

November 8, 1990

Giant Yellowknife Mines
Bag 3000
Yellowknife, N.W.T.
X1A 2M2

Attention: Mr. Gary Halverson

SUBJECT: AIR QUALITY MONITORING REPORT

WR Job Number 8911

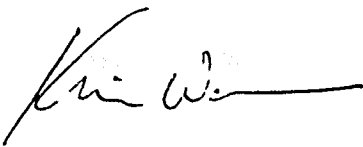
We are pleased to submit the enclosed report on air quality as monitored by Western Research in the vicinity of the Yellowknife Mining Operation during the months of September and October 1990.

The enclosed table details exceedances of Environment Canada's National Air Quality Objectives for SO₂.

Should you have any questions concerning this report, please contact us at your convenience.

Yours truly,

WESTERN RESEARCH



Kevin Warren
Coordinator
Air Quality Monitoring

KW/cu

P_c
V1

GIANT YELLOWKNIFE MINES
Yellowknife, N.W.T.

AIR QUALITY MONITORING

September & October / 1990

WESTERN RESEARCH

EXCEEDENCES OF NATIONAL AIR QUALITY STANDARDS FOR SO₂
GIANT YELLOWKNIFE MINES - YELLOWKNIFE, N.W.T.
SEPT. 19 - OCT. 22, 1990

Maximum Desirable Level (0.06 ppm)
of Average Concentration for a
24 Hour Period

| Date | Time | Conc. (ppm) | Wind Dir. Spd. |
|-------|-----------|----------------|-------------------|
| 09/27 | 0000-2400 | .061 | Various |

Maximum Acceptable Level (0.11 ppm)
of Average Concentration for a
24 Hour Period

| Date | Time | Conc. (ppm) | Wind Dir. Spd. |
|----------------|------|----------------|-------------------|
| NO EXCEEDENCES | | | |

Maximum Tolerable Level (0.31 ppm)
of Average Concentration for a
24 Hour Period

| Date | Time | Conc. (ppm) | Wind Dir. Spd. |
|----------------|------|----------------|-------------------|
| NO EXCEEDENCES | | | |

Maximum Desirable Level (0.17 ppm)
of Average Concentration for a
1 Hour Period

| Date | Time | Conc. (ppm) | Wind Dir. Spd. |
|-------|-----------|----------------|-------------------|
| 09/21 | 0900-1000 | .33 ppm | S 19 |
| 09/27 | 1100-1200 | .19 ppm | SW 7 |
| 09/27 | 1200-1300 | .27 ppm | S 7 |
| 09/27 | 2100-2200 | .19 ppm | S 22 |
| 09/27 | 2200-2300 | .32 ppm | S 25 |
| 09/28 | 0000-0100 | .25 ppm | S 31 |
| 09/29 | 0000-0100 | .25 ppm | S 30 |

Maximum Acceptable Level (0.34 ppm)
of Average Concentration for a
1 Hour Period

| Date | Time | Conc. (ppm) | Wind Dir. Spd. |
|-------|-----------|----------------|-------------------|
| 09/29 | 0300-0400 | .63 ppm | S 21 |

NO MAXIMUM TOLERABLE LEVEL FOR
1 HOUR PERIOD

NOTE: The maximum desirable level defines the long-term goal for air quality and provides a basis for an anti-degradation policy for the unpolluted parts of the country and for the continuing development of control technology. The maximum acceptable level is intended to provide adequate protection against adverse effects on soil, water, vegetation, materials, animals, visibility, personal comfort and well-being. The maximum tolerable level denotes a concentration of an air contaminant that requires abatement without delay to avoid further deterioration to an air quality that endangers the prevailing Canadian lifestyle or, ultimately, to an air quality that poses a substantial health risk.

INSTRUMENTATION AND OPERATING EFFICIENCIES

| | |
|---------------|--------------------------|
| OPERATOR | GIANT YELLOWKNIFE MINES |
| LOCATION | Yellowknife, N.W.T. |
| PERIOD | September & October 1990 |
| WR JOB NUMBER | 8911 |

WIND SPEED AND DIRECTION:

Make and Model of Instrument:

Percentage of Time Operational - Direction: 99.86%

Speed: 99.86%

Simultaneous Operating Efficiency: 99.86%

Instrumentation Difficulties:

GIANT YELLOWKNIFE MINES - YELLOWKNIFE N.W.T

SEPTEMBER 1990

WIND SPEED (KM/HR) AND DIRECTION

| DATE | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | DAILY AVERAGE |
|------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------------|
| 1 | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | **** |
| 2 | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | **** |
| 3 | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | **** |
| 4 | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | **** |
| 5 | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | **** |
| 6 | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | **** |
| 7 | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | **** |
| 8 | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | **** |
| 9 | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | **** |
| 10 | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | **** |
| 11 | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | **** |
| 12 | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | **** |
| 13 | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | **** |
| 14 | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | **** |
| 15 | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | **** |
| 16 | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | **** |
| 17 | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | **** |
| 18 | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | **** |
| 19 | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | **** |
| 20 | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | 15SE | 14SE | 9ESE | 8SE | 6ESE | 5SSE | 6SW | 6W | 4NNW | 2S | 6S | 7.4 |
| 21 | 6SW | 8W | 10W | 7W | 4S | 6S | 6SSW | 8S | 10SSE | 19S | 23S | 29S | 30S | 29SSE | 29SSE | 30SSE | 30SSE | 30SSE | 29SSE | 33SSE | 33SSE | 31SSE | 28SSE | 26SSE | 20.6 |
| 22 | 21SSE | 15SSE | 9S | 6SW | 20NW | 21NW | 21NNW | 19NW | 23NNW | 21NNW | 16NNW | 16NW | 11NNW | 5NNW | 10SW | 14WSW | 8SW | 7SSE | 7SSE | 10SE | 12SE | 13SE | 14SE | 15SSE | 13.9 |
| 23 | 19SSE | 18SE | 17SE | 18SE | 18SE | 21SE | 19SE | 18SE | 25SE | 29SSE | 27SSE | 28S | 23S | 21S | 17SSE | 13SSE | 13SSE | 10S | 7SSW | 14WSW | 14WSW | 9SW | 13WSW | 8W | 17.5 |
| 24 | 11WSW | 9SW | 5SSW | 7SSE | 7SE | 8SSE | 8S | 9SSE | 13S | 7S | 11SSW | 24WSW | 19W | 13WSW | 23WSW | 24NNW | 17NNW | 30NW | 27NNW | 43NNW | 40NNW | 37NNW | 32NNW | 32NNW | 19.0 |
| 25 | 36NNW | 32NNW | 32NNW | 29NNW | 25NNW | 21NNW | 19NNW | 18N | 20N | 22NNW | 25NNW | 24NNW | 24NNW | 24NNW | 23NNW | 24NNW | 22NNW | 24NNW | 22NNW | 21NNW | 20NNW | 20NNW | 17NNW | 13NNW | 23.2 |
| 26 | 14NNW | 15NNW | 11NNW | 11NNW | 10NNW | 11NNW | 11NE | 7NE | 8ENE | 9ENE | **** | 7ENE | 7NE | 5ENE | 4NE | 5N | 5NE | 6NNE | 6NNE | 6N | 8NNW | 7NW | 8NNW | 6NNE | 8.1 |
| 27 | 6NNE | 7NNE | 6NE | 6N | 6NNE | 6NNE | 6NNE | 5NE | 8ENE | 6NNE | 6SSE | 7SW | 7S | 8WSW | 9SSW | 14S | 16SSW | 14S | 12S | 13SSE | 16SSE | 22S | 25S | 29S | 10.8 |
| 28 | 31S | 33S | 33S | 35S | 33S | 34SSE | 34S | 39S | 39SSE | 38SSE | 37SSE | 41SSE | 43SSE | 43SSE | 43SSE | 43SSE | 46SSE | 40SSE | 40SSE | 37SSE | 40SSE | 42SSE | 40SSE | 39S | 38.5 |
| 29 | 30S | 27S | 29S | 21S | 19SSW | 20SSW | 21SW | 23SW | 25SW | 26WSW | 28W | 29W | 29W | 30W | 34NNW | 35NNW | 32NNW | 36NNW | 29NNW | 27NNW | 28NW | 26NW | 27NW | 27NW | 27.4 |
| 30 | 24NW | 21NW | 20NW | 17NW | 17NNW | 13N | 9NW | 8NNW | 12N | 10NNE | 8N | 8N | 7NNW | 7NNW | 6NW | 6N | 7NE | 7NE | 8ENE | 8E | 8ESE | 10ESE | 11ESE | 10E | 10.9 |
| AVER | 19.8 | | 17.2 | | 15.9 | | 15.4 | | 18.3 | | 20.1 | | 20.0 | | 19.3 | | 18.5 | | 17.5 | | 20.5 | | 19.7 | | |
| | | 18.5 | | 15.7 | | 16.1 | | 15.4 | | 18.7 | | 21.3 | | 18.2 | | 19.7 | | 19.1 | | 19.8 | | 20.1 | | 19.2 | 17.9 |

