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10 July 1978
76C073

QUARTERLY REPORT

ON THE

SEISMIC MONITORING NETWORK

IN THE VICINITY OF

INDIAN POINT, NEW YORK

CONSOLIDATED EDISON PROJECT

WCC/6

March 1978 through May 1978

INTRODUCTION

During this quarter there were no naturally occurring seismic events within the network. On March 5, 1978 there was a naturally occurring event near Highland Mills, New York (origin time - 02:53 am EST, 07:53 UTC) which is on the perimeter of the network.

There was an earthquake in Berkeley Springs, Maryland on April 26, 1978. This event was recorded by all of our stations, but was well beyond our limits for determining a location.

On May 13, 1978, there were two earthquakes near Attica, New York which were also too far away to be located.

Bloomington, New Jersey had a small, naturally occurring seismic event on May 6, 1978. Some of our stations recorded this event, but because of the small magnitude and distance, the readings were not clear enough to be useable.

On March 24, 1978, a magnitude six earthquake occurred near Bermuda. This event was followed by ten aftershocks, occurring in March, April, and to the end of May. The large number of aftershocks are listed in a separate table. Using data from

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Offices in Other Principal Cities



stations 5 to 15 km away & all up and down the east coast, the United States Geological Survey computed residuals on these aftershocks. The aftershocks at first were characterized by low frequency arrivals. Each aftershock had progressively higher frequencies. The anomalous residuals may be due to the 400 km discontinuity, according to Lamont-Doherty.

DATA ANALYSIS

Routine Analysis

The only change in the analysis procedures during the quarter was the addition of a high speed computer terminal in the Clifton office. This terminal enables us to process the data and locate earthquakes with much greater efficiency.

The Highlands Mills event on March 5, 1978, although not within the boundaries of the network, was close enough to establish a location. The data from our stations, combined with data from Lamont-Doherty Geological Observatory, gave us the necessary span in distance to determine the epicenter. The event was run through the computer program with variations in the crustal models which enabled us to match very closely the location determined by Lamont-Doherty. Based on station distribution about the hypocenter, data obtained were not sufficient to construct a consistent fault plane solution.

STATUS OF THE NETWORK

Network stations operated satisfactorily despite minor problems due to thunderstorms toward the end of the quarter.

RESULTS

Six hundred and seventy-two events were detected by routine analysis during this quarter. As usual, most of these events were due to confirmed or suspected blasting operations as listed in Tables III and IV. Only one of the naturally occurring seismic events listed in Table I was near the perimeter of the network.

TABLE I

NATURALLY OCCURRING SEISMIC EVENTS

WITHIN THE NETWORK

None

REGIONAL EVENTS

(WITHIN TWO DEGREES OF THE NETWORK)

| <u>Date</u> | <u>Time (UTC)</u> | <u>Location</u> | <u>Magnitude</u> |
|---------------|-------------------|---------------------------------------------|------------------|
| 05 March 1978 | 07:53 | Highland Mills, NY 41°N 21.07 74°W 08.81 | 2.1 |
| 18 May 1978 | 01:29 | Bloomington, NJ 41°N 01.44 74°W 20.09 | 1.5 |

DISTANT EVENTS RECORDED BY THE NETWORK

(WITHIN SIX DEGREES)

| <u>Date</u> | <u>Time (UTC)</u> | <u>Location</u> | |
|---------------|-------------------|------------------------------------------|-----|
| 26 April 1978 | 19:31 | Berkeley Springs, MD 39.65°N 78.22°W | 3.1 |
| 13 May 1978 | 21:57 | Near Attica, NY 42°N 45.80 78°W 17.60 | 2.7 |
| 13 May 1978 | 22:10 | Near Attica, NY 42°N 45.80 78°W 17.60 | 2.6 |

TELESEISMS

| <u>Date</u> | <u>Time (UTC)</u> | <u>Date</u> | <u>Time (UTC)</u> |
|---------------|-------------------|-------------|-----------------------------|
| 04 March 1978 | 17:41 | 04 May 1978 | 18:31 |
| 06 March 1978 | 00:34 | 10 May 1978 | 20:32 |
| 07 March 1978 | 03:01 | 11 May 1978 | 00:34 |
| 11 March 1978 | 12:14 | 16 May 1978 | 07:48 |
| 15 March 1978 | 15:05 | 16 May 1978 | 08:37 |
| 19 March 1978 | 01:45 | 23 May 1978 | 08:04 |
| 20 March 1978 | 15:52 | 23 May 1978 | 20:24 |
| 20 March 1978 | 18:19 | 23 May 1978 | 23:45 |
| 22 March 1978 | 01:03 | 24 May 1978 | 06:27 |
| 22 March 1978 | 21:47 | 29 May 1978 | 03:14 |
| 23 March 1978 | 00:43 | 29 May 1978 | 03:19 |
| 23 March 1978 | 02:02 | 31 May 1978 | 01:13 |
| 23 March 1978 | 02:49 | | |
| 23 March 1978 | 03:27 | | (earthquake from Nicaragua) |
| 23 March 1978 | 03:28 | | |
| 23 March 1978 | 04:03 | | |
| 23 March 1978 | 07:33 | | |
| 23 March 1978 | 08:27 | | |
| 23 March 1978 | 19:25 | | |
| 24 March 1978 | 20:00 | | |
| 24 March 1978 | 21:19 | | |
| 28 March 1978 | 20:29 | | |
| 04 April 1978 | 21:18 | | |
| 10 April 1978 | 21:11 | | |
| 11 April 1978 | 17:51 | | |
| 12 April 1978 | 03:51 | | |
| 13 April 1978 | 06:06 | | |
| 18 April 1978 | 17:46 | | |
| 27 April 1978 | 20:44 | | |
| 29 April 1978 | 02:46 | | |

