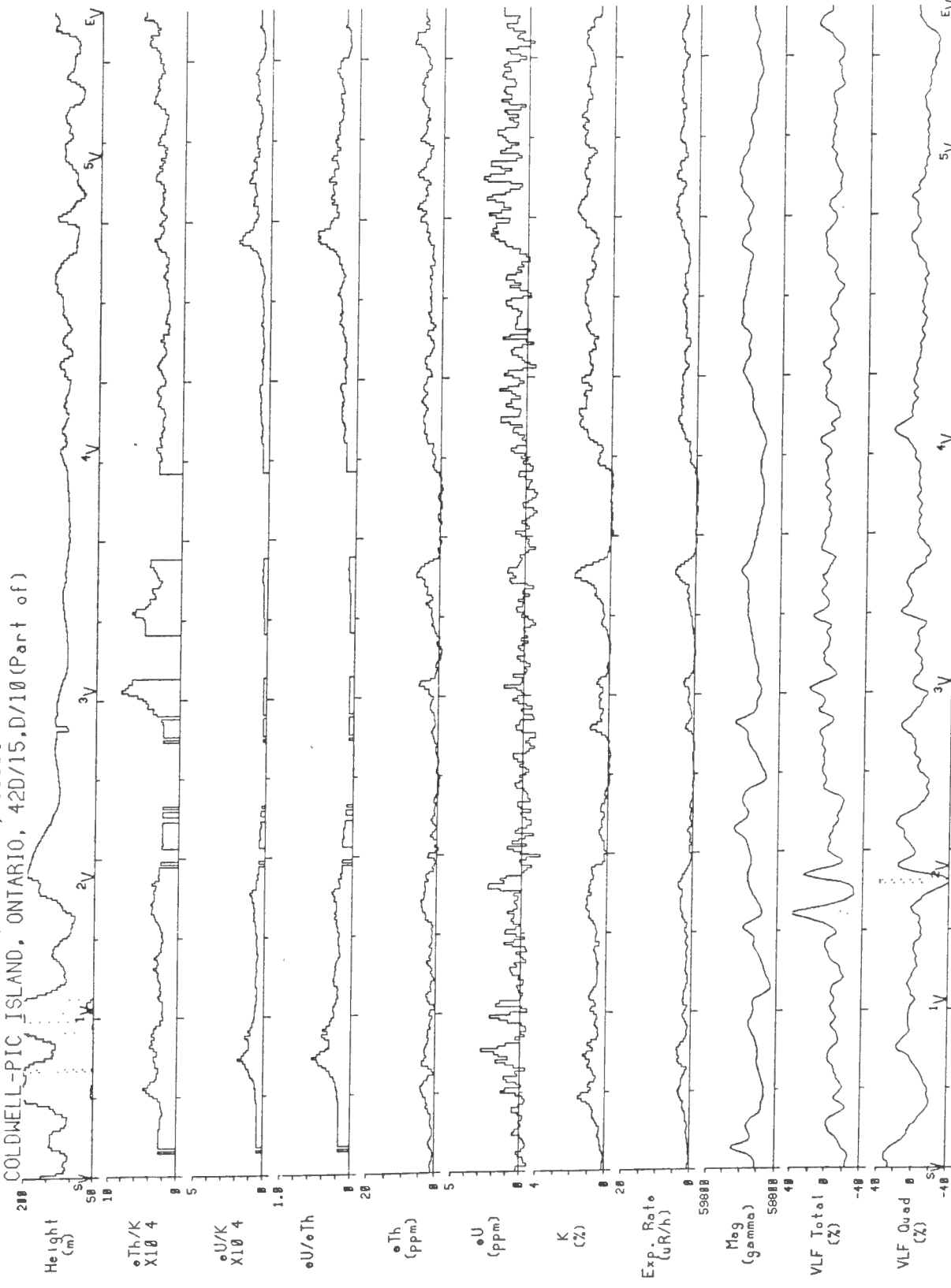


Hemlo-Schreiber Area, Ontario, 1990.
COLDWELL-PIC ISLAND, ONTARIO, 42D/15,D/10(Part of)



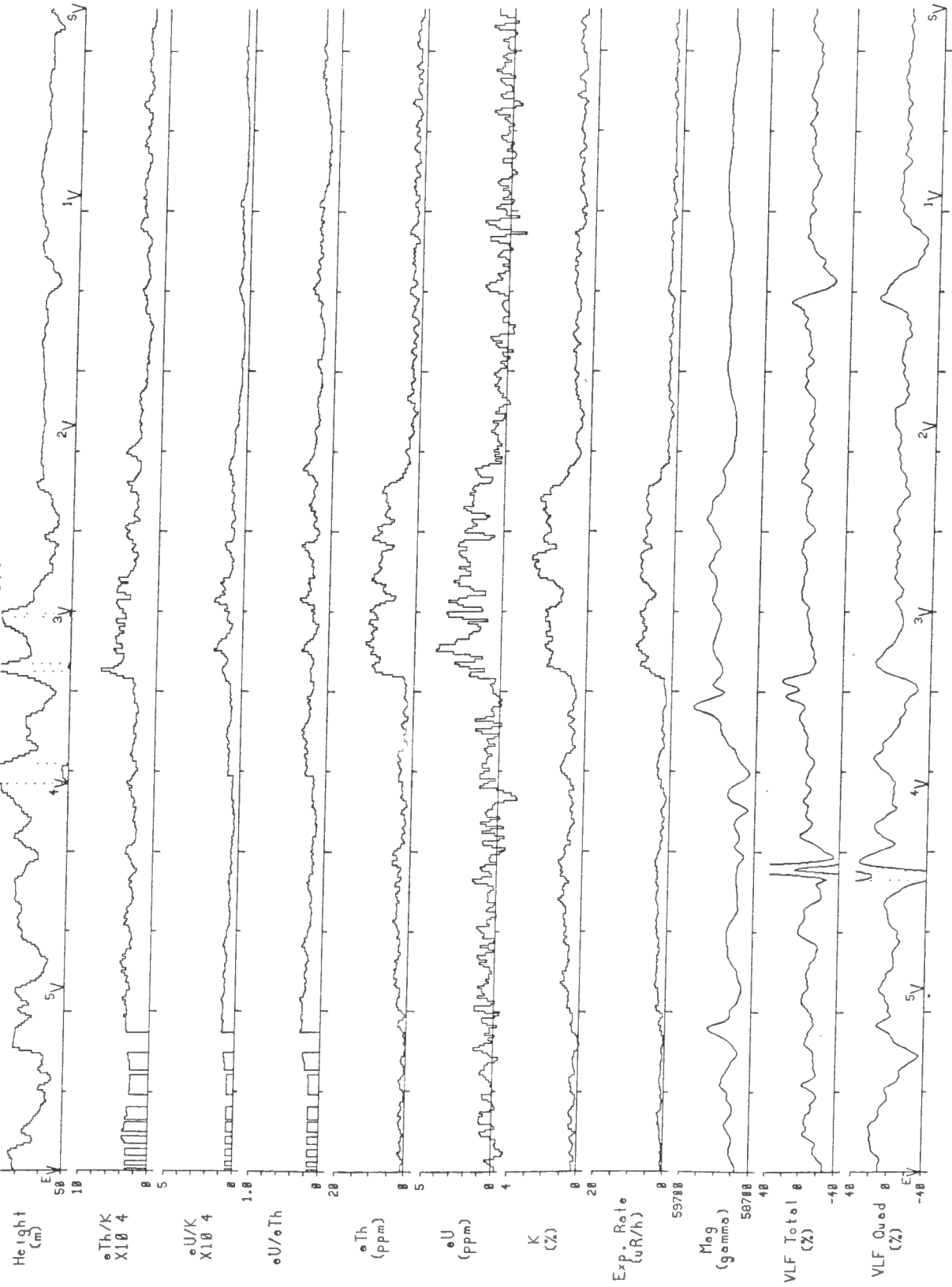
Line 57 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
COLDWELL-PIC ISLAND, ONTARIO, 42D/15,D/10(Part of)



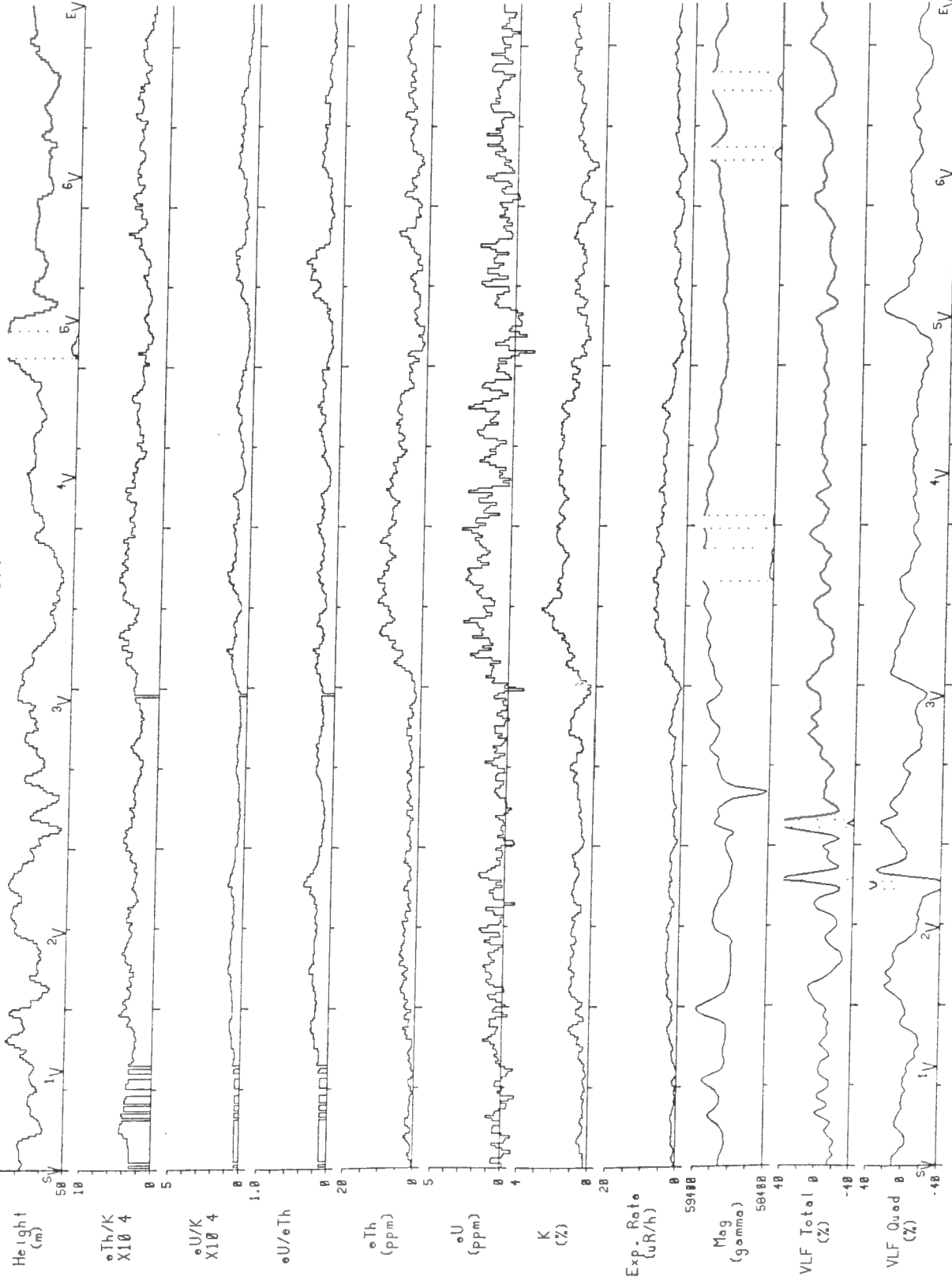
Line 58 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
COLDWELL-PIC ISLAND, ONTARIO, 42D/15.D/10 (Part of)



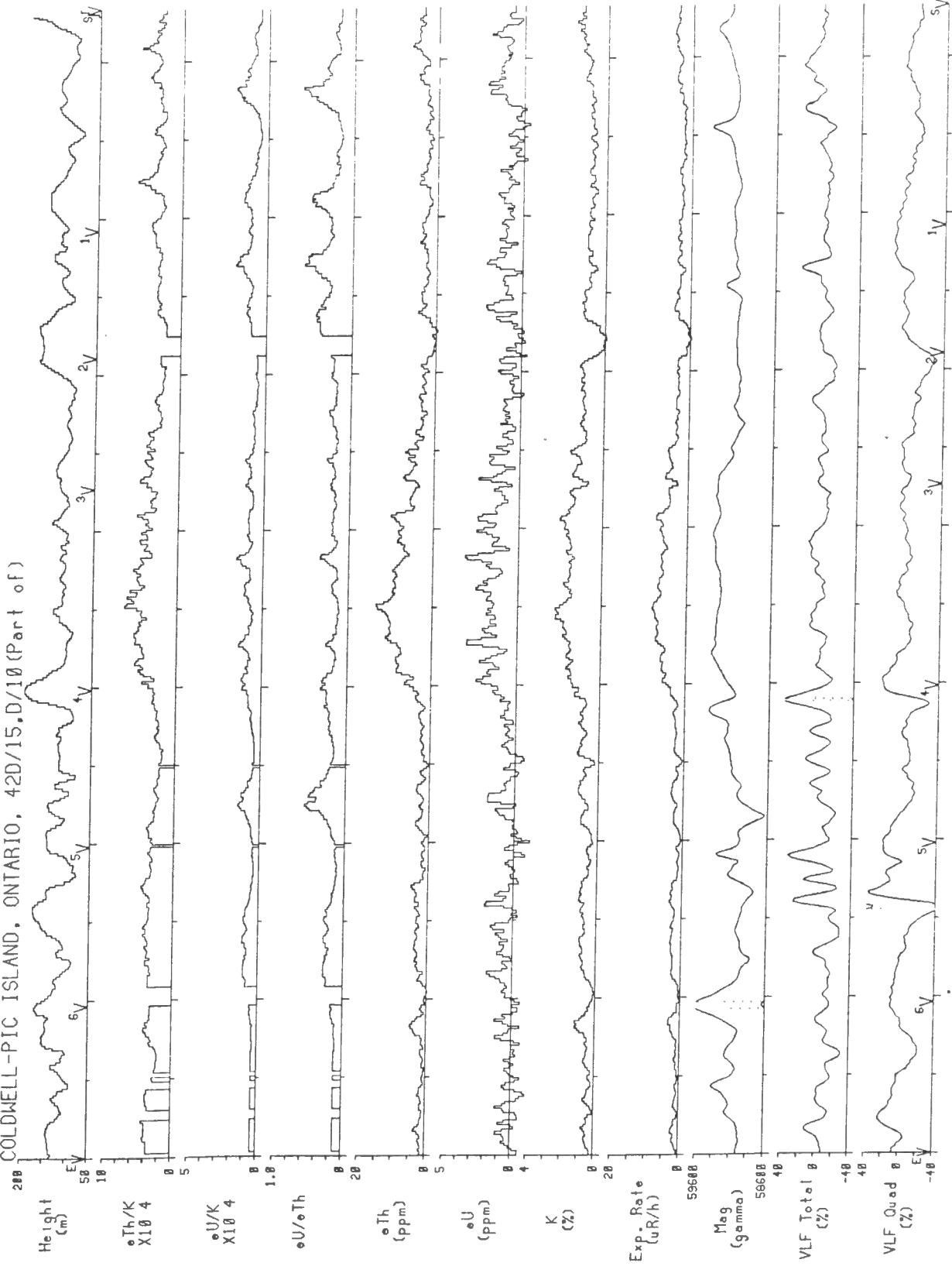
Line 59 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
COLDWELL-PIC ISLAND, ONTARIO, 42D/15.D/10 (Part of)



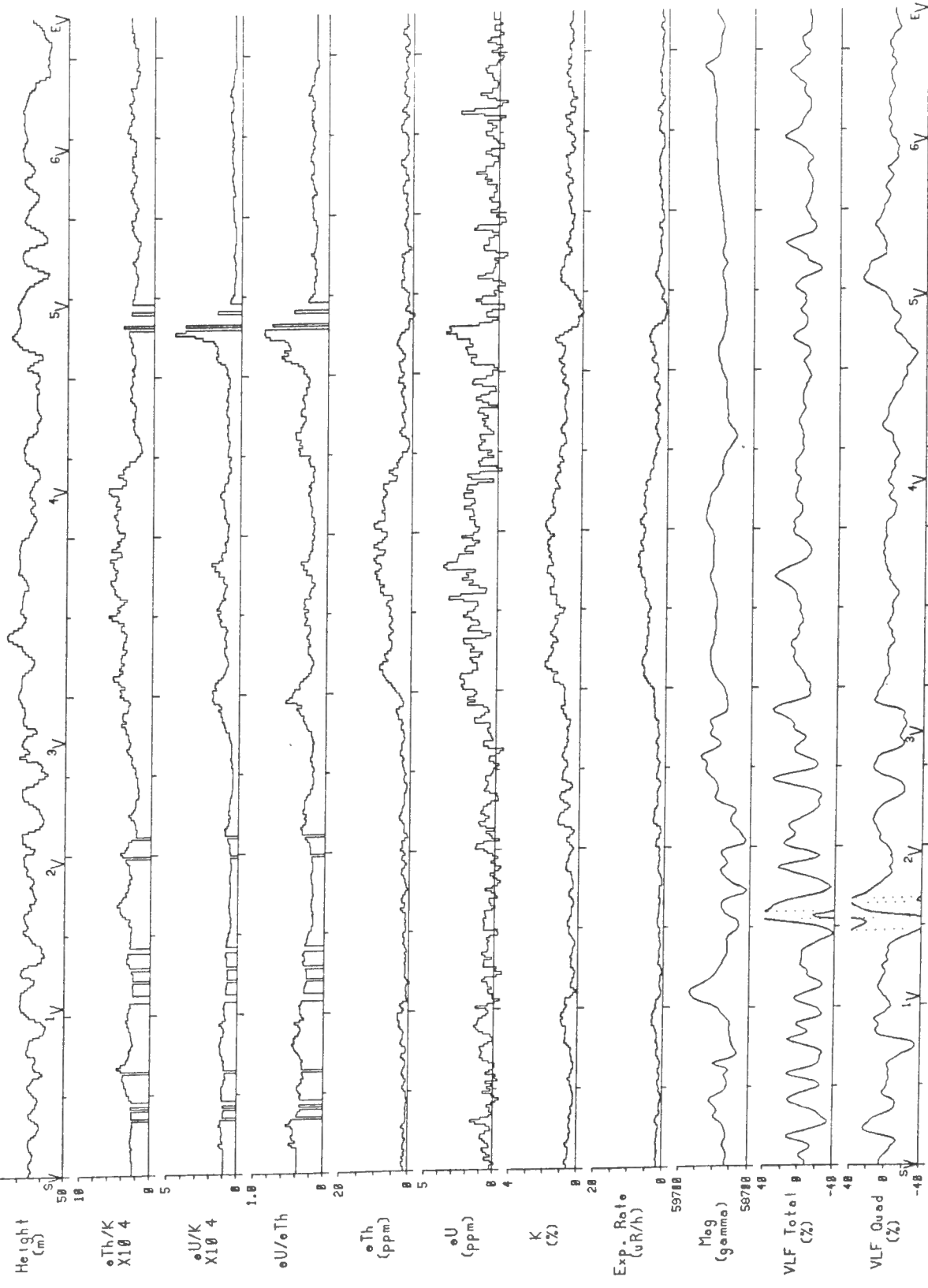
Line 60 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
COLDWELL-PIC ISLAND, ONTARIO, 42D/15.D/10 (Part of)



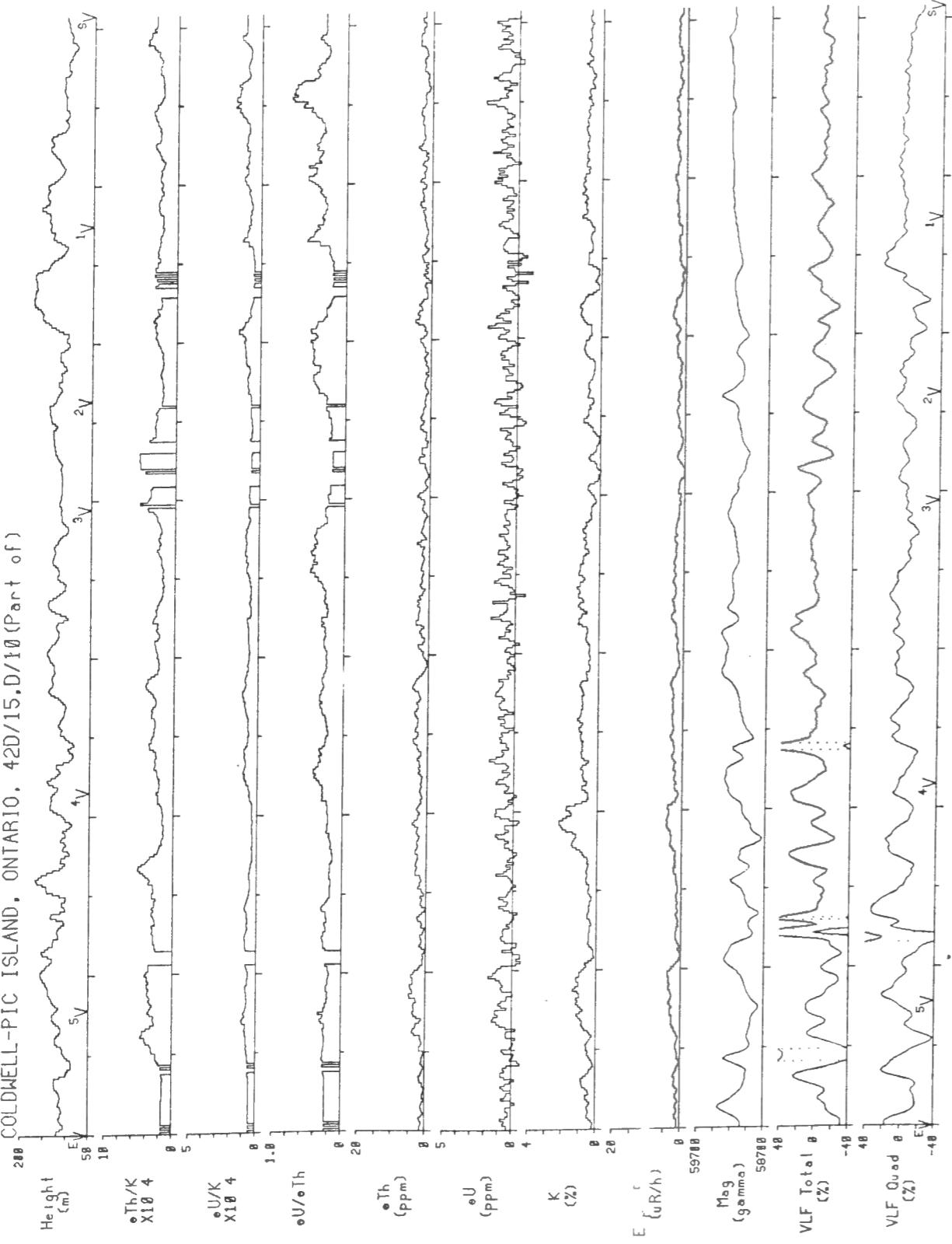
Line 61 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
COLDWELL-PIC ISLAND, ONTARIO, 42D/15.D/10 (Part of)