MAX HOURLY AVERAGE 46 ON DAY 28 HOUR 17

MAX DAILY AVERAGE 38.5 ON DAY 28

AVERAGE FOR THE PERIOD 17.9

OPERATING EFFICIENCY 99.86 %

SPEED ONLY 99.86 %

*** INDICATES NO DATA

'C' INDICATES CALIBRATION

'I' INSTALLATION, 'R' REMOVAL

DIRECTION ONLY 99.86 %

GIANT YELLOWKNIFE MINES - YELLOWKNIFE N.W.T
SEPTEMBER 1990
AVERAGE WIND SPEED AND FREQUENCY DISTRIBUTION

| SPEED (KM/HR) | FREQUENCY (PERCENT) | | | | | | | | | | | | | | | | TOTAL |
|--------------------|---------------------|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|-------|
| | N | NNE | NE | ENE | E | ESE | SE | SSE | S | SSW | SW | WSW | W | WNW | NW | NNW | |
| 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1 - 5 | 0.4 | 0.0 | 1.2 | 0.4 | 0.0 | 0.0 | 0.0 | 0.4 | 0.8 | 0.4 | 0.0 | 0.0 | 0.0 | 0.4 | 0.0 | 0.4 | 4.4 |
| 6 - 11 | 2.0 | 4.0 | 2.4 | 2.0 | 0.8 | 2.0 | 1.2 | 2.8 | 3.2 | 1.6 | 3.2 | 0.8 | 2.0 | 0.0 | 1.2 | 4.0 | 33.2 |
| 12 - 19 | 1.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.4 | 3.2 | 2.0 | 0.8 | 0.0 | 2.0 | 0.4 | 0.8 | 1.2 | 2.4 | 18.4 |
| 20 - 28 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.8 | 1.6 | 3.2 | 0.4 | 1.2 | 1.2 | 0.4 | 2.0 | 3.6 | 6.4 | 21.2 |
| 29 - 38 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.6 | 4.4 | 0.0 | 0.0 | 0.0 | 1.2 | 4.8 | 0.4 | 0.0 | 16.4 |
| 39+ | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.8 | 0.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.8 | 0.0 | 0.0 | 6.4 |
| TOTAL | 4.0 | 4.0 | 3.6 | 2.4 | 0.8 | 2.0 | 6.4 | 18.4 | 14.4 | 3.2 | 4.4 | 4.0 | 4.0 | 8.8 | 6.4 | 13.2 | |
| AVG SPD (KM/HR) | 10.2 | 6.5 | 6.6 | 7.5 | 9.0 | 8.8 | 15.4 | 26.8 | 20.9 | 11.6 | 11.8 | 16.0 | 17.4 | 29.3 | 19.9 | 16.6 | |