BERMUDA EVENTS

| <u>Date</u> | <u>Time (UTC)</u> | <u>Location</u> | <u>Magnitude</u> |
|---------------|-------------------|---------------------------------|------------------|
| 24 March 1978 | 00:45 | Near Bermuda 30.61°N 68.29°W | 6 |

AFTERSHOCKS

4

| <u>Date</u> | <u>Time (UTC)</u> |
|---------------|-------------------|
| 24 March 1978 | 13:41 |
| 07 April 1978 | 22:48 |
| 13 April 1978 | 21:18 |
| 15 April 1978 | 16:29 |
| 16 April 1978 | 22:16 |
| 19 April 1978 | 11:35 |
| 24 April 1978 | 05:47 |
| 24 April 1979 | 08:00 |
| 04 May 1978 | 05:45 |
| 20 May 1978 | 20:58 |

TABLE II

PROBABLE NATURALLY OCCURRING SEISMIC EVENTS

None

TABLE IIIA

CLINTON POINT QUARRY BLASTS
41°N 37.5' 73°W 57.0

| <u>Date</u> | <u>Time (UTC)</u> |
|---------------|-------------------|
| 16 March 1978 | 18:45 |
| 23 March 1978 | 19:47 |
| 28 March 1978 | 21:05 |
| 30 March 1978 | 20:53 |
| 31 March 1978 | 21:05 |
| 05 April 1978 | 20:50 |
| 07 April 1978 | 20:46 |
| 10 April 1978 | 20:45 |
| 11 April 1978 | 21:31 |
| 13 April 1978 | 20:55 |
| 14 April 1978 | 17:32 |
| 17 April 1978 | 21:17 |
| 18 April 1978 | 20:46 |
| 19 April 1978 | 20:46 |
| 20 April 1978 | 20:49 |
| 21 April 1978 | 16:47 |
| 24 April 1978 | 20:50 |
| 25 April 1978 | 21:04 |
| 27 April 1978 | 20:48 |
| 28 April 1978 | 20:49 |
| 01 May 1978 | 19:52 |
| 02 May 1978 | 19:55 |
| 03 May 1978 | 16:03 |
| 04 May 1978 | 16:24 |
| 04 May 1978 | 19:45 |
| 08 May 1978 | 19:45 |
| 09 May 1978 | 19:45 |
| 10 May 1978 | 19:51 |
| 11 May 1978 | 16:21 |
| 15 May 1978 | 17:28 |
| 15 May 1978 | 19:49 |
| 16 May 1978 | 17:26 |
| 17 May 1978 | 17:26 |
| 17 May 1978 | 18:44 |
| 19 May 1978 | 19:51 |
| 22 May 1978 | 20:11 |
| 23 May 1978 | 17:35 |
| 25 May 1978 | 19:47 |
| 26 May 1978 | 19:40 |
| 30 May 1978 | 19:50 |
| 31 May 1978 | 18:01 |

TABLE III B

HAYERSTRAW QUARRY BLASTS

41°N 10.6' 73°W57.2'

| <u>Date</u> | <u>Time (UTC)</u> |
|-------------|-------------------|
| 01 May 1978 | 16:17 |
| 02 May 1978 | 16:14 |
| 04 May 1978 | 14:58 |
| 05 May 1978 | 15:25 |
| 05 May 1978 | 17:11 |
| 07 May 1978 | 13:30 |
| 08 May 1978 | 21:18 |
| 10 May 1978 | 16:56 |
| 11 May 1978 | 15:32 |
| 12 May 1978 | 17:16 |
| 15 May 1978 | 17:15 |
| 22 May 1978 | 16:22 |
| 26 May 1978 | 16:15 |
| 31 May 1978 | 13:49 |
| 31 May 1978 | 16:16 |

