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Woodward-Clyde Consultants, Inc.

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FILES

15 OCTOBER 1979

76C073

QUARTERLY REPORT
ON THE
SEISMIC MONITORING NETWORK
IN THE VICINITY OF
INDIAN POINT, NEW YORK
CONSOLIDATED EDISON PROJECT

WCC/11

JUNE 1979 through AUGUST 1979

50-3/247/286
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INTRODUCTION

During the quarter June 1979 through August 1979 one thousand four hundred and thirty seven (1437) seismic events were detected by routine analysis of data recorded by the Indian Point Seismic Monitoring Network (IPSMN). This represents a 23 percent increase in the number of events from that of the preceding quarter. The increase is the result of a rise in blasting operations at local quarries (Tables IIA through IIH) and a rise in construction activity (Tables IIIA and IIIB) typical of the summer quarter. No naturally occurring seismic events were detected within the IPSMN perimeter during this quarter.

Other distant events, both regional and teleseismic were recorded by the IPSMN and are presented in Tables IA and IB. These events are too distant to be located with data recorded by the IPSMN. For these events, epicenter locations were obtained from the National Earthquake Information Service (NEIS).

DATA ANALYSIS

There were no changes in basic analysis procedure during this quarter. The computer program used for epicentral determinations (a modified version of HYPOELLIPSE) utilizes seismic data recorded at stations operated by the IPSMN, the Lamont - Doherty Geological Observatory (LDGO) and Weston Observatory.

STATUS OF THE NETWORK

Network stations operated satisfactorily during this quarter; coordinates of network stations are listed in Table IV. Coordinates of other stations from which data is routinely utilized for locations of regional events are listed in Table V. IPSMN station locations are shown on Figure 1.

Occasional recording difficulties were encountered which resulted from telephone line failure. The central recording facilities in the Woodward-Clyde Consultants Clifton office were offline for the following periods:

<u>Date</u>	<u>Time (UTC)</u>
11 July 1979	15:54 to 17:34
11 July 1979	05:06 to 12:19
13 July 1979	03:57 to 06:16

A detailed review of the LDGO data for these periods indicates that no seismic events occurred.

TABLE 1A
NATURALLY OCCURRING SEISMIC EVENTS
Within the Network

None

Local Events

(Within Two Degrees of the Network)

None

Regional Events

(Within Six Degrees of the Network)

<u>Date</u>	<u>Time (UTC)</u>	<u>Location</u>	<u>Magnitude</u>
28 July 1979	23:29	Maine 43°N 15.96', 70°W 22.44'	3.5*

(Within Ten Degrees of the Network)

<u>Date</u>	<u>Time (UTC)</u>	<u>Location</u>	<u>Magnitude</u>
08 July 1979	01:29	Gaspe, Canada 46°N 54', 75°W 34.8'	4**
09 July 1979	08:16	Gaspe, Canada 46°N 33', 74°W 37.8'	4.2**
19 August 1979	22:51	Gaspe, Canada 47°N 38.4', 69°W 57.6'	5.1**

* Location and magnitude obtained from NEIS

** Location and magnitude obtained from LDGO

TABLE IB

TELESEISMS

<u>Date</u>	<u>Time (UTC)</u>	<u>Location *</u>
01 June 1979	17:13	Guatemala
03 "	04:18	Puerto Rico Region
04 "	06:32	Near the coast of Chiapas, Mexico
04 "	07:59	Virgin Islands
08 "	20:58	Nicobar Islands Region
09 "	06:39	North Atlantic Ridge
10 "	06:45	Southern Pacific Ocean
10 "	06:58	Central Mid-Atlantic Ridge
10 "	17:08	Northwest of Kuril Islands
11 "	04:18	New Madrid Missouri Region
11 "	14:06	Southern Nevada (Nuclear Blast)
11 "	19:33	New Britain Region
13 "	11:12	East Papua, New Guinea Region
14 "	11:56	Aegean Sea
15 "	09:02	Near the coast of Peru
17 "	15:16	Southwest of Sumatera
17 "	19:43	Chile - Bolivia Border Region
19 "	20:27	Near the coast of Central Chile
20 "	22:06	West of Macquarie Island
21 "	14:18	Sea of Japan
22 "	06:36	Chiapas, Mexico
22 "	20:32	(unknown origin)
23 "	03:09	Eastern Kazakh USSR (Nuclear Blast)
25 "	05:47	East Papua New Guinea Region
25 "	12:37	Southwest of Sumatera
27 "	09:03	Northwest Territories, Canada
27 "	09:56	South of Panama
27 "	21:57	San Juan Province, Argentina
28 "	04:24	Central Mid-Atlantic Ridge
01 July 1979	20:44	Panama - Costa Rica Border Region
02 "	06:22	Panama - Costa Rica Border Region
04 "	06:20	Kuril Islands

* Locations obtained from NEIS

TABLE IB
(continued)

<u>Date</u>	<u>Time (UTC)</u>	<u>Location</u>
04 July 1979	20:37	Panama - Costa Rica Border Region
06 "	02:12	Near the coast of Central Chile
06 "	21:24	South Pacific Cordillera
07 "	03:58	Easter Kazakh USSR (Nuclear Blast)
07 "	09:38	Guatemala
11 "	14:25	Northwest Territories, Canada
15 "	06:00	Southern Alaska
17 "	20:52	Central Alaska
20 "	21:46	South of Kermadec Islands
20 "	23:02	Fiji Islands
21 "	02:00	Kamchatka
21 "	03:59	Oaxaca, Mexico
21 "	12:18	Near the coast of Chiapas, Mexico
24 "	19:51	South of Java
24 "	22:12	South of Panama
25 "	18:09	Tuamotu Archipelago Region
28 "	15:35	Sakhalin Island
28 "	20:13	Off the coast of Mexico
29 "	05:45	Southwest of Sumatera
29 "	10:03	Andreanof Islands
01 August 1979	10:58	Off the coast of Northern California
02 "	22:30	South of Sumbawa Island
04 "	04:09	Eastern Kazakh USSR (Nuclear Blast)
05 "	01:12	South of the Fiji Islands
06 "	17:12	Central California
07 "	05:01	Java
08 "	09:01	Mariana Islands
18 "	03:04	Eastern Kazakh USSR (Nuclear Blast)
18 "	15:02	(unknown origin)
19 "	23:59	South of the Kermadec Islands
20 "	04:03	Hindu Kush Region
20 "	04:20	(unknown origin)
22 "	18:40	Kamchatka
24 "	04:33	Costa Rica
25 "	08:51	North Atlantic Ridge