TOTAL NUMBER OF HOURS USED FOR CALCULATION 250

AVERAGE WIND SPEED FOR THE PERIOD (KM/HR) 18.52

GIANT YELLOWKNIFE MINES - YELLOWKNIFE N.W.T

OCTOBER 1990

WIND SPEED (KM/HR) AND DIRECTION

| DATE | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | DAILY AVERAGE |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------------|
| 1 | 10E | 10E | 13E | 13E | 14E | 14E | 13ENE | 16E | 18E | 18E | 20E | 22E | 21E | 21E | 19E | 18E | 18ESE | 15E | 12ENE | 15ENE | 15ENE | 14ENE | 14ENE | 13NE | 15.7 |
| 2 | 12NE | 13ENE | 15ENE | 15ENE | 15ENE | 15ENE | 12ENE | 12ENE | 15ENE | 15ENE | 15ENE | 16ENE | 14ENE | 13ENE | 13ENE | 13ENE | 11ENE | 11ENE | 9ENE | 9ENE | 8ENE | 8ENE | 11ENE | 9ENE | 12.5 |
| 3 | 8NE | 3ENE | 10ENE | 13ENE | 10E | 11E | 9E | 9ENE | 13ENE | 14NE | 14NE | 13NE | 14NE | 14NE | 14NE | 13NE | 13NE | 12NE | 10NNE | 13NNE | 11NE | 9NE | 9NE | 10NE | 11.2 |
| 4 | 9NNE | 9NNE | 8NNE | 9NNE | 10NE | 10NE | 11NNE | 9NE | 7NE | 5E | 6E | 7ESE | 6SE | 5SE | 5SE | 5SE | 2SE | 3ESE | 2ESE | 3E | 5E | 7E | 6ESE | 6E | 6.5 |
| 5 | 7E | 6E | 6E | 6E | 8E | 2E | 4ESE | 6ESE | 2ENE | 10ESE | 10ESE | 10SE | 8ESE | 8SSE | 8SSE | 8SSE | 10S | 8SSE | 7SE | 8SSE | 5ESE | 6ESE | 7SE | 6ESE | 6.9 |
| 6 | 4E | 4ESE | 6ESE | 6E | 8E | 10E | 9E | 12ESE | 13ESE | 13ESE | 16SE | 17SE | 17SE | 15SE | 17SSE | 18SSE | 14SSE | 13SE | 11SE | 11ESE | 12ESE | 12ESE | 12E | 11E | 11.7 |
| 7 | 9SE | 8ESE | 10ESE | 6E | 14ESE | 13E | 10E | 10ESE | 8SE | 10ESE | 14SE | 17SE | 22SSE | 23SSE | 23SSE | 23SSE | 24SSE | 19SE | 12SE | 11SSE | 11SSE | 11SE | 9ESE | 9ESE | 13.6 |
| 8 | 9ESE | 9SE | 7SSE | 7SSE | 8SSE | 10ESE | 11SE | 16ESE | 15SE | 24SSE | 26SSE | 26SSE | 27SSE | 29SSE | 35SSE | 35SSE | 41S | 41SSE | 34SSE | 28SSE | 22SSE | 20SSE | 16SSE | 10SSE | 21.1 |
| 9 | 4SE | 6W | 10NNW | 20NNW | 26NNW | 31NNW | 30NNW | 29NNW | 28W | 29W | 27W | 31W | 27NNW | 25NNW | 29NW | 33NW | 33NW | 32NNW | 28NNW | 29NNW | 25NNW | 30NNW | 31NNW | 30NNW | 26.0 |
| 10 | 31NNW | 32N | 30NNW | 28N | 29NNW | 29NNW | 27NNW | 29NNW | 26NNW | 27NNW | 27N | 26N | 23N | 22NNE | 22NNE | 21N | 19NNE | 17NNE | 17NE | 15NE | 14NNE | 11NE | 10NE | 14ENE | 22.8 |
| 11 | 8NE | 6ENE | 10E | 8E | 13ESE | 11E | 12E | 13ENE | 12E | 13E | 15ESE | 16E | 19ESE | 21ESE | 18ESE | 21E | 19ESE | 21SE | 18E | 18E | 21ESE | 23ESE | 21E | 25E | 15.9 |
| 12 | 25E | 21E | 21E | 23E | 23E | 22E | 22E | 25E | 24E | 30E | 28E | 28E | 27E | 29E | 25E | 22E | 20ENE | 17ENE | 16ENE | 17ENE | 19ENE | 15E | 16ENE | 19E | 22.3 |
| 13 | 17E | 15E | 16ENE | 15ENE | 14E | 14E | 14E | 12E | 12E | 12ENE | 12NE | 13NNE | 12NE | 11NE | 11NNE | 11NNE | 9NE | 6ENE | 8NE | 9NE | 12NE | 10NE | 10N | 14NNW | 12.0 |
| 14 | 15NNW | 12NNW | 10NNW | 11NW | 14NW | 14NW | 12NW | 13NNW | 11NNW | 8ESE | 6E | 5E | 4WSW | 7NNW | 12NNW | 13NNW | 16NNW | 19NNW | 20NNW | 16NNW | 10NNW | 8N | 11NNE | 10NE | 11.5 |
| 15 | 10ENE | 10ENE | 10ENE | 10ENE | 11ENE | 11ENE | 10NE | 14NE | 15NE | 15NE | 16NNE | 15NNE | 15NNE | 15NNE | 15NNE | 14NNE | 13NNE | 10NE | 5NE | 5NE | 8NNE | 7NE | 8NNE | 8NE | 11.3 |
| 16 | 7ENE | 7NE | 7ENE | 10NNE | 13NE | 11NNE | 9NE | 10E | 12ESE | 14SE | 11ESE | 14SE | 14SE | 15SE | 16SE | 14SE | 10ESE | 10ESE | 14ESE | 13ESE | 16ESE | 14ESE | 13ESE | 11E | 11.9 |
| 17 | 14ESE | 12ESE | 8ESE | 9E | 8E | 9E | 9ESE | 8ESE | 12SE | 12SE | 15SE | 17SE | 16SE | 17SE | 17SE | 14ESE | 17ESE | 19ESE | 19ESE | 18ESE | 19E | 19ESE | 18E | 16E | 14.2 |
| 18 | 16E | 15E | 16E | 17E | 19E | 18E | 16E | 14ENE | 17E | 15E | 16E | 18ESE | 18ESE | 18E | 21ESE | 20E | 16E | 14E | 14E | 12E | 12ENE | 12ENE | 11ENE | 10NE | 15.6 |
| 19 | 11ENE | 10ENE | 10ENE | 9ENE | 9NE | 8NE | 8ENE | 7ENE | 5NE | 8NE | 6N | 5NNW | 6NNW | 6NNW | 7NNW | 8NNW | 9NNW | 5NW | 5NNW | 7NW | 7NW | 5NNW | 5NW | 6NW | 7.2 |
| 20 | 7NW | 8NNW | 8NNW | 8NNW | 7NW | 12NW | 12NW | 15NNW | 14NNW | 10NNW | 9NNW | 8NNW | 7NW | 8NNW | 6NNW | 7WSW | 7WSW | 5W | 4N | 8ENE | 11E | 11E | 10E | 12E | 8.9 |
| 21 | 14E | 13E | 16ESE | 20SE | 25SE | 21ESE | 15SE | 17SE | 18SE | 28SE | 28SE | 30SE | 27SE | 26SE | 25SSE | 24SE | 22ESE | 20ESE | 20ESE | 15ESE | 13ESE | 14ESE | 20ESE | 21ESE | 20.5 |
| 22 | 20ESE | 20ESE | 20ESE | 17E | 18E | 18E | 16E | 17E | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | 18.3 |
| 23 | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R |
| 24 | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R |
| 25 | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R |
| 26 | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R |
| 27 | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R |
| 28 | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R |
| 29 | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R |
| 30 | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R |
| 31 | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R |
| AVER | 12.1 | 12.1 | 12.1 | 12.7 | 14.4 | 14.2 | 13.2 | 14.2 | 14.1 | 16.0 | 16.4 | 16.4 | 16.6 | 16.9 | 17.0 | 16.3 | 15.1 | 13.6 | 13.3 | 13.1 | 12.7 | 12.8 | 12.9 | 14.4 | |

MAX HOURLY AVERAGE 41 ON DAY 8 HOUR 17

MAX DAILY AVERAGE 26.0 ON DAY 9

AVERAGE FOR THE PERIOD 14.4

OPERATING EFFICIENCY 100 %

SPEED ONLY 100 %

*** INDICATES NO DATA

'C' INDICATES CALIBRATION

'I' INSTALLATION, 'R' REMOVAL

DIRECTION ONLY 100 %

GIANT YELLOWKNIFE MINES - YELLOWKNIFE N.W.T
OCTOBER 1990
AVERAGE WIND SPEED AND FREQUENCY DISTRIBUTION

| SPEED (KM/HR) | FREQUENCY (PERCENT) | | | | | | | | | | | | | | | | TOTAL |
|--|---------------------|------|------|------|------|------|------|------|------|-----|-----|-----|------|------|------|------|-------|
| | N | NNE | NE | ENE | E | ESE | SE | SSE | S | SSW | SW | WSW | W | WNW | NW | NNW | |
| 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1 - 5 | 0.2 | 0.0 | 0.6 | 0.4 | 1.2 | 1.0 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.2 | 0.0 | 0.4 | 0.6 | 5.8 |
| 6 - 11 | 0.6 | 2.5 | 5.5 | 5.5 | 6.3 | 4.9 | 2.0 | 2.1 | 0.2 | 0.0 | 0.0 | 0.4 | 0.2 | 0.4 | 1.4 | 3.1 | 35.1 |
| 12 - 19 | 0.0 | 2.3 | 3.9 | 7.0 | 10.4 | 6.4 | 5.1 | 0.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 1.0 | 2.0 | 39.1 |
| 20 - 28 | 1.0 | 0.4 | 0.0 | 0.2 | 4.3 | 2.5 | 1.6 | 2.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 | 0.8 | 0.0 | 1.2 | 14.9 |
| 29 - 38 | 0.2 | 0.0 | 0.0 | 0.0 | 0.4 | 0.0 | 0.2 | 0.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 | 0.6 | 0.6 | 2.0 | 5.2 |
| 39+ | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 |
| TOTAL | 2.0 | 5.2 | 10.0 | 13.1 | 22.6 | 14.8 | 9.9 | 6.4 | 0.4 | 0.0 | 0.0 | 0.6 | 1.2 | 2.0 | 3.4 | 8.9 | |
| AVG SPD (KM/HR) | 18.5 | 12.9 | 10.6 | 11.9 | 14.7 | 13.2 | 14.7 | 19.6 | 25.5 | 0.0 | 0.0 | 6.0 | 21.0 | 21.7 | 13.0 | 16.6 | |
| TOTAL NUMBER OF HOURS USED FOR CALCULATION 512 | | | | | | | | | | | | | | | | | |