TABLE IIIC

PLAZA MATERIALS QUARRY BLASTS

41°N 07.0' 74°W08.8'

| <u>Date</u> | <u>Time (UTC)</u> |
|---------------|-------------------|
| 06 April 1978 | 14:29 |
| 10 April 1978 | 13:57 |
| 10 April 1978 | 19:53 |
| 12 April 1978 | 16:28 |
| 14 April 1978 | 14:14 |
| 17 April 1978 | 16:43 |
| 25 April 1978 | 16:58 |
| 27 April 1978 | 14:00 |
| 27 April 1978 | 21:00 |
| 01 May 1978 | 17:26 |
| 03 May 1978 | 14:43 |
| 04 May 1978 | 16:54 |
| 08 May 1978 | 20:07 |
| 10 May 1978 | 13:14 |
| 11 May 1978 | 19:58 |
| 17 May 1978 | 18:00 |
| 23 May 1978 | 16:11 |
| 25 May 1978 | 20:05 |
| 31 May 1978 | 12:27 |

TABLE IIID

WEST NYACK QUARRY BLASTS
41°N 06.3' 73°W57.5'

No confirmed blasts during this quarter

TABLE III E

HAZELTON, PENNSYLVANIA BLASTS

| <u>Date</u> | <u>Time (UTC)</u> |
|---------------|-------------------|
| 03 March 1978 | 18:54 |
| 08 March 1978 | 17:43 |
| 09 March 1978 | 18:29 |
| 21 March 1978 | 20:30 |
| 28 March 1978 | 18:03 |
| 31 March 1978 | 16:43 |
| 05 April 1978 | 18:32 |
| 06 April 1978 | 17:28 |
| 06 April 1978 | 19:11 |
| 06 April 1978 | 19:31 |
| 07 April 1978 | 17:25 |
| 08 April 1978 | 18:12 |
| 10 April 1978 | 20:01 |
| 12 April 1978 | 19:27 |
| 13 April 1978 | 19:00 |
| 14 April 1978 | 18:05 |
| 14 April 1978 | 18:46 |
| 17 April 1978 | 18:27 |
| 19 April 1978 | 20:31 |
| 19 April 1978 | 20:34 |
| 24 April 1978 | 17:38 |
| 28 April 1978 | 19:52 |
| 28 April 1978 | 21:18 |
| 03 May 1978 | 17:29 |
| 05 May 1978 | 18:08 |
| 06 May 1978 | 16:16 |
| 10 May 1978 | 18:19 |
| 13 May 1978 | 17:59 |
| 16 May 1978 | 17:52 |
| 22 May 1978 | 16:06 |
| 27 May 1978 | 15:23 |
| 27 May 1978 | 17:50 |
| 30 May 1978 | 17:50 |

TABLE III F
MT. HOPE QUARRY BLASTS

40°N56.3' 74°W32.3'

No confirmed blasts during this quarter

TABLE IIIG
ATLANTIC CEMENT QUARRY BLASTS
42°N 29.5' 73°W 50.0'

| <u>Date</u> | <u>Time (UTC)</u> |
|---------------|--------------------------|
| 21 March 1978 | 18:19 |
| 30 March 1978 | 18:42 (time discrepancy) |
| 31 March 1978 | 18:33 (time discrepancy) |
| 26 April 1978 | 18:45 |
| 28 April 1978 | 19:28 |
| 01 May 1978 | 18:27 |
| 10 May 1978 | 18:45 |
| 19 May 1978 | 17:00 |
| 25 May 1978 | 17:00 |

