APPENDIX 2J

SAMPLE DESCRIPTIONS FOR BORINGS MADE IN NOVEMBER-DECEMBER 1972

(REFERENCE FSAR FIGURE 2.5-46)

The information contained in this appendix was not revised, but has been extracted from the original FSAR and is provided for historical information.

SAMPLE DESCRIPTIONS
FOR
BORINGS MADE NOVEMBER-DECEMBER, 1972

SEABROOK STATION

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE

Submitted

to

YANKEE ATOMIC ELECTRIC

Project 7286

GEOTECHNICAL ENGINEERS, INC.
934 Main Street
Winchester, Massachusetts 01890

January 1973

NOTATION

w	water content of split-spoon sample received in the laboratory
PL	plastic limit
q_u(rec)	equivalent unconfined compressive strength based on penetrometer resistance measured in the laboratory on the split-spoon sample

NOTES

1. There are no borings corresponding to the following numbers: D1-2, D2-2, D2-6.
2. Logs of the rock cores are shown on separate sheets.
3. All samples taken with 2-inch split-spoon sampler.

BORING NO. DI-1

SOIL DESCRIPTIONS

Ground Elevation: 9.8 ft

Depth to Water Level: 8.8 ft

Project No. 7286

Sample No.	Depth ft	Number of Blows per 6"	Description
1	o- 0.5	1	Dark brown leaves and root material.
1A	0.5- 2	2-2-3	Gray-brown slightly organic silty uniform fine to medium sand.
2	5- 6.5	40-17-39	Brown and red-brown silty gravelly sand. Widely graded; contains some fine-sandy silt pockets; grave up to ~ 25 mm in size.
3	10-11	16-20	Brown silty gravelly sand. Widely graded; angular to subrounded grains; contains ~ 20-30% gravel up to 28 mm in size and ~ 10-20% nonplastic fines; few gray lenses ~ 5 mm thick and several rusty-brown spots.
4	15-16.5	10-12-20	Light gray slightly silty and gravelly sand. Fine to coarse grained with a few gravel pieces up to 35 mm in size; angular to subrounded grains; ~ 5-10% silt.

BORING NO. D1-3
SOIL DESCRIPTIONS

Ground Elevation: 14.0 ft
Depth to Water Level: 2.0 ft

Project No. 7286

Sample No.	Depth ft	Number of Blows per 6"	Description
1	0- 0.5	1	Dark brown fine-sandy organic silt. Nonplastic; contains some roots up to 0.5 mm diameter.
1A	0.5-1.5	3-4	Light brown sand. Fine to medium grained; uniform contains few black organic pieces < 0.5 mm in size; < 5% nonplastic fines.
2	5- 6.5	8-15-2:	Brown to rusty-brown sandy silty gravel. Widely graded; angular to subangular grains; contains ~ 30-40% nonplastic fines and ~ 20-30% sand; grave pieces up to 25 mm in size. w = 11.2%
3	10-11	43-150	Gray silty gravelly sand. Widely graded; angular grains; contains ~ 30-40% gravel up to 30 mm in size and ~ 20-30% slightly cohesvie fines.

BORING NO. Dl-4
SOIL DESCRIPTIONS

Ground Elevation: 11.4 ft
Depth to Water Level: 2.0 ft bove ground surface Project No. '7286

Sample No.	Depth ft	Number of Blows per 6"	Description
1	0- 0.5	1	Dark brown decomposed leaves.
1A	0.5-l.	3-3'	Light brown slightly gravelly silty sand. Widely graded; subangular grains; slightly plastic fines; gravel pieces up to ~ 20 mm in size.
2	5- 6.5	13-8-1!	Yellow-brown silty clay. Stiff; orange streaks throughout sample; occasional pockets of orange fine sand; some discoloration on freshly broken surface. w = 19.9%
3	8- 9.5	12-25-5!	Brown slightly clayey gravelly fine sand. Subangular grains; red-brown fine sand at top of sample; contain gravel up to ~ 30 mm in size.
4	13-13.9	64-87/5'	Gray gravelly silty sand. Widely graded; contains subangular gravel pieces up to ~ 25 mm in size; slightly plastic fines.
5	5.4-15.	25/1"-25/0"	No recovery.

BORING NO. D1-5
SOIL DESCRIPTIONS

Ground Elevation: 16.6 ft
Depth to Water Level: 2.8 ft

Project No. 7286

Sample No.	Depth ft	Number of Blows per 6"	Description
1	0-1.5	1-1-2	Top is dark brown leaves and decomposed root materials. Bottom is brown silty sand. Sand is mostly fine-grained with a trace of medium and coarse grains.
2	1.5-3	1-2-10	Light brown slightly silty fine sand. Contains few medium sand grains and gravel pieces up to ~ 20 mm in size.
3	5-6.5	31-33-46	Brown slightly gravelly silty sand. Widely graded; subangular to subrounded grains; contains a pocket of weathered quartz; orange-brown staining on freshly broken gravel surfaces.
4	10-11.5	23-52-122	Brown gravelly silty sand. Widely graded; gravel is subangular to subrounded; iron oxide staining on freshly broken surfaces of gravel; gravel pieces range in size up to ~ 20 mm.
5	14-15.3	20-29-100/4"	Top is orange-brown silty fine to medium sand with a trace of coarse sand. Bottom is gray stratified sand: clayey silt and Clay. Layers are < 2 mm thick; contains some coarse sand and a few gravel pieces up to ~ 25 mm in size. w = 23.6%

BORING NO. D1-6
SOIL DESCRIPTIONS

Ground Elevation: 19.2 ft
Depth to Water Level: 3 ft

Project No. 7286

Sample No.	Depth ft	Number of Blows per 6"	Description
1	0- 1	1-1	Brown organic silty fine sand with small roots and leaves.
1A	1- 1.5	4	Light brown silty fine sand. Uniform; contains a few gravel pieces up to ~ 15 mm in size.
2	5- 6.1	24-124-46/1"	Light brown and red-brown gravelly silty sand. Widely graded; some iron staining on weathered gravel pieces up to ~ 20 mm in size.
3	0-11.5	1-56-11	Red-brown silty fine to coarse Hand. Generally angular grains; has appearance of weathered rock.

BORING NO. D1-7
SOIL DESCRIPTIONS

Ground Elevation: 14.3 ft
Depth to Water Level: 1.2 ft

Project No. 7286

Sample No.	Depth ft	Number of Blows per 6"	Description
1	o- 1.5	1-2-3	Brown sandy organic silt. Contains leaves and roots up to 8 mm diameter; some lighter brown silty sand pockets.
2	1.5- 3	2-3-4	Mottled brown, gray, and rusty-brown clayey silt. Very stiff; low plasticity and *toughness;* w slightly above PL; contains brown and rnsty-brown silty fine sand layers up to 40 mm thick; a few roots up to 2 mm diameter. q_u(rec) = 2.5 tsf w = 19.0%
3	5- 6.5	20-26-29	Most of sample is gray angular rock fragments up to 35 mm in size. One layer ~ 30 mm thick is brown tc rusty-brown gravelly silty sand. Widely graded; angular grains; contains ~ 20-30% slightly cohesive fines and gravel up to 10 mm in size.
4	10-11	55-90	Brown and rusty-brown silty sandy gravel. Widely graded; angular grains; contains ~ 30-40% fine to coarse sand and ~ 10-20% nonplastic fines; gravel pieces up to 35 mm in size.
5	13-14.5	15-30-55	Gray sandy silty gravel, Widely graded; angular grains; contains ~ 20-25% slightly cohesvie fines and ~ 10% fine to coarse sand; gravel pieces up to 30 mm in size.

BORING NO. D1-8
SOIL DESCRIPTIONS

Ground Elevation: 15.9 ft
Depth to Water Level: 1.9 ft

Project No. 7286

Sample No.	Depth ft	Number of Blows per 6"	Description
1	o- 1.5	1-1-12	Top is dark brown fine-sandy organic silt containing *several* roots < 1 mm diameter; Bottom is brown and rusty-brown sandy silt containing many dark brown organic pieces < 0.5 mm in size.
2	5- 6.5	31-40-72	Brown slightly gravelly silty sand. Widely graded; angular to subrounded grains; contains ~ 30-40% nonplastic fines and ~ 10-15% gravel up to 35 mm in size; fast reaction to shaking test.
3	8.5- 9	127	Gray-brown silty gravelly sand. Widely graded; angular grains; contains ~ 30-40% gravel up to 25 mm in size and ~ 20-30% nonplastic fines.