TABLE IIA

CLINTON POINT QUARRY BLASTS

41°N 37.5' 73°W 57.0'

<u>Date</u>	<u>Time (UTC)</u>
18 June 1979	18:37
19 "	19:09
21 "	19:27
22 "	19:38
25 "	19:39
26 "	16:00
26 "	19:27
27 "	19:32
29 "	17:27
02 July 1979	17:32
03 "	19:30
05 "	19:40
06 "	19:31
09 "	19:41
11 "	19:33
12 "	19:36
13 "	19:33
16 "	16:06
17 "	19:30
19 "	19:31
20 "	19:28
23 "	18:26
24 "	17:53
25 "	17:09
27 "	16:07
27 "	19:37
30 "	16:06
31 "	16:01
01 August 1979	17:16
03 "	19:30
06 "	16:09
06 "	19:33
07 "	19:23
08 "	16:03
09 "	19:30
10 "	18:15
13 "	19:32
14 "	19:30
15 "	19:32

TABLE IIA

(continued)

<u>Date</u>	<u>Time (UTC)</u>
17 August 1979	19:26
20 "	19:30
21 "	19:32
22 "	19:31
23 "	19:31
24 "	19:30
27 "	18:06
28 "	16:05
29 "	15:57
30 "	17:21
31 "	19:30

TABLE IIB

HAVERSTRAW QUARRY BLASTS

41°N 10.6' 73°W 57.2'

<u>Date</u>	<u>Time (UTC)</u>
01 June 1979	16:16
05 "	16:16
06 "	16:16
07 "	16:15
11 "	16:15
13 "	16:15
18 "	16:19
19 "	16:15
20 "	16:06
21 "	16:16
25 "	16:18
26 "	16:19
27 "	16:18
29 "	16:15
02 July 1979	16:15
03 "	16:15
06 "	16:15
09 "	16:16
12 "	16:15
13 "	16:15
17 "	16:15
18 "	16:15
19 "	16:15
23 "	16:18
24 "	16:14
25 "	16:15
26 "	16:15
27 "	16:15
31 "	16:13
01 August 1979	16:14
02 "	16:14
03 "	16:17
06 "	16:15
07 "	16:14
08 "	16:14
13 "	16:14
14 "	16:14
16 "	16:15

TABLE IIB

(continued)

<u>Date</u>	<u>Time (UTC)</u>
20 August 1979	16:14
21 "	16:16
22 "	16:15
23 "	16:30
24 "	16:14
27 "	16:14
28 "	16:14
30 "	16:14

TABLE IIC

PLAZA MATERIALS QUARRY BLASTS

41°N 07.0' 74°W 08.8'

<u>Date</u>	<u>Time (UTC)</u>
01 June 1979	14:43
06 "	19:41
07 "	14:29
12 "	20:25
13 "	20:37
14 "	14:28
15 "	19:47
18 "	14:25
18 "	18:24
20 "	15:59
21 "	19:00
22 "	19:49
25 "	15:43
26 "	14:01
27 "	18:28
29 "	13:45
29 "	21:42
03 July 1979	19:54
06 "	13:29
06 "	15:17
06 "	19:50
09 "	16:31
11 "	19:51
13 "	21:16
24 "	19:54
26 "	17:28
27 "	14:59
30 "	13:24
30 "	15:59
31 "	15:58
02 August 1979	19:55
06 "	15:15
08 "	14:01
08 "	19:54
10 "	14:30
13 "	15:00
14 "	13:29

TABLE IIC
(continued)

<u>Date</u>	<u>Time (UTC)</u>
15 August 1979	14:00
16 "	13:57
17 "	12:59
17 "	19:27
21 "	14:30
21 "	17:28
29 "	16:29
29 "	19:57
30 "	15:00

TABLE IID

WEST NYACK QUARRY BLASTS

41°N 06.3' 73°W 57.4'

<u>Date</u>	<u>Time (UTC)</u>
01 June 1979	16:20
05 "	16:15
06 "	16:14
07 "	16:17
08 "	16:15
13 "	16:15
15 "	16:15
18 "	16:15
21 "	16:16
25 "	16:20
26 "	16:15
27 "	16:15
28 "	16:20
29 "	16:16
 05 July 1979	 16:15
06 "	16:16
09 "	16:19
10 "	16:13
12 "	16:15
17 "	16:15
18 "	16:15
25 "	16:17
26 "	16:16
31 "	16:22
 03 August 1979	 16:15
06 "	16:16
07 "	16:20
08 "	16:17
13 "	16:18
15 "	16:22
20 "	16:18
21 "	16:20
23 "	16:19
28 "	16:18

TABLE IIE

HAZELTON, PENNSYLVANIA BLASTS

<u>Date</u>	<u>Time (UTC)</u>
01 June 1979	19:14
05 "	13:40
05 "	14:32
05 "	15:31
07 "	16:13
08 "	15:34
12 "	18:19
15 "	13:47
18 "	16:56
18 "	17:44
19 "	14:45
19 "	18:14
20 "	17:07
21 "	14:09
22 "	17:20
25 "	18:15
27 "	14:41
27 "	15:54
27 "	16:04
28 "	16:19
28 "	18:13
29 "	16:47
 02 July 1979	 14:17
02 "	14:51
03 "	14:49
05 "	14:44
06 "	17:12
06 "	18:35
09 "	15:42
11 "	21:09
13 "	18:41
17 "	15:06
17 "	20:11
18 "	18:04
23 "	16:53
24 "	19:48
27 "	16:42
28 "	16:47
30 "	18:18

TABLE IIE
(continued)

<u>Date</u>	<u>Time (UTC)</u>
01 August 1979	13:48
01 "	14:35
02 "	18:09
03 "	18:24
07 "	14:51
08 "	19:24
15 "	14:13
15 "	17:09
17 "	13:41
20 "	17:49
21 "	17:46
21 "	17:46
23 "	14:57
23 "	15:40
24 "	16:48
25 "	14:15
29 "	13:20
31 "	16:03

TABLE IIG

ATLANTIC CEMENT QUARRY BLAST

42°N 29.5' 73°W 50.0'