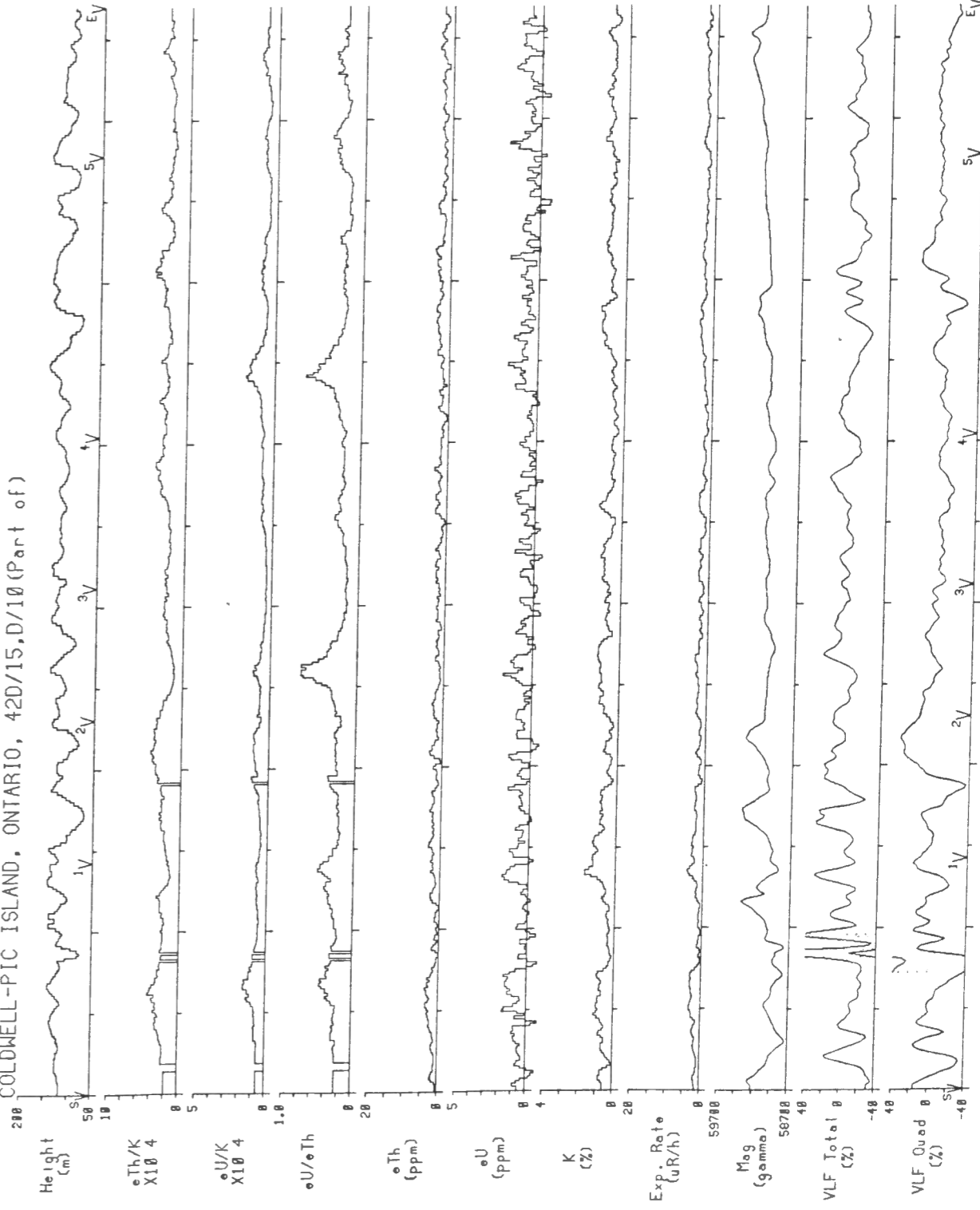
Line 62 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
COLDWELL-PIC ISLAND, ONTARIO, 42D/15,D/10(Part of)



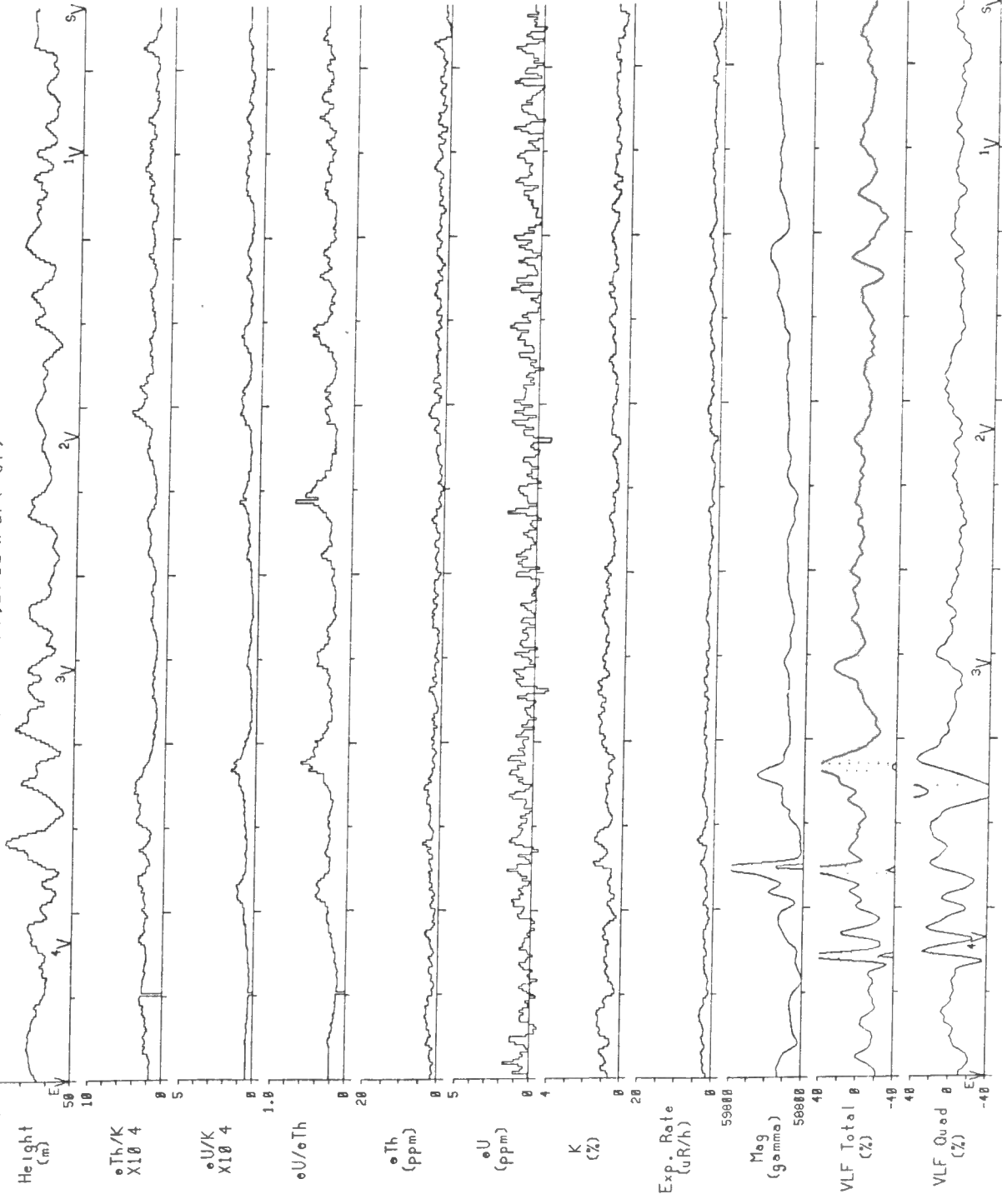
Line 63 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
COLDWELL-PIC ISLAND, ONTARIO, 42D/15,D/10(Part of)



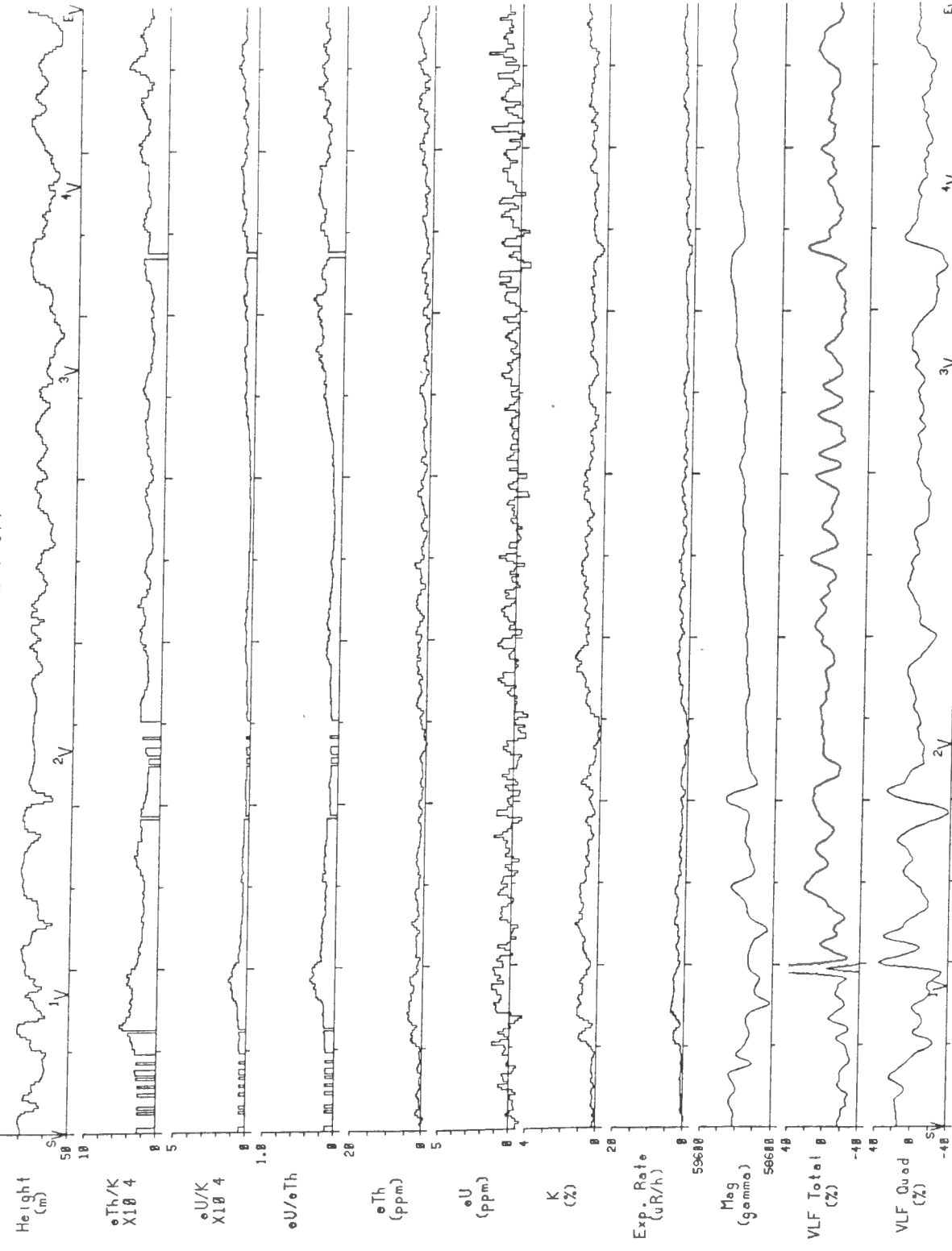
Line 64 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
COLDWELL-PIC ISLAND, ONTARIO, 42D/15.D/10 (Part of)



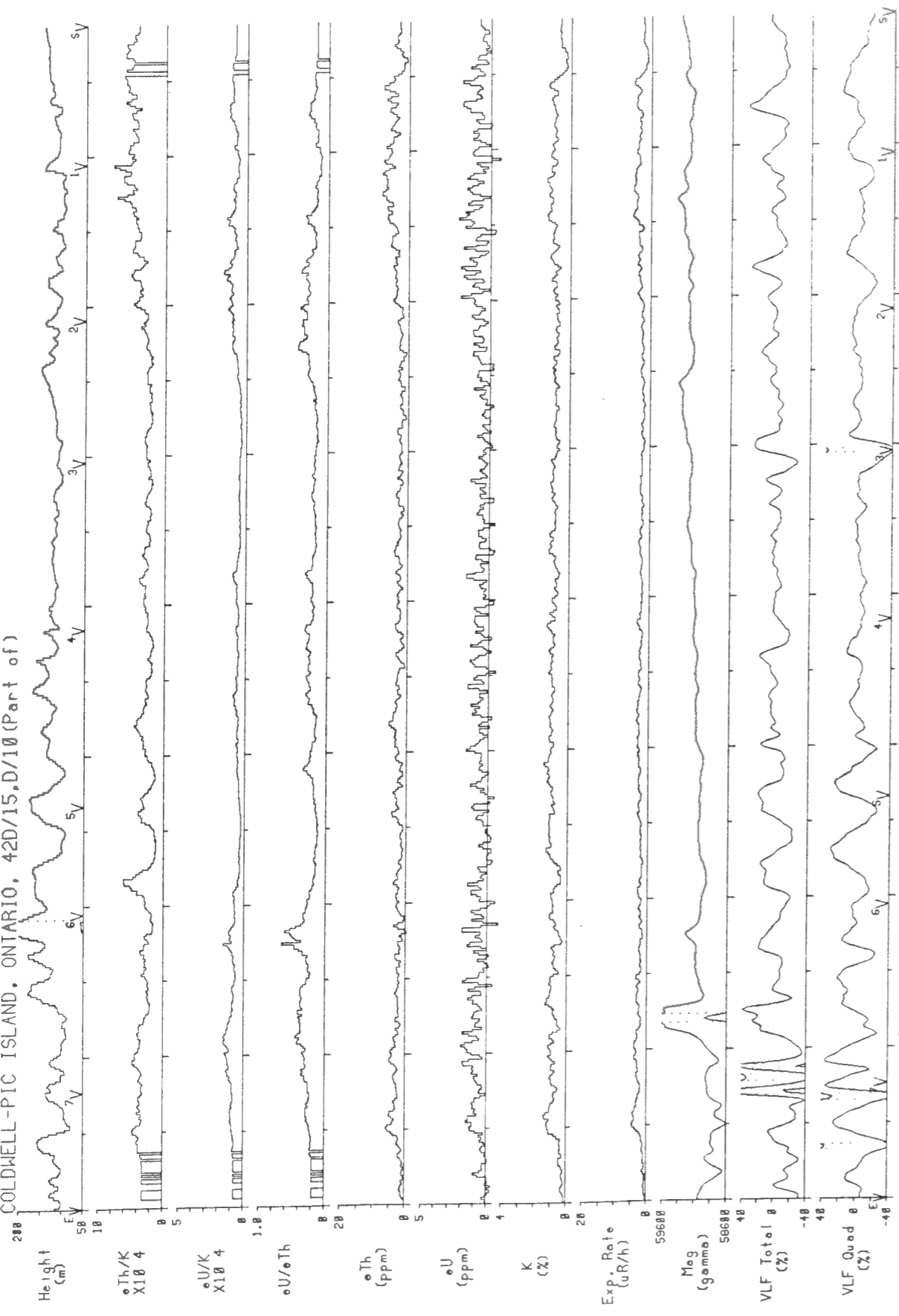
Line 65 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
COLDWELL-PIC ISLAND, ONTARIO, 42D/15.D/10 (Part of)



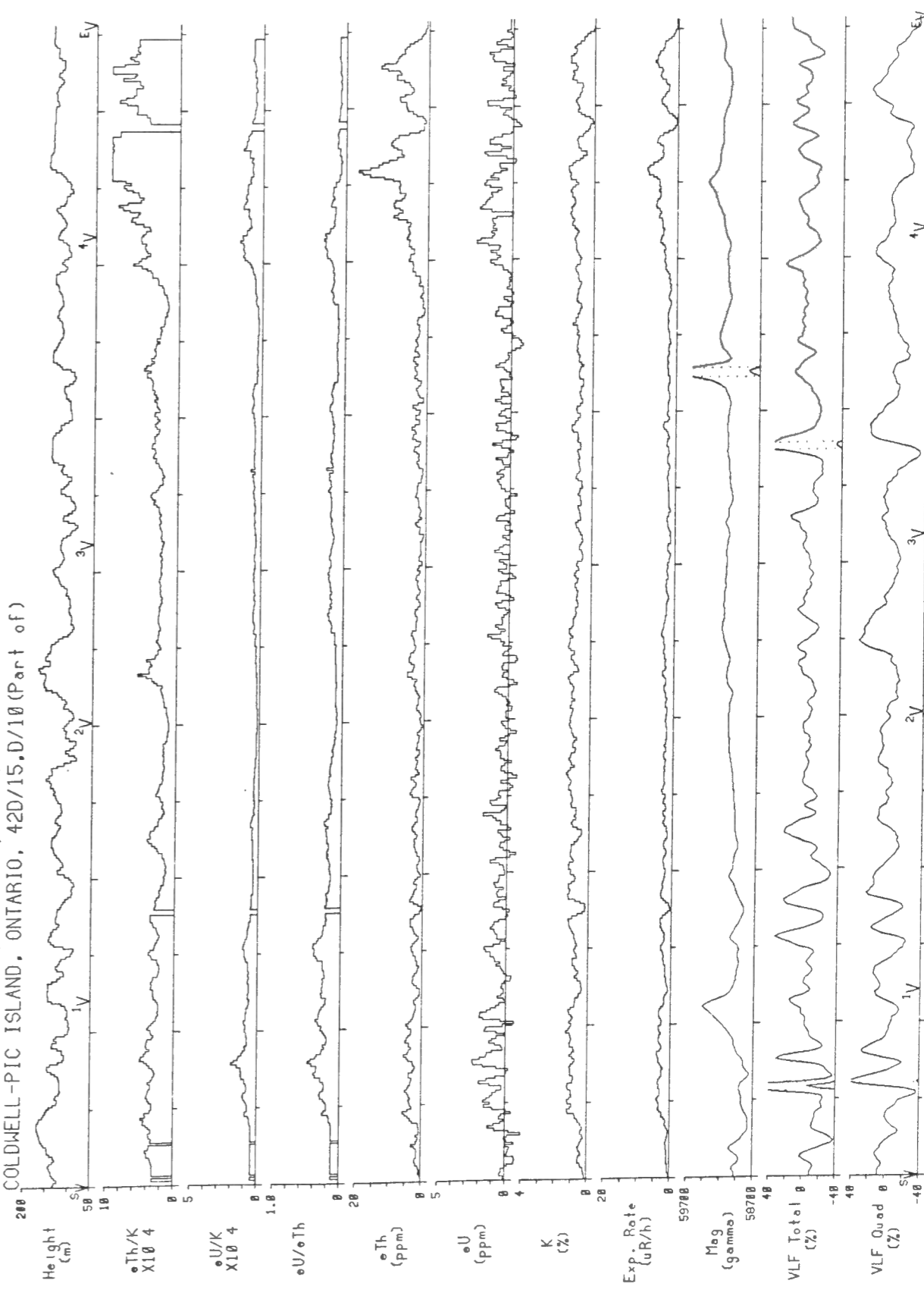
Line 66 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
COLDWELL-PIC ISLAND, ONTARIO, 42D/15.D/10 (Part of)



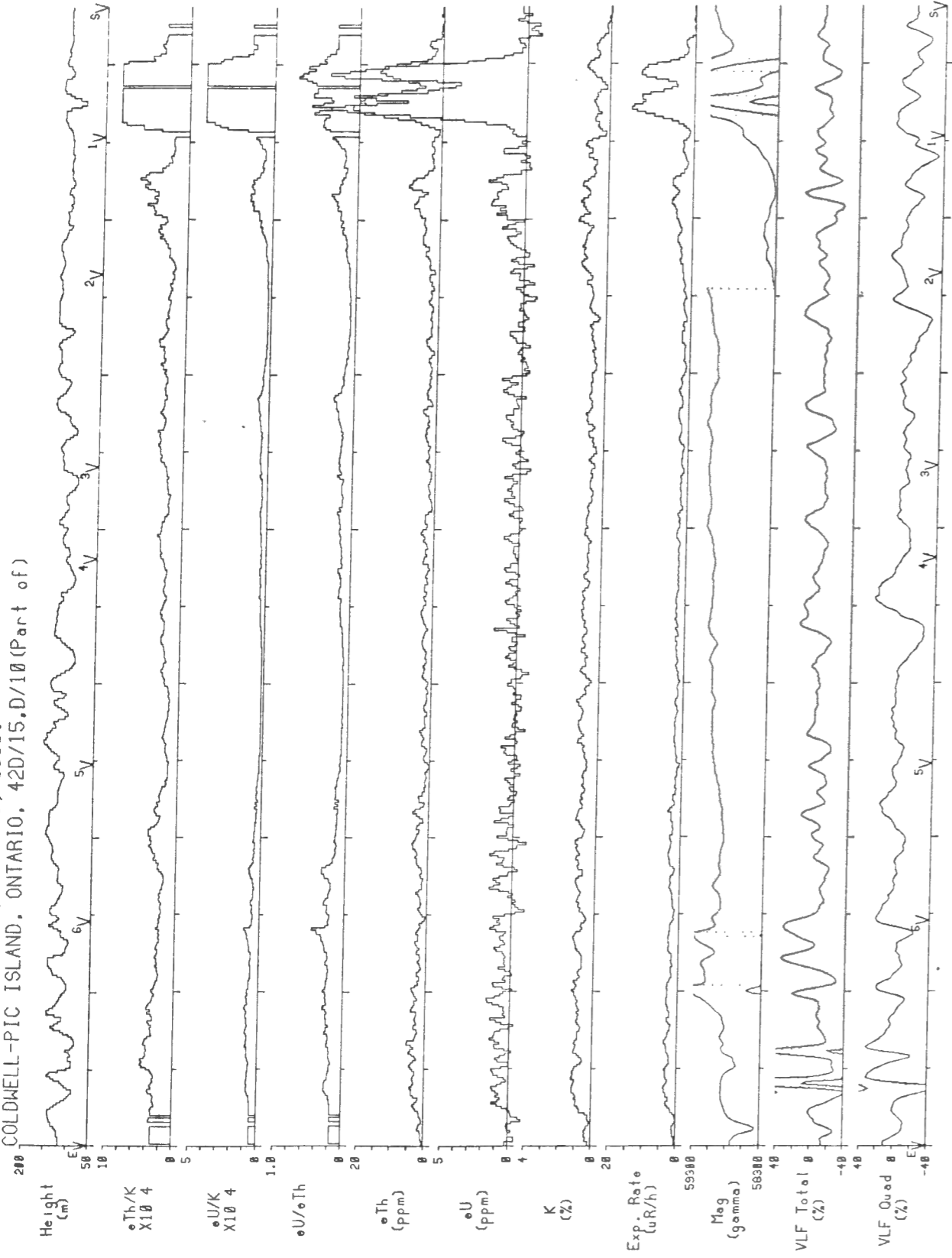
Line 67 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
COLDWELL-PIC ISLAND, ONTARIO, 42D/15.D/10 (Part of)