AVERAGE WIND SPEED FOR THE PERIOD (KM/HR) 14.30

GIANT YELLOWKNIFE MINES - YELLOWKNIFE N.W.T

SEPTEMBER 1990

HOURLY AVERAGE SO2 (PPM)

| DATE | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | DAILY AVERAGE | |
|------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------------|-------|
| 1 | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | **** |
| 2 | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | **** |
| 3 | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | **** |
| 4 | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | **** |
| 5 | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | **** |
| 6 | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | **** |
| 7 | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | **** |
| 8 | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | **** |
| 9 | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | **** |
| 10 | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | **** |
| 11 | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | **** |
| 12 | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | **** |
| 13 | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | **** |
| 14 | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | **** |
| 15 | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | **** |
| 16 | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | **** |
| 17 | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | **** |
| 18 | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | **** |
| 19 | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***I | ***C | ***C | ***C | ***C | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.000 |
| 20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | ***C | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.000 | |
| 21 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | ***C | 0.00 | 0.02 | 0.01 | 0.33 | 0.11 | 0.20 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.030 | |
| 22 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | ***C | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.002 | |
| 23 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | ***C | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.15 | 0.00 | 0.00 | 0.01 | 0.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.013 | |
| 24 | 0.00 | 0.00 | 0.02 | 0.02 | 0.00 | ***C | 0.08 | 0.02 | 0.10 | 0.11 | 0.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.018 | |
| 25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | ***C | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.000 | |
| 26 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | ***C | 0.00 | 0.00 | 0.00 | 0.00 | **** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.000 | |
| 27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | ***C | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.19 | 0.27 | 0.01 | 0.06 | 0.00 | 0.02 | 0.07 | 0.09 | 0.00 | 0.00 | 0.19 | 0.32 | 0.17 | 0.061 | |
| 28 | 0.25 | 0.17 | 0.09 | 0.00 | 0.00 | ***C | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.024 | |
| 29 | 0.25 | 0.17 | 0.01 | 0.63 | 0.06 | ***C | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.049 | |
| 30 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | ***C | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.000 | |
| AVER | 0.045 | | 0.014 | | 0.005 | | 0.008 | | 0.010 | | 0.019 | | 0.032 | | 0.007 | | 0.003 | | 0.007 | | 0.000 | | 0.027 | | | |
| | | 0.031 | | 0.059 | | **** | | 0.004 | | 0.040 | | 0.035 | | 0.015 | | 0.000 | | 0.015 | | 0.000 | | 0.016 | | 0.017 | | 0.016 |

MAX HOURLY AVERAGE 0.63
 MAX DAILY AVERAGE 0.061
 AVERAGE FOR THE PERIOD 0.016
 OPERATING EFFICIENCY 99.86 %

ON DAY 29 HOUR 4
 ON DAY 27

*** INDICATES NO DATA
 'C' INDICATES CALIBRATION
 'I' INSTALLATION, 'R' REMOVAL

GIANT YELLOWKNIFE MINES - YELLOWKNIFE N.W.T
 SEPTEMBER 1990
 CUMULATIVE FREQUENCY DISTRIBUTION
 FOR HOURLY AVERAGE SO₂ (PPH) CONCENTRATIONS

| CONCENTRATION | NUMBER OF HOURS | PERCENTAGE | CUMULATIVE PERCENTAGE |
|---------------|--------------------|------------|--------------------------|
| 0.0 | 218 | 84.50 | 84.50 |
| .01 - .02 | 13 | 5.04 | 89.54 |
| .03 - .06 | 5 | 1.94 | 91.48 |
| .07 - .17 | 13 | 5.04 | 96.52 |
| .18 - .34 | 8 | 3.10 | 99.62 |
| .35+ | 1 | 0.39 | 100.01 |

GIANT YELLOWKNIFE MINES - YELLOWKNIFE N.W.T
 SEPTEMBER 1990
 AVERAGE WIND SPEED AND FREQUENCY DISTRIBUTION
 FOR HOURLY AVERAGE SO2 CONCENTRATIONS GREATER THAN 0.0 (PPM)

| SPEED (KM/HR) | FREQUENCY (PERCENT) | | | | | | | | | | | | | | | | |
|--------------------|---------------------|-----|-----|-----|-----|-----|-----|------|------|------|-----|-----|-----|-----|-----|-----|-------|
| | N | NNE | NE | ENE | E | ESE | SE | SSE | S | SSW | SW | WSW | W | WNW | NW | NNW | TOTAL |
| 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1 - 5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.5 |
| 6 - 11 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 10.0 | 15.0 | 5.0 | 5.0 | 2.5 | 0.0 | 0.0 | 0.0 | 0.0 | 37.5 |
| 12 - 19 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.5 | 10.0 | 5.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 17.5 |
| 20 - 28 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 17.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 17.5 |
| 29 - 38 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 22.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 22.5 |
| 39+ | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.5 |
| TOTAL | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 12.5 | 67.5 | 12.5 | 5.0 | 2.5 | 0.0 | 0.0 | 0.0 | 0.0 | |
| AVG SPD (KM/HR) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 9.0 | 21.7 | 12.0 | 8.5 | 8.0 | 0.0 | 0.0 | 0.0 | 0.0 | |

TOTAL NUMBER OF HOURS USED FOR CALCULATION 40

AVERAGE WIND SPEED FOR THE PERIOD (KM/HR) 17.90

GIANT YELLOWKNIFE MINES - YELLOWKNIFE N.W.T
SEPTEMBER 1990

CORRELATION OF WIND SPEED (KM/HR)
AND SO₂ (PPM) CONCENTRATION DISTRIBUTION

CONCENTRATIONS

| | < 1 | 1 - 5 | 6 - 11 | 12 - 19 | 20 - 28 | 29 - 38 | 39 + |
|-----------|-----|-------|--------|---------|---------|---------|------|
| 0.0 | 0.0 | 90.9 | 81.0 | 84.4 | 85.7 | 77.5 | 93.8 |
| .01 - .02 | 0.0 | 9.1 | 8.9 | 4.4 | 0.0 | 7.5 | 0.0 |
| .03 - .06 | 0.0 | 0.0 | 2.5 | 2.2 | 2.0 | 0.0 | 6.3 |
| .07 - .17 | 0.0 | 0.0 | 5.1 | 6.7 | 6.1 | 7.5 | 0.0 |
| .18 - .34 | 0.0 | 0.0 | 2.5 | 2.2 | 4.1 | 7.5 | 0.0 |
| .35+ | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 |

WIND SPEED
DISTRIBUTION

| | | | | | | |
|-----|-----|------|------|------|------|-----|
| 0.0 | 4.6 | 32.9 | 18.8 | 20.4 | 16.7 | 6.7 |
|-----|-----|------|------|------|------|-----|

GIANT YELLOWKNIFE MINES - YELLOWKNIFE N.W.T
SEPTEMBER 1990

CORRELATION OF WIND DIRECTION
AND SO₂ (PPH) CONCENTRATION DISTRIBUTION

CONCENTRATIONS

| | N | NNE | NE | ENE | E | ESE | SE | SSE | S | SSW | SW | WSW | W | WNW | NW | NNW |
|--------------------|-------|-------|-------|-------|-------|-------|-------|------|------|------|------|------|-------|-------|-------|-------|
| 0.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 88.6 | 22.9 | 28.6 | 81.8 | 90.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| .01 - .02 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 11.4 | 11.4 | 28.6 | 9.1 | 10.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| .03 - .06 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 8.6 | 28.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| .07 - .17 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 34.3 | 14.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| .18 - .34 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 20.0 | 0.0 | 9.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| .35+ | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| WIND DIR. DIST. | 3.8 | 3.8 | 3.8 | 2.5 | 0.8 | 2.1 | 6.3 | 18.3 | 14.6 | 2.9 | 4.6 | 4.2 | 4.2 | 8.8 | 6.3 | 13.3 |