<u>Date</u>	<u>Time (UTC)</u>
08 June 1979	17:01
19 "	17:41
26 "	18:33
05 July 1979	18:32
12 "	15:57
17 "	18:09
19 "	18:00
02 August 1979	15:07
03 "	17:31
07 "	17:00
24 "	18:01
28 "	15:47

TABLE IIF

MT. HOPE QUARRY BLASTS

40°N 56.3' 74°W 32.3'

No Blasting Activity During This Quarter

TABLE IIH

TOMKINS COVE QUARRY BLASTS

TOMKINS COVE, NEW YORK

<u>Date</u>	<u>Time (UTC)</u>
19 June 1979	16:17
22 "	16:44
29 "	16:35
10 July 1979	16:15
13 "	16:09
26 "	16:30
30 "	16:35
24 August 1979	16:14
30 "	16:08

TABLE IIIA

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>
01 June 1979	14:30	13 WGL
01 "	15:04	6 WGL
01 "	15:55	11 WGL
01 "	19:21	17.5 WGL
01 "	20:53	14 WGL
01 "	22:04	14 WGL
04 "	15:17	6 OSB
04 "	15:20	12 OSB
04 "	15:35	13 OSB
04 "	16:12	17 OSB
04 "	16:16	21 CHR
04 "	16:24	19 DPL
04 "	17:56	18 DPL
04 "	19:02	13 DPL
04 "	20:57	19 OSB
04 "	22:01	21 OSB
04 "	23:34	21 OSB
05 "	14:07	8 CHR
05 "	14:45	15 WGL
05 "	15:09	17 WGL
05 "	16:14	20 CHR
05 "	17:24	23 CHR
05 "	17:29	16 WGL
05 "	17:56	11 WGL
05 "	18:18	22 WGL
05 "	19:06	4 WGL
06 "	13:53	5 CHR
06 "	14:36	18.5 DPL
06 "	14:40	23 WGL
06 "	14:50	13 WGL
06 "	14:58	10 WGL
06 "	15:54	7 WGL
06 "	16:40	26 WGL
06 "	21:30	20 WGL
06 "	21:43	21 WGL
07 "	15:50	12 WGL
07 "	16:43	10 CHR
07 "	17:02	13 CHR
07 "	18:06	22 WGL
07 "	20:11	20 WGL
07 "	21:29	20 WGL

TABLE IIIA

(continued)

<u>Date</u>	<u>Time (UTC)</u>	<u>S-P(Seconds) at Nearest Station</u>
08 June 1979	15:48	19 CHR
08 "	16:08	19 WGL
08 "	16:18	20 DPL
08 "	17:58	22 CHR
08 "	18:18	20 CHR
08 "	18:32	6 WGL
08 "	20:05	4 WGL
08 "	21:26	20 WGL
11 "	12:52	5 CHR
11 "	14:30	11 WGL
11 "	14:53	2 CHR
11 "	15:39	13 WGL
11 "	17:23	27 CHR
11 "	18:16	23 WGL
12 "	15:18	7 CHR
12 "	15:45	8 WGL
12 "	17:13	10 WGL
12 "	19:22	17 WGL
12 "	20:07	7 WGL
12 "	20:48	23 WGL
12 "	20:51	16 WGL
12 "	21:05	22 DPL
12 "	21:29	19 WGL
12 "	22:15	23 WGL
13 "	14:52	11.5 WGL
13 "	15:49	12 WGL
13 "	15:50	17 WGL
13 "	15:54	19 WGL
13 "	16:17	15 CHR
13 "	19:24	7 WGL
13 "	19:33	4 WGL
13 "	21:40	19 WGL
14 "	15:55	14 WGL
14 "	16:12	6 WGL
14 "	16:35	9 WGL
14 "	16:45	13 WGL
14 "	17:13	22 CHR
14 "	17:45	19 WGL
14 "	18:32	13 CHR
14 "	19:09	3 CHR
14 "	20:09	3 CHR
14 "	20:49	19 CHR
14 "	21:27	19.5 WGL
14 "	21:39	19 CHR
15 "	14:08	4.5 CHR
15 "	14:23	6 CHR
15 "	15:29	3 CHR
15 "	15:55	11 WGL

TABLE IIIA

(continued)

<u>Date</u>	<u>Time (UTC)</u>	<u>S-P(Seconds) at Nearest Station</u>
15 June 1979	17:01	14 CHR
15 "	18:14	19 CHR
15 "	18:58	27 CHR
15 "	19:52	4 WGL
15 "	20:23	17 WGL
15 "	21:28	18 WGL
18 "	13:02	18 WGL
18 "	15:00	18 CHR
18 "	15:11	24 GSC
18 "	16:13	7 WGL
18 "	16:28	13 CHR
19 "	14:33	16 CHR
19 "	15:09	15 CHR
19 "	15:20	12 CHR
19 "	15:54	13 CHR
19 "	20:13	7 WGL
19 "	20:14	19 WGL
19 "	20:50	21 CHR
19 "	21:33	19 WGL
19 "	21:46	21 WGL
20 "	12:49	10 WGL
20 "	14:10	5 SRM
20 "	15:56	11 WGL
20 "	15:58	20 WGL
20 "	16:12	19 SRM
20 "	17:02	25 WGL
20 "	17:30	15 WGL
20 "	17:50	15 WGL
20 "	20:45	17 WGL
20 "	21:36	19.5 WGL
20 "	22:43	4.5 WGL
21 "	14:04	9 WGL
21 "	14:14	22 WGL
21 "	15:00	10 WGL
21 "	15:14	17.5 WGL
21 "	17:47	18 SRM
21 "	18:15	29 SRM
21 "	20:25	22 WGL
21 "	21:23	20 WGL
21 "	21:33	19 WGL
21 "	21:59	4 WGL
21 "	23:39	21 WGL
22 "	14:14	20 SRM
22 "	14:16	7 WGL
22 "	14:19	12 WGL
22 "	14:40	23 SRM
22 "	16:42	13 SRM
22 "	17:07	21 SRM
22 "	19:47	20 SRM

TABLE IIIA

(continued)