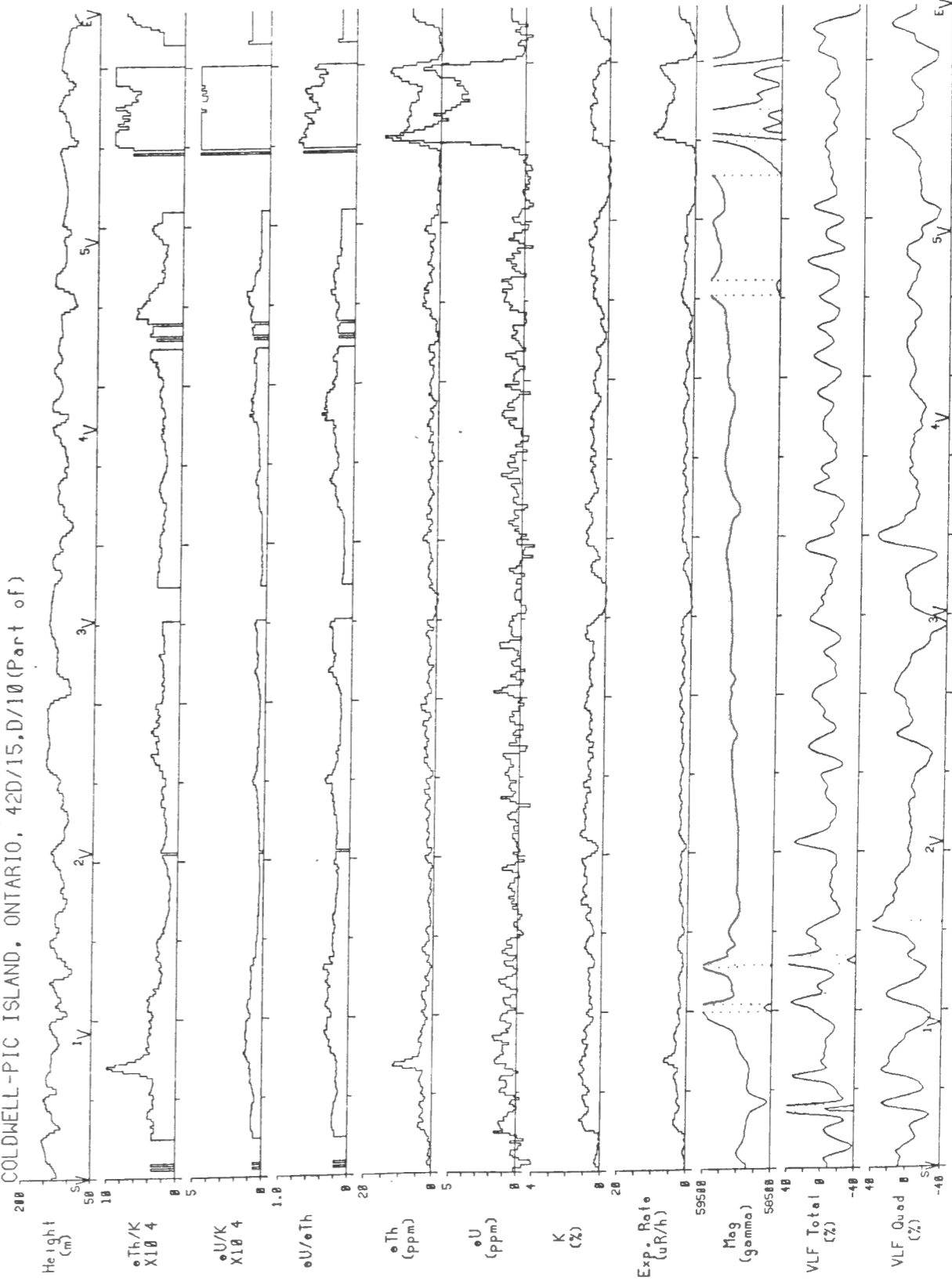
Line 68 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
COLDWELL-PIC ISLAND, ONTARIO, 42D/15.D/10 (Part of)



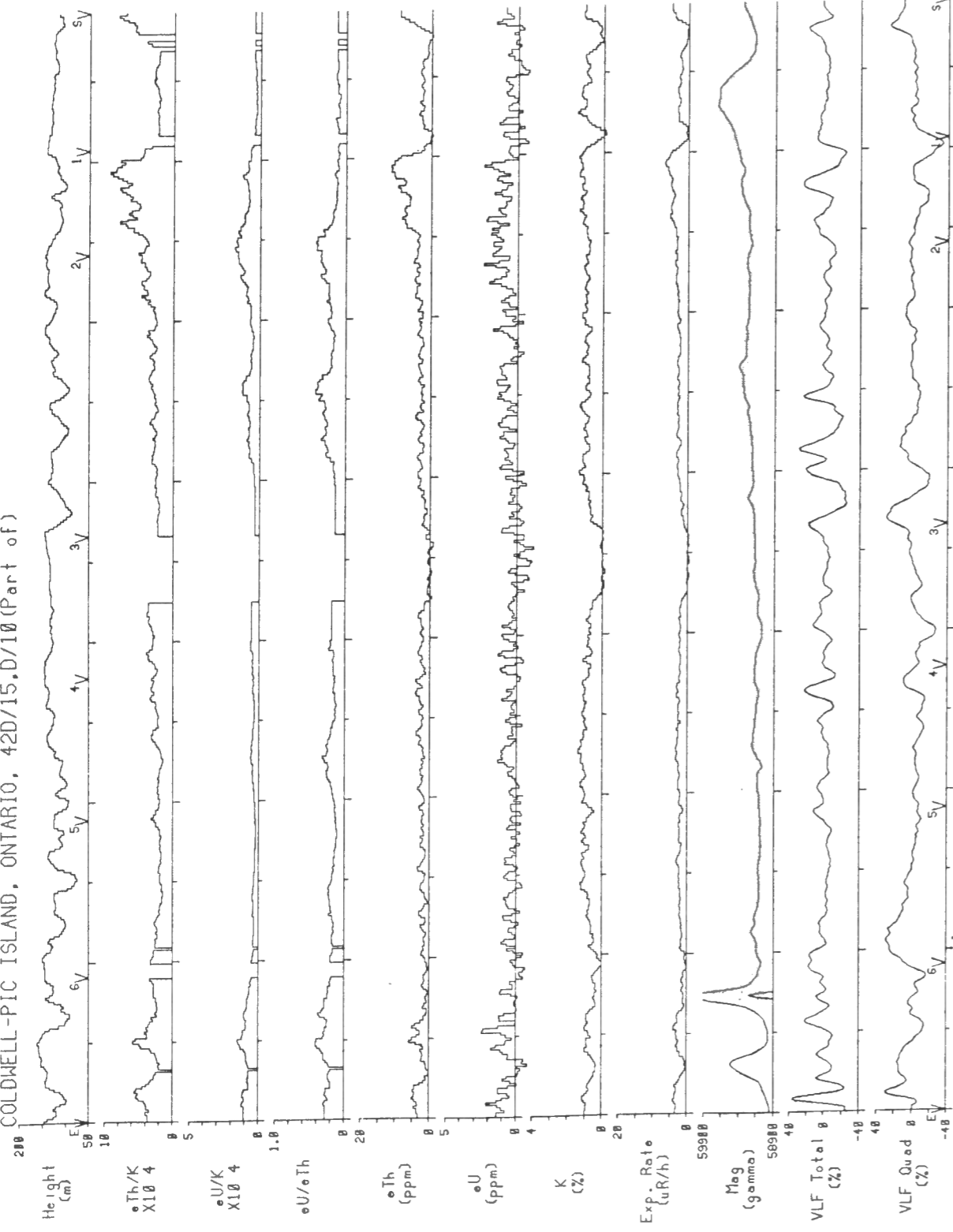
Line 69 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
COLDWELL-PIC ISLAND, ONTARIO, 42D/15.D/10 (Part of)



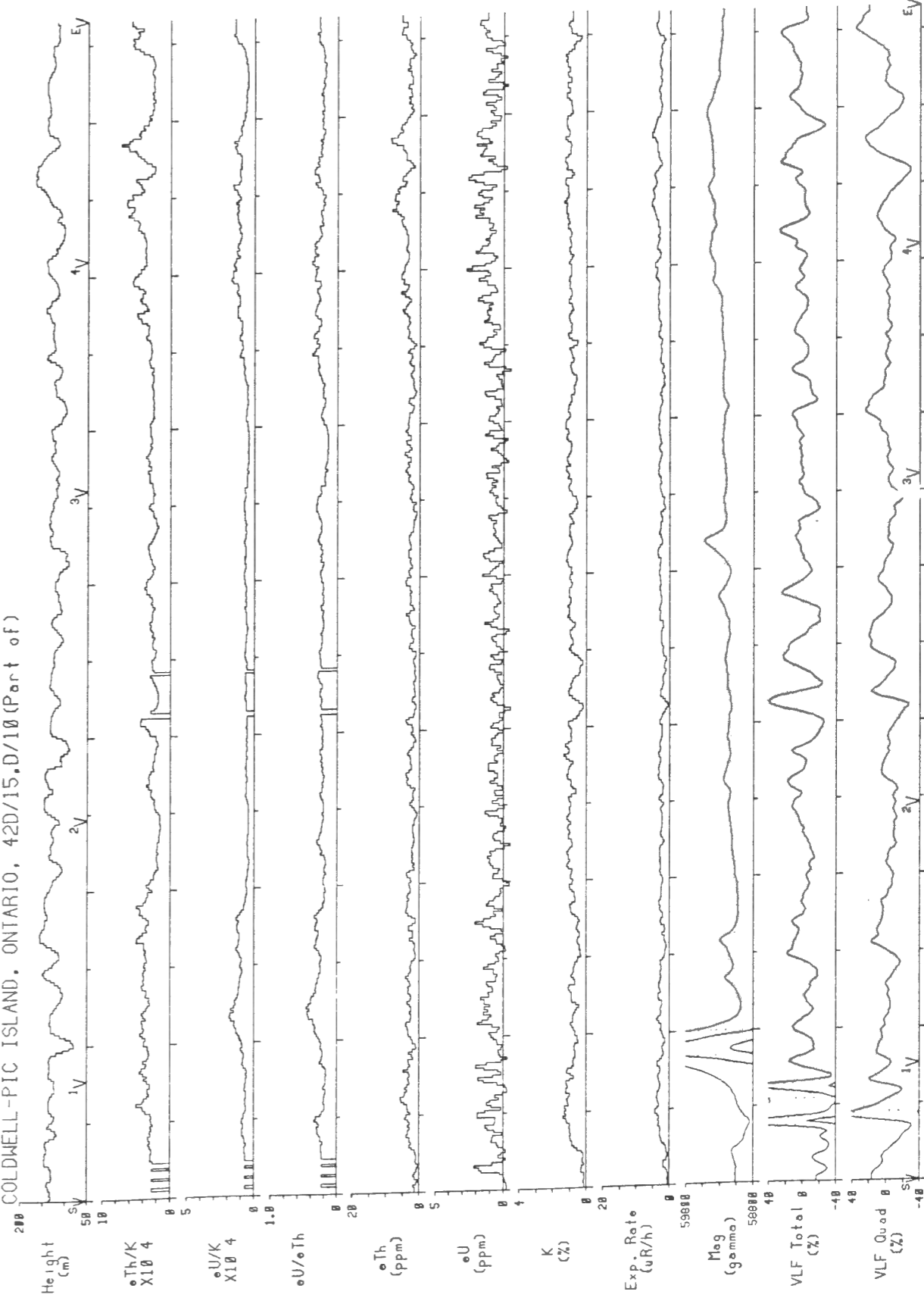
Line 70 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
COLDWELL-PIC ISLAND, ONTARIO, 42D/15.D/10 (Part of)



Line 71 | 2 km | Scale 1:150000

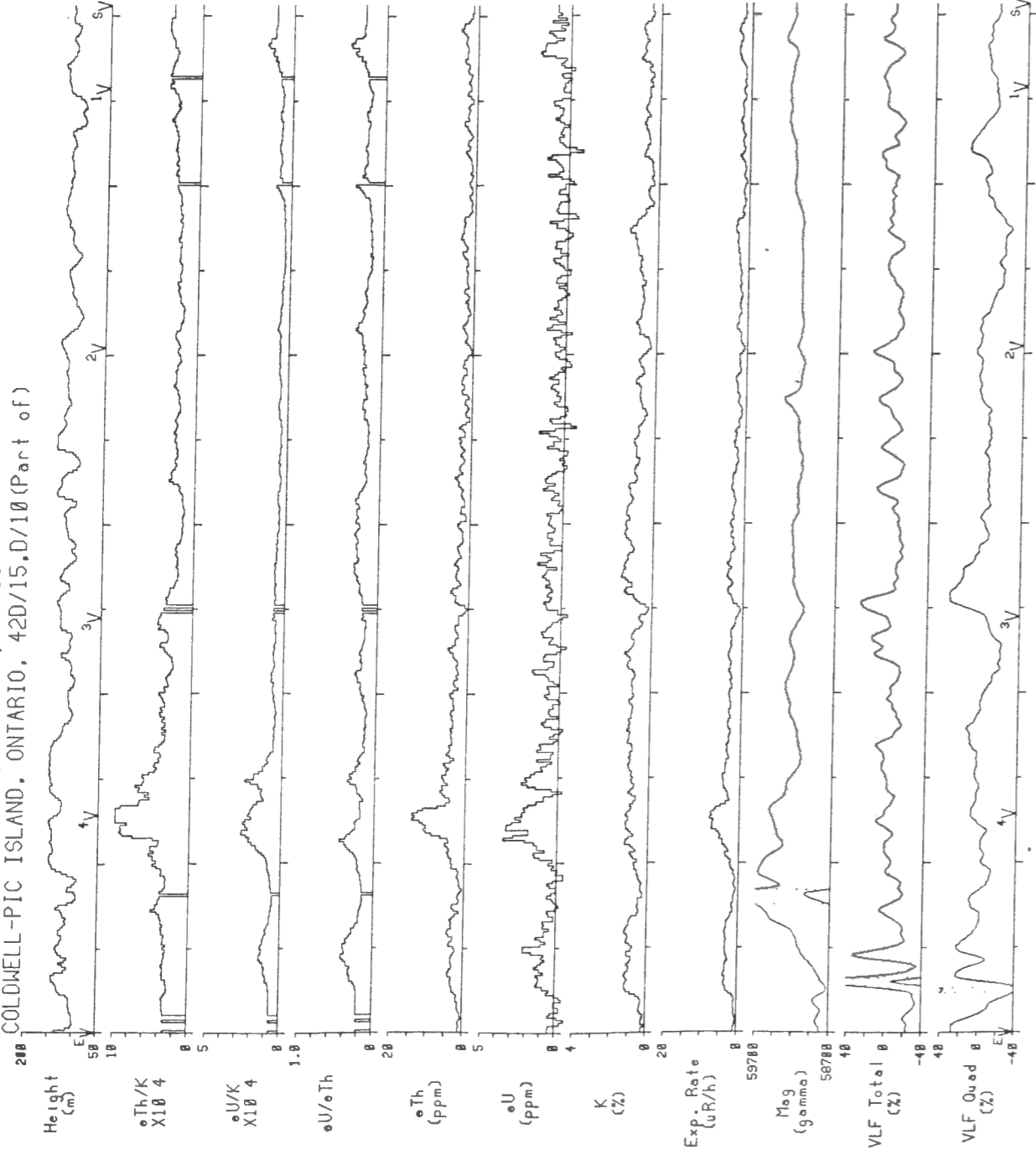
Hemlo-Schreiber Area, Ontario, 1990.
COLDWELL-PIC ISLAND, ONTARIO, 42D/15.D/10 (Part of)



2 km

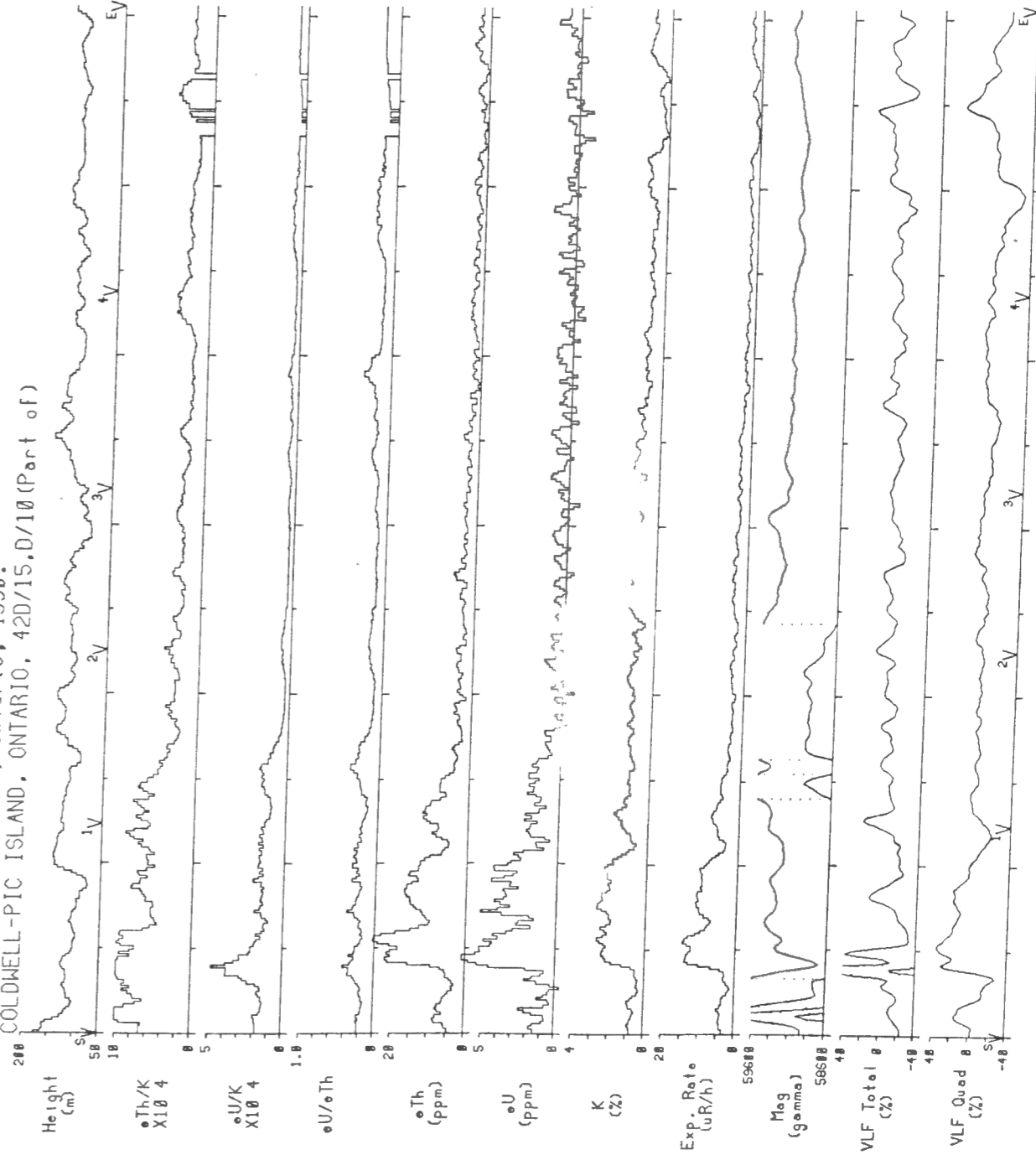
Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
COLDWELL-PIC ISLAND, ONTARIO, 42D/15.D/10 (Part of)



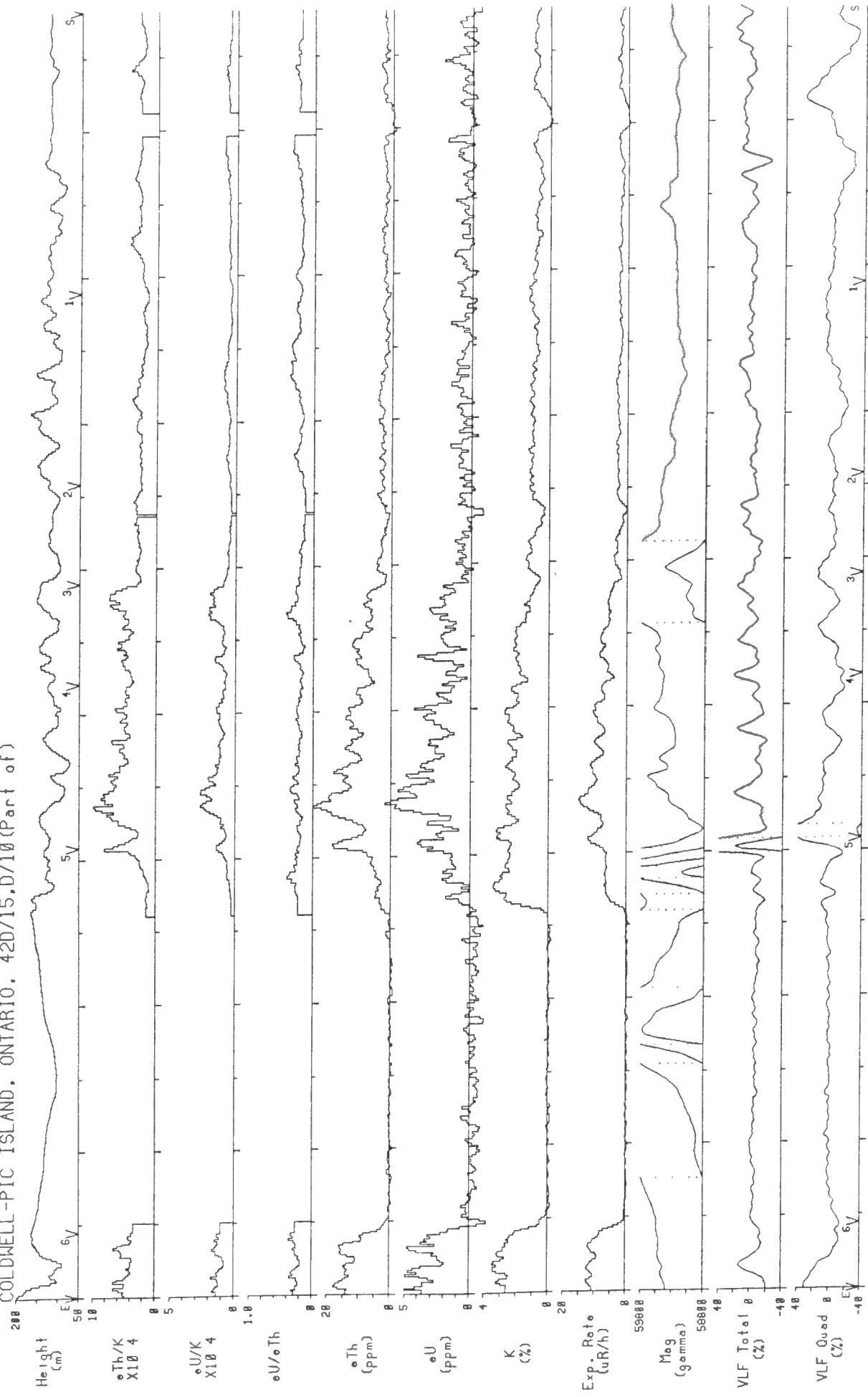
Line 73 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
COLDWELL-PIC ISLAND, ONTARIO, 42D/15.D/10 (Part of)