GIANT YELLOWKNIFE MINES - YELLOWKNIFE N.W.T

OCTOBER 1990

HOURLY AVERAGE SO2 (PPM)

| DATE | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | DAILY AVERAGE | |
|------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------------|-------|
| 1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | ***C | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.000 | |
| 2 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | ***C | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.000 | |
| 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | ***C | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.000 | |
| 4 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | ***C | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.000 | |
| 5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | ***C | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 | 0.12 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.010 | |
| 6 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | ***C | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.001 | |
| 7 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | ***C | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.001 | |
| 8 | 0.00 | 0.00 | 0.02 | 0.01 | 0.00 | ***C | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.004 | |
| 9 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | ***C | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.000 | |
| 10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | ***C | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.000 | |
| 11 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | ***C | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.000 | |
| 12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | ***C | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.000 | |
| 13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | ***C | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.000 | |
| 14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | ***C | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.000 | |
| 15 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | ***C | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.000 | |
| 16 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | ***C | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.000 | |
| 17 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | ***C | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.000 | |
| 18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | ***C | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.000 | |
| 19 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | ***C | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.000 | |
| 20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | ***C | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.000 | |
| 21 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | ***C | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.000 | |
| 22 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | ***C | 0.00 | ***C | ***C | ***C | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | 0.000 | |
| 23 | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R |
| 24 | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R |
| 25 | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R |
| 26 | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R |
| 27 | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R |
| 28 | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R |
| 29 | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R |
| 30 | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R |
| 31 | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R | ***R |
| AVER | 0.000 | | 0.001 | | 0.000 | | 0.000 | | 0.000 | | 0.000 | | 0.000 | | 0.001 | | 0.008 | | 0.000 | | 0.000 | | 0.000 | | 0.001 | |
| | | 0.000 | | 0.001 | | **** | | 0.000 | | 0.000 | | 0.000 | | 0.000 | | 0.005 | | 0.001 | | 0.000 | | 0.000 | | 0.000 | | 0.001 |

MAX HOURLY AVERAGE 0.12 ON DAY 5 HOUR 17
 MAX DAILY AVERAGE 0.010 ON DAY 5
 AVERAGE FOR THE PERIOD 0.001
 OPERATING EFFICIENCY 100 %

*** INDICATES NO DATA
 'C' INDICATES CALIBRATION
 'I' INSTALLATION, 'R' REMOVAL

GIANT YELLOWKNIFE MINES - YELLOWKNIFE N.W.T

OCTOBER 1990

CUMULATIVE FREQUENCY DISTRIBUTION
FOR HOURLY AVERAGE SO₂ (PPM) CONCENTRATIONS

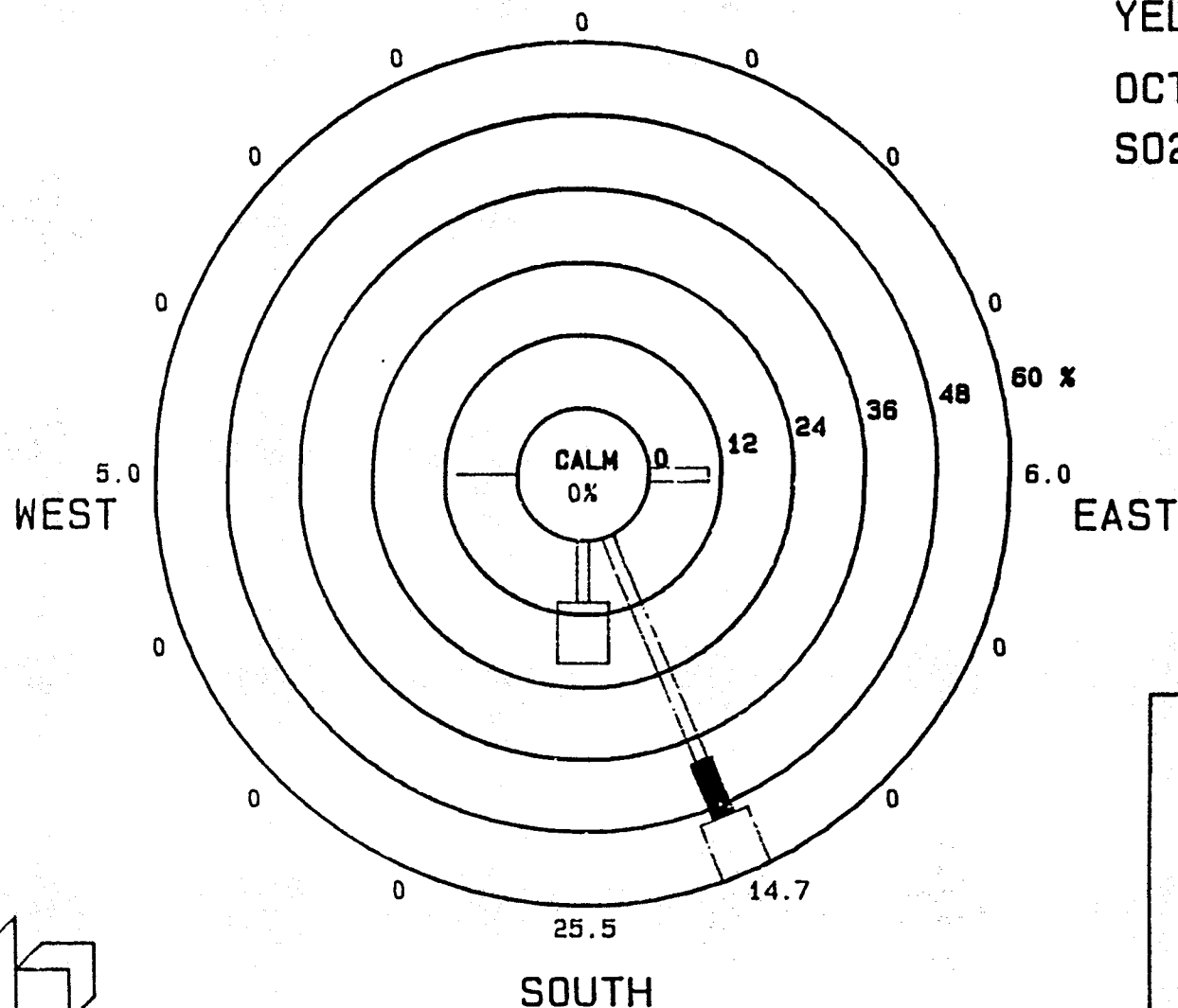
| CONCENTRATION | NUMBER OF HOURS | PERCENTAGE | CUMULATIVE PERCENTAGE |
|---------------|--------------------|------------|--------------------------|
| 0.0 | 479 | 97.96 | 97.96 |
| .01 - .02 | 6 | 1.23 | 99.19 |
| .03 - .06 | 2 | 0.41 | 99.60 |
| .07 - .17 | 2 | 0.41 | 100.01 |
| .18 - .34 | 0 | 0.00 | 100.01 |
| .35+ | 0 | 0.00 | 100.01 |