BORING NO, D1-9
SOIL DESCRIPTIONS

Ground Elevation: 20.8 ft
Depth to Water Ia I: 2.2 ft

Project No. 7286

Sample No.	Depth ft	Number of Blows per 6"	Description
1	o- 1.5	2-2-2	Light brown silty fine sand.

BORING NO. D1-10
SOIL DESCRIPTIONS

Ground Elevation: 19.2 ft
Depth to Water Level: 5.5 ft

Project No. 7286

Sample No.	Depth ft	Number of Blows per 6"	Description
1	0- 1.5	2-2-3	Brown slightly organic sandy silt. Nonplastic; contains ~40-50% fine to medium sand and several root up to 1 mm diameter, many decomposed vegetation pieces < 1 mm in size; fast reaction to shaking test.
2	1.5- 3	3-4-5	Brown gravelly silty sand. Widely graded; grains ax angular to subangular; contains ~ 20-30% nonplastic fines and ~10-20% gravel up to 30 mm in size; fast reaction to shaking test.
3	7.5- 8	120	Similar to Sample No. 2, but more silty; some gray pockets or layers ~ 30 mm thick; contains several gray angular rock fragments at bottom.

BORING NO, Dl-11
SOIL DESCRIPTIONS

Ground Elevation: 13.8 ft
Depth to Water Level: 1.2 ft

Project No. 7286

Sample No.	Depth ft	Number of Blows per 6"	Description
1	o-2	1-1-4-7	Top is dark brown peat with many roots up to 1 mm diameter. Bottom is brown sand. Fine grained; uniform; contains few black organic pieces < 1 mm in size; < 5% silt.
2	5- 6.5	7-10-12	Light gray silty sand. Fine grained; uniform; very fast reaction to shaking test; contains ~ 30-40% nonplastic fines; part of sample is silty gravelly sand containing gravel up to 28 mm in size; angular grains
3	10-11.5	27-30-44	Gray silty sand. Widely graded; angular to subrounded grains ; contains ~ 25-30% nonplastic fines; few gravel pieces up to 8 mm in size. w = 7.5%

BORING NO. D1-12
SOIL DESCRIPTIONS

Ground Elevation: 23.9 ft
Depth to Water Level: 3.5 ft

Project No. 7268

Sample No.	Depth ft	Number of Blows per 6"	Description
1	0- 1.5	1-1-3	Brown and dark brown slightly organic silty gravelly sand. Fine to medium grained; contains many pockets of dark brown organic sandy silt, and several roots up to 6 mm diameter; fines are nonplastic; contains several gravel pieces 10-27 mm in size.
2	5- 6.5	17-32-57	Brown gravelly silty sand.. Widely graded; angular to subangular grains; contains ~ 30-35% nonplastic fine; and ~ 20-30% gravel up to 30 mm in size; very fast reaction to shaking test.

BORING NO. D2-1
SOIL DESCRIPTIONS

Ground Elevation: 21.2 ft
Depth to Water Level: 0.3 ft

Project No. 7286

Sample No.	Depth ft	Number of Blows per 6"	Description
1	o- 1.5	2-2-5	Brown slightly organic silty sand. 'Fine to medium grained; uniform; contains ~ 20-30% nonplastic fines and roots up to 1 mm diameter; some black organic pieces < 0.5 mm in size.
2	5- 6	17-120	Mottled gray, brown, and rusty-brown gravelly silty sand. Widely graded; subangular to subrounded grains; contains ~ 25-35% nonplastic fines and ~ 15-25% gravel up to 20 mm in size. w = 10.5%

BORING NO. D2-3
SOIL DESCRIPTIONS

Ground Elevation: 19.4 ft
Depth to Water Level: 2.0 ft

Project No. 7286

Sample No.	Depth ft	Number of Blows per 6"	Dcecription
1	o- 0.5	1	Brown organic silty fine sand. Contains some leaves at top and few small roots.
IA	0.5- 2	3-4-4	Light brown silty fine to medium sand. Contains a few gravel piece6 up to ~ 20 mm in size; fines are nonplastic.
2	5.5-7.5	13-30-29-23	Light brown slightly gravelly very silty sand; sand is fine to coarse; few coarse gravel pieces are gray; contains some iron staining at bottom.
3	10-11.5	21-28-26	Stratified light brown and red-brown and gray silty sand. Contains a few gravel pieces up to ~ 20 mm in size.
4	15-16.5	38-32-31	Gray slightly gravelly very silty sand. Widely graded; few gravel pieces up to ~ 35 mm in size.
5	20-21.5	14-22-31	Similar to Sample No. 4, but fines are very slightly plastic.
6	25-25.2	35/3"	Similar to Sample No. 4, but fines are slightly plasti

BORING NO. D2-4
SOIL DESCRIPTIONS

Ground Elevation: 16.7 ft
Depth to Water Level: 0.0

Project No. 7286

Sample No.	Depth ft	Number of Blows per 6"	Description
1	o- 1.5	1-1-3	Top is dark brown decomposed roots and leaves. Bottom is red-brown slightly silty fine sand containing numerous mica flakes.
2	1.5- 3	3-6-11	Light brown slightly silty gravelly fine sand. Gravel pieces are subangular and range in size up to ~ 20 m contains numerous mica flakes.
3	5- 6.5	24-35-3:	Brown slightly gravelly silty fine sand. Contains some medium and coarse sand and few fine gravel pieces; one 25 mm size piece of subrounded quartz at top; occasional pockets of red-brown fine sand.
4	10-10.6	25-100/1	Gray slightly clayey gravelly sand. Widely graded; gravel pieces are subangular to subrounded. w = 9.1%
5	13-14.5	18-22-2	Similar to Sample No. 4; 50 mm size piece of gravel at bottom.
6	15-16.5	20-16-2	Gray moderately clayey gravelly sand. Widely graded; gravel fragments are subangular and range in size up to ~ 25 mm.
7	20-21.5	9-27-2	Similar to Sample No. 6.

BORING NO. D2-5
SOIL DESCRIPTIONS

Ground Elevation: 16.5 ft
Depth to Water Level: 5.8 ft

Project No. 7268

Sample No.	Depth ft	Number of Blows per 6"	Description
1	0 - 1.5	2-2-4	Rusty-brown silty sand. Fine grained; uniform; contains ~ 10-20% nonplastic fines; trace of black organic specks < 0.5 mm in size; some black organic sandy silt and roots at top.
2	5- 6.5	7-7-5	Brown sandy clayey silt. Very stiff; low plasticity; slow reaction to shaking test; friable @ PL; w slightly above PL; contains ~ 10-15% fine to coarse subangular sand; several rusty-brown weathered gravel pieces up to 8 mm in size. q_u(rec) = 3.5 tsf w = 17.4%

BORING NO. D2-7
SOIL DESCRIPTIONS

Ground Elevation: 16.7 ft
Depth to Water Level: 1.5 ft

Project No. 7268

Sample No.	Depth ft	Number of Blows per 6"	Description
1	o- 1.5	1/12"-2	Brown leaves and root material; changes to gray-brown organic silty fine sand with layers of brown organic silt.
2	1.5- 2	3	Brown organic silty fine sand.
2A	2- 3	13-12	Light brown silty fine sand; changing to gravelly silt: fine to coarse sand at bottom.
3	5- 6.5	13-16-21	Light brown and red-brown very silty fine sand. Contains a trace of coarse sand and a few gravel pieces up to ~ 35 mm in size; some iron staining.
4	10-11.5	40-81-200	Gray gravelly silty sand. Contains angular gravel fragments up to ~ 30 mm in size; bottom of sample is rock fragments.
5	15-16.5	18-52-47	Mottled gray and brown gravelly sandy clay. Contains some' coarse sand and gravel fragments up to ~ 35 mm in size. w = 29.6%
6	19-19.6	100-100/1"	Similar to Sample No. 5, but less clayey. w = 11.5%
7	24-24.5	250	Similar to Sample No. 5, but more gravelly. w = 12.4%

BORING NO. E1-1
SOIL DESCRIPTIONS

Ground Elevation: 28.9 ft
Depth to Water Level:

Project No. 7286

Sample No.	Depth ft	Number of Blows per 6"	Description
			No soil samples taken. **(Bedrock at ground surface.)**

BORING NO. El-2
SOIL DESCRIPTIONS

Ground Elevation: 21.4 ft
Depth to Water Level: 3.8 ft

Project No. 7286

Sample No.	Depth ft	Number of Blows per 6"	Dcecription
1	o- 1.5	3-14-6	Brown and dark brown slightly organic silty sand. Fine to medium grained; contains ~ 30 mm thick layer of sandy organic silt containing many small roots up to 3 mm diameter; contains a few angular gravel pieces up to 22 mm in size.
2	5- 6.5	19-31-54	Light brown silty sand. Fine to coarse grained; subangular; contains ~ 20-25% nonplastic fines; very fast reaction to shaking test; contains a few gravel up to 35 mm in size; some darker brown spots.