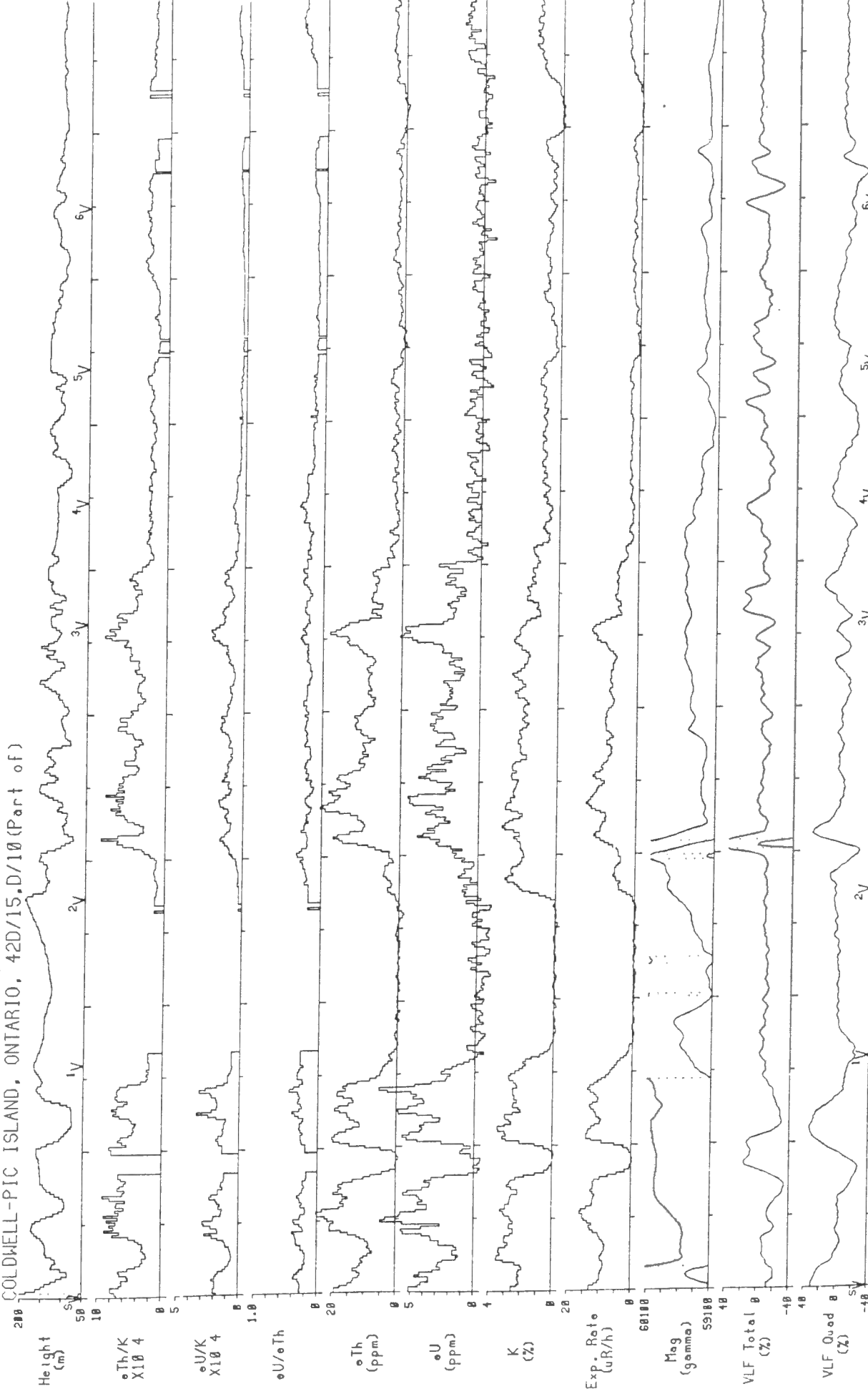
Line 74 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
COLDWELL-PIC ISLAND, ONTARIO, 42D/15.D/10 (Part of)



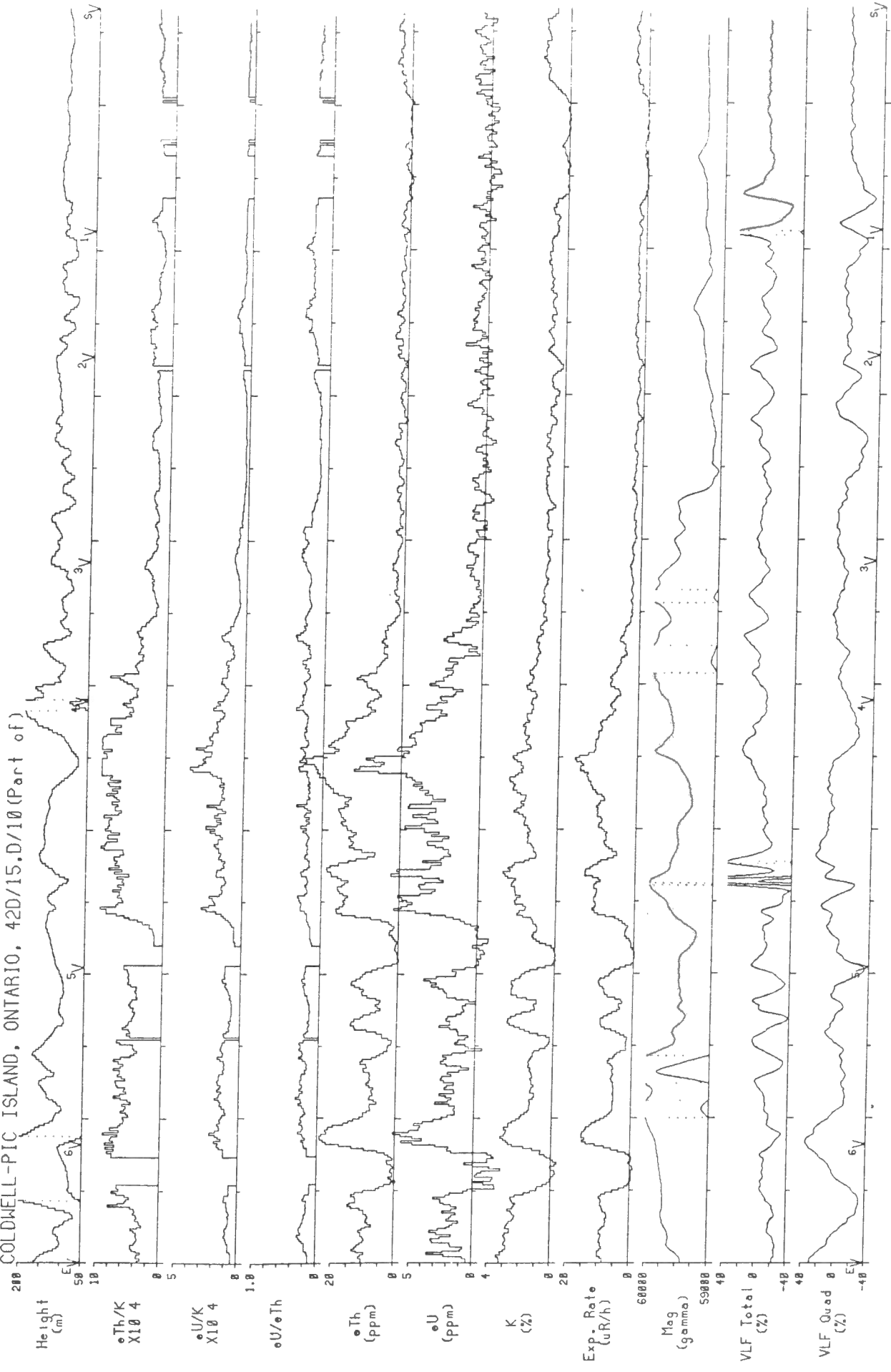
Line 75 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
COLDWELL-PIC ISLAND, ONTARIO, 42D/15.D/10 (Part of)

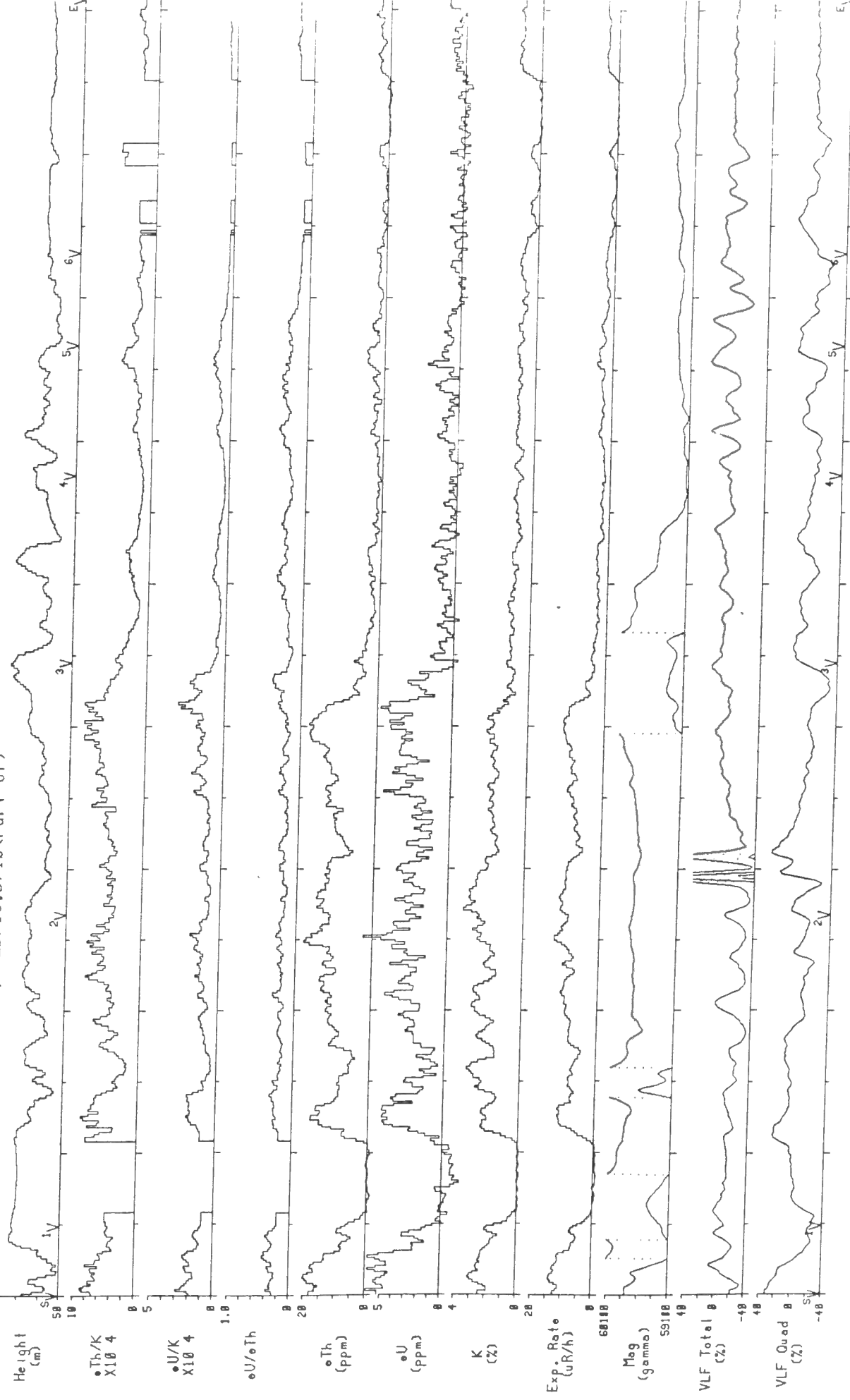


Line 76 | 2 km | Scale 1:150000

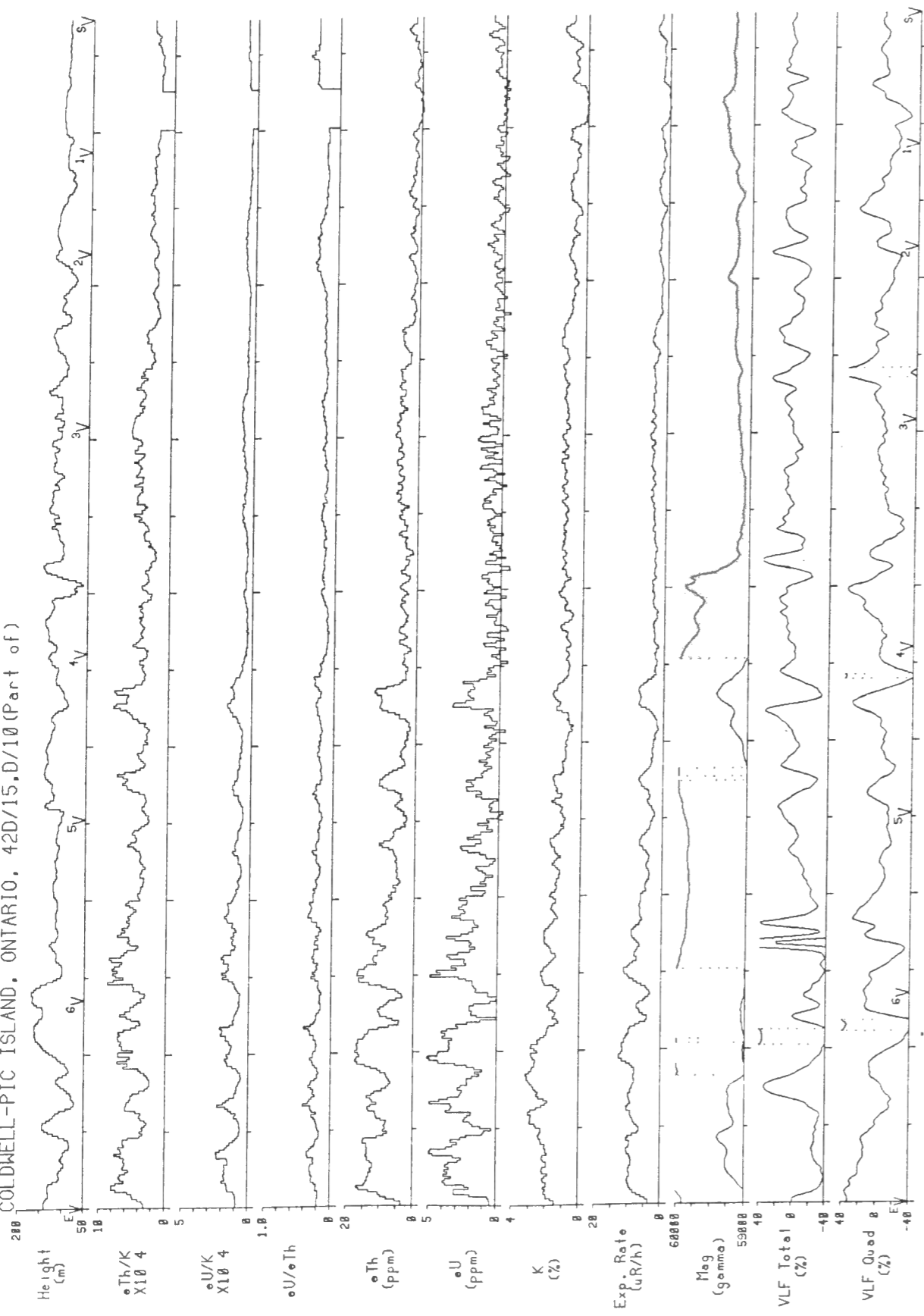
Hemlo-Schreiber Area, Ontario, 1990.
COLDWELL-PIC ISLAND, ONTARIO, 42D/15.D/10 (Part of)



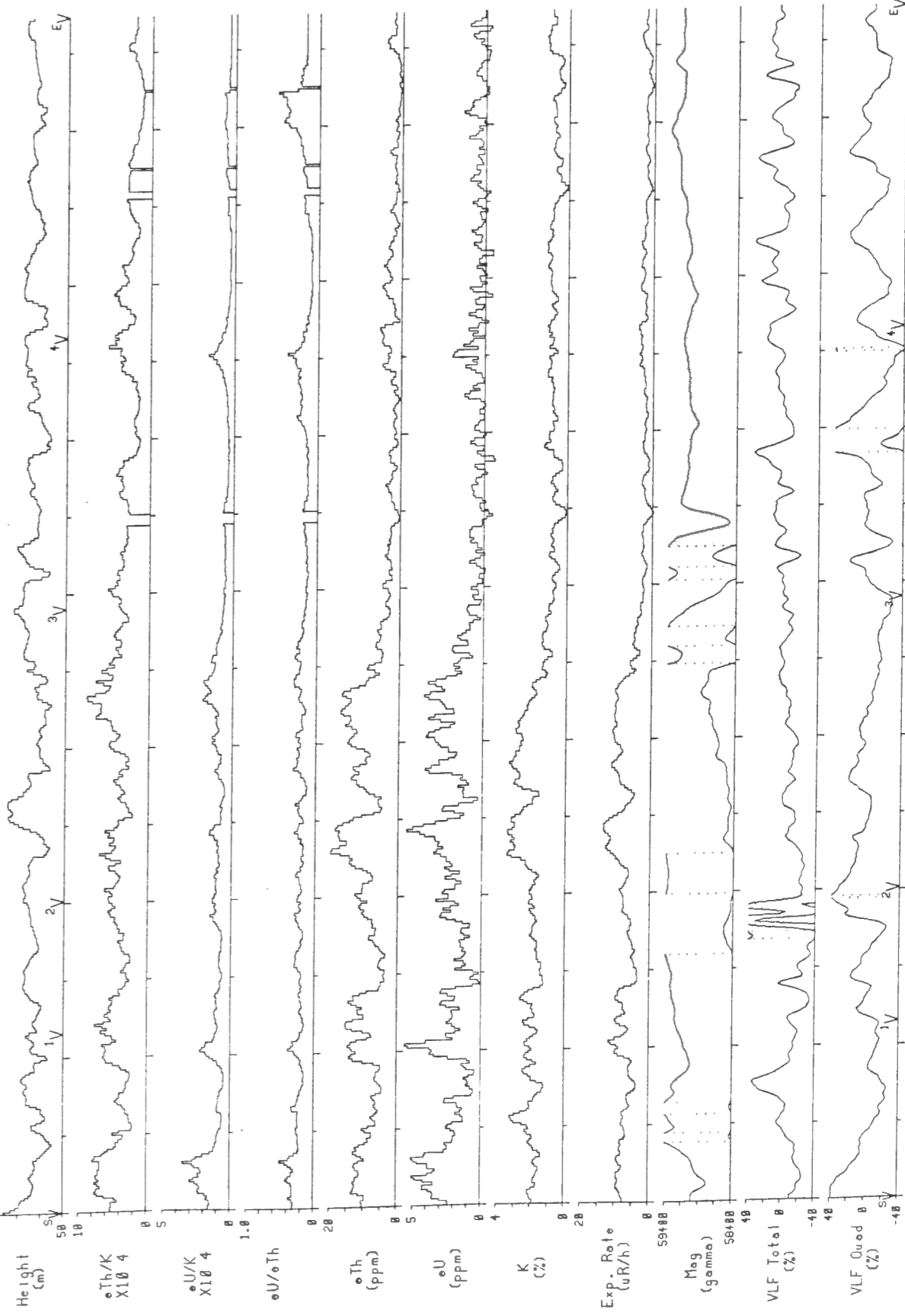
Hemlo-Schreiber Area, Ontario, 1990.
COLDWELL-PIC ISLAND, ONTARIO, 42D/15.D/10 (Part of)



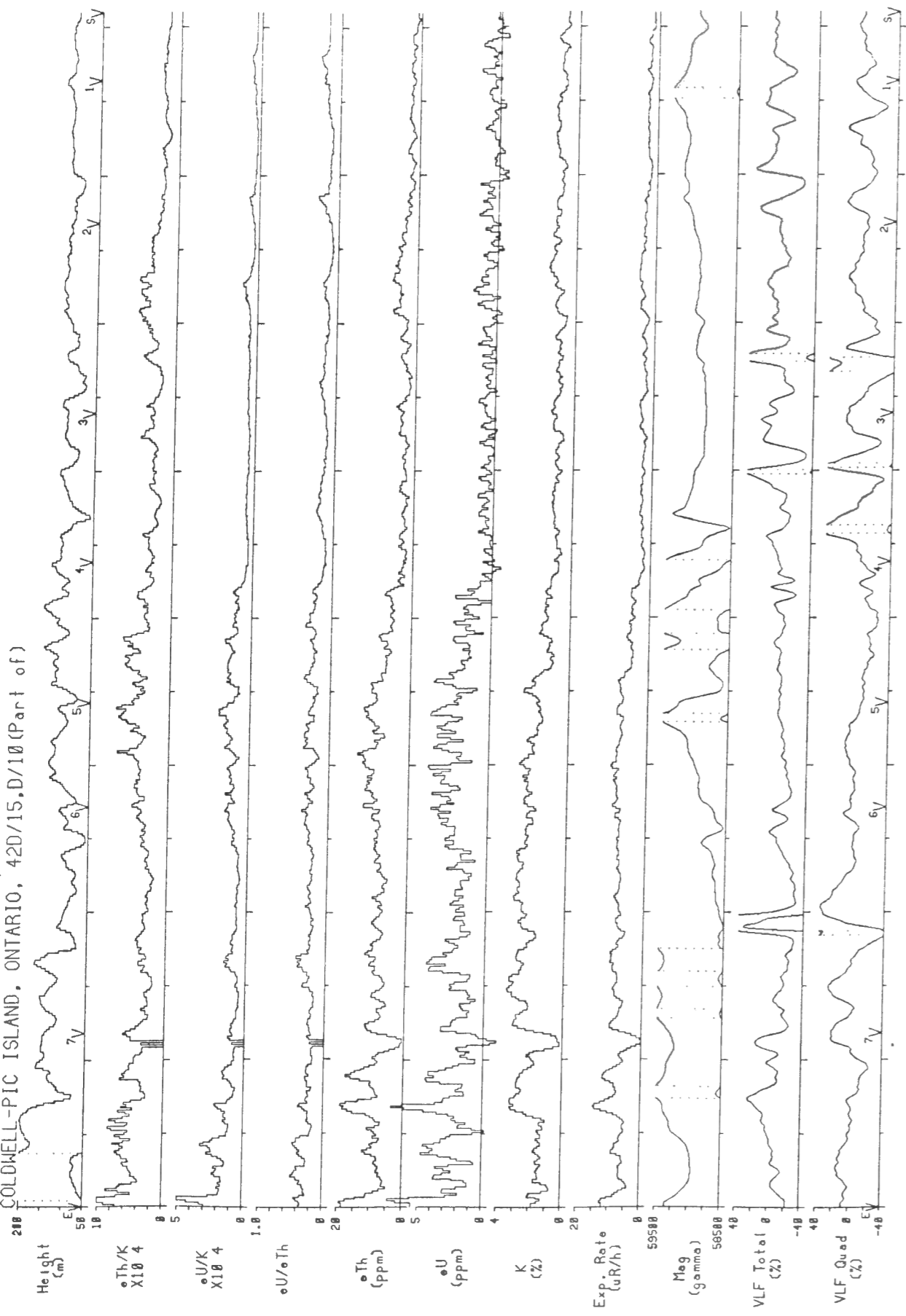
Hemlo-Schreiber Area, Ontario, 1990.
COLDWELL-PIC ISLAND, ONTARIO, 42D/15.D/10 (Part of)