<u>Date</u>	<u>Time (UTC)</u>	<u>S-P(Seconds) at Nearest Station</u>
25 June 1979	13:05	26 CHR
25 "	14:48	25 WGL
25 "	16:10	14 WGL
25 "	16:15	4 WGL
25 "	16:27	15 WGL
25 "	17:47	23 STL
25 "	21:32	21 WGL
25 "	21:47	20 WGL
25 "	22:40	4 WGL
26 "	12:35	14 WGL
26 "	13:45	4 STL
26 "	14:09	15 WGL
26 "	16:06	24.5 WGL
26 "	20:47	22 WGL
26 "	20:51	4 WGL
27 "	13:39	19 WGL
27 "	14:00	9 WGL
27 "	14:06	26 WGL
27 "	14:58	24 WGL
27 "	17:11	15 WGL
27 "	18:00	44 STL
27 "	19:18	1 SRM
27 "	19:24	6 WGL
27 "	20:20	12 WGL
27 "	21:21	7 WGL
27 "	21:24	18 WGL
27 "	23:13	4 WGL
28 "	14:37	12 WGL
28 "	15:45	16.5 SRM
28 "	15:52	25 WGL
28 "	16:33	26 WGL
28 "	17:49	18 WGL
29 "	16:04	20 SRM
29 "	16:06	17 SRM
29 "	17:16	25 SRM
29 "	17:39	4 SRM
29 "	18:15	20 GOB
29 "	18:26	21 SRM
29 "	19:13	26 SRM
29 "	19:26	17.5 SRM
30 "	12:46	23 GOB
30 "	13:46	9 STL
02 July 1979	13:16	19 GOB
02 "	14:13	14 GOB
02 "	18:20	22 GOB

TABLE IIIA

(continued)

<u>Date</u>	<u>Time (UTC)</u>	<u>S-P(Seconds) at Nearest Station</u>
03 July 1979	13:34	19 SRM
03 "	14:11	11 SRM
03 "	14:40	15 STL
03 "	15:00	11 GOB
03 "	15:56	15 GOB
03 "	16:16	23 STL
03 "	19:13	21 GOB
03 "	19:48	6 GOB
03 "	20:53	3 GOB
03 "	21:25	25 GOB
05 "	12:59	3 STL
05 "	14:15	12 GOB
05 "	19:12	12 STL
06 "	15:19	19 GOB
06 "	16:02	20 GOB
06 "	16:11	12 GOB
06 "	19:49	2 STL
06 "	21:21	19 GOB
07 "	14:50	23 STL
07 "	18:51	6 GOB
07 "	19:59	10 GOB
09 "	15:11	13.5 STL
09 "	19:09	4 STL
10 "	14:34	23 GOB
10 "	15:00	11 GOB
10 "	15:51	22 GOB
10 "	15:53	21 GOB
10 "	17:15	14 GOB
11 "	14:59	22 STL
11 "	15:02	6 GOB
11 "	15:46	23 STL
11 "	18:59	31 GOB
12 "	15:45	14 GOB
12 "	16:09	15 STL
12 "	16:10	21 GOB
12 "	18:45	15 GOB
12 "	19:04	1 GOB
12 "	21:01	23 GOB
12 "	21:45	6 GOB
13 "	00:13	18 GOB
13 "	14:47	5 STL
13 "	16:17	19 SRM
13 "	20:30	35 SRM
17 "	15:02	12 OSB
17 "	15:10	12 STL
17 "	16:33	19 OSB

TABLE IIIA

(continued)

<u>Date</u>	<u>Time (UTC)</u>	<u>S-P(Seconds) at Nearest Station</u>
18 July 1979	17:45	2 OSB
18 "	18:40	8 STL
19 "	14:01	7 STL
19 "	17:30	13 STL
19 "	20:53	19 OSB
19 "	23:38	1.5 OSB
20 "	14:19	24 STL
20 "	15:30	24 OSB
20 "	16:10	19 OSB
20 "	16:19	20 OSB
20 "	17:11	7 STL
20 "	17:13	21 OSB
20 "	17:24	8 STL
20 "	17:45	25 SRM
20 "	20:50	1.5 OSB
23 "	13:59	10 STL
23 "	15:41	21 OSB
23 "	16:00	20 OSB
23 "	17:19	25 OSB
24 "	14:48	14 DBM
24 "	16:05	13 DBM
24 "	19:37	7 SNP
25 "	13:55	19 DBM
25 "	14:15	16 SRM
25 "	18:06	20 SRM
25 "	18:17	11 SRM
25 "	18:31	44 SRM
26 "	14:02	19 WGL
26 "	15:20	4 WGL
26 "	16:12	23 SRM
26 "	16:14	15 CHR
26 "	16:18	33 SRM
26 "	17:18	1 SNP
26 "	18:13	18 WGL
26 "	19:34	7 WGL
26 "	21:30	22 SRM
27 "	14:03	24 WGL
27 "	14:17	24 SRM
27 "	15:12	19 WGL
27 "	16:11	6 SRM
27 "	17:00	24 WGL
27 "	19:34	24 SNP
27 "	19:35	18 WGL
27 "	21:33	22 WGL
28 "	11:46	23 SRM
28 "	13:23	24 SRM

TABLE IIIA
(continued)

<u>Date</u>	<u>Time (UTC)</u>	<u>S-P(Seconds) at Nearest Station</u>
30 July 1979	12:59	2.5 SRM
30 "	15:31	21 WGL
30 "	15:53	25 SRM
30 "	16:01	17 SRM
30 "	20:54	7 WGL
31 "	10:39	5 WGL
31 "	12:58	8 SRM
31 "	14:14	17 SRM
31 "	15:30	13 SRM
31 "	15:36	21 WGL
31 "	16:00	6 DPL
31 "	16:15	20 WGL
31 "	19:32	38 WGL
01 August 1979	12:30	4 SRM
01 "	13:36	19 WGL
01 "	14:00	11 WGL
01 "	14:04	13 WGL
01 "	14:54	26 SRM
01 "	15:20	11 WGL
01 "	17:27	18 SRM
01 "	18:56	21 SRM
01 "	19:08	22 WGL
01 "	20:39	7 WGL
02 "	14:28	14 WGL
02 "	15:17	26 SRM
02 "	16:13	23 SRM
02 "	16:34	18 SRM
02 "	16:58	17 WGL
03 "	16:05	5 WGL
03 "	16:07	1.5 WGL
03 "	17:00	21 SRM
03 "	18:27	3.5 WGL
03 "	22:35	23 WGL
04 "	10:42	5 WGL
06 "	12:56	22 WGL
06 "	14:04	16 SRM
06 "	14:19	19 WGL
06 "	15:53	15 WGL
06 "	16:41	20 SRM
06 "	18:06	16 SRM
07 "	12:58	4 CHR
07 "	14:30	2 CHR
07 "	15:42	7 SRM
07 "	23:06	23 BLM