TABLE IVA

PROBABLE QUARRY OR OTHER MAN-MADE BLASTS
WITH DISTINCT PHASES

| <u>Date</u> | <u>Time (UTC)</u> | <u>S-P (seconds) at Nearest Station</u> | <u>Remarks</u> |
|---------------|-------------------|---------------------------------------------|--------------------|
| 01 March 1978 | 17:03 | 45 GSC | |
| 01 March 1978 | 17:47 | 21 CHR | |
| 01 March 1978 | 19:30 | 51 CHR | |
| 01 March 1978 | 19:34 | 26.5 OSB | |
| 02 March 1978 | 16:12 | 18 CHR | |
| 02 March 1978 | 18:25 | 20 GSC | |
| 02 March 1978 | 20:14 | 31 OSB | |
| 03 March 1978 | 15:25 | 24 OSB | |
| 03 March 1978 | 17:45 | 12 CHR | |
| 03 March 1978 | 18:38 | 22 GSC | |
| 06 March 1978 | 18:00 | 12 OSB | |
| 07 March 1978 | 20:15 | 17 CHR | |
| 08 March 1978 | 14:26 | 23 CHR | |
| 08 March 1978 | 18:54 | 21 CHR | |
| 08 March 1978 | 19:02 | 24 CHR | |
| 09 March 1978 | 16:59 | 10 OSB | |
| 10 March 1978 | 14:14 | 24 GSC | |
| 10 March 1978 | 15:27 | 21 CHR | |
| 10 March 1978 | 16:43 | 24 GSC | |
| 10 March 1978 | 17:17 | 13 OSB | |
| 10 March 1978 | 18:19 | 24 GSC | |
| 11 March 1978 | 16:27 | 40 OSB | |
| 13 March 1978 | 14:13 | 22 CHR | |
| 13 March 1978 | 20:51 | 21 IPS | |
| 14 March 1978 | 15:58 | 10 CHR | |
| 15 March 1978 | 15:46 | 22 CHR | |
| 15 March 1978 | 19:54 | 23 CHR | |
| 16 March 1978 | 17:58 | 12 CHR | |
| 16 March 1978 | 18:58 | 12 DBM | |
| 17 March 1978 | 21:04 | 10 OSB | |
| 18 March 1978 | 18:23 | 37 DBM | |
| 20 March 1978 | 12:26 | 13 CHR | |
| 20 March 1978 | 14:28 | 6 CHR | |
| 21 March 1978 | 15:12 | 7 CHR | |
| 21 March 1978 | 19:30 | 10 CHR | Possible Riverdale |
| 22 March 1978 | 19:25 | 18 DBM | |
| 23 March 1978 | 16:45 | 10 OSB | |
| 23 March 1978 | 21:13 | 24 OSB | |
| 24 March 1978 | 16:31 | 10 OSB | |
| 24 March 1978 | 20:19 | 4 CHR | |
| 25 March 1978 | 16:44 | 9 CHR | |
| 26 March 1978 | 14:31 | 24 DBM | |
| 27 March 1978 | 20:13 | 15 DBM | |
| 28 March 1978 | 09:17 | 27 DBM | |
| 28 March 1978 | 16:45 | 9 OSB | |
| 28 March 1978 | 18:14 | 13 DBM | |
| 28 March 1978 | 21:31 | 10 OSB | |

| | | |
|---------------|--------------------|----------|
| 29 March 1978 | 18:21 | 11 OSB |
| 30 March 1978 | 15:04 | 8 STL |
| 30 March 1978 | 17:05 | 22 STL |
| 30 March 1978 | 18:42 | 17 OSB |
| 30 March 1978 | 18:46 | 24 STL |
| 30 March 1978 | 18:48 | 12 STL |
| 30 March 1978 | 18:57 | 23 STL |
| 31 March 1978 | 17:09 | 19 STL |
| 31 March 1978 | 18:02 ⁴ | 12 STL |
| 03 April 1978 | 15:53 | 14 OSB |
| 03 April 1978 | 16:45 | 13 OSB |
| 03 April 1978 | 17:24 | 22 OSB |
| 03 April 1978 | 17:48 | 18 OSB |
| 03 April 1978 | 19:57 | 11 OSB |
| 03 April 1978 | 23:58 | 11 OSB |
| 05 April 1978 | 16:25 | 23 DBM |
| 05 April 1978 | 20:45 | 37 DBM |
| 06 April 1978 | 15:12 | 25 DBM |
| 06 April 1978 | 15:30 | 13 OSB |
| 06 April 1978 | 15:32 | 39 DBM |
| 06 April 1978 | 15:40 | 14 OSB |
| 06 April 1978 | 16:45 | 11 OSB |
| 06 April 1978 | 18:06 | 28 DBM |
| 06 April 1978 | 18:54 | 39 DBM |
| 06 April 1978 | 19:03 | 17.5 DBM |
| 06 April 1978 | 19:04 | 26 DBM |
| 07 April 1978 | 15:50 | 23 STL |
| 07 April 1978 | 18:37 | 24 STL |
| 09 April 1978 | 12:33 | 33 DBM |
| 10 April 1978 | 16:54 | 17 STL |
| 10 April 1978 | 17:25 | 23 STL |
| 10 April 1978 | 18:59 | 13 DBM |
| 11 April 1978 | 03:50 | 8 DBM |
| 11 April 1978 | 17:10 | 21.5 STL |
| 11 April 1978 | 18:22 | 39 WGL |
| 11 April 1978 | 19:03 | 24 WGL |
| 11 April 1978 | 21:06 | 30 DBM |
| 12 April 1978 | 15:14 | 20 WGL |
| 12 April 1978 | 16:26 | 11 WGL |
| 12 April 1978 | 16:46 | 12 WGL |
| 12 April 1978 | 16:56 | 12 WGL |
| 12 April 1978 | 17:18 | 10.5 WGL |
| 12 April 1978 | 18:45 | 24 STL |
| 12 April 1978 | 18:57 | 12 STL |
| 12 April 1978 | 20:47 | 1 DBM |
| 13 April 1978 | 14:18 | 19 WGL |
| 13 April 1978 | 15:45 | 19 DBM |
| 13 April 1978 | 15:49 | 12 WGL |
| 13 April 1978 | 17:40 | 19 DBM |
| 13 April 1978 | 17:55 | 23 STL |
| 13 April 1978 | 19:06 | 24 DBM |