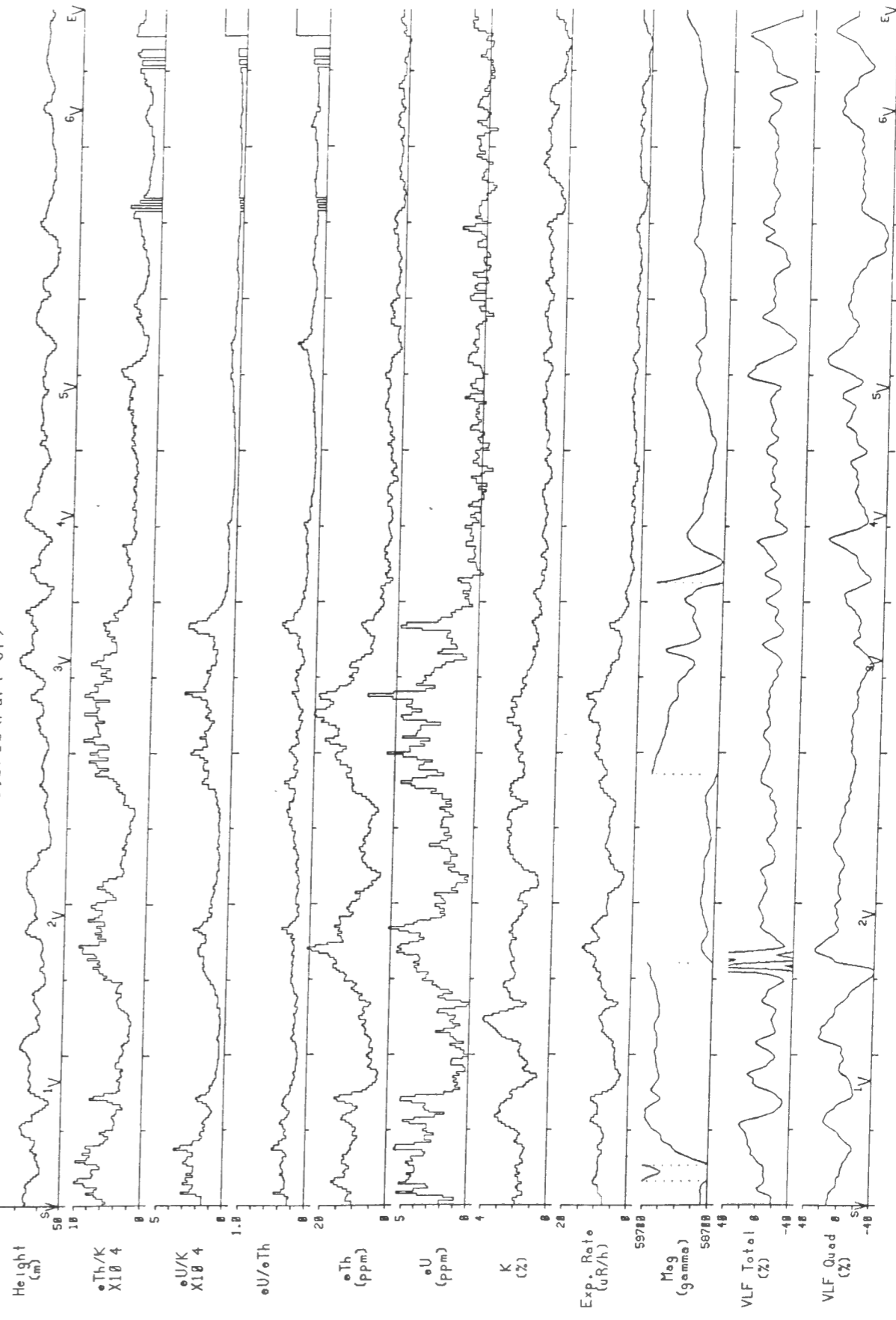
Hemlo-Schreiber Area, Ontario, 1990.
COLDWELL-PIC ISLAND, ONTARIO, 42D/15.D/10 (Part of)



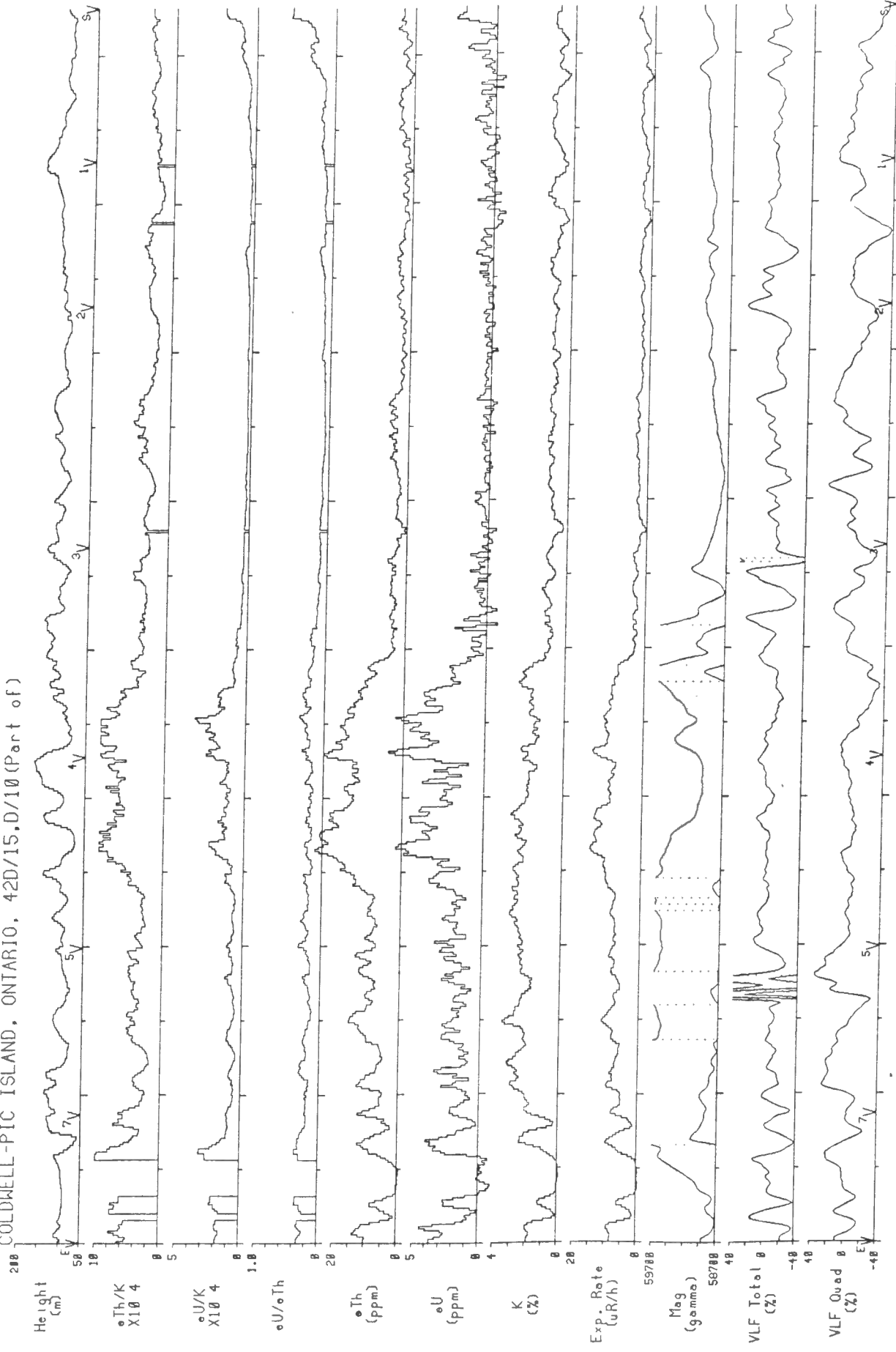
Hemlo-Schreiber Area, Ontario, 1990.
COLDWELL-PIC ISLAND, ONTARIO, 42D/15.D/10(Part of)



Hemlo-Schreiber Area, Ontario, 1990.
COLDWELL-PIC ISLAND, ONTARIO, 42D/15.D/10(Part of)

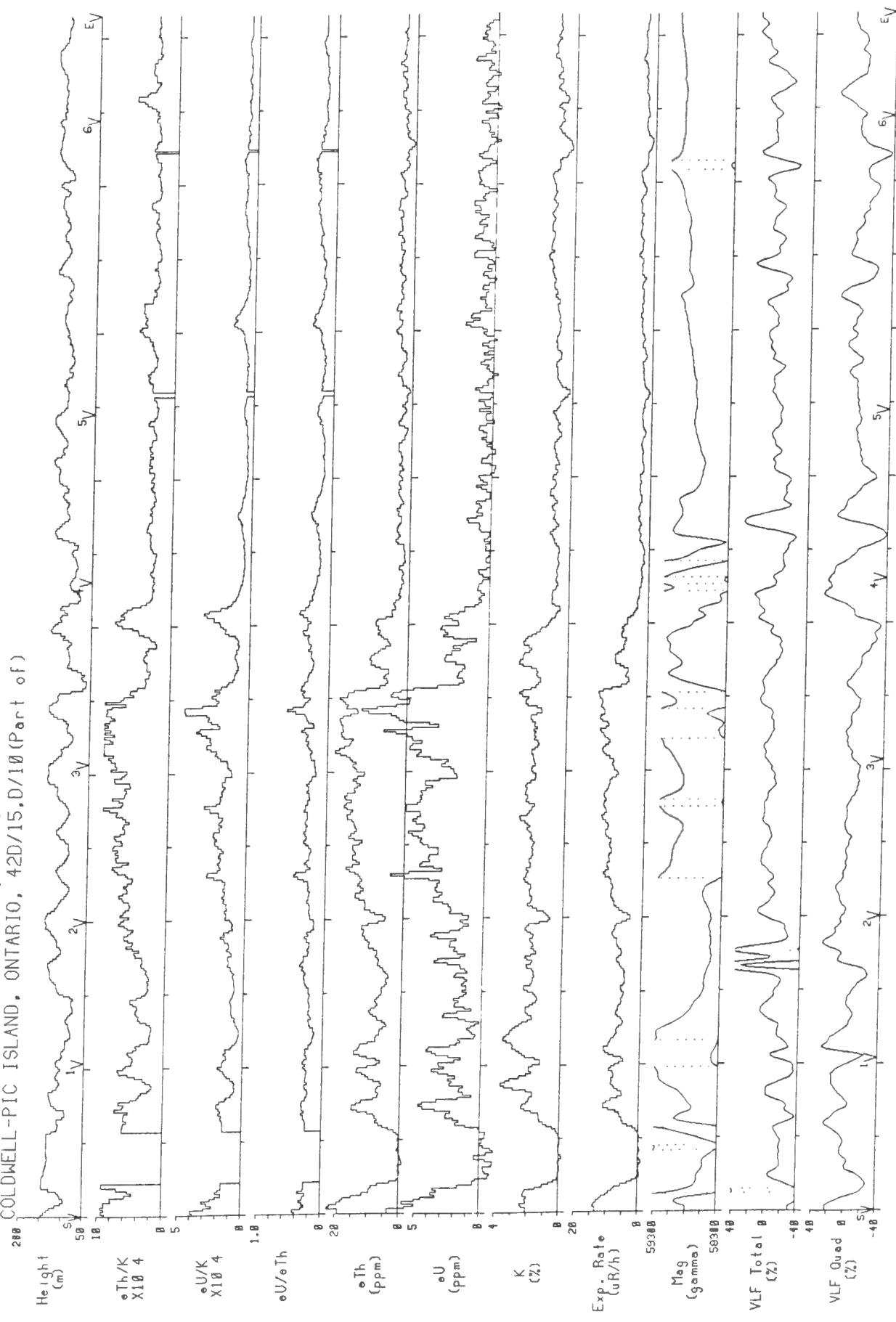


Hemlo-Schreiber Area, Ontario, 1990.
COLDWELL-PIC ISLAND, ONTARIO, 42D/15.D/10 (Part of)



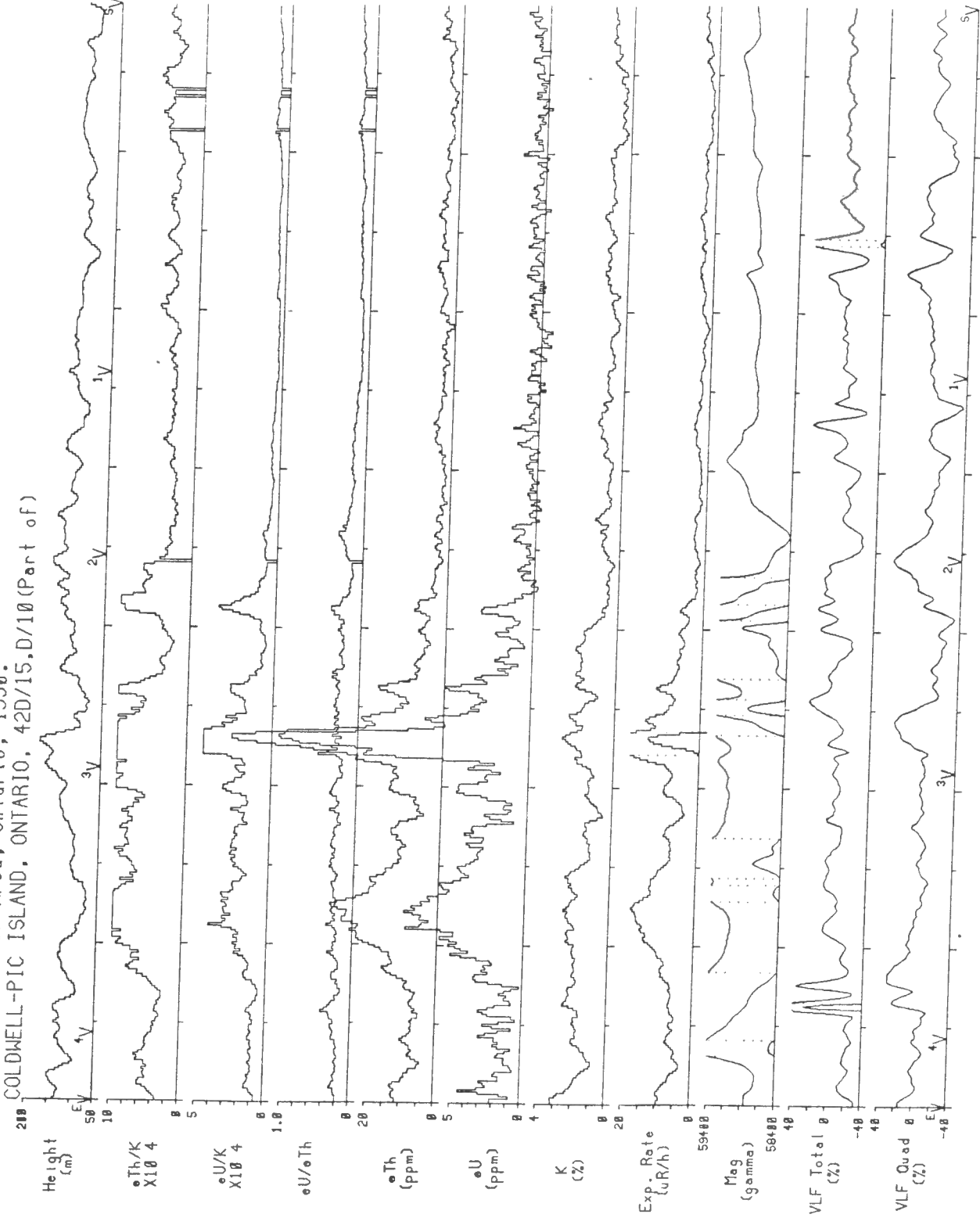
Line 83 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
COLDWELL-PIC ISLAND, ONTARIO, 42D/15.D/10 (Part of)



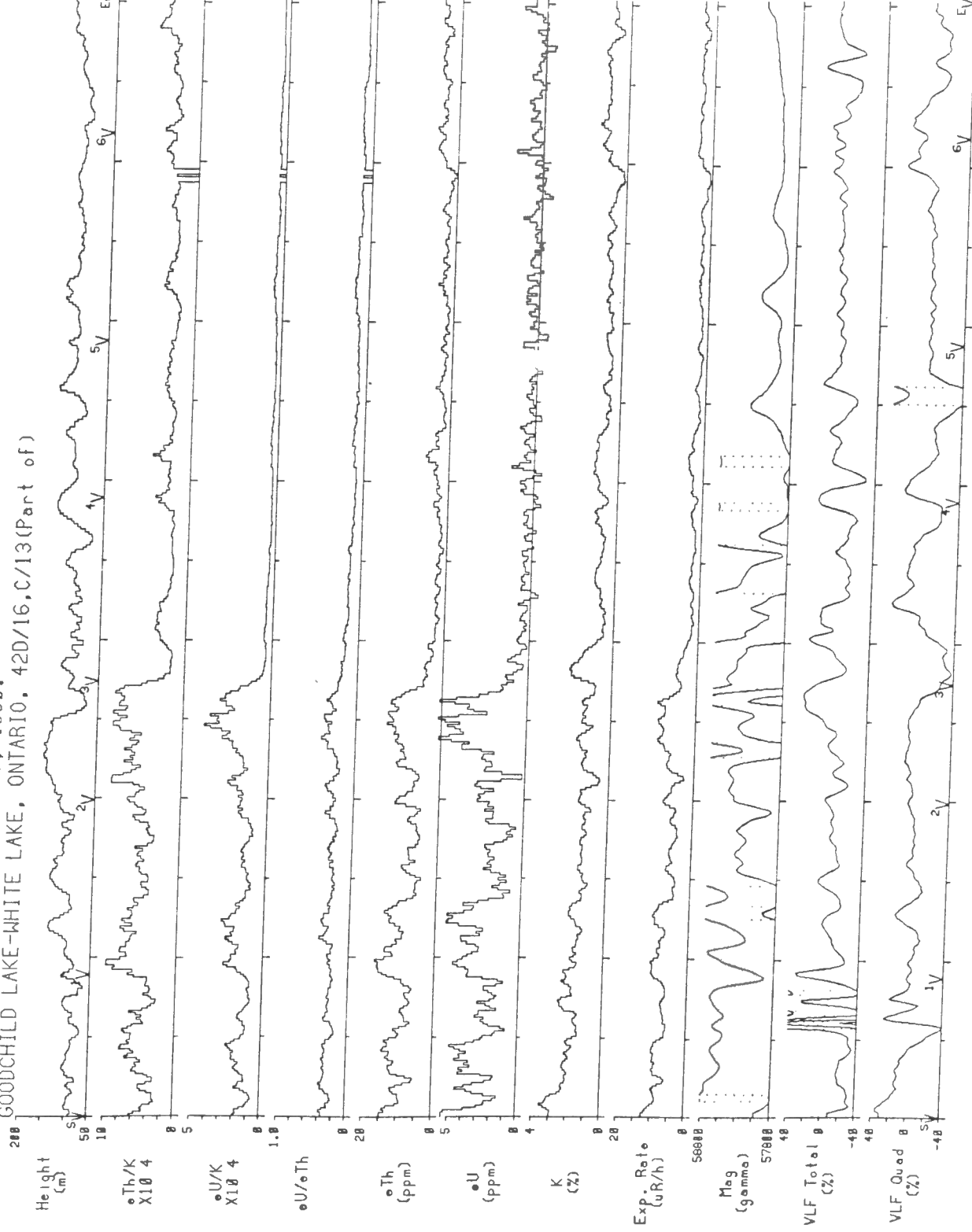
Line 84 | 2 km | Scale 1:150,000

Hemlo-Schreiber Area, Ontario, 1990.
COLDWELL-PIC ISLAND, ONTARIO, 42D/15.D/10(Part of)



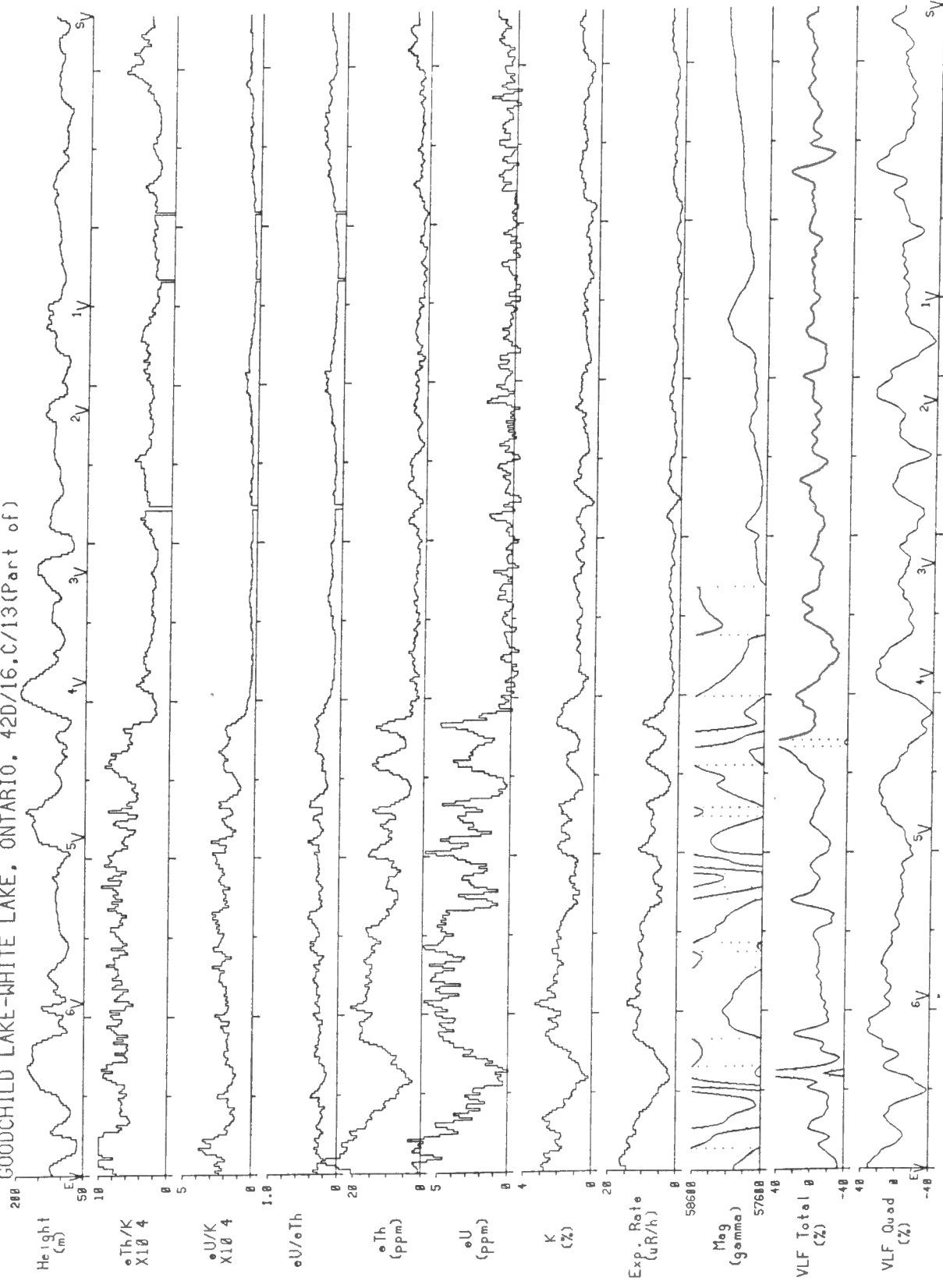
Line 85 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
GOODCHILD LAKE-WHITE LAKE, ONTARIO, 42D/16.C/13(Part of)