TABLE IIIA

(continued)

<u>Date</u>	<u>Time (UTC)</u>	<u>S-P(Seconds) at Nearest Station</u>
08 August 1979	14:15	17 SRM
08 "	16:19	23 SRM
08 "	17:36	10 CHR
09 "	15:55	16 BLM
09 "	17:30	20 SRM
09 "	17:53	8 BLM
10 "	14:49	26 GOB
10 "	14:52	11 GOB
10 "	17:30	12 CHR
10 "	18:19	20 SRM
11 "	17:45	19 CHR
13 "	14:24	23 GOB
13 "	16:00	12 CHR
13 "	16:08	26 GOB
13 "	16:25	22 SRM
13 "	16:31	21 SRM
13 "	16:39	12 GOB
13 "	16:45	11 GOB
13 "	16:57	19 SRM
13 "	19:26	18 SRM
13 "	23:34	22 GOB
14 "	15:50	20 SRM
14 "	16:12	6 GOB
14 "	17:29	13 GOB
14 "	19:36	30 SRM
15 "	12:13	3 GOB
15 "	13:41	21 CHR
15 "	14:20	12 GOB
15 "	14:59	7.5 SRM
15 "	16:23	21 GOB
15 "	23:38	23 OSB
16 "	15:11	12 GOB
16 "	17:43	11 SRM
16 "	18:58	29 CHR
16 "	19:51	26 GOB
17 "	13:00	29 GOB
17 "	14:15	4 CHR
20 "	18:21	21 GOB
20 "	18:40	16 GOB
21 "	13:25	6 SRM
21 "	15:15	11 DBM
21 "	16:08	7 GOB
21 "	16:16	11.5 GOB
21 "	18:07	19 SRM
21 "	18:20	17 GOB
22 "	14:29	21 CHR
22 "	14:31	12 GOB
22 "	18:07	12 CHR

TABLE IIIA

(continued)

<u>Date</u>	<u>Time (UTC)</u>	<u>S-P(Seconds) at Nearest Station</u>
22 August 1979	18:17	18 SRM
22 "	18:48	20 GOB
23 "	13:06	26 SRM
23 "	13:59	6.5 SRM
23 "	16:25	11.5 GOB
23 "	17:05	20.5 GOB
23 "	17:35	1 DBM
23 "	18:10	23 GOB
23 "	18:17	21 DBM
24 "	13:01	1.5 STL
24 "	14:10	11 SRM
24 "	15:01	6.5 GOB
24 "	17:06	4 STL
24 "	18:14	23 GOB
24 "	19:14	22 GOB
25 "	12:13	2 STL
27 "	14:19	23 SRM
27 "	14:40	12 GOB
27 "	15:47	21 SRM
27 "	16:07	7 GOB
27 "	18:48	12 STL
27 "	19:49	21 SRM
28 "	13:00	1.5 STL
28 "	13:42	24 GOB
28 "	14:13	7 SRM
28 "	14:43	25 SRM
28 "	15:45	15 SRM
28 "	15:58	18 SRM
28 "	16:19	23 GOB
28 "	20:28	1.5 STL
29 "	13:30	4 STL
29 "	14:00	18 SRM
29 "	15:14	19 SRM
29 "	16:03	19.5 SRM
29 "	16:09	16 SRM
29 "	16:32	12 GOB
29 "	16:45	15 SRM
29 "	17:26	23 GOB
29 "	19:00	29 STL
30 "	13:15	36 SRM
30 "	13:22	4.5 SRM
30 "	14:22	25 SRM
30 "	14:44	26 GOB
30 "	15:36	14 SRM
30 "	15:55	15 GOB
30 "	16:02	20.5 GOB

TABLE IIIA

(continued)

<u>Date</u>	<u>Time (UTC)</u>	<u>S-P(Seconds) at Nearest Station</u>
30 August 1979	16:15	4 STL
30 "	18:09	11 GOB
30 "	18:17	1 GOB
30 "	20:50	26 STL
31 "	15:49	4 STL
31 "	17:11	15 OSB

TABLE IIIB

PROBABLE QUARRY OR OTHER MAN-MADE
BLASTS WITH INDISTINCT PHASES

<u>Date</u>	<u>Time (UTC)</u>
01 June 1979	14:02
01 "	14:51
01 "	15:56
01 "	16:09
01 "	16:17
01 "	17:24
01 "	17:42
01 "	18:51
01 "	19:00
01 "	20:06
01 "	20:49
02 "	14:29
02 "	15:45
02 "	17:21
02 "	18:14
02 "	18:30
03 "	09:29
04 "	15:15
04 "	15:19
04 "	15:34
04 "	16:20
04 "	16:30
04 "	16:50
04 "	17:39
04 "	19:33
04 "	21:30
04 "	23:08
05 "	14:38
05 "	14:46
05 "	14:48
05 "	15:00
05 "	15:06
05 "	15:22
05 "	15:38
05 "	15:47
05 "	15:56
05 "	16:00
05 "	18:08
05 "	18:26
05 "	18:28
05 "	18:35
05 "	19:31
05 "	19:35

TABLE IIIB
(continued)

<u>Date</u>	<u>Time (UTC)</u>
05 June 1979	19:48
05 "	19:58
05 "	20:00
05 "	20:01
05 "	20:15
06 "	13:59
06 "	14:19
06 "	14:57
06 "	16:08
06 "	16:15
06 "	16:36
06 "	17:16
06 "	17:20
06 "	20:33
07 "	16:14
07 "	19:15
07 "	19:34
07 "	22:14
07 "	23:57
08 "	00:43
08 "	13:52
08 "	14:16
08 "	14:52
08 "	15:15
08 "	16:00
08 "	16:09
08 "	16:11
08 "	17:33
08 "	17:49
08 "	20:35
08 "	21:24
08 "	11:57
09 "	12:59
09 "	16:19
09 "	14:15
11 "	14:19
11 "	14:43
11 "	14:52
11 "	15:41
11 "	16:00
11 "	17:08
11 "	19:02
11 "	19:34
11 "	20:04
11 "	20:09
11 "	20:12
12 "	14:15