| | | |
|---------------|-------|----------|
| 14 April 1978 | 19:15 | 21 STL |
| 14 April 1978 | 20:31 | 30 WGL |
| 15 April 1978 | 16:55 | 22 WGL |
| 17 April 1978 | 16:30 | 5 DBM |
| 17 April 1978 | 16:31 | 24 DBM |
| 17 April 1978 | 16:56 | 13 WGL |
| 17 April 1978 | 19:18 | 9 WGL |
| 18 April 1978 | 19:19 | 13 WGL |
| 19 April 1978 | 16:33 | 21 WGL |
| 19 April 1978 | 16:48 | 9 WGL |
| 19 April 1978 | 17:46 | 15 WGL |
| 19 April 1978 | 18:08 | 22 DBM |
| 20 April 1978 | 17:37 | 22 CHR |
| 20 April 1978 | 18:41 | 30 WGL |
| 20 April 1978 | 22:26 | 41 WGL |
| 21 April 1978 | 01:25 | 7 WGL |
| 21 April 1978 | 16:01 | 15 DBM |
| 21 April 1978 | 16:40 | 11 WGL |
| 21 April 1978 | 17:57 | 24 DBM |
| 21 April 1978 | 19:16 | 15.5 WGL |
| 21 April 1978 | 20:14 | 17 WGL |
| 22 April 1978 | 14:44 | 19 DBM |
| 22 April 1978 | 15:28 | 22 WGL |
| 22 April 1978 | 17:47 | 19 DBM |
| 22 April 1978 | 18:02 | 17 WGL |
| 24 April 1978 | 19:00 | 15 CHR |
| 24 April 1978 | 20:27 | 41 DBM |
| 25 April 1978 | 16:01 | 6 DBM |
| 25 April 1978 | 16:24 | 12 WGL |
| 25 April 1978 | 17:07 | 7 WGL |
| 25 April 1978 | 17:08 | 19 WGL |
| 25 April 1978 | 19:17 | 21 WGL |
| 25 April 1978 | 19:36 | 24 WGL |
| 26 April 1978 | 16:46 | 12 WGL |
| 26 April 1978 | 16:57 | 24 CHR |
| 26 April 1978 | 17:04 | 18 DBM |
| 26 April 1978 | 19:43 | 16 WGL |
| 26 April 1978 | 21:50 | 19 DBM |
| 27 April 1978 | 19:06 | 20 DBM |
| 27 April 1978 | 20:18 | 12 WGL |
| 28 April 1978 | 16:59 | 12 WGL |
| 28 April 1978 | 21:01 | 10 DBM |
| 30 April 1978 | 20:30 | 25 CHR |
| 01 May 1978 | 17:34 | 31 WGL |
| 01 May 1978 | 18:18 | 24 STL |
| 01 May 1978 | 18:46 | 18 DBM |
| 01 May 1978 | 19:56 | 22 STL |
| 01 May 1978 | 20:10 | 24 STL |

| | | |
|-------------|-------|----------|
| 02 May 1978 | 13:14 | 20 DBM |
| 02 May 1978 | 13:15 | 20 WGL |
| 02 May 1978 | 15:00 | 11 WGL |
| 02 May 1978 | 15:33 | 28 DBM |
| 02 May 1978 | 15:45 | 20 WGL |
| 02 May 1978 | 16:40 | 13 WGL |
| 02 May 1978 | 19:31 | 12 STL |
| 03 May 1978 | 13:16 | 26 DBM |
| 03 May 1978 | 14:15 | 22 WGL |
| 03 May 1978 | 15:32 | 13 DBM |
| 03 May 1978 | 15:45 | 28 DBM |
| 03 May 1978 | 15:59 | 8 WGL |
| 03 May 1978 | 17:05 | 20 WGL |
| 03 May 1978 | 20:01 | 26 WGL |
| 04 May 1978 | 14:20 | 17 DBM |
| 04 May 1978 | 14:29 | 26.5 STL |
| 04 May 1978 | 14:49 | 13 DBM |
| 04 May 1978 | 14:59 | 11 WGL |
| 04 May 1978 | 15:14 | 13 WGL |
| 04 May 1978 | 15:31 | 24 STL |
| 04 May 1978 | 15:49 | 21 DBM |
| 04 May 1978 | 17:18 | 38 STL |
| 04 May 1978 | 18:04 | 32 STL |
| 05 May 1978 | 02:37 | 8 DBM |
| 05 May 1978 | 13:35 | 10 WGL |
| 05 May 1978 | 19:07 | 32 STL |
| 05 May 1978 | 12:54 | 20 WGL |
| 06 May 1978 | 14:12 | 27 WGL |
| 06 May 1978 | 14:44 | 39 STL |
| 08 May 1978 | 13:53 | 22 DBM |
| 08 May 1978 | 14:48 | 26 STL |
| 08 May 1978 | 15:27 | 3 STL |
| 08 May 1978 | 16:06 | 24 STL |
| 08 May 1978 | 20:59 | 24 WGL |
| 08 May 1978 | 21:49 | 44 DBM |
| 10 May 1978 | 15:48 | 9 OSB |
| 10 May 1978 | 19:01 | 16 OSB |
| 10 May 1978 | 19:14 | 24 STL |
| 11 May 1978 | 13:14 | 2 STL |
| 11 May 1978 | 14:30 | 16 STL |
| 11 May 1978 | 14:44 | 14 OSB |
| 11 May 1978 | 17:10 | 12 OSB |
| 11 May 1978 | 17:20 | 21 OSB |
| 12 May 1978 | 15:48 | 9 OSB |
| 12 May 1978 | 16:00 | 8 OSB |
| 12 May 1978 | 16:46 | 24 STL |
| 12 May 1978 | 17:11 | 20 STL |
| 12 May 1978 | 17:20 | 18 DBM |
| 12 May 1978 | 18:48 | 12 STL |
| 15 May 1978 | 20:48 | 1 STL |
| 16 May 1978 | 17:00 | 12 OSB |
| 16 May 1978 | 17:31 | 23 STL |

Possible Plaza Materia

Possible Plaza Materia

Possible Haverstraw

| | | | |
|-------------|-------|--------|---------------------|
| 17 May 1978 | 13:18 | 24 DBM | |
| 17 May 1978 | 14:15 | 6 STL | |
| 18 May 1978 | 18:43 | 1 STL | Possible Haverstraw |
| 18 May 1978 | 18:49 | 23 STL | |
| 18 May 1978 | 18:56 | 22 OSB | |
| 19 May 1978 | 14:37 | 10 STL | |
| 19 May 1978 | 16:00 | 7 OSB | |
| 19 May 1978 | 16:05 | 10 OSB | |
| 19 May 1978 | 16:06 | 1 STL | Possible Haverstraw |
| 19 May 1978 | 16:30 | 12 OSB | |
| 19 May 1978 | 18:03 | 21 STL | |
| 19 May 1978 | 18:15 | 13 STL | |
| 19 May 1978 | 18:17 | 22 STL | |
| 19 May 1978 | 18:47 | 16 OSB | |
| 20 May 1978 | 16:29 | 18 STL | |
| 22 May 1978 | 15:03 | 18 STL | |
| 22 May 1978 | 16:42 | 13 OSB | |
| 22 May 1978 | 20:27 | 20 OSB | |
| 23 May 1978 | 15:58 | 11 DBM | |
| 23 May 1978 | 20:36 | 22 DBM | |
| 23 May 1978 | 15:58 | 11 DBM | |
| 23 May 1978 | 20:36 | 22 DBM | |
| 24 May 1978 | 14:14 | 20 OSB | |
| 24 May 1978 | 16:05 | 16 OSB | |
| 24 May 1978 | 16:11 | 1 STL | Possible Haverstraw |
| 24 May 1978 | 17:45 | 19 STL | |
| 25 May 1978 | 14:42 | 19 STL | |
| 25 May 1978 | 16:36 | 13 OSB | |
| 25 May 1978 | 17:58 | 24 STL | |
| 25 May 1978 | 18:42 | 18 DBM | |
| 26 May 1978 | 15:00 | 13 OSB | |
| 26 May 1978 | 16:45 | 10 OSB | |
| 26 May 1978 | 17:41 | 21 STL | |
| 26 May 1978 | 18:47 | 21 STL | |
| 30 May 1978 | 17:00 | 18 OSB | |
| 31 May 1978 | 15:45 | 27 STL | |
| 31 May 1978 | 18:11 | 27 STL | |