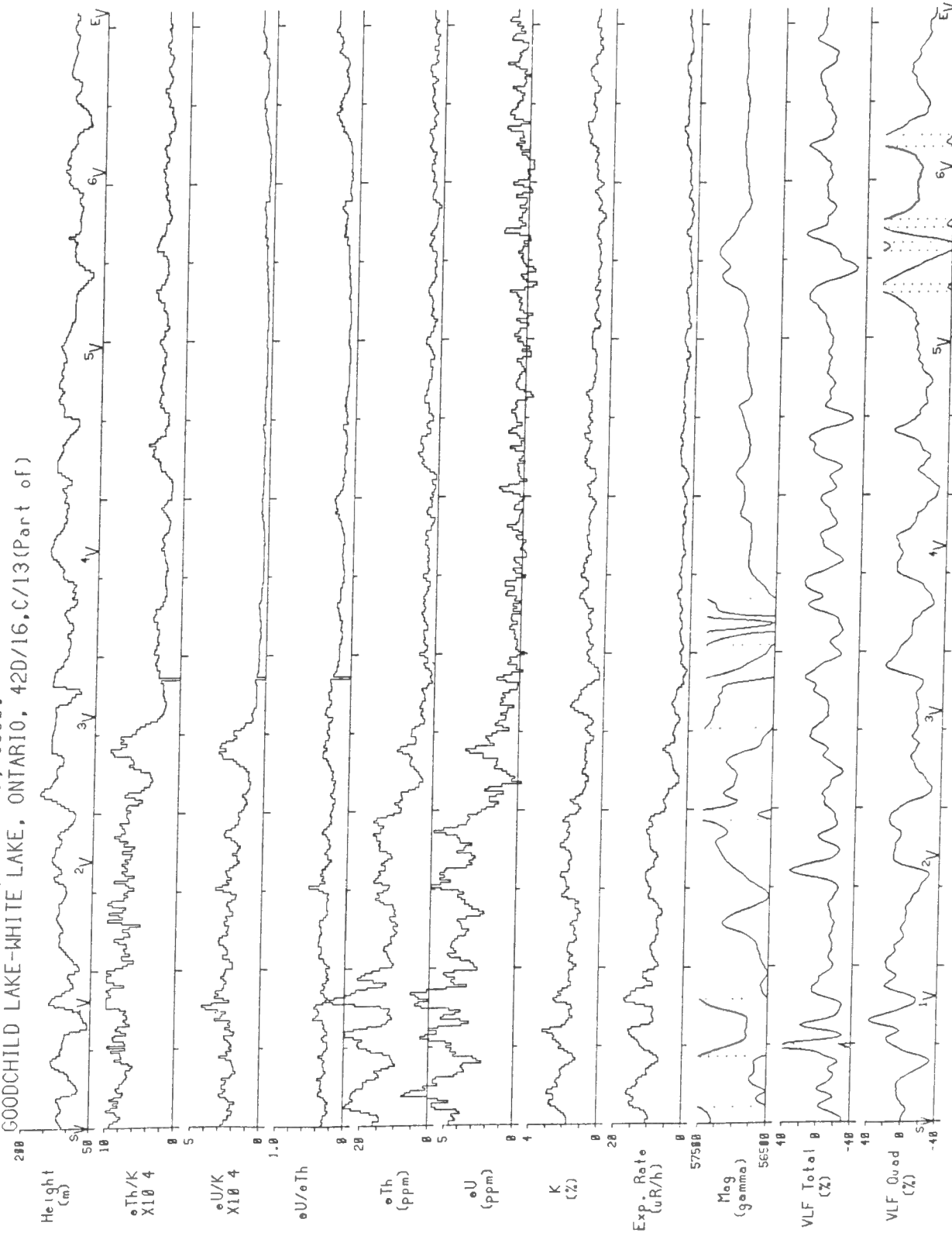
Line 86 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
GOODCHILD LAKE-WHITE LAKE, ONTARIO, 42D/16.C/13(Part of)



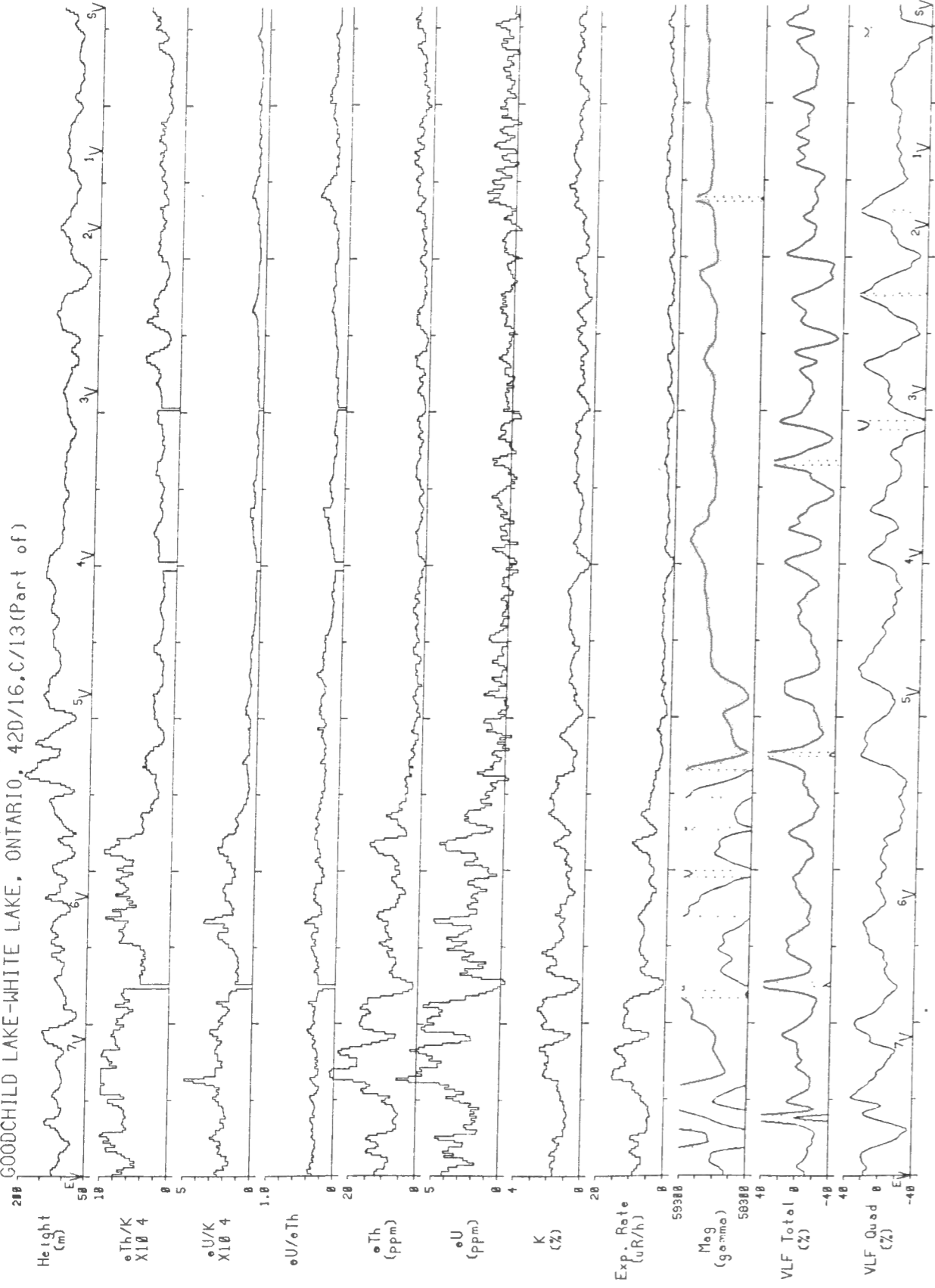
Line 87 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
GOODCHILD LAKE-WHITE LAKE, ONTARIO, 42D/16.C/13(Part of)



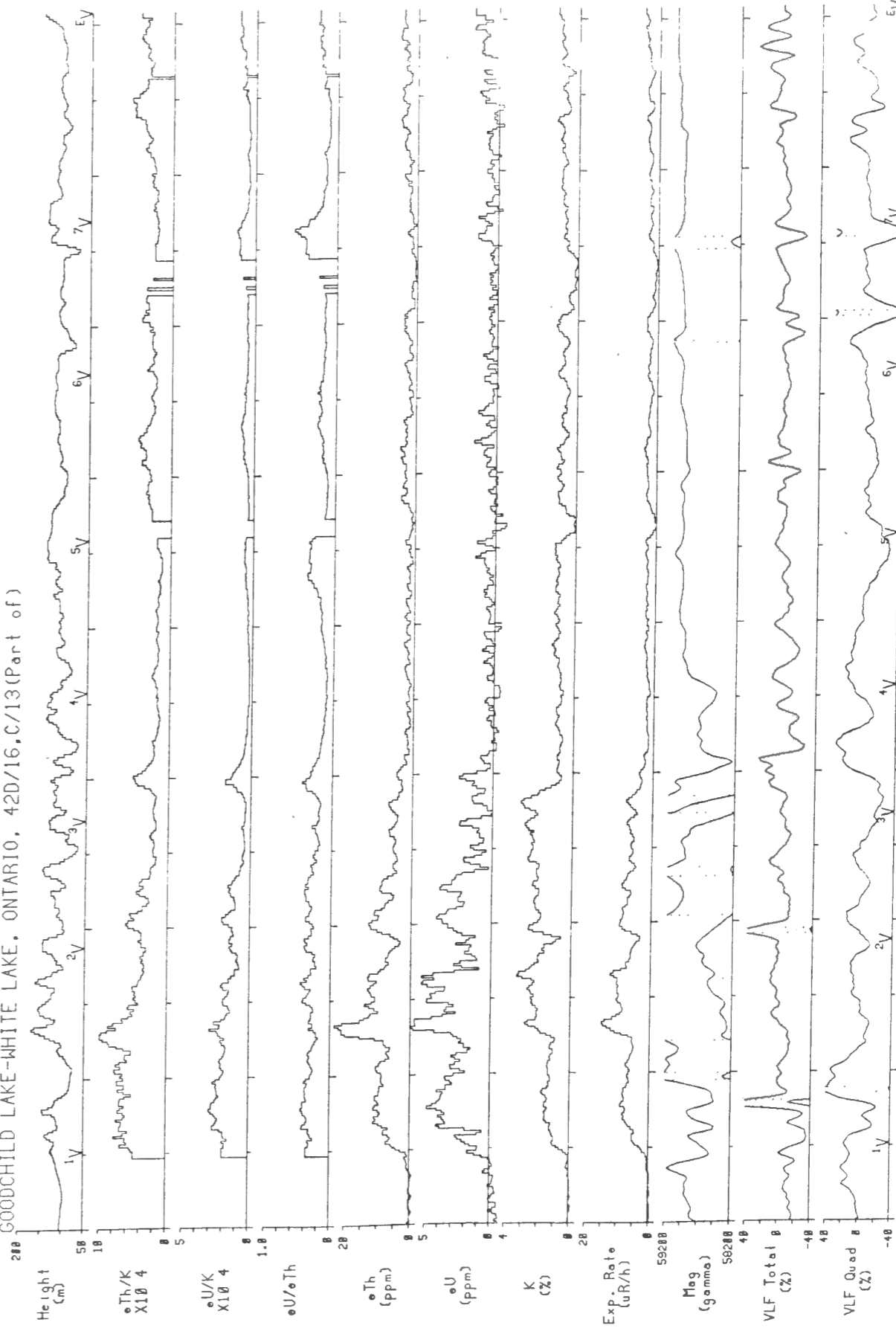
Line 88 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
 GOODCHILD LAKE-WHITE LAKE, ONTARIO, 42D/16.C/13(Part of)



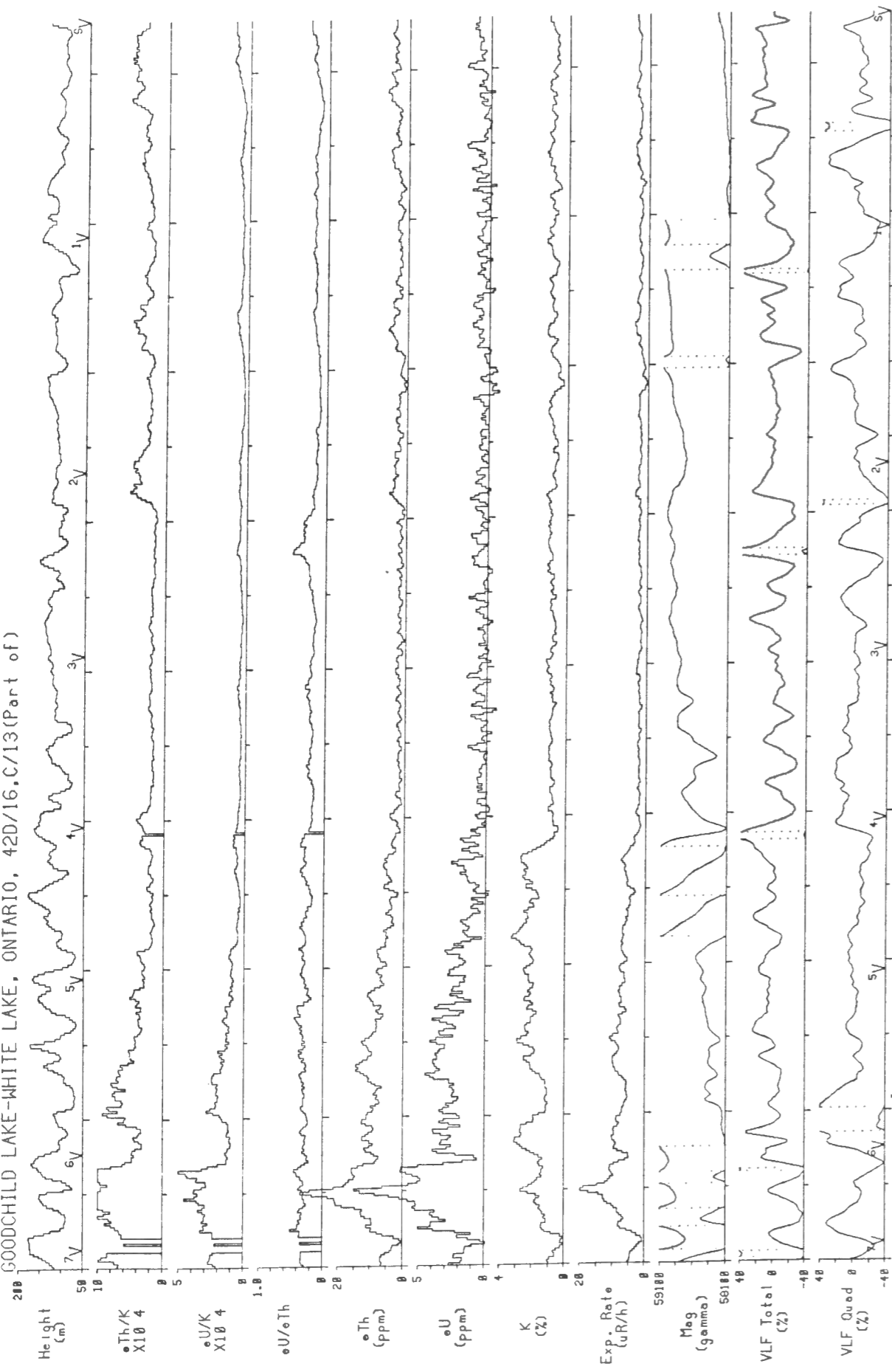
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Hemlo-Schreiber Area, Ontario, 1990.
 GOODCHILD LAKE-WHITE LAKE, ONTARIO, 42D/16.C/13(Part of)



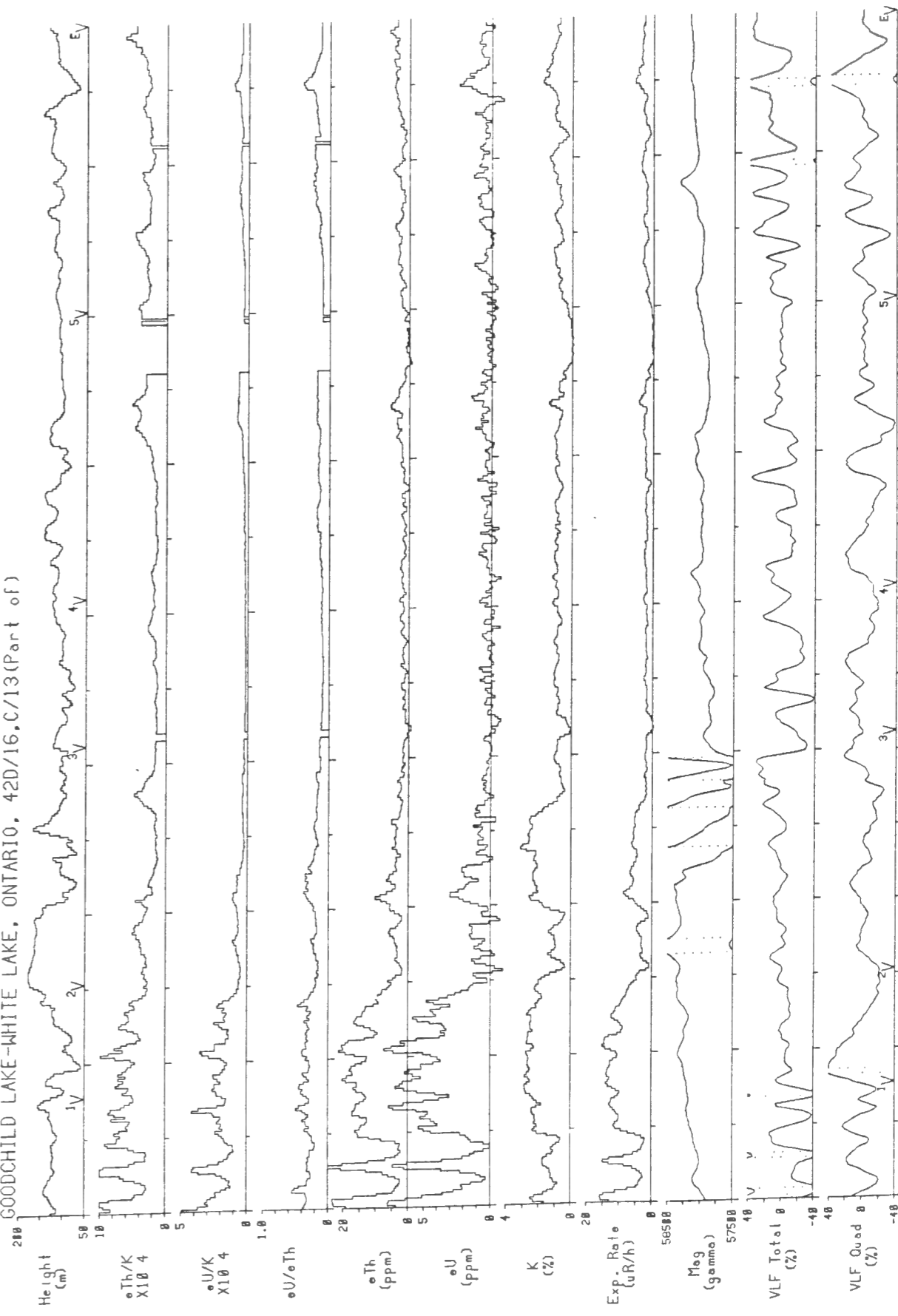
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Hemlo-Schreiber Area, Ontario, 1990.
GOODCHILD LAKE-WHITE LAKE, ONTARIO, 42D/16.C/13(Part of)

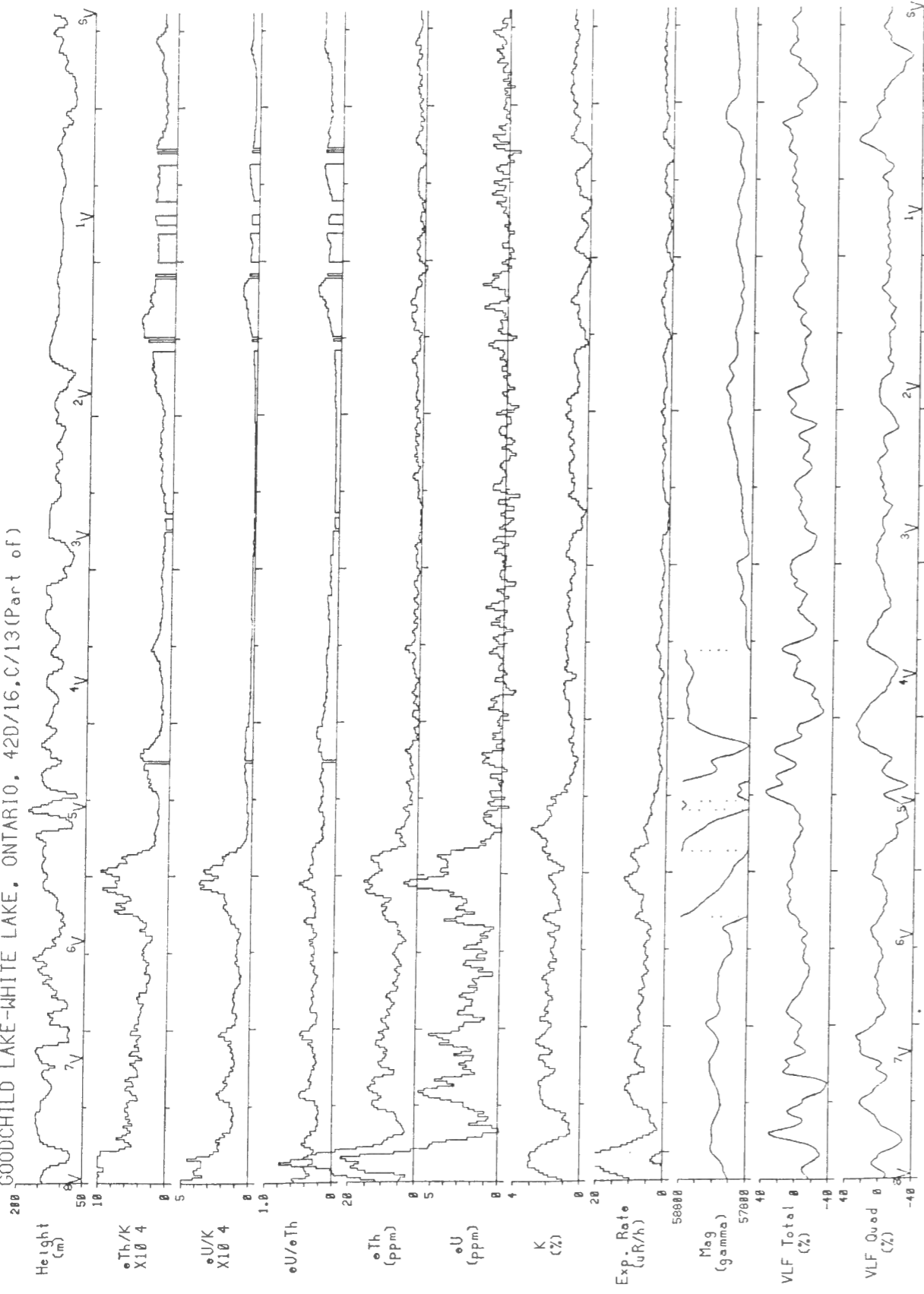


Line 91 | 2 km | Scale 1:150000

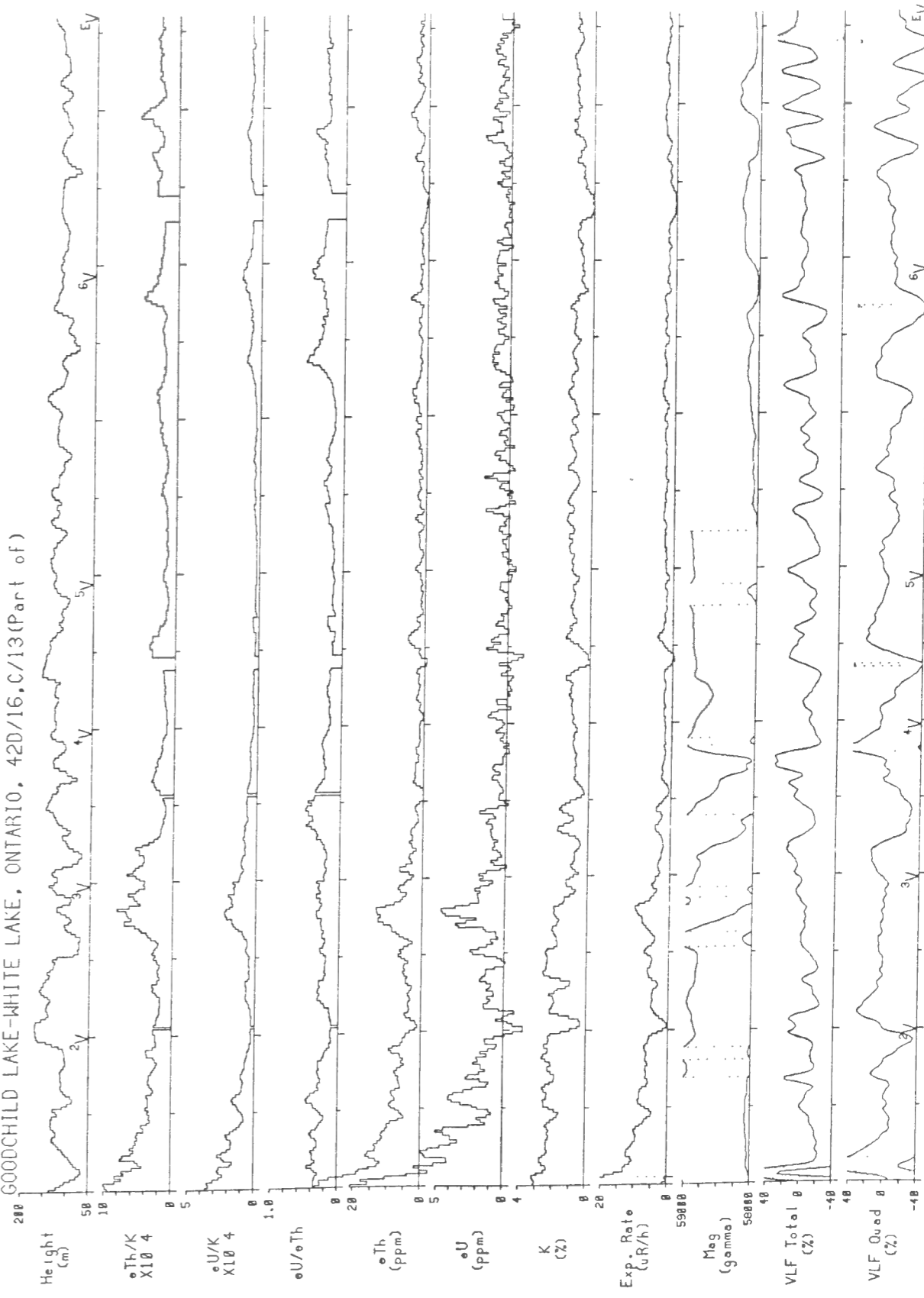
Hemlo-Schreiber Area, Ontario, 1990.
GOODCHILD LAKE-WHITE LAKE, ONTARIO, 42D/16.C/13(Part of)