TABLE IIIB
(continued)

<u>Date</u>	<u>Time (UTC)</u>
12 June 1979	14:28
12 "	16:14
12 "	16:16
12 "	16:17
12 "	16:20
12 "	16:29
12 "	16:32
12 "	17:09
12 "	17:15
12 "	17:25
12 "	18:59
12 "	19:14
12 "	19:40
12 "	20:21
13 "	14:00
13 "	14:16
13 "	15:46
13 "	15:51
13 "	15:58
13 "	17:01
13 "	18:46
13 "	19:25
13 "	19:32
13 "	19:50
13 "	20:15
14 "	13:36
14 "	14:30
14 "	15:15
14 "	15:29
14 "	16:01
14 "	16:15
14 "	16:43
14 "	18:01
14 "	18:16
14 "	18:26
14 "	18:36
14 "	18:57
14 "	19:48
14 "	20:07
14 "	20:31
14 "	20:39
14 "	20:52
14 "	20:57
14 "	21:08
15 "	14:26
15 "	14:59
15 "	15:13
15 "	15:22

TABLE IIIB

(continued)

<u>Date</u>	<u>Time (UTC)</u>
15 June 1979	20:08
18 "	14:29
18 "	14:35
18 "	16:07
18 "	16:55
18 "	17:51
18 "	18:10
18 "	18:52
18 "	18:56
18 "	19:15
18 "	19:16
18 "	19:45
19 "	13:30
19 "	14:21
19 "	14:58
19 "	15:00
19 "	15:00
19 "	15:16
19 "	17:18
19 "	17:50
19 "	18:51
19 "	19:49
20 "	14:15
20 "	15:02
20 "	16:07
20 "	16:25
20 "	17:37
20 "	18:09
20 "	18:20
20 "	19:20
20 "	20:27
20 "	21:33
21 "	13:01
21 "	15:38
21 "	15:49
21 "	17:52
21 "	19:25
21 "	19:32
21 "	19:35
21 "	19:51
21 "	20:11
21 "	20:14
21 "	20:35
21 "	20:36
21 "	21:16
22 "	12:59
22 "	17:05
22 "	17:57

TABLE IIIB

(continued)

<u>Date</u>	<u>Time (UTC)</u>
22 June 1979	19:44
22 "	20:43
22 "	21:25
23 "	15:21
23 "	16:07
23 "	17:32
25 "	13:59
25 "	14:04
25 "	14:54
25 "	15:43
25 "	16:34
25 "	17:34
25 "	17:39
25 "	17:42
25 "	20:07
25 "	20:18
25 "	21:03
26 "	13:59
26 "	15:00
26 "	15:16
26 "	15:26
26 "	16:00
26 "	16:12
26 "	17:44
26 "	18:30
26 "	18:53
26 "	19:02
26 "	19:16
26 "	19:26
26 "	19:44
26 "	19:52
26 "	20:22
26 "	23:46
27 "	12:15
27 "	13:28
27 "	14:10
27 "	14:30
27 "	14:51
27 "	16:09
27 "	17:06
27 "	19:27
27 "	20:50
27 "	20:57
27 "	14:44
28 "	14:46
28 "	15:01
28 "	15:25
28 "	16:15
28 "	16:27

TABLE IIIB
(continued)

<u>Date</u>	<u>Time (UTC)</u>
28 June 1979	17:00
28 "	18:03
28 "	21:28
29 "	13:17
29 "	13:43
29 "	13:49
29 "	14:12
29 "	14:29
29 "	15:50
29 "	16:15
29 "	18:19
29 "	19:03
29 "	19:16
29 "	19:33
29 "	20:02
29 "	20:46
30 "	12:39
30 "	13:06
02 July 1979	14:29
02 "	15:26
02 "	15:57
02 "	16:02
02 "	16:19
02 "	17:16
02 "	18:24
02 "	18:30
02 "	20:13
02 "	20:17
02 "	20:34
02 "	20:37
03 "	14:04
03 "	15:02
03 "	15:47
03 "	20:07
03 "	21:04
03 "	21:05
03 "	21:33
05 "	12:20
05 "	14:14
05 "	15:40
05 "	16:10
05 "	16:19
05 "	16:25
05 "	18:45
05 "	19:02

TABLE IIIB
(continued)

<u>Date</u>	<u>Time (UTC)</u>
05 July 1979	19:11
05 "	19:40
05 "	20:17
05 "	20:22
06 "	12:34
06 "	13:26
06 "	14:16
06 "	15:16
06 "	15:44
06 "	17:58
09 "	14:08
09 "	14:20
09 "	14:32
09 "	14:34
09 "	16:04
09 "	16:05
09 "	16:08
09 "	16:09
09 "	16:58
09 "	17:35
09 "	19:11
09 "	19:49
09 "	19:52
09 "	20:19
09 "	20:32
09 "	21:05
10 "	14:20
10 "	14:44
10 "	15:06
10 "	15:23
10 "	15:54
10 "	16:00
10 "	16:07
10 "	16:08
10 "	17:21
10 "	17:58
10 "	18:54
10 "	21:06
10 "	21:44
11 "	13:17
11 "	14:25
11 "	14:44
11 "	14:45
11 "	17:43
11 "	18:01
11 "	21:38
12 "	12:43

TABLE III B

(continued)

<u>Date</u>	<u>Time (UTC)</u>
11 July 1979	18:01
11 "	21:38
12 "	12:43
12 "	15:07
12 "	15:17
12 "	16:05
12 "	16:13
12 "	16:19
12 "	17:14
12 "	19:36
12 "	20:54
12 "	20:59
12 "	23:34
13 "	13:50
13 "	13:53
13 "	13:56
13 "	14:02
13 "	14:06
13 "	15:59
13 "	16:12
13 "	17:24
13 "	17:28
13 "	17:30
13 "	17:31
13 "	18:00
13 "	19:31
13 "	21:15
13 "	21:29
14 "	17:49
14 "	18:38
16 "	14:05
16 "	14:12
16 "	16:20
16 "	16:58
16 "	17:30
16 "	19:31
16 "	19:50
16 "	22:28
17 "	13:59
17 "	14:59
17 "	17:03
17 "	18:43
17 "	21:03
17 "	21:36
18 "	12:59
18 "	13:16
18 "	13:25
18 "	13:56