GIANT YELLOWKNIFE MINES

AIR QUALITY DATA

NORTH

YELLOWKNIFE N.W.T
OCTOBER 1990
SO₂



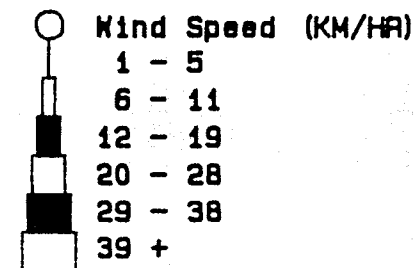
Directional Mean
Speeds are Indicated

ALL SO₂ READINGS ARE USED
IN THIS PLOT

OVERALL AVERAGE SPEED = 15.0

NUMBER OF HOURLY
OBSERVATIONS USED = 10

Legend



GIANT YELLOWKNIFE MINES - YELLOWKNIFE N.W.T
OCTOBER 1990
AVERAGE WIND SPEED AND FREQUENCY DISTRIBUTION
FOR HOURLY AVERAGE SO₂ CONCENTRATIONS GREATER THAN 0.0 (PPM)

| SPEED (KM/HR) | FREQUENCY (PERCENT) | | | | | | | | | | | | | | | | TOTAL |
|--------------------|---------------------|-----|-----|-----|------|-----|-----|------|------|-----|-----|-----|------|-----|-----|-----|-------|
| | N | NNE | NE | ENE | E | ESE | SE | SSE | S | SSW | SW | WSW | W | WNW | NW | NNW | |
| 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1 - 5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 10.0 | 0.0 | 0.0 | 0.0 | 10.0 |
| 6 - 11 | 0.0 | 0.0 | 0.0 | 0.0 | 10.0 | 0.0 | 0.0 | 40.0 | 10.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 60.0 |
| 12 - 19 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 10.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 10.0 |
| 20 - 28 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 29 - 38 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 39+ | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 10.0 | 10.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 20.0 |
| TOTAL | 0.0 | 0.0 | 0.0 | 0.0 | 10.0 | 0.0 | 0.0 | 60.0 | 20.0 | 0.0 | 0.0 | 0.0 | 10.0 | 0.0 | 0.0 | 0.0 | |
| AVG SPD (KM/HR) | 0.0 | 0.0 | 0.0 | 0.0 | 6.0 | 0.0 | 0.0 | 14.7 | 25.5 | 0.0 | 0.0 | 0.0 | 5.0 | 0.0 | 0.0 | 0.0 | |

TOTAL NUMBER OF HOURS USED FOR CALCULATION 10

AVERAGE WIND SPEED FOR THE PERIOD (KM/HR) 15.00

GIANT YELLOWKNIFE MINES - YELLOWKNIFE N.W.T

OCTOBER 1990

CORRELATION OF WIND SPEED (KM/HR)
AND SO₂ (PPH) CONCENTRATION DISTRIBUTION

CONCENTRATIONS

| | < 1 | 1 - 5 | 6 - 11 | 12 - 19 | 20 - 28 | 29 - 38 | 39 + |
|-----------|-----|-------|--------|---------|---------|---------|------|
| 0.0 | 0.0 | 96.4 | 96.5 | 99.5 | 100.0 | 100.0 | 0.0 |
| .01 - .02 | 0.0 | 3.6 | 2.4 | 0.0 | 0.0 | 0.0 | 50.0 |
| .03 - .06 | 0.0 | 0.0 | 0.0 | 0.5 | 0.0 | 0.0 | 50.0 |
| .07 - .17 | 0.0 | 0.0 | 1.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| .18 - .34 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| .35+ | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

WIND SPEED
DISTRIBUTION

| | | | | | | |
|-----|-----|------|------|------|-----|-----|
| 0.0 | 5.7 | 34.8 | 39.1 | 15.1 | 4.9 | 0.4 |
|-----|-----|------|------|------|-----|-----|

GIANT YELLOWKNIFE MINES - YELLOWKNIFE N.W.T
OCTOBER 1990

CORRELATION OF WIND DIRECTION
AND SO2 (PPM) CONCENTRATION DISTRIBUTION

CONCENTRATIONS

| | N | NNE | NE | ENE | E | ESE | SE | SSE | S | SSW | SW | WSW | W | WNW | NW | NNW |
|--------------------|-------|-------|-------|-------|------|-------|-------|------|------|-----|-----|-------|------|-------|-------|-------|
| 0.0 | 100.0 | 100.0 | 100.0 | 100.0 | 99.0 | 100.0 | 100.0 | 81.8 | 0.0 | 0.0 | 0.0 | 100.0 | 83.3 | 100.0 | 100.0 | 100.0 |
| .01 - .02 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 12.1 | 0.0 | 0.0 | 0.0 | 0.0 | 16.7 | 0.0 | 0.0 | 0.0 |
| .03 - .06 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 50.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| .07 - .17 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 50.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| .18 - .34 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| .35+ | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| WIND DIR. DIST. | 2.0 | 5.3 | 10.0 | 13.3 | 21.1 | 15.1 | 10.2 | 6.7 | 0.4 | 0.0 | 0.0 | 0.6 | 1.2 | 1.8 | 3.1 | 9.0 |

QUALITY ANALYZER CALIBRATION DATA

PARAMETER SO₂

Company : GIANT YELLOWKNIFE MINES Job #: 8911
 Plant : YELLOWKNIFE Location: NORTH OF PLANT STACK
 Date: SEPT 17 1990 Start Time (MST): 14:35 End Time (MST): 18:08
 Atmospheric Pressure: 746.76 mm Hg Station Temperature: 19.0 °C
 Routine: _____ Installation: SEPT Removal: _____ Other: _____

Site Information:

Analyzer : MONITOR LABS 8350 S/N: 914 Detection Principle: SO₂ FLUORESCENCE
 Calibrator: MELOV LABS CHSD2W S/N: AH022
 Flow Meter: HASTINGS HGM-1A S/N: 914
 Recorder : SOLTEC 54202 S/N: 222013
 Range: 0-10.00 Speed: 2cm/min Pen Color: RED

| Calibr. Standards | Type | ID | Conc/Rate |
|-----------------------|----------------|-----------------|-----------------------------------|
| <u>U.S. METRONICS</u> | <u>PERMUTE</u> | <u>22-39884</u> | <u>1237.061/mst +/- 0% @ 38°C</u> |
| | | | |
| | | | |

| MONITOR SETTINGS | Before Calibration | After Calibration |
|------------------|--------------------|-------------------|
| Range | <u>1.0 ppm</u> | <u>1.0 ppm</u> |
| Zero Pot | <u>NA</u> | <u>291</u> |
| Span Pot | <u>NA</u> | <u>158</u> |
| Sample Flow | <u>450 cc/min</u> | <u>450 cc/min</u> |

CALIBRATION DATA

| Flow rates (cm ³ /min) | Dilution | Calculated | Indicated | Correction | D.A.S. | Responses |
|-----------------------------------|-----------|------------|------------|------------|---------|-----------|
| Dilution | Pollutant | Ratio | Conc. (Cc) | Conc. (Ci) | Factor | Raw |
| Air | Gas | | ppm/ppb | Recorder | (Cc/Ci) | Counts |
| 1301.7 | | | 0.363 | 0.360 | 1.0083 | 31.2 |
| 2212.0 | | | 0.214 | 0.210 | 1.0190 | 21.3 |
| 4222.7 | | | 0.112 | 0.110 | 1.0182 | 10.9 |
| | | | 0.000 | | | -2 |
| | | | | | | |
| | | | | | | |
| | | | | | | |