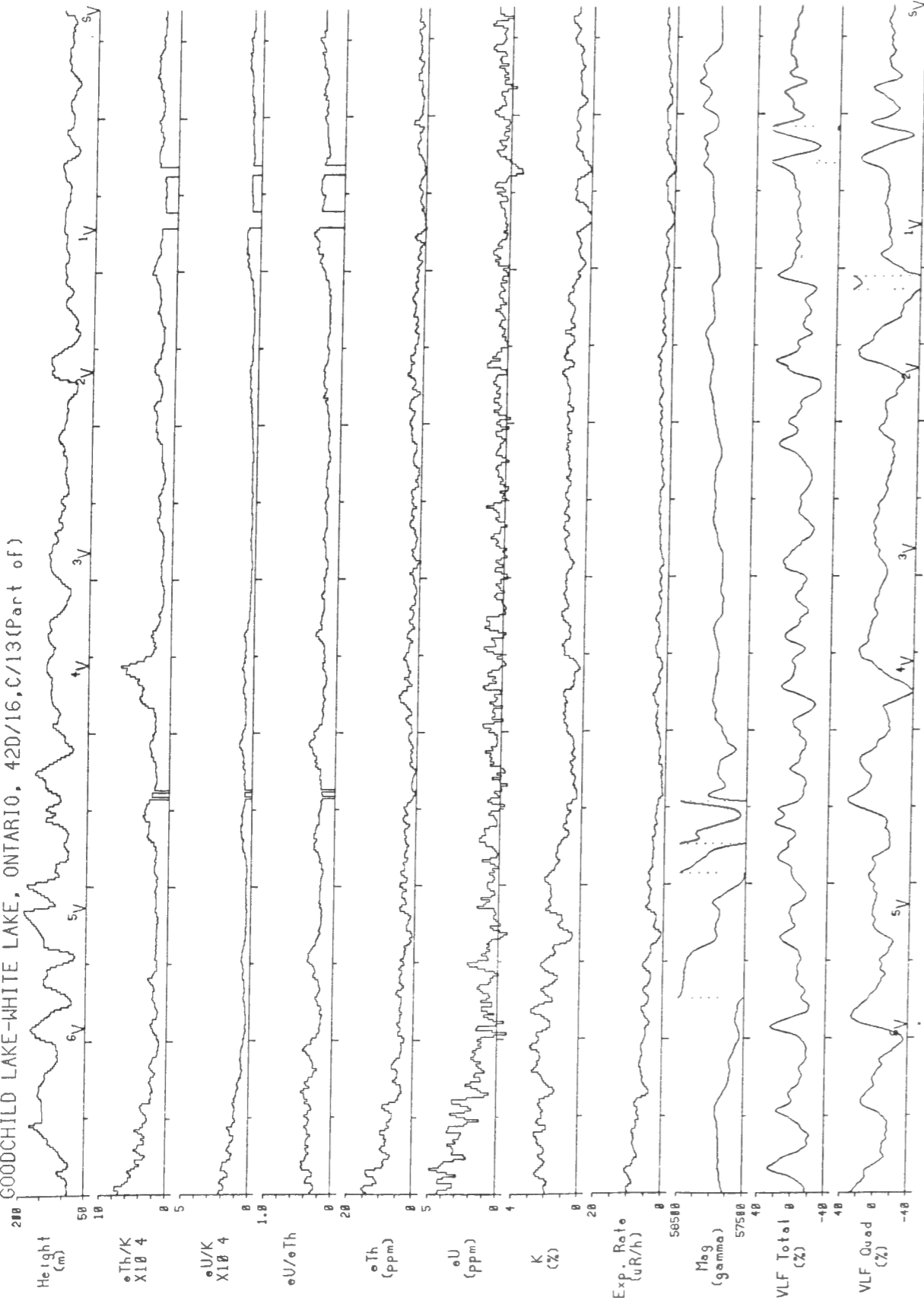
Hemlo-Schreiber Area, Ontario, 1990.
GOODCHILD LAKE-WHITE LAKE, ONTARIO, 42D/16.C/13(Part of)



Hemlo-Schreiber Area, Ontario, 1990.
GOODCHILD LAKE-WHITE LAKE, ONTARIO, 42D/16.C/13(Part of)

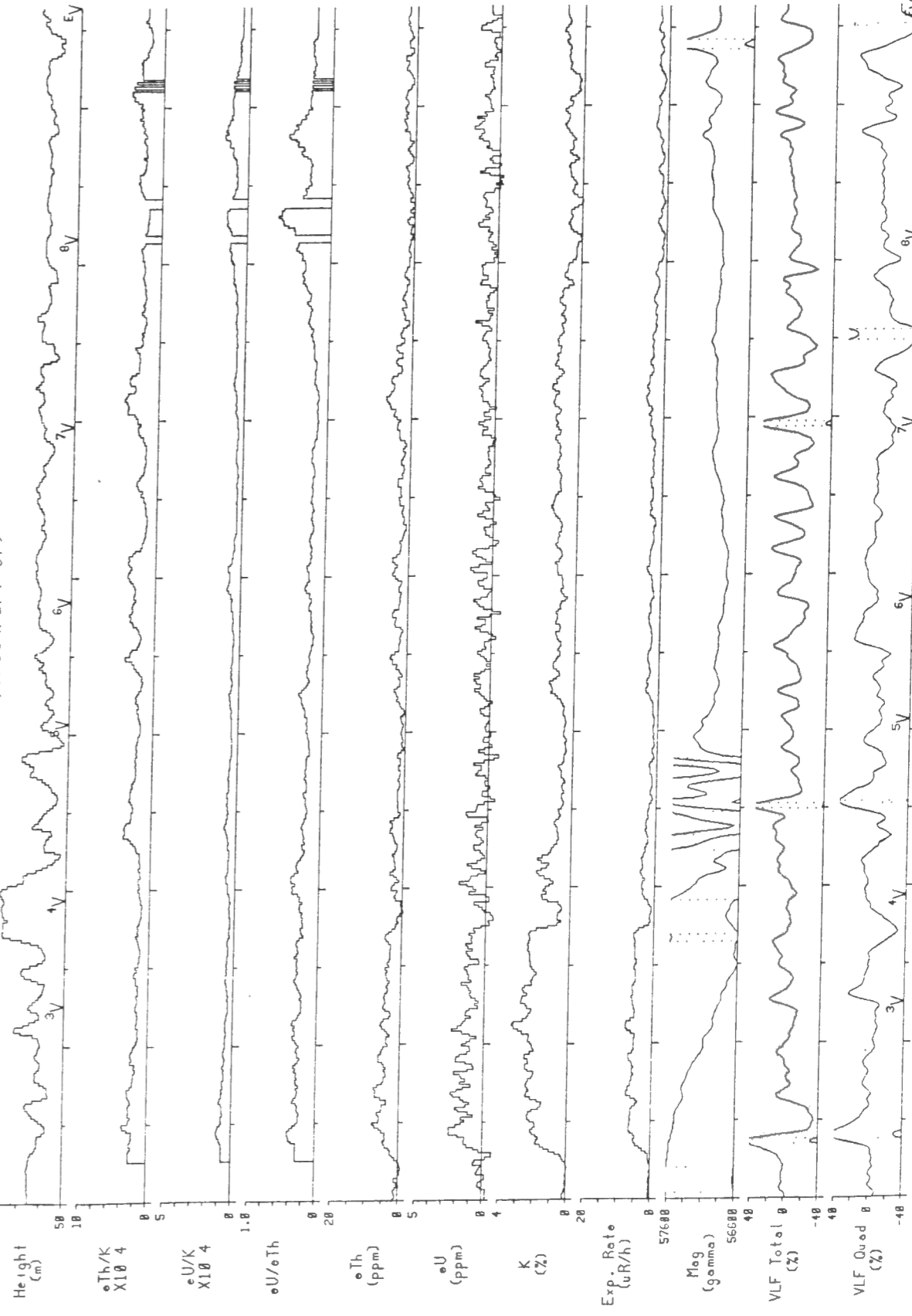


Hemlo-Schreiber Area, Ontario, 1990.
 GOODCHILD LAKE-WHITE LAKE, ONTARIO, 42D/16.C/13(Part of)

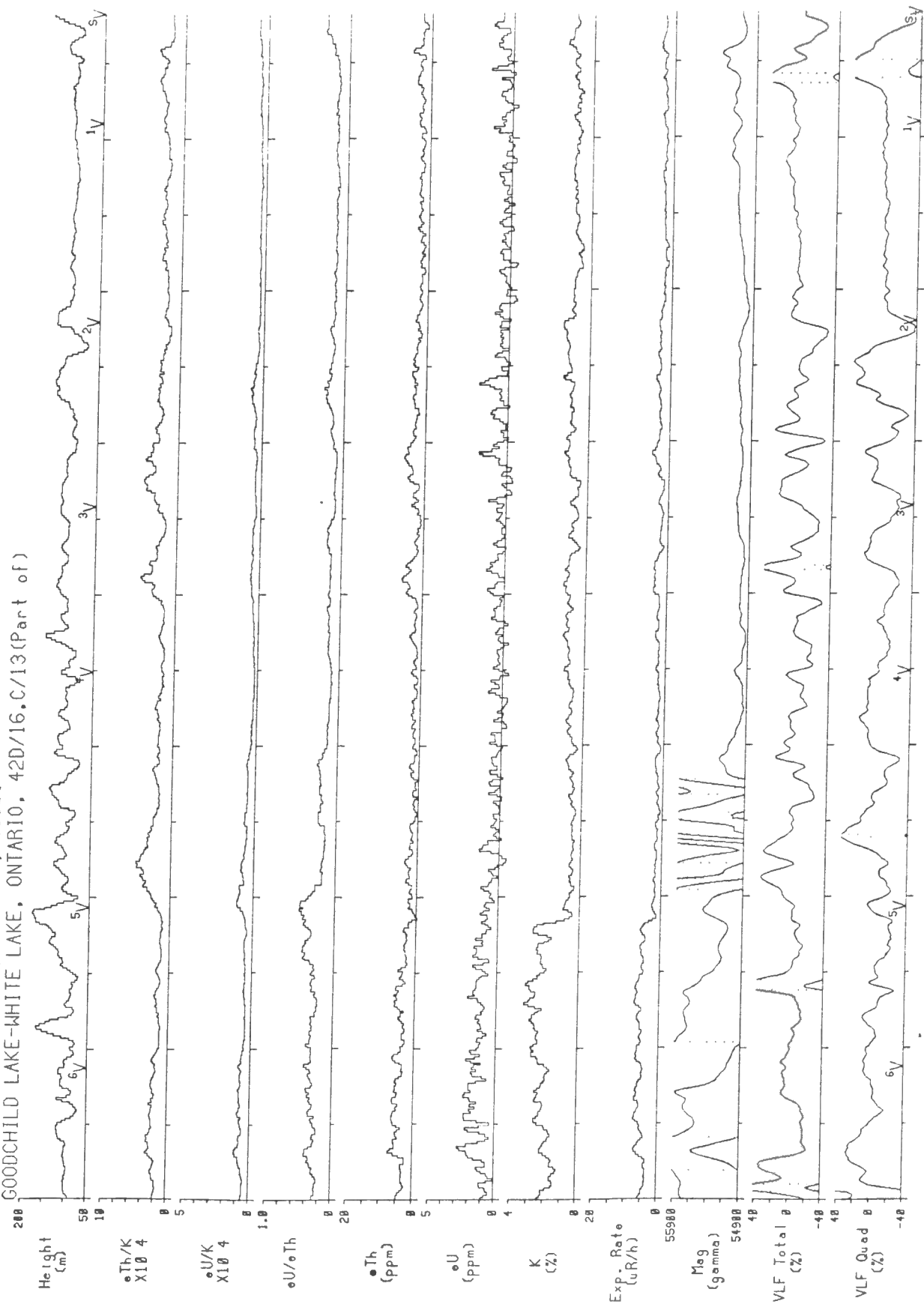


Line 95 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
 GOODCHILD LAKE-WHITE LAKE, ONTARIO, 42D/16.C/13(Part of)

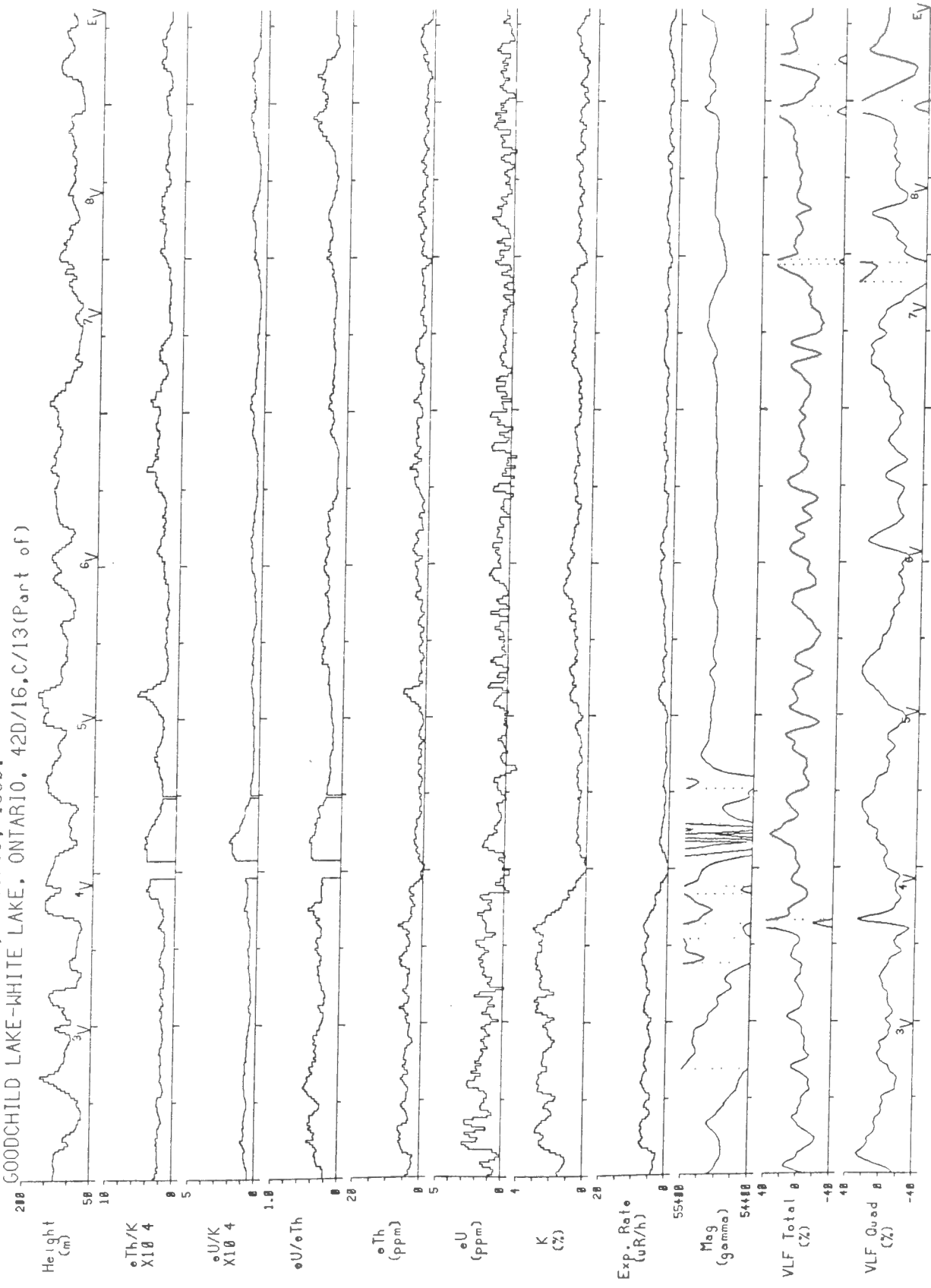


Hemlo-Schreiber Area, Ontario, 1990.
GOODCHILD LAKE-WHITE LAKE, ONTARIO, 42D/16.C/13(Part of)



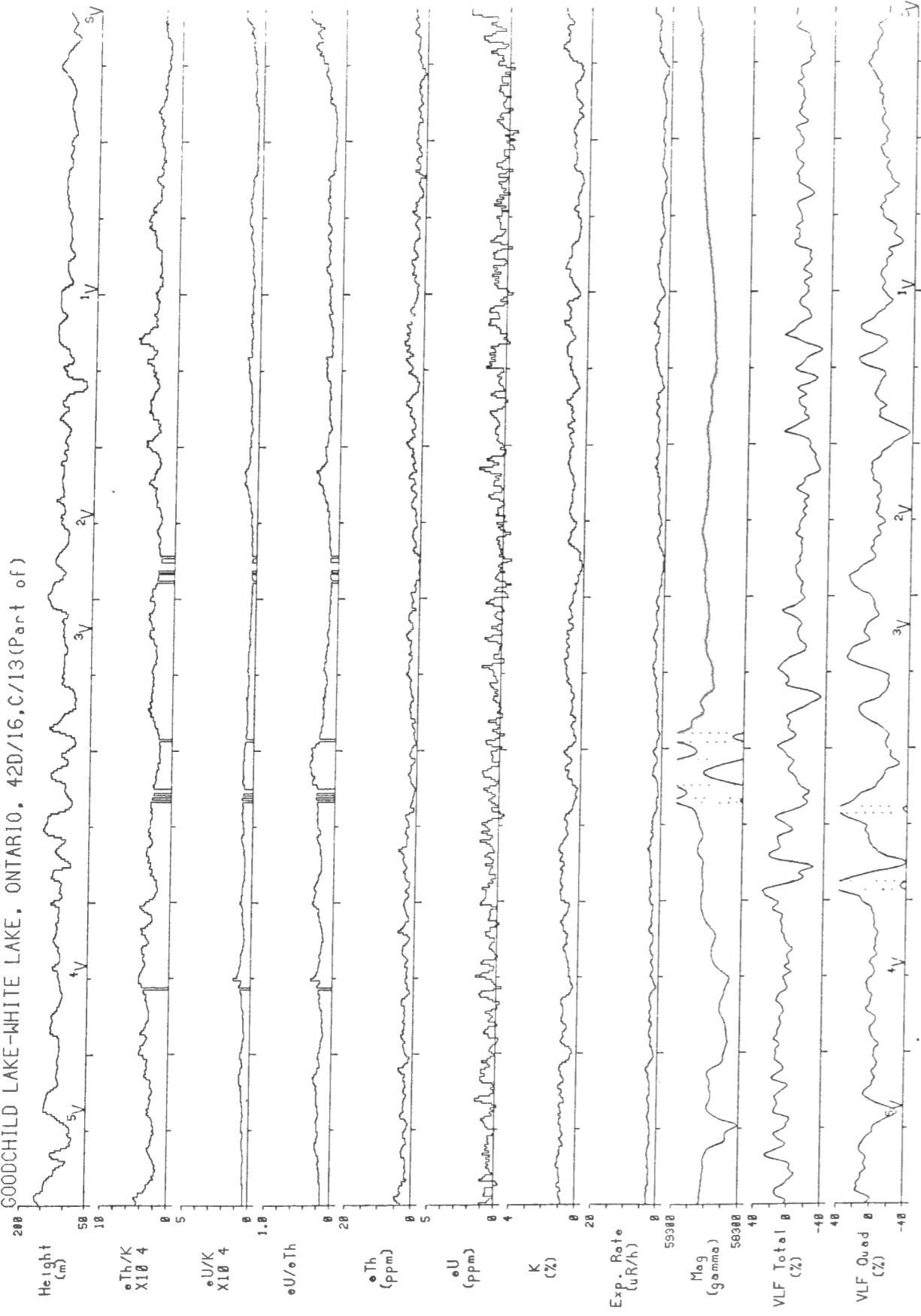
Line 97 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
GOODCHILD LAKE-WHITE LAKE, ONTARIO, 42D/16.C/13(Part of)