TABLE IIIB

(continued)

<u>Date</u>	<u>Time (UTC)</u>
18 July 1979	14:29
18 "	14:36
18 "	15:19
18 "	16:42
18 "	20:35
18 "	21:32
19 "	13:58
19 "	16:14
19 "	16:17
19 "	16:18
19 "	17:47
20 "	13:12
20 "	14:33
20 "	15:34
20 "	15:59
20 "	16:20
20 "	17:13
20 "	21:16
20 "	21:32
20 "	21:33
21 "	12:21
21 "	18:50
23 "	12:33
23 "	14:09
23 "	16:19
23 "	17:57
23 "	20:06
23 "	21:34
24 "	13:11
24 "	13:33
24 "	13:57
24 "	14:29
24 "	17:59
24 "	20:18
24 "	20:27
24 "	20:37
24 "	20:45
25 "	15:29
25 "	15:40
25 "	15:44
25 "	16:17
25 "	16:20
25 "	16:23
25 "	17:02
25 "	19:19
25 "	21:50
26 "	13:56

TABLE IIIB

(continued)

<u>Date</u>	<u>Time (UTC)</u>
26 July 1979	14:32
26 "	14:36
26 "	14:45
26 "	15:32
26 "	16:11
26 "	17:55
26 "	18:05
26 "	18:09
26 "	19:44
26 "	21:12
26 "	10:21
27 "	12:26
27 "	14:02
27 "	16:06
27 "	16:15
27 "	18:24
27 "	20:20
27 "	21:31
27 "	16:17
28 "	16:22
28 "	20:59
29 "	13:30
30 "	13:43
30 "	13:55
30 "	14:11
30 "	15:02
30 "	15:45
30 "	15:51
30 "	15:54
30 "	15:57
30 "	16:45
30 "	17:55
30 "	18:25
30 "	18:30
30 "	21:28
30 "	12:53
31 "	13:02
31 "	13:43
31 "	14:17
31 "	14:45
31 "	15:33
31 "	15:33
31 "	16:44
31 "	17:49
31 "	18:17
31 "	19:56
31 "	20:00
31 "	20:08
31 "	20:16

TABLE IIIB
(continued)

<u>Date</u>	<u>Time (UTC)</u>
31 July 1979	21:28
01 August 1979	10:36
01 "	13:39
01 "	14:29
01 "	16:15
01 "	16:53
01 "	17:30
01 "	19:07
01 "	20:47
01 "	21:30
02 "	10:13
02 "	14:16
02 "	15:39
02 "	15:58
02 "	16:14
02 "	16:43
02 "	17:01
02 "	18:38
03 "	14:00
03 "	14:46
03 "	14:47
03 "	14:57
03 "	14:59
03 "	15:40
03 "	16:05
03 "	18:00
03 "	18:03
03 "	21:03
06 "	13:59
06 "	14:11
06 "	14:45
06 "	15:00
06 "	15:16
06 "	15:57
06 "	15:59
06 "	16:22
06 "	17:16
07 "	14:40
07 "	14:50
07 "	16:03
07 "	16:04
07 "	16:04
07 "	16:05
07 "	16:18
07 "	17:05

TABLE IIIB
(continued)

<u>Date</u>	<u>Time (UTC)</u>
07 August 1979	17:07
07 "	20:06
07 "	20:41
08 "	13:57
08 "	14:10
08 "	14:17
08 "	15:34
08 "	16:07
08 "	16:18
08 "	17:15
08 "	17:38
08 "	18:42
08 "	19:09
08 "	20:49
08 "	21:31
09 "	13:13
09 "	13:14
09 "	13:36
09 "	14:15
09 "	14:50
09 "	15:14
09 "	15:39
09 "	16:15
09 "	16:21
09 "	18:01
09 "	18:41
10 "	13:43
10 "	14:30
10 "	17:29
13 "	16:05
13 "	16:26
13 "	17:00
13 "	18:29
13 "	18:50
13 "	19:34
14 "	10:17
14 "	14:01
14 "	14:03
14 "	15:07
14 "	16:01
14 "	19:34
14 "	19:55
15 "	14:22
15 "	14:56
15 "	16:55
15 "	20:53
16 "	13:41

TABLE IIIIB
(continued)

<u>Date</u>	<u>Time (UTC)</u>
16 August 1979	14:16
16 "	14:30
16 "	16:05
16 "	16:21
16 "	16:35
16 "	18:00
16 "	18:18
16 "	20:18
16 "	20:37
16 "	21:43
17 "	15:05
17 "	15:16
17 "	15:33
17 "	16:53
17 "	19:55
20 "	14:54
20 "	15:18
20 "	15:31
20 "	16:04
20 "	16:49
20 "	17:32
20 "	17:36
20 "	19:04
21 "	20:42
21 "	22:03
22 "	14:13
22 "	14:30
22 "	14:46
22 "	16:17
22 "	17:15
22 "	18:46
22 "	19:19
22 "	19:44
22 "	20:37
22 "	20:44
23 "	13:40
23 "	14:05
23 "	15:19
23 "	16:04
23 "	16:06
23 "	16:17
23 "	16:33
23 "	17:19
23 "	17:28
23 "	17:44
23 "	18:31
23 "	18:49

TABLE IIIB
(continued)

<u>Date</u>	<u>Time (UTC)</u>
23 August 1979	18:56
23 "	19:24
24 "	13:40
24 "	16:17
24 "	17:45
24 "	19:46
27 "	14:30
27 "	16:14
27 "	16:40
28 "	16:09
28 "	16:30
28 "	16:31
28 "	17:54
28 "	18:14
28 "	19:44
29 "	13:25
29 "	14:19
29 "	14:31
29 "	14:39
29 "	15:18
29 "	15:30
29 "	16:10
29 "	16:14
29 "	16:18
29 "	16:21
29 "	16:40
29 "	17:19
29 "	17:29
29 "	20:07
30 "	02:56
30 "	12:27
30 "	15:37
30 "	16:06
30 "	18:19
30 "	18:37
30 "	19:27
30 "	19:55
30 "	20:06
31 "	14:13
31 "	15:02
31 "	15:50

TABLE IV

INDIAN POINT SEISMIC MONITORING NETWORK
STATION COORDINATES

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'