TABLE IVB

PROBABLE QUARRY OR OTHER MAN-MADE BLASTS
WITH INDISTINCT PHASES

| <u>Date</u> | <u>Time</u> | <u>Date</u> | <u>Time</u> |
|---------------|-------------|---------------|-------------|
| 01 March 1978 | 16:45 | 05 April 1978 | 16:29 |
| 04 March 1978 | 17:04 | 05 April 1978 | 18:43 |
| 04 March 1978 | 19:16 | 05 April 1978 | 20:32 |
| 06 March 1978 | 19:02 | 05 April 1978 | 05:07 |
| 07 March 1978 | 16:08 | 05 April 1978 | 05:10 |
| 07 March 1978 | 17:28 | 05 April 1978 | 07:26 |
| 07 March 1978 | 20:19 | 05 April 1978 | 07:28 |
| 09 March 1978 | 16:45 | 06 April 1978 | 15:04 |
| 09 March 1978 | 17:29 | 06 April 1978 | 18:01 |
| 10 March 1978 | 14:42 | 06 April 1978 | 19:33 |
| 10 March 1978 | 16:15 | 07 April 1978 | 13:36 |
| 10 March 1978 | 16:59 | 07 April 1978 | 13:38 |
| 10 March 1978 | 18:30 | 08 April 1978 | 02:32 |
| 10 March 1978 | 21:01 | 09 April 1978 | 03:23 |
| 10 March 1978 | 21:16 | 10 April 1978 | 16:43 |
| 13 March 1978 | 17:12 | 11 April 1978 | 14:00 |
| 14 March 1978 | 18:19 | 11 April 1978 | 14:29 |
| 14 March 1978 | 19:18 | 11 April 1978 | 17:15 |
| 14 March 1978 | 21:14 | 11 April 1978 | 19:47 |
| 15 March 1978 | 15:05 | 12 April 1978 | 17:00 |
| 15 March 1978 | 16:42 | 12 April 1978 | 17:25 |
| 15 March 1978 | 19:29 | 12 April 1978 | 18:14 |
| 17 March 1978 | 22:29 | 12 April 1978 | 18:29 |
| 20 March 1978 | 16:43 | 13 April 1978 | 13:11 |
| 22 March 1978 | 21:02 | 13 April 1978 | 14:59 |
| 23 March 1978 | 17:29 | 13 April 1978 | 15:02 |
| 23 March 1978 | 19:57 | 13 April 1978 | 16:29 |
| 28 March 1978 | 08:46 | 13 April 1978 | 16:30 |
| 28 March 1978 | 14:29 | 13 April 1978 | 17:01 |
| 29 March 1978 | 01:59 | 13 April 1978 | 17:02 |
| 29 March 1978 | 16:29 | 13 April 1978 | 17:22 |
| 29 March 1978 | 16:46 | 14 April 1978 | 13:55 |
| 30 March 1978 | 12:58 | 14 April 1978 | 14:10 |
| 30 March 1978 | 14:29 | 14 April 1978 | 14:19 |
| 30 March 1978 | 16:50 | 14 April 1978 | 15:32 |
| 30 March 1978 | 14:29 | 14 April 1978 | 16:50 |
| 31 March 1978 | 16:25 | 14 April 1978 | 16:56 |
| 31 March 1978 | 20:45 | 14 April 1978 | 17:03 |
| | | 14 April 1978 | 18:18 |
| 03 April 1978 | 15:19 | 14 April 1978 | 19:36 |
| 03 April 1978 | 17:12 | 15 April 1978 | 17:24 |
| 04 April 1978 | 16:32 | 17 April 1978 | 15:22 |
| 05 April 1978 | 11:24 | 17 April 1978 | 16:15 |
| 05 April 1978 | 13:29 | 17 April 1978 | 21:15 |
| 05 April 1978 | 14:43 | 18 April 1978 | 08:05 |
| 05 April 1978 | 15:29 | 18 April 1978 | 15:44 |

| <u>Date</u> | <u>Time</u> |
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| 18 April 1978 | 15:52 |
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| 18 April 1978 | 17:21 |
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| 21 April 1978 | 21:22 |
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| 24 April 1978 | 17:16 |
| 24 April 1978 | 17:21 |
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| 26 April 1978 | 14:30 |
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| 26 April 1978 | 16:31 |
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| 26 April 1978 | 19:25 |
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| 27 April 1978 | 15:29 |
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| 27 April 1978 | 16:58 |
| 27 April 1978 | 17:03 |
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| 27 April 1978 | 21:36 |
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| 28 April 1978 | 15:53 |

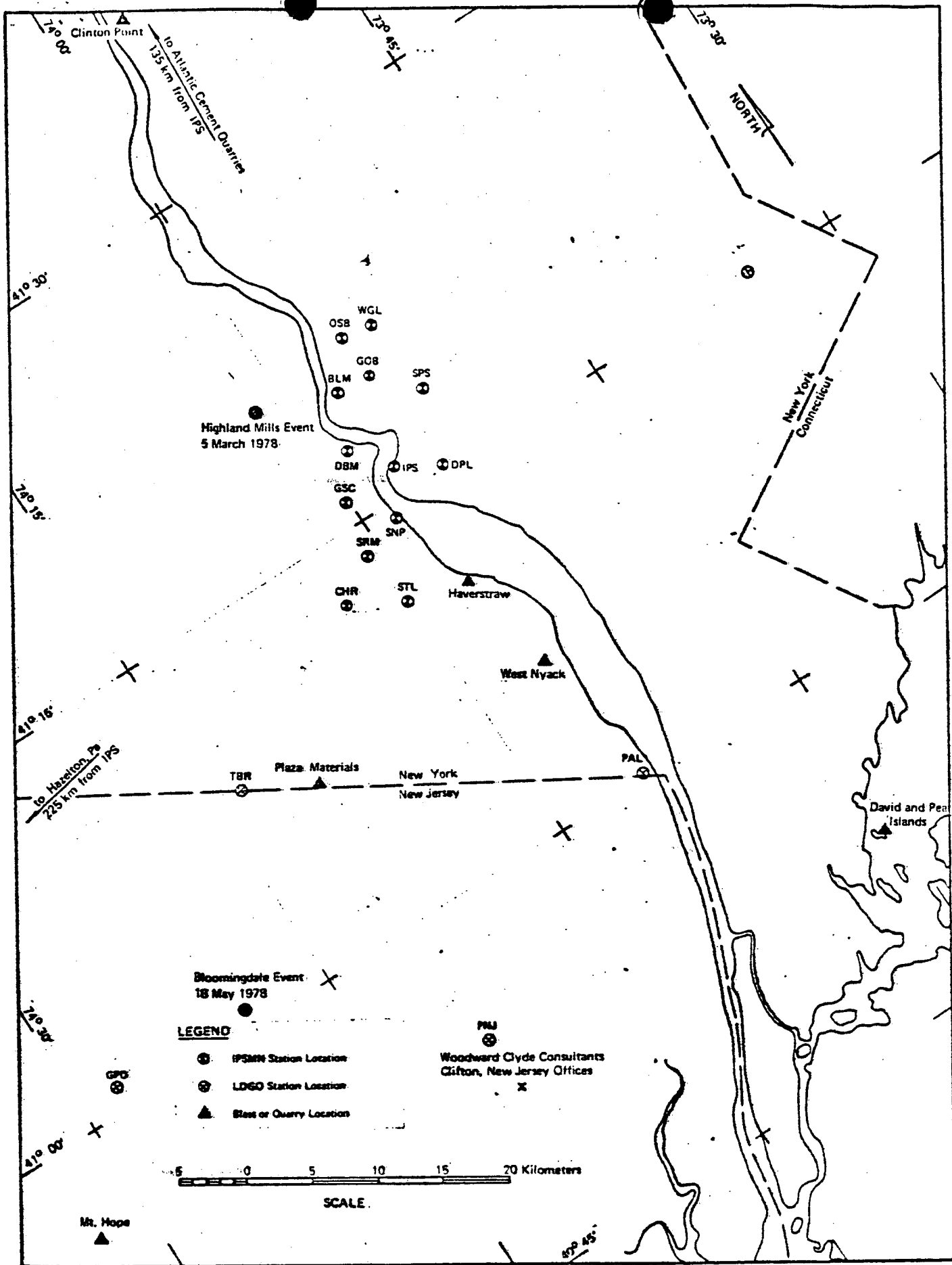
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| 28 April 1978 | 18:04 |
| 28 April 1978 | 18:42 |
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| 28 April 1978 | 19:59 |
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| 29 April 1978 | 18:13 |
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| 01 May 1978 | 14:20 |
| 01 May 1978 | 14:55 |
| 01 May 1978 | 14:58 |
| 01 May 1978 | 15:14 |
| 01 May 1978 | 15:29 |
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| 02 May 1978 | 20:03 |
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| 11 May 1978 | 20:23 |
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| <u>Date</u> | <u>Time</u> |
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| 25 May 1978 | 16:01 |
| 25 May 1978 | 16:01 |
| 25 May 1978 | 16:02 |
| 26 May 1978 | 16:19 |
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| 30 May 1978 | 13:26 |
| 30 May 1978 | 14:09 |
| 30 May 1978 | 16:05 |
| 30 May 1978 | 17:10 |
| 30 May 1978 | 19:42 |
| 21 May 1978 | 18:01 |

CONSOLIDATED EDISON NETWORK STATIONS

| | | |
|-----|------------|------------|
| IPS | 41°N16.07' | 73°W56.84 |
| CHR | 41°N12.49' | 74°W03.26' |
| SPS | 41°N18.12' | 73°W53.44' |
| STL | 41°N11.32' | 74°W00.22' |
| GSC | 41°N15.98' | 74°W00.24' |
| SRM | 41°N13.70' | 74°W00.82' |
| DBM | 41°N17.68' | 73°W58.50' |
| BLM | 41°N19.78' | 73°W57.31' |
| OSB | 41°N21.62' | 73°W55.44' |
| GOB | 41°N19.77' | 73°W55.31' |
| SNP | 41°N14.45' | 73°W58.28' |
| WGL | 41°N21.53' | 73°W53.96' |
| DPL | 41°N15.17' | 73°W54.65' |



INDIAN POINT SEISMIC MONITORING NETWORK

FIG. 1