Last Calibration Date: NA Previous Correction Factor : NA
 Correction Factor Before Span Adjust: NA
 & Change: NA
 Correction Factor After Span Adjust: 1.0083

Previous Instrument Factor: NA New Instrument Factor: 0.0101

Correlation Coefficient: 0.99974 Slope: 1.001428 Intercept: -2459723.6

| D.A.S Settings/Responses | Before Calibration | After Calibration |
|--------------------------|--------------------|---------------------|
| A/D coeff. A | <u>NA</u> | <u>9.958968E-04</u> |
| A/D coeff. B | <u>NA</u> | <u>2.409395E-03</u> |
| Zero | | |
| Span | | |

Notes: _____

Calibration performed by: R. F. H. [Signature]

GIANT YELLOWKNIFE MINES
YELLOWKNIFE
SEPTEMBER 19, 1990
SO2

LEAST SQUARES
CALCULATIONS

CALCULATED
CONCENTRATION
PPM

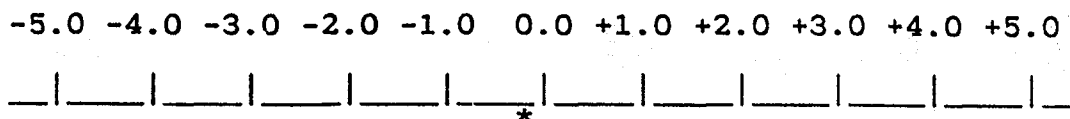
.363
.214
.112
0

D.A.S.
RESPONSE
PPM

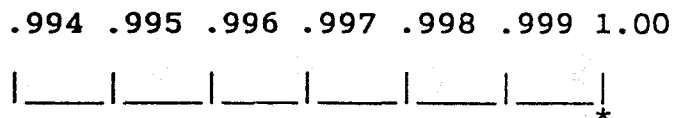
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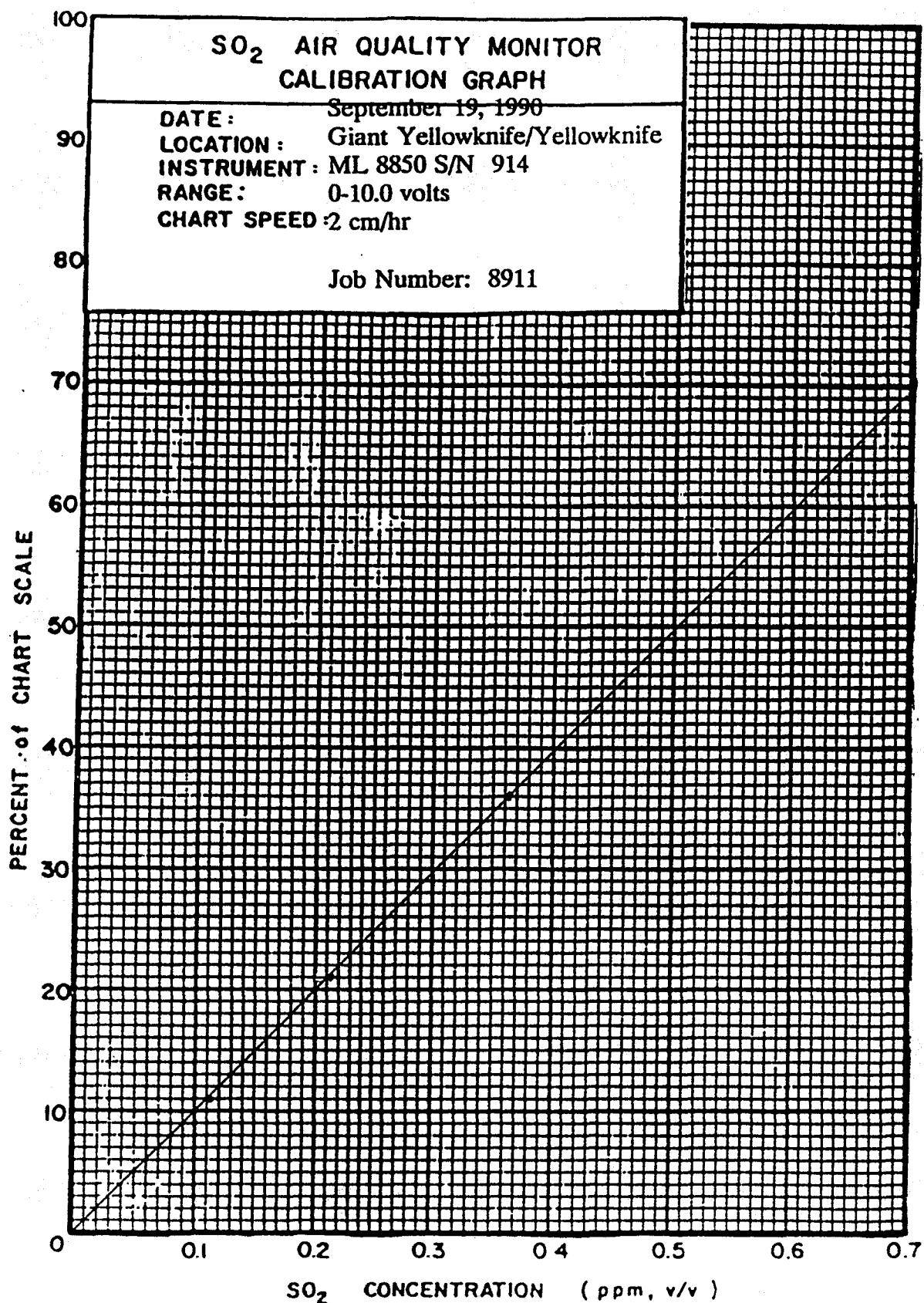
SLOPE 1.0014
INTERCEPT -0.0002
CORRELATION COEFFICIENT 1.0000

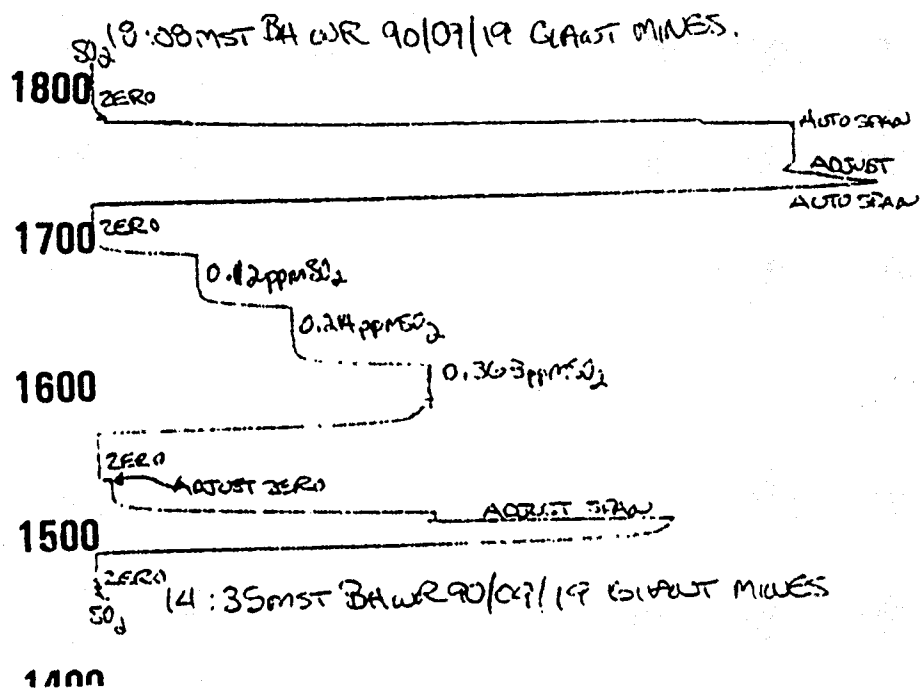
INTERCEPT -0.0002



CORR.
COEFF. 1.0000







AIR QUALITY ANALYZER CALIBRATION DATA

PARAMETER

SO₂

Company : Giant Yellauknife Mines

Job #: 8911

Plant : Yellauknife

Location: _____

Date: Oct 22/90 Start Time (MST): 0700 End Time (MST): 0922

Atmospheric Pressure: 735 mm Hg Station Temperature: 20 °C

Routine: _____ Installation: _____ Removal: ☒ Other: _____

Site Information:

Analyzer : Monitor Labs 8550

S/N: 914

Detection Principle:

Calibrator: Meloy CHS10-2w

S/N: 4H092

Fluorescence

Flow Meter: Hastings HBM-1A

S/N: 914

Recorder : So lke 4-20V

S/N: 222013

Pen Color: Red

Range: 0-10 Volts

Speed: 2cm/hr

Calibr. Standards

Type

ID

Conc/Rate

Vici Metronics Permutation Device 2S-39554 1237 mg SO₂/min @ 27°C 35°C

MONITOR SETTINGS

Before Calibration

After Calibration

Range

0-1.0ppm

Zero Pot

399

Span Pot

157

Sample Flow

450cc/min

SAME

CALIBRATION DATA

| Flow rates (cm ³ /min) | Dilution | Calculated | Indicated | Correction | D.A.S. | Resp |
|-----------------------------------|-----------|------------|-------------|---------------|------------|------------|
| Dilution | Pollutant | Ratio | Conc. (Cc) | Factor | Raw | Conver |
| Air | Gas | | ppm/ppb | (Cc/Ci) | Counts | Data |
| <u>726</u> | | | <u>.650</u> | <u>1.0031</u> | <u>632</u> | <u>.65</u> |
| <u>1152</u> | | | <u>.410</u> | <u>1.0042</u> | <u>392</u> | <u>.41</u> |
| <u>1890</u> | | | <u>.252</u> | <u>1.0000</u> | <u>235</u> | <u>.25</u> |
| | | | <u>.000</u> | | <u>-16</u> | <u>.00</u> |

Last Calibration Date: Sept. 14/90 Previous Correction Factor: 1.0083

Correction Factor Before Span Adjust: 1.0031

& Change: 0.52%

Correction Factor After Span Adjust: 1.0031

Previous Instrument Factor: .0101 New Instrument Factor: .0100

Correlation Coefficient: .994141 Slope: .794286 Intercept: .000233

D.A.S Settings/Responses

Before Calibration

After Calibration

A/D coeff. A

9.95576E-04

1.00396E-03

A/D coeff. B

2.44954E-03

015515

Zero

Span

Notes: _____

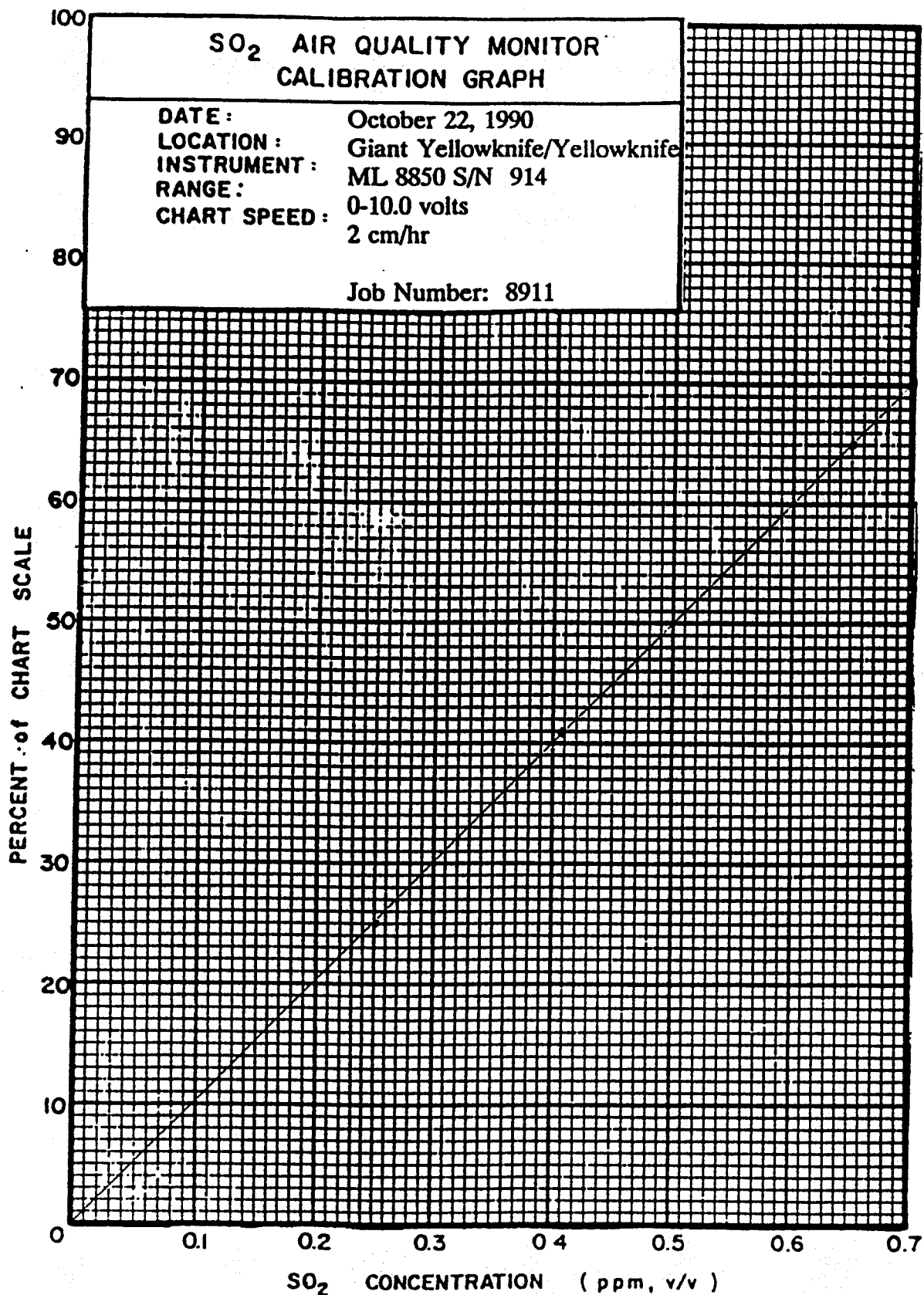
Calibration performed by: _____

LEAST SQUARES CALCULATIONS

**D.A.S.
RESPONSE
PPM**

.65
.409
.251
0

| | | | | | | | | |
|--------|--------|------|------|------|------|------|------|------|
| CORR. | | .994 | .995 | .996 | .997 | .998 | .999 | 1.00 |
| COEFF. | 1.0000 | | | | | | | * |



0900 ^{0.122 msp} ^{Spn}
^{Zero}

0800 ^{0.250 ppm} ^{0.410 ppm} ^{0.650 ppm}

0700 ^{Zero} ^{0.700 inst}
Giant Mines - Yellowknife
SO₂ Calibration
Oct. 22/90

0600