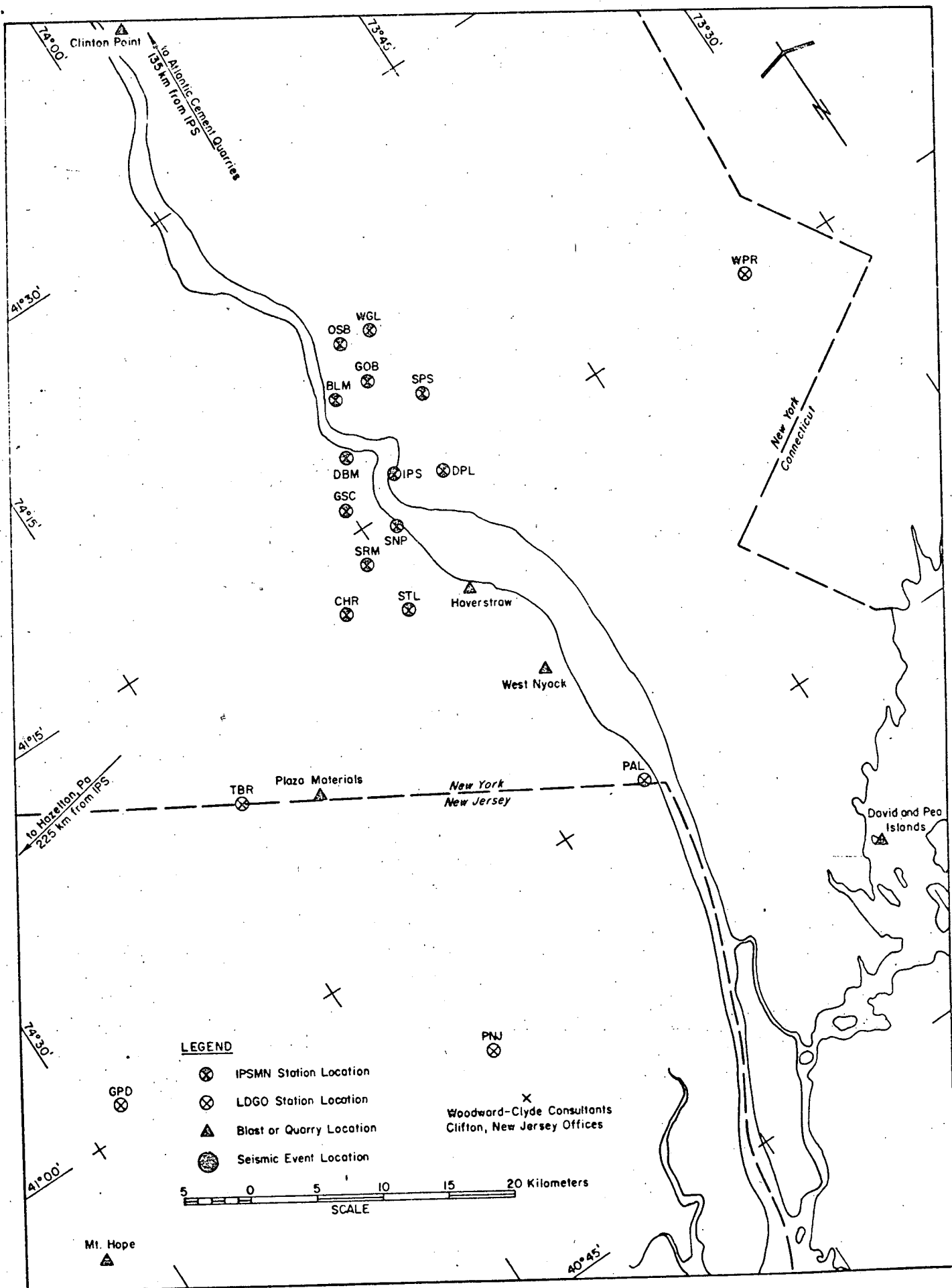
TABLE V

SEISMIC STATIONS UTILIZED FOR EPICENTRAL DETERMINATIONS

BCT	41°N29.60'	73°W23.03'
ECT	41°N50.08'	73°W24.68'
HDM	41°N29.15'	72°W31.39'
UCT	41°N49.90'	72°W15.03'
TBR	41°N08.50'	74°W13.33'
LVNJ	40°N48.51'	74°W45.61'
GPD	41°N01.06'	74°W27.65'
PAL	41°N00.25'	73°W54.55'
WND	42°N20.25'	74°W09.15'
PQN	41°N00.44'	75°W05.15'
PRIN	40°N22.01'	74°W43.07'
WPR	41°N15.28'	73°W35.14'
MARL	42°N50.30'	72°W48.05'
CLIN	41°N52.05'	73°W50.94'
GMTN	40°N52.95'	74°W11.07'
WPNY	41°N48.18'	73°W58.24'
ALX	44°N19.35'	75°W55.68'
ALF	42°N13.52'	77°W47.83'
BGR	44°N49.63'	74°W22.73'
COV	44°N34.66'	73°W08.75'
CROG	43°N54.30'	75°W24.75'
DANY	44°N45.50'	73°W50.14'
FLET	44°N43.36'	72°W57.10'
HNY	42°N49.91'	75°W30.89'
AMNH	40°N46.85'	73°W58.43'
MDV	43°N59.95'	73°W10.87'
MGVT	44°N54.81'	72°W37.66'
MPVT	44°N20.35'	72°W34.95'

TABLE V
(Continued)

OGD	41°N05.25'	74°W35.75'
LDO	41°N00.25'	73°W54.55'
PNY	44°N50.05'	73°W33.30'
PTN	44°N34.35'	74°W58.97'
SANY	43°N08.97'	78°W52.86'
TABN	39°N51.85'	74°W39.77'
WVLY	42°N28.25'	78°W34.10'
WNY	44°N23.46'	73°W51.57'
APH	43°N50.48'	74°W29.82'
CTR	43°N52.45'	74°W27.60'
CLY	43°N51.08'	74°W26.94'
EGN	43°N51.57'	74°W28.91'
OCN	43°N53.09'	74°W31.76'
UWL	43°N50.27'	74°W32.60'
DNY	42°N50.18'	78°W10.13'
RAMA	41°N05.71'	74°W12.84'
LNK	42°N20.33'	73°W16.34'
BNH	44°N35.44'	71°W15.36'
HKM	44°N39.38'	69°W38.45'



INDIAN POINT SEISMIC MONITORING NETWORK