BORING NO. El-3
SOIL DESCRIPTIONS

Ground Elevation: 15. 2 ft
Depth to Water Level: 0.3 ft

Project No. 7286

Sample No.	Depth ft	Number of Blows per 6"	Description
1	o- 1.5	1-1-1	Brown slightly organic silty sand. Fine to medium grained; contains ~ 10-20% nonplastic fines; contains a few small roots up to 1 mm diameter and a trace of black decomposed vegetation fibers; one ~ 50 mm thick layer at top is black sandy organic silt with small roots.
2	5- 6.5	8-8-7	Light brown sand. Fine to medium grained; uniform; < 5% silt; contains a few black organic specks < 0.5 mm in size.
3	10-11.5	12-12-15	Gray gravelly silty sand. Widely graded; grains are subangular to subrounded; contains ~ 30-40% slightly cohesive fines and ~ 10-15% gravel up to 30 mm in size; moderately fast reaction to shaking test. w = 9.8%
4	15-16.5	17-23-21	Similar to Sample No. 3. w = 11.4%

BORING NO. EI -4
SOIL DESCRIPTIONS

Ground Elevation: 20. 2 ft
Depth to Water Level: 3 . 0 ft

Project No. 7286

Sample No.	Depth ft	Number of Blows per 6"	Description
1	o- 1.5	1-1-1	No Recovery.

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BORING NO. El-5
SOIL DESCRIPTIONS

Ground Elevation: 16.0 ft
Depth to Water Levels: 4.2 ft

Project No. 7286

Sample No.	Depth ft	Number of Blows per 6"	Dcecription
1	0 - 1	2-3	Brown fine-sandy organic silt with leaves, several roots up to 3 mm diameter.
2	1- 2.5	5-7-10	Brown sand. Fine grained; uniform; contains severa black organic pieces < 1 mm in size; < 5% nonplastic fines; contains one 20 mm size gravel piece.
3	5- 6.5	23-55-78	Brown and gray silty gravel. Widely graded; angulai grains; contains ~ 3C -40% slightly sandy brown silt between the gray gravel and rock fragments ranging in size up to 28 mm; the brown silt is nonplastic; ver fast reaction to shaking test.

BORING NO. EI-6
SOIL DESCRIPTIONS

Ground Elevation: 14.3 ft
Depth to Water Level: 1.3 ft

Project No. 7286

Sample No.	Depth ft	Number of Blows per 6"	Description
1	o- 1.5	1-2-5	No Recovery. (Pushed gravel.)

BORING NO. E2-1
SOIL DESCRIPTIONS

Ground Elevation: 15.9 ft
Depth to Water Level: 6.0 ft

Project No. 7286

Sample No.	Depth ft	Number of Blows per 6"	Description
1	0- 2	1-1-7-19	Top is brown sandy organic silt containing roots up to 12 mm diameter. Bottom is light brown to gray-brown gravelly silty sand. Widely graded; generally angular grains; contains ~20-30% nonplastic fines and ~10-20% gravel up to 18 mm in size; several rusty-brown spots up to 10 mm in size.
2	5- 6.6	31-60-74	Similar to bottom portion of Sample No. 1, but slightly less silty and fewer rusty-brown spots.

BORING NO. E2-2
SOIL DESCRIPTIONS

Ground Elevation: 13.7 ft
Depth to Water Level: 0.1 ft

Project No. 7286

Sample No.	Depth ft	Number of Blows per 6"	Description
1	o- 1.5	1-2-2	Top is dark brown peat. Highly decomposed; contain! several roots up to 0.5 mm diameter. Bottom is brown sand. Fine grained; uniform; contains < 5% nonplastic fines.
2	5- 6.5	6-7-9	Similar to bottom portion of Sample No. 1.
3	10-11.5	18-21-39	Gray silty gravelly sand. Widely graded; angular to subangular grains; contains ~ 30-40% gravel up to 34 mm in size and ~15-20% nonplastic fines.

APPENDIX 2K

SEISMIC SURVEY

(THIS APPENDIX HAS BEEN EXTRACTED IN ITS ENTIRETY FROM THE SEABROOK STATION PSAR, WHERE IT IS REFERRED TO AS APPENDIX 2E)

The information contained in this appendix was not revised, but has been extracted from the original FSAR and is provided for historical information.

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APPENDIX 2E

SEISMIC SURVEYS

Seismic refraction surveys wer e conducted in the following areas: the plant site; tidal marsh; Hampton Harbor; Hampton State Park-State Beach; and offshore (to the east of Hampton State Beach). The purpose of these reconnaissance, seismic surveys was to determine depths to bedrock and depths of major seismic overburden discontinuities. The results of these surveys are summarized as follows:

1. Plant Site Area

The plan of the seismic lines of investigation, in the plant site area is shown on Figure 2E-1. In addition to the previously stated purpose, Line 20,000N was extended west to.provide supplimentary data for the groundwater hydrology study. Other lines were extended north for the purpose of exploring the contact zone between the Newburyport quartz diorite in the site area and the Merrimack Formation to the north of the site.

The results of refraction surveys in the plant site area are shown on Figure 2E-2 (Sheets 1, 2, and 3). In 'general, the seismic survey showed that hard rock was shallow in the vicinity of the selected plant location, with dense till along the north side of the site and less dense till and possible other overburden materials west of the plant location. There is good correlation between seismic and boring data.

The bedrock velocities measured by surface refraction techniques ranged between 13,000 and 16,000 ft/sec; this is indicative of sound bedrock conditions.

Overburden materials can be tentatively identified by their respective seismic velocities. Velocities for the overburden materials ranged from 2,000 ft/sec for loose, unconsolidated overburden materials to 6,500 to 6,800 ft/sec for dense glacial till. In general, overburden materials with velocities in excess of 5,500 ft/sec and in excess of 3,000 ft/sec for unsaturated materials are indicative of glacial till. Velocities below 5,500 ft/sec for saturated overburden usually indicate a fluvial or marine deposition.

The extension of Line 20,000N west to 76,900E indicates bedrock in the order of 200 feet deep and the absence of any potentially important aquifers.

A number of lines were extended northward to investigate a contact zone; however, Line 78,750E was the only one over which a velocity change from 15,000 ft/sec (Newburyport) to 13,000 ft/sec (Merrimack) was noted. This change was noted near Station 21,400N. The velocity change was subsequently confirmed by crosslines, and the contact location confirmed by borings. Line 80,500E had a velocity change between 20,900N and 21,100N, but it was not as evident as Line 78,750E. Other lines were either not extended sufficiently to the north or overburden velocity or depth variations were such that any

velocity change could not be definitely ascribed to the bedrock type.

2. Tidal Marsh Area

The plan map of the seismic lines in the tidal marsh area is shown on Figure 2E-3. The basic program of investigation consisted of Line A and Lines 2A, 2B, and 2C across the tidal marsh area with a number of crosslines between. The location and orientation of the crosslines were determined by depths to bedrock and the numerous small streams and man-made canals which crisscrossed the area. Detailed investigations were made along Browns River (600 series of seismic lines) and then westward to the site passing north of Hunts Island (Line NS-2 and the 700 and 800 series). A detailed plan map of the seismic lines in this area is shown on Figure 2E-3. The 600 series of seismic lines were operated as a marine refraction survey. Elevations of the bottom of Browns River were provided by McKenna Associates.

The results of the seismic survey in the tidal marsh area are shown on Figure 2E-4 (Sheets 1 through 10). In general, the bedrock surface in the tidal marsh is *more* than 50 feet below ground surface although a few sharp rises in the bedrock surface were noted in the vicinity of Browns River, where some outcrops were noted. Although Boring C-68 encountered refusal at an elevation of -28 feet, the bedrock surface rises to an

elevation of -10 feet along Lines 805 and NS-24, about SO to 70 feet northeast of the boring. Another example of the sharp changes in bedrock depths occurs in the vicinity of Line A where Boring C-52, 25 feet right of Line A, encountered refusal at the elevation of -33 feet, while the seismic data along Lines A and NS-6 indicate that a ridge of shallow rock (approximately Elevation -18 feet) occurs along or just to the north of Line A.

The borings showed that the glacial till found along the north of the site extends into the tidal marsh south of Line A and as far east as Line A-12. The till is only a few feet in thickness and, therefore, could not be detected seismically.

Boring data subsequently showed that in some areas the depths to bedrock were too shallow by as much as S feet. This was due'to a surface layer of organic material (peat) of about the same thickness. Organic materials, because of air entrapped and the overall nature of the material, are not conducive to good generation or transmission of seismic energy. In a few areas of the tidal marsh, organic materials were so thick as to prevent the generation of a recordable seismic signal.

3. Hampton Harbor Area

The results of the fathometer survey which took place during March and April 1973 are shown in the form of a bottom contour

map (Figure 2E-5). The results of the seismic investigations are shown in the form of a bedrock contour map (Figure 2E-6). The contours are based on seismic reflection and seismic refraction surveys conducted during March and April 1973 and augmented by the data obtained from a seismic refraction survey conducted in the fall of 1968. The 1968 data were obtained in the northern half of the area shown on Figure 2E-6 and mainly consisted of information on the minimum depths to a bedrock with only a few computed bedrock depths. The track maps for the 1973 reflection and refraction surveys are shown on Figures 2E-7 and 2E-8, respectively.

In the southern half of the area the bedrock was found to be generally shallow and somewhat irregular. The bedrock contour map in this area was based principally on seismic reflection data, the interpretation of which was confirmed by Boring F1A. Organic materials which prevented the generation of a good seismic signal were noted in a few small areas and at the southern edge of the area of investigation.

The bedrock contour map in the northern half of the area of investigation is based on a combination of seismic reflection and refraction data. Glacial till was detected against the north side of the shallow rock area by the seismic reflection.

The till appeared to thin towards the north so that the till and bedrock could not be distinguished on the seismic reflection records. Based on Boring F-2 which encountered 14 feet of till above bedrock, the seismic reflection data were reevaluated and the contours, as shown on Figure 2E-6, were constructed from the reevaluated reflection data and the seismic refraction data.

4. State Park - State Beach Area

The location plan of the seismic lines in this area is shown on Figure 2E-9 and the seismic results are shown on Figure 2E-10 (Sheets 1, 2, and 3). Two relatively shallow areas in the bedrock surface were detected in the State Park: one in the vicinity of Lines SPS and SPB, just north of Boring C-56; the second, in the vicinity of Lines SP3, SP4, and SPE, just north of Boring C-66. Boring C-24 confirmed the fact that a depression in the bedrock surface exists between the two high areas of rock.

In the State' Beach area, a thin layer of glacial till was encountered by Boring P-1, but was not detected seismically. The seismic overburden velocity of 5,500 ft/sec, as detected on the more easterly lines of the State Beach area, may be indicative of a dense sand.

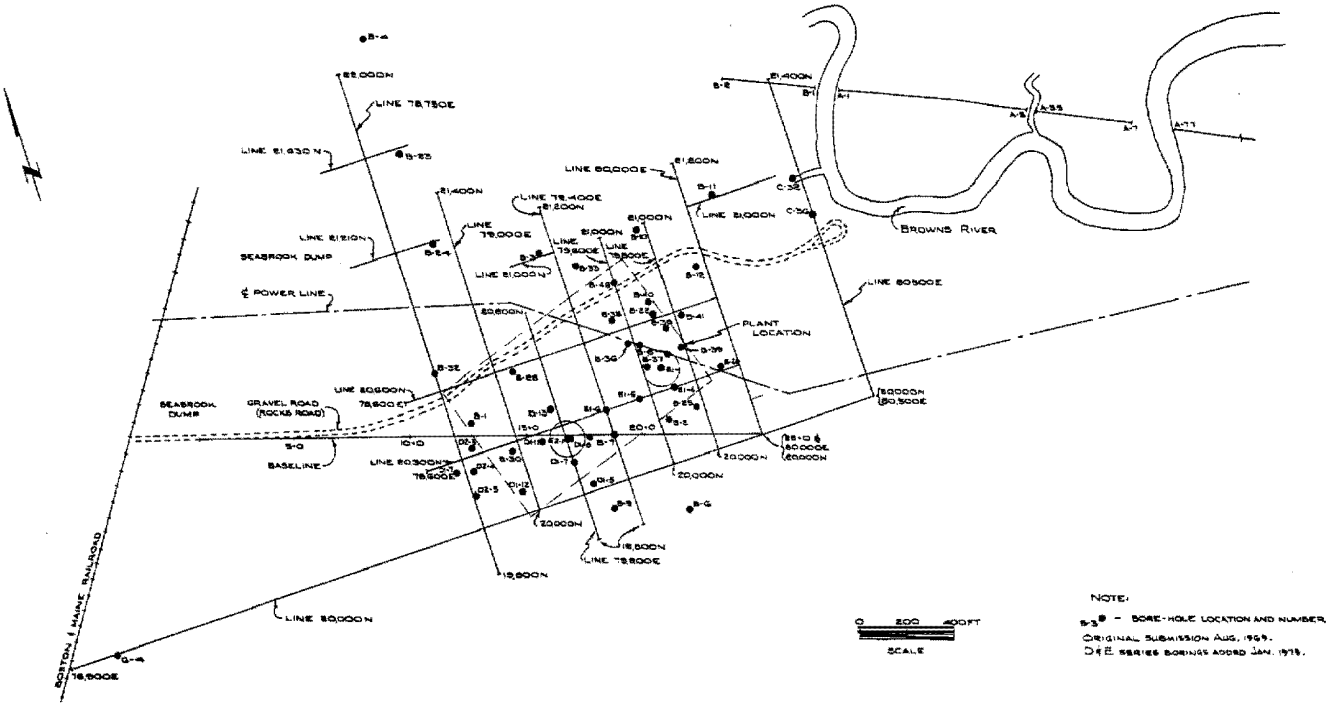
5. Offshore Area

The results of the fathometer survey which took place in March and April 1973 are shown on Figure 2E-11. The bedrock contour map, Figure 2E-12, was constructed from seismic reflection and refraction data obtained in March and April 1973, and from a seismic refraction survey conducted during the fall of 1968. The track map for the 1973 reflection and refraction surveys is shown on Figure 2E-13. The 1968 seismic refraction survey was conducted in an area extending in an east-northeasterly direction for a distance of about a mile from the Hampton State Beach.

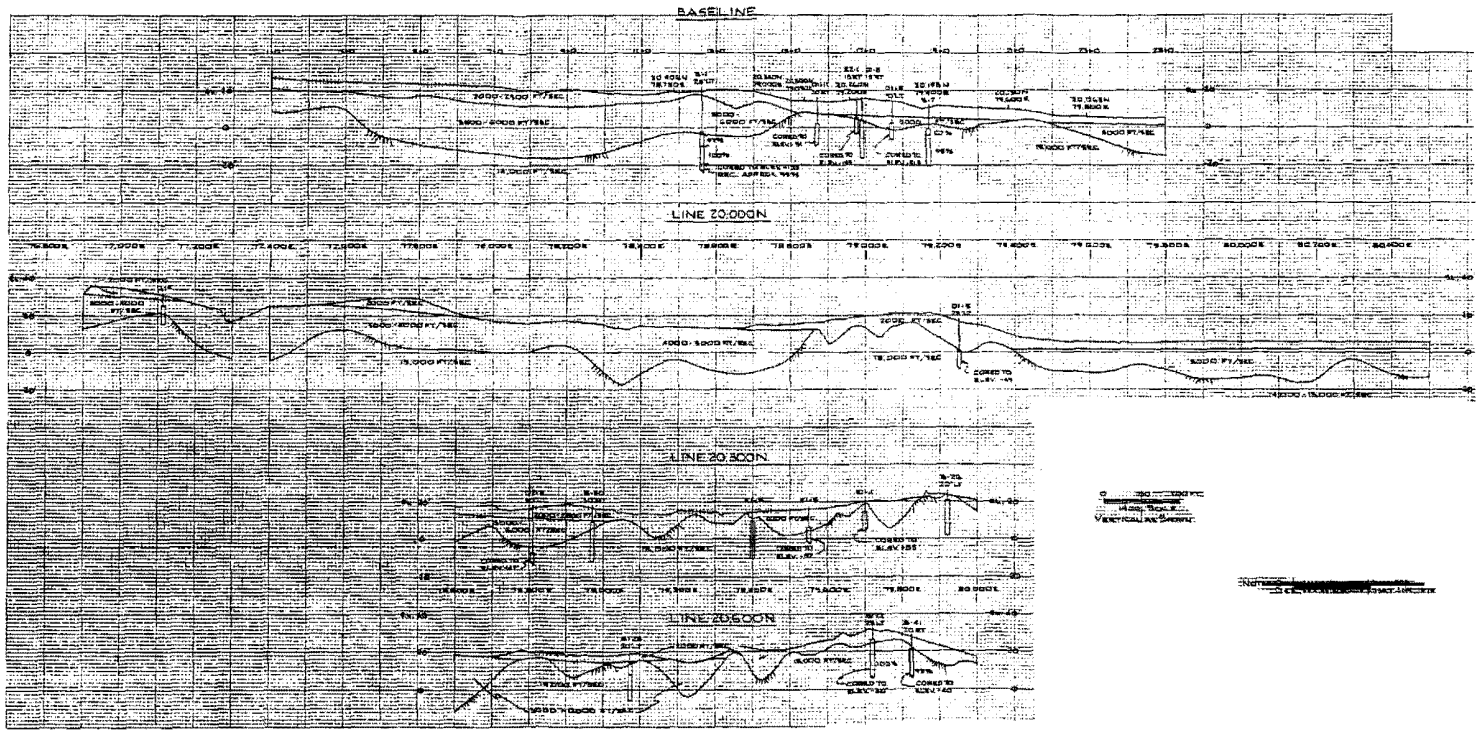
The contour maps show that much of the ocean bottom offshore consists of highly irregular bedrock outcrops. A denser material, possibly glacial till as indicated by the seismic refraction velocities, was found along the northern and western sides of the ledge outcrops. Refraction velocities in the 5,500 to 5,700 ft/sec range were found in this area, while away from the area, velocities generally ranged between 5,100 and 5,400 ft/sec. The seismic reflection data showed both glacial till and bedrock, although in some areas, reflections were only obtained from the till. In these latter cases, the refraction data provided the basis for the bedrock contours. Borings P-2 through P-10 conformed to the general picture shown by the seismic data.

SECTION 2E.1

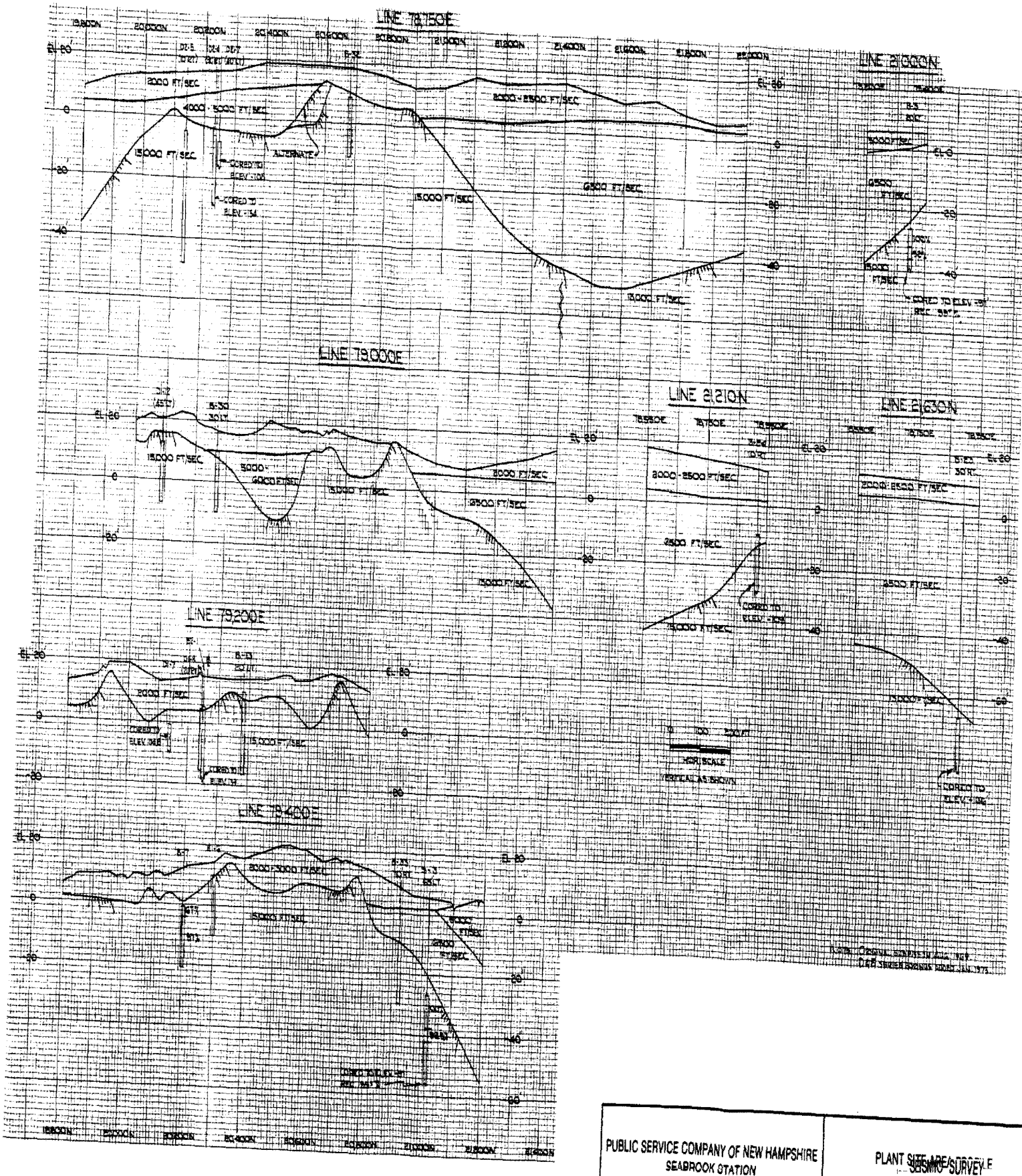
PLANT SITE AREA FIGURES



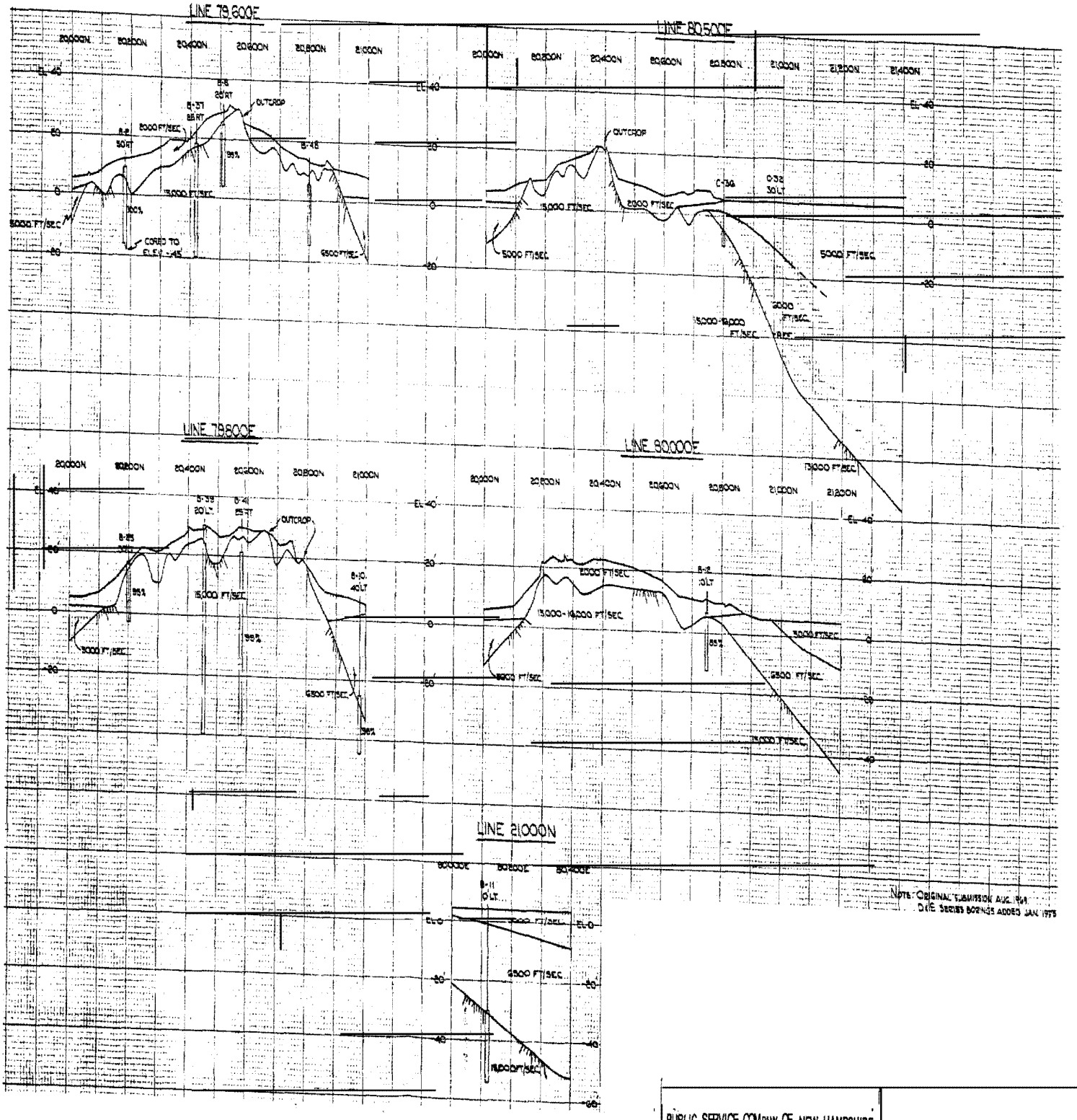
PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE SEABROOK STATION FINAL SAFETY ANALYSIS REPORT	PLANT SITE AREA PLAN MAP SEISMIC SURVEY
	FIG. 2E-1 SB 1 & 2



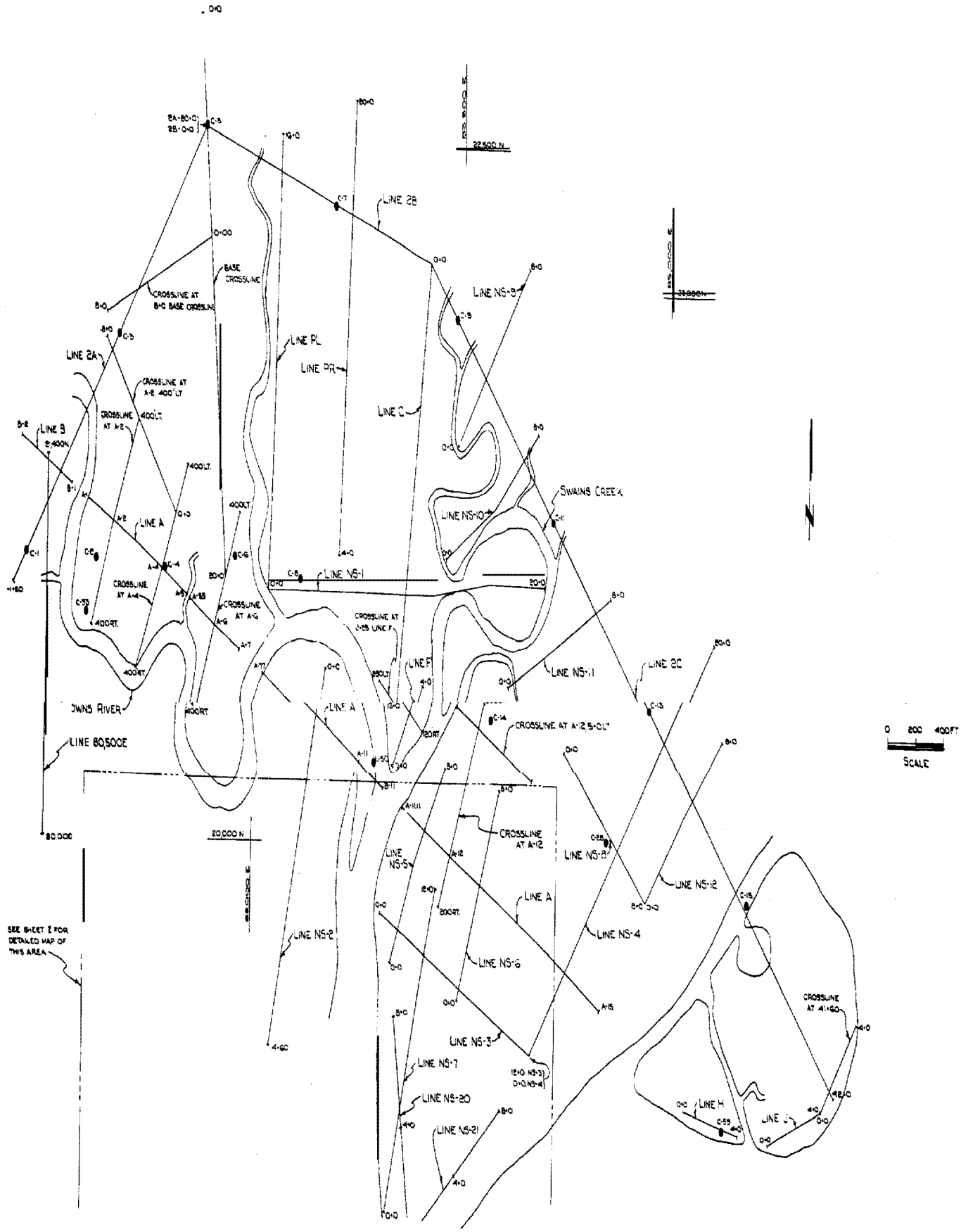
PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE SEABROOK STATION FINAL SAFETY ANALYSIS REPORT	PLANT SITE AREA PROFILE SEISMIC SURVEY
	FIG. 2E-2 SH.1 SB 1 & 2



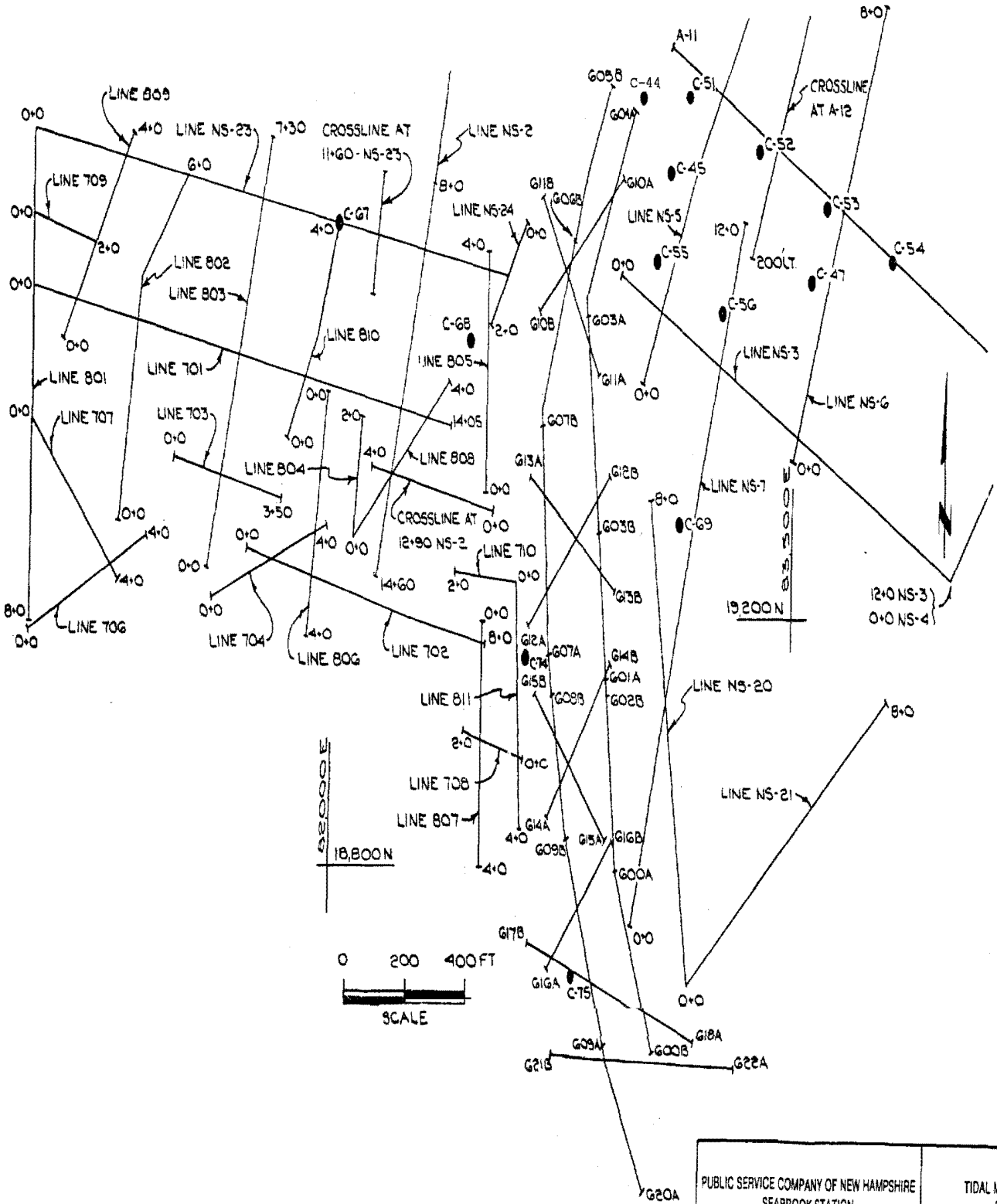
PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE SEABROOK STATION FINAL SAFETY ANALYSIS REPORT	PLANT SITE AREA PROFILE SEISMIC SURVEY
	FIG 2E-2 SH.2 SE162



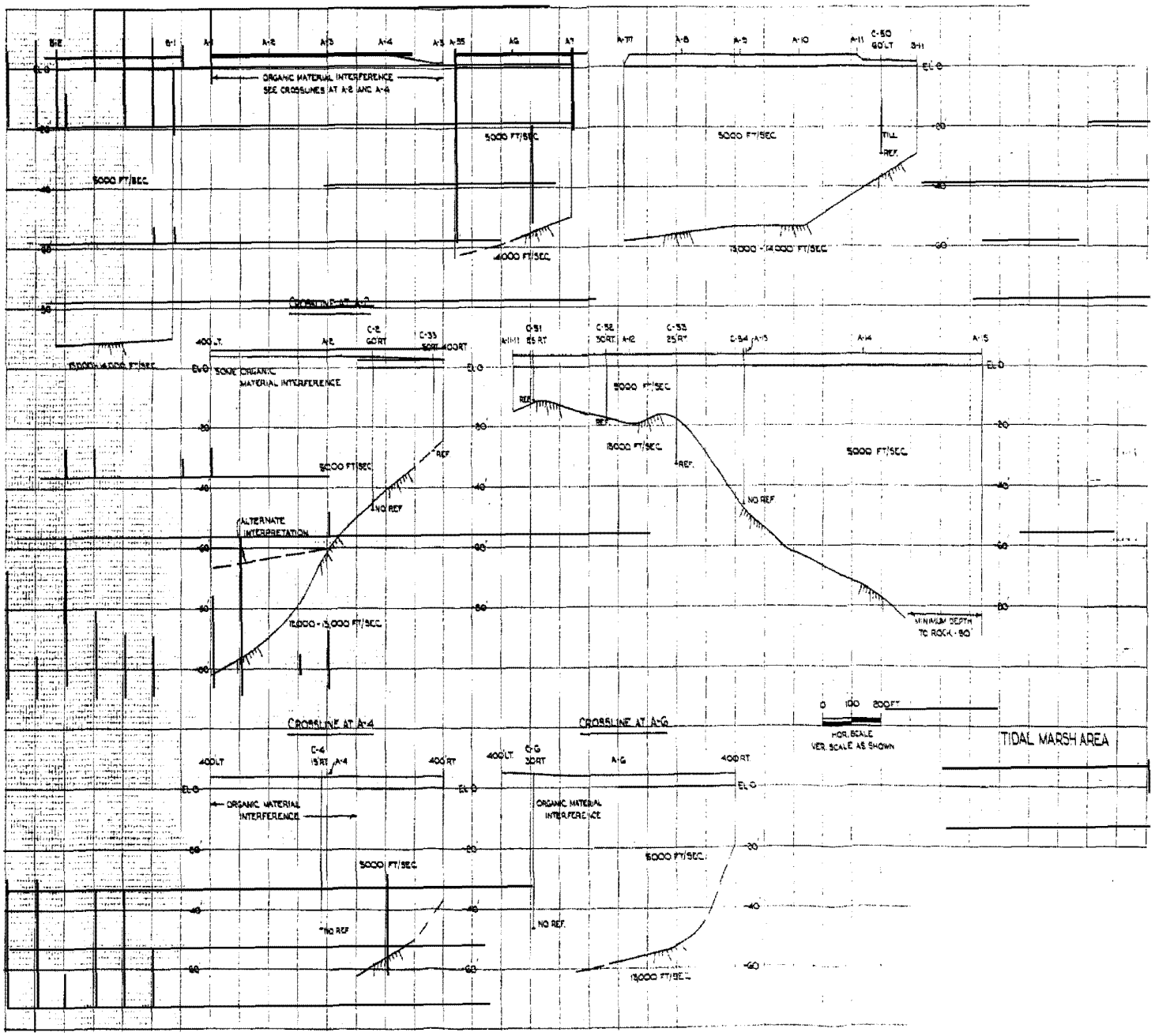
PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE SEABROOK STATION FINAL SAFETY ANALYSIS REPORT	PLANT SITE AREA PROFILE SEISMIC SURVEY		
	FIG. 2E-2	SH.3	SB 1 & 2



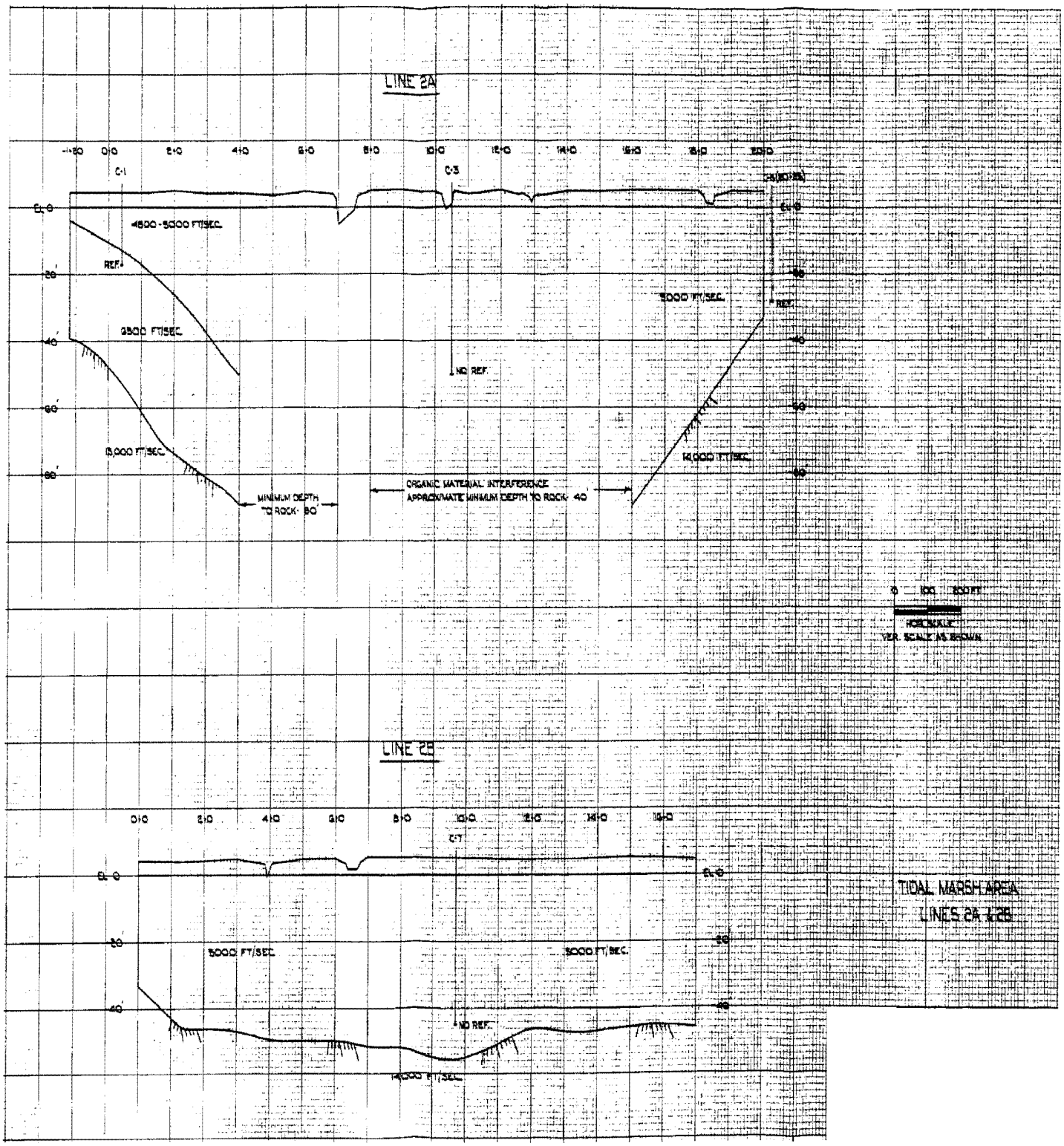
PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE SEABROOK STATION FINAL SAFETY ANALYSIS REPORT	TIDAL MARSH AREA PLAN MAP SEISMIC SURVEY
	FIG 2E-3 SH.1 SB 1 & 2



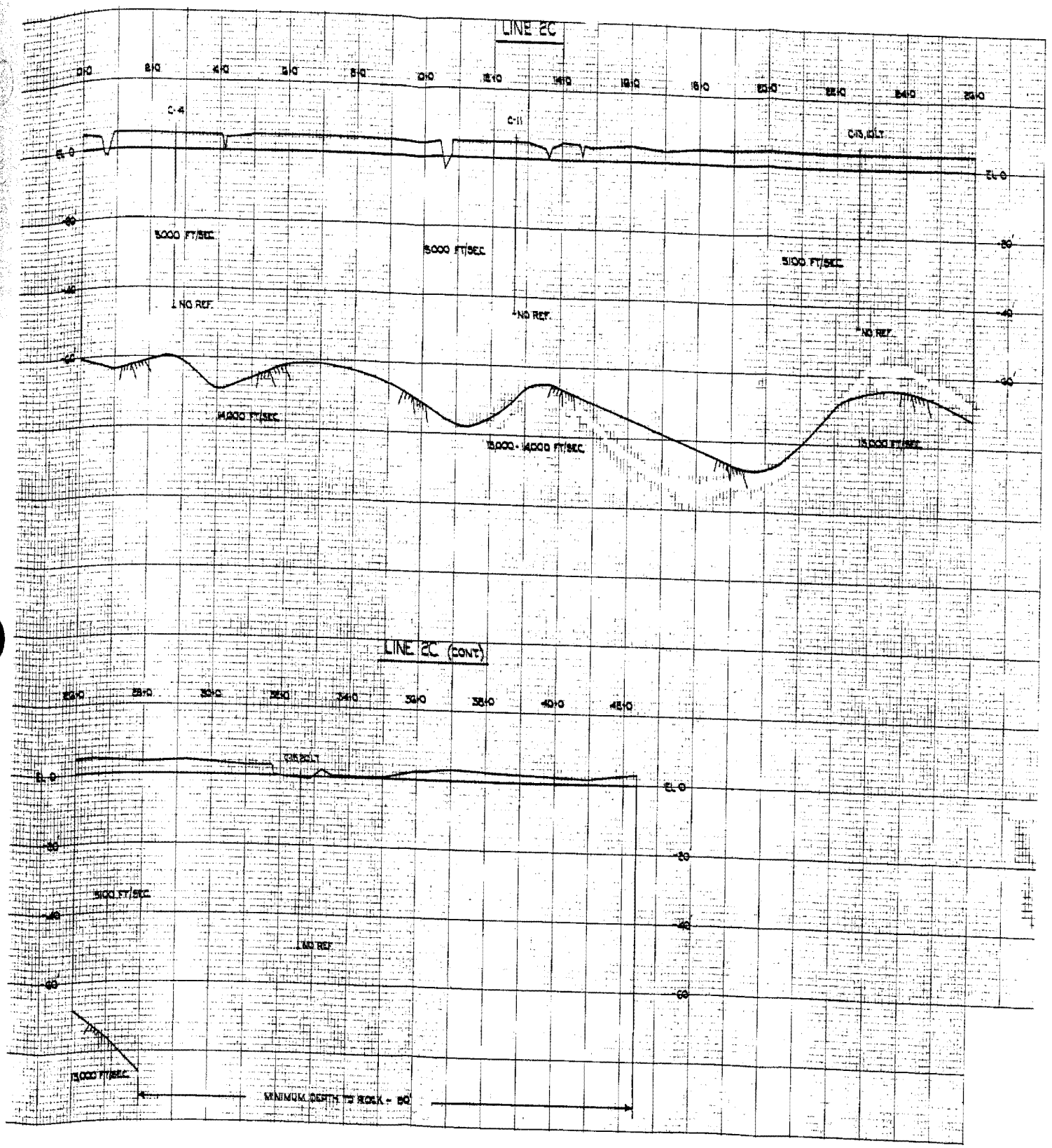
PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE SEABROOK STATION FINAL SAFETY ANALYSIS REPORT	TIDAL MARSH AREA PLAN MAP SEISMIC SURVEY		
	FIG. 2E-3	SH.2	SB 1 & 2



PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE SEABROOK STATION FINAL SAFETY ANALYSIS REPORT	TIDAL MARSH AREA PROFILE SEISMIC SURVEY		
	FIG. 2E-4	SH. 1	SB 1 & 2



PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE SEABROOK STATION FINAL SAFETY ANALYSIS REPORT	TIDAL MARSH AREA PROFILE SEISMIC SURVEY		
	FIG. 2E-4	SH.2	SB 1 & 2



0 100 200 FT

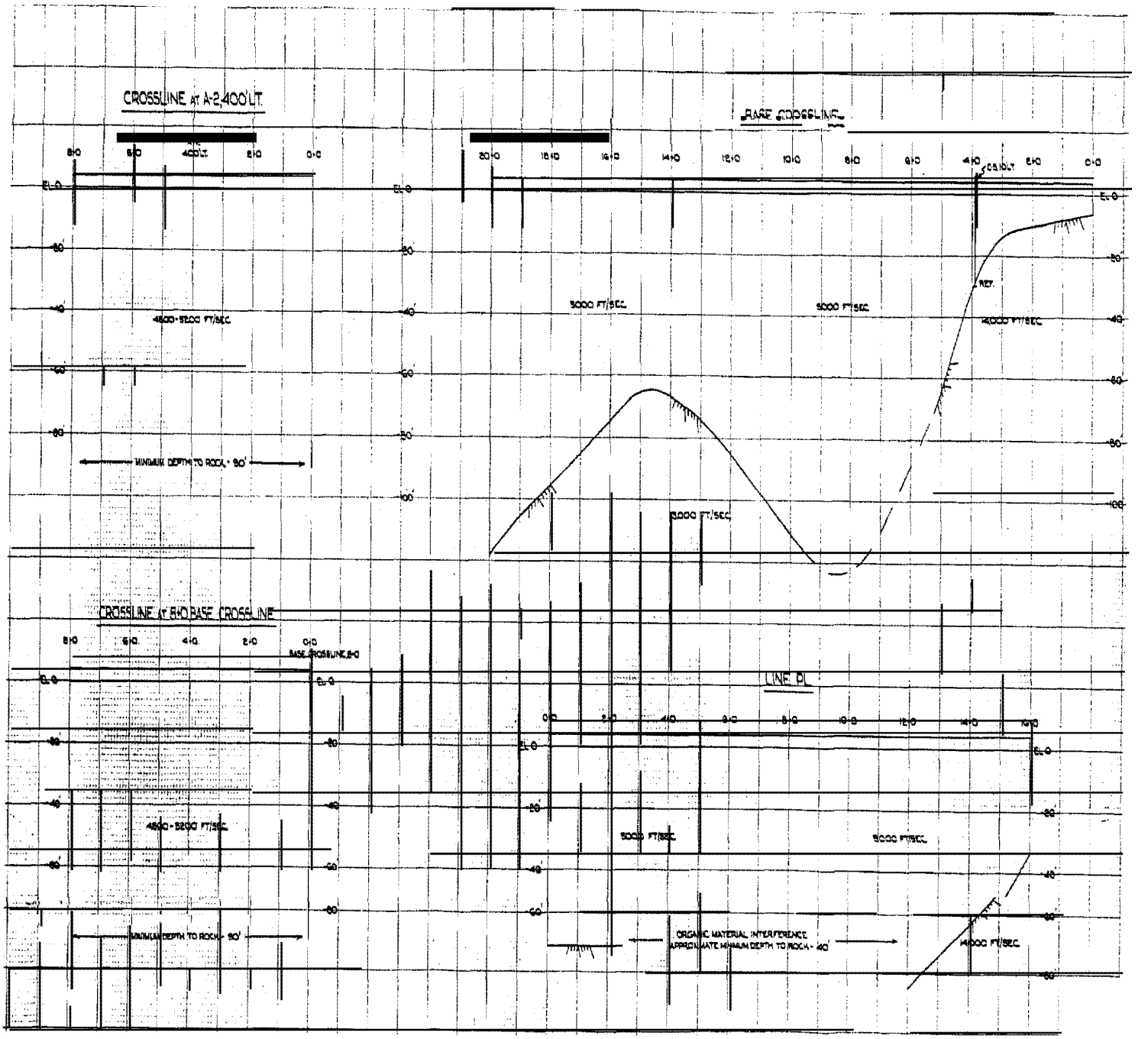
HOR. SCALE

VER. SCALE AS SHOWN