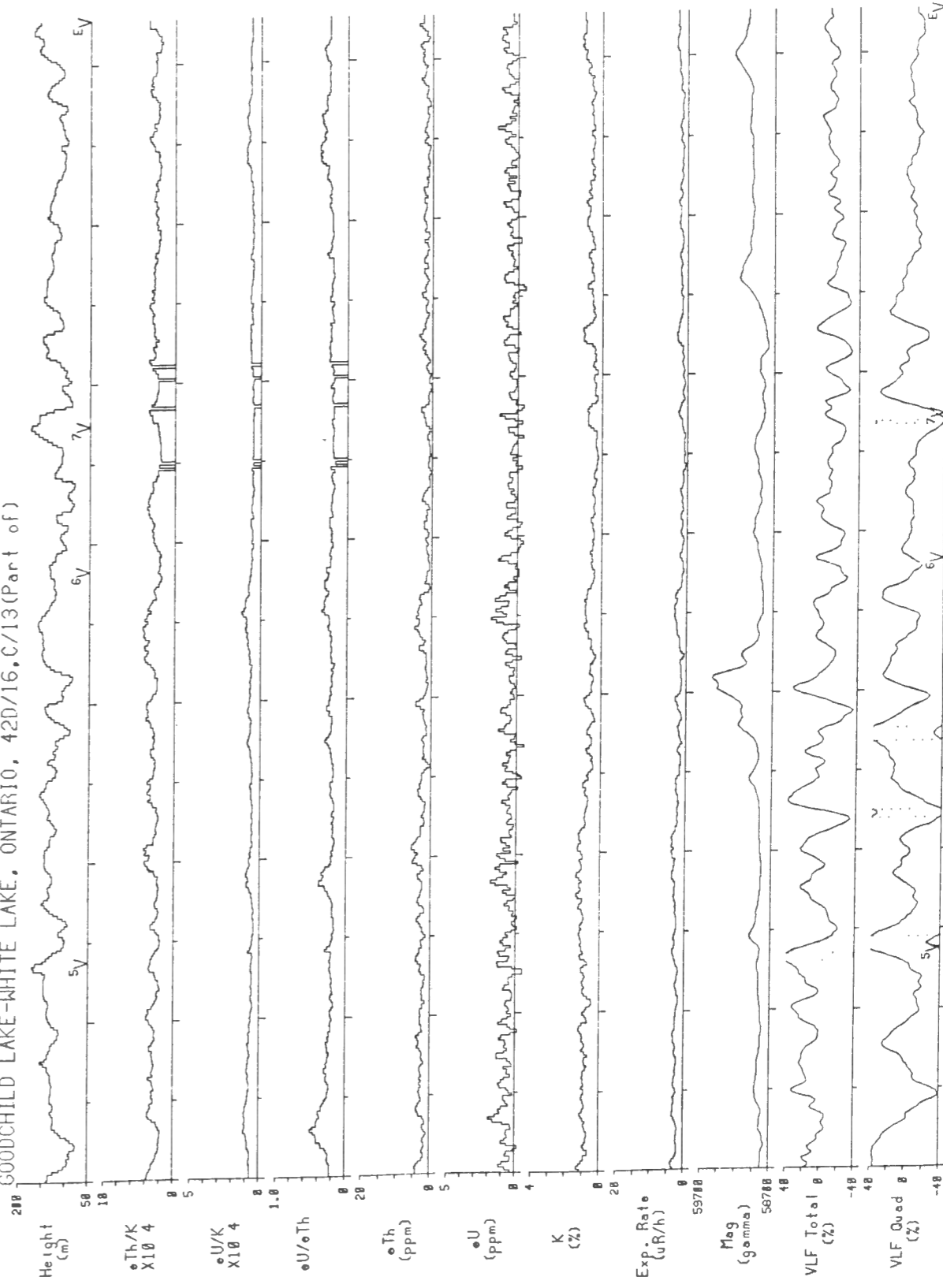
Line 98 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
GOODCHILD LAKE-WHITE LAKE, ONTARIO, 42D/16.C/13(Part of)



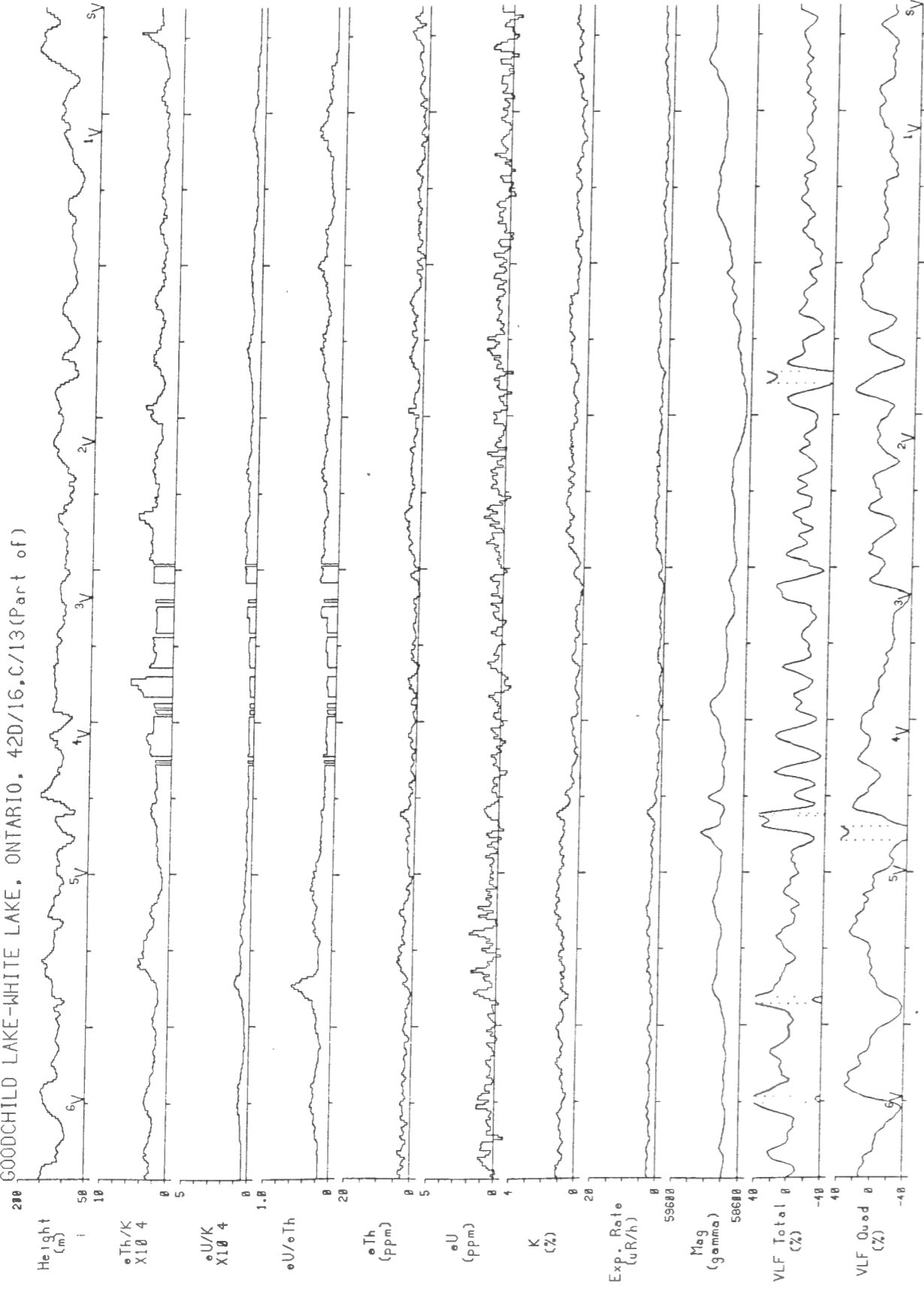
Line 101 | 2 km | Scale 1:150000

Hemlo-Schreiber Area, Ontario, 1990.
GOODCHILD LAKE-WHITE LAKE, ONTARIO, 42D/16.C/13(Part of)

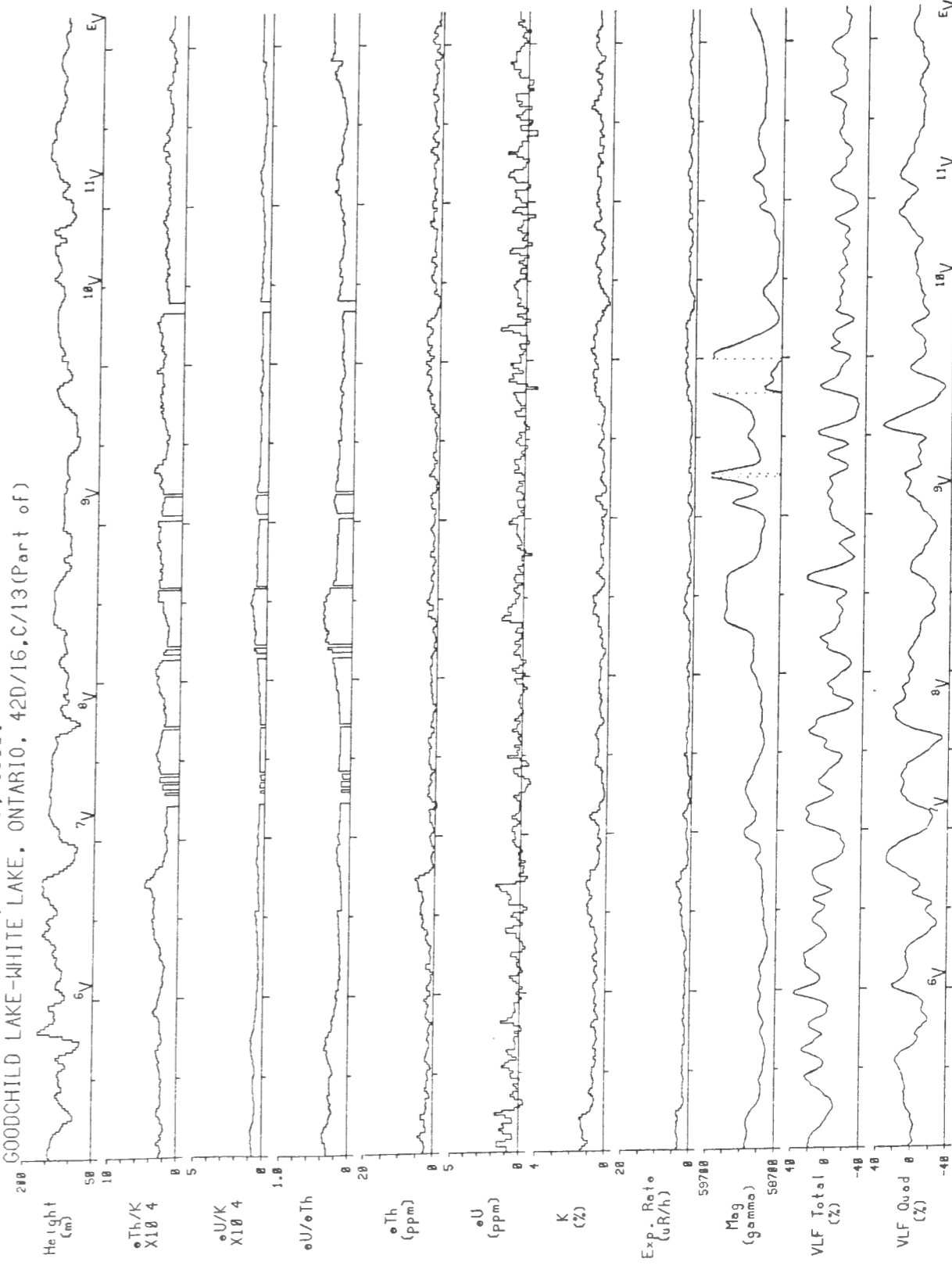


Line 102 | 2 km | Scale 1:150000

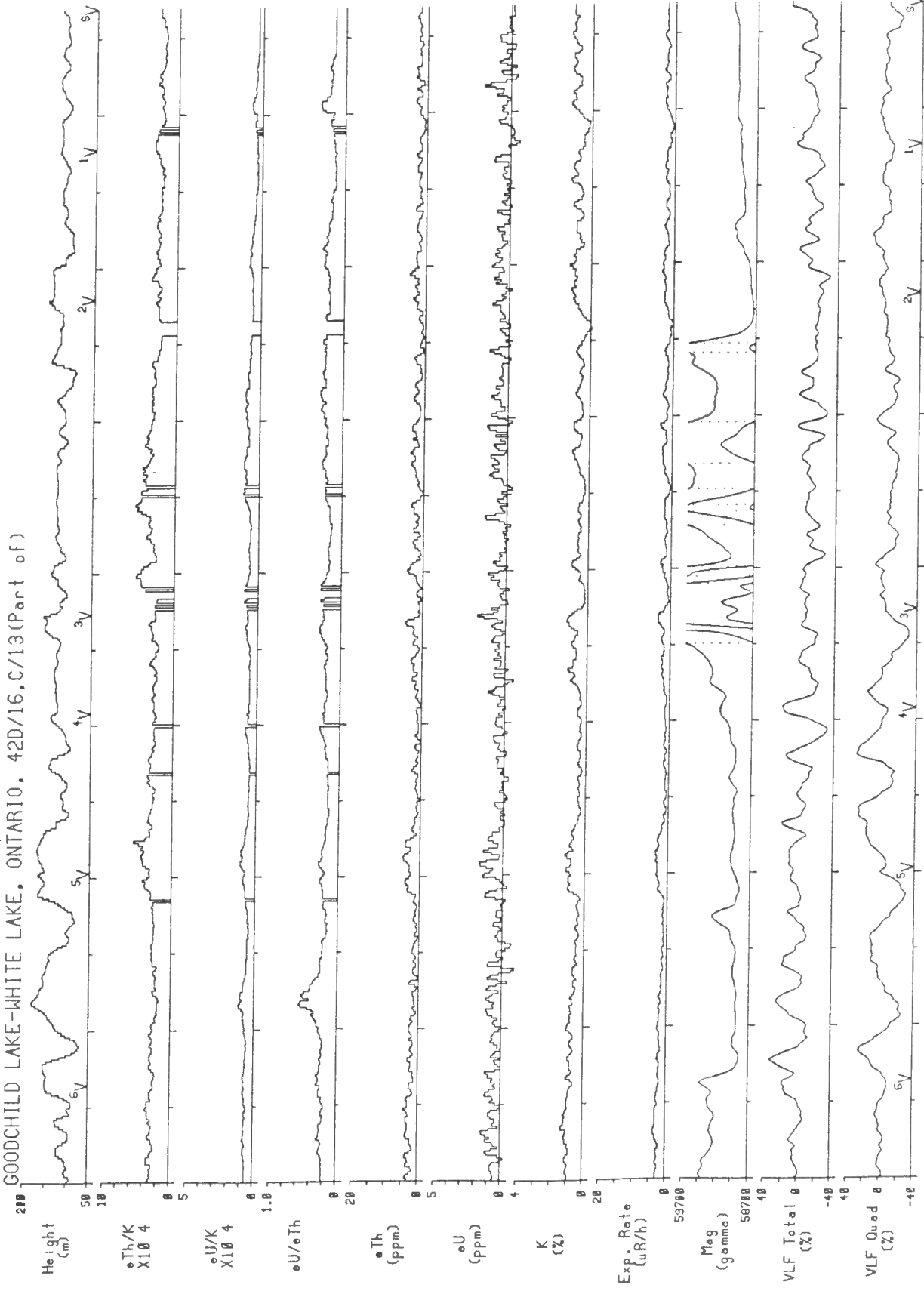
Hemlo-Schreiber Area, Ontario, 1990.
 GOODCHILD LAKE-WHITE LAKE, ONTARIO, 42D/16,C/13(Part of)



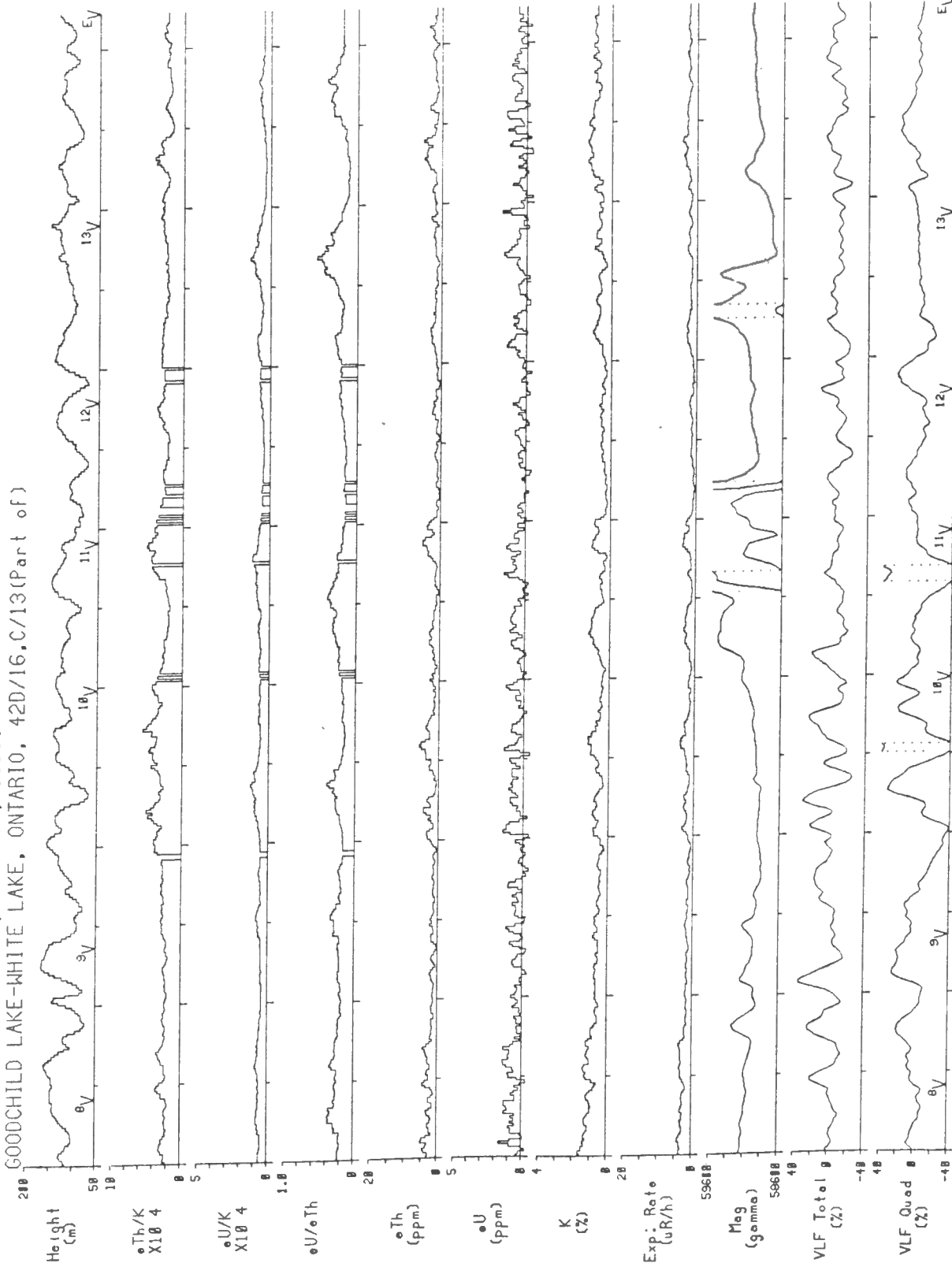
Hemlo-Schreiber Area, Ontario, 1990.
 GOODCHILD LAKE-WHITE LAKE, ONTARIO, 42D/16,C/13(Part of)



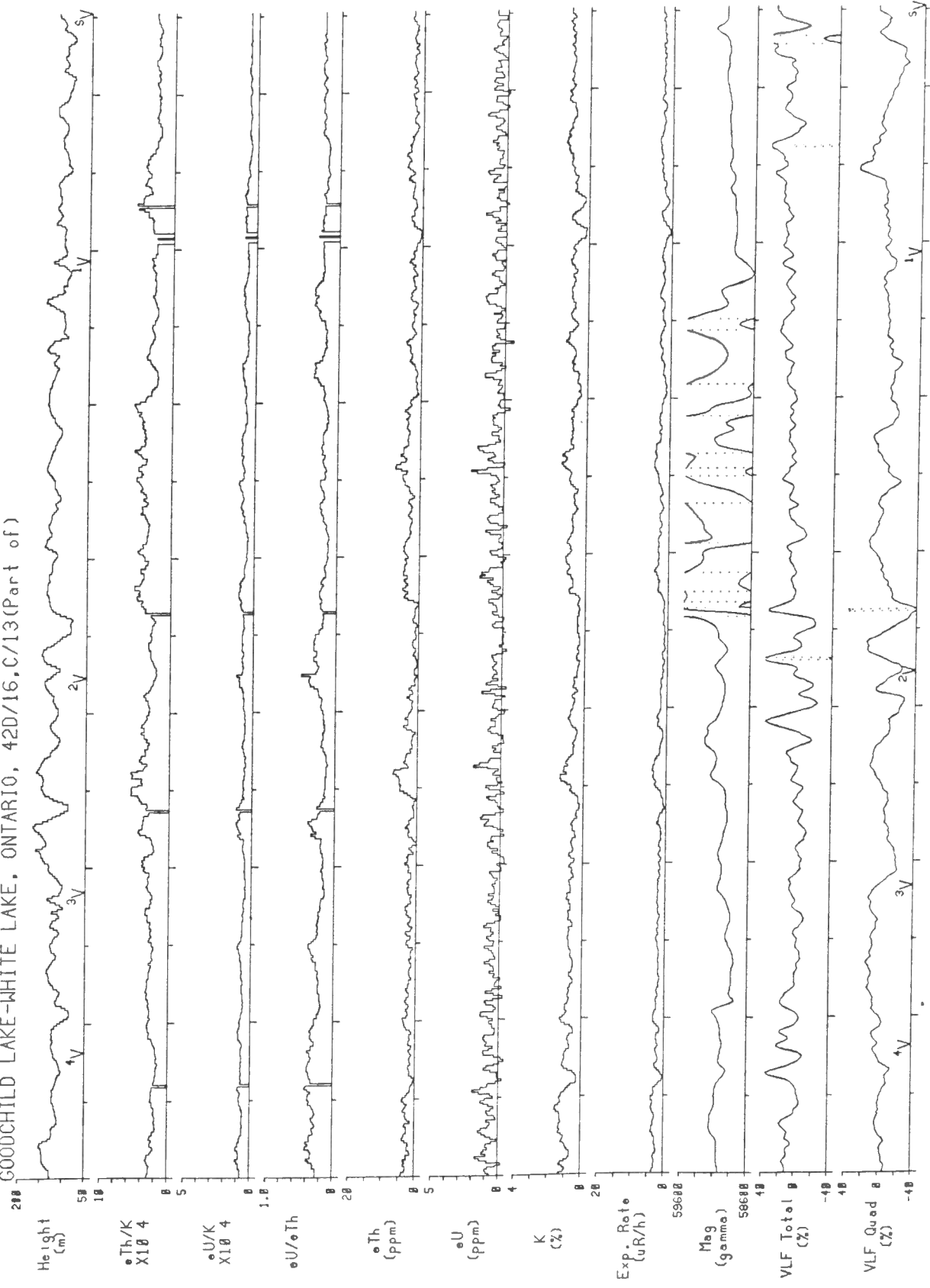
Hemlo-Schreiber Area, Ontario, 1990.
 GOODCHILD LAKE-WHITE LAKE, ONTARIO, 42D/16.C/13(Part of)



Hemlo-Schreiber Area, Ontario, 1990.
 GOODCHILD LAKE-WHITE LAKE, ONTARIO, 42D/16.C/13(Part of)



Hemlo-Schreiber Area, Ontario, 1990.
GOODCHILD LAKE-WHITE LAKE, ONTARIO, 42D/16.C/13(Part of)



Hemlo-Schreiber Area, Ontario, 1990.
GOODCHILD LAKE-WHITE LAKE, ONTARIO, 42D/16.C/13(Part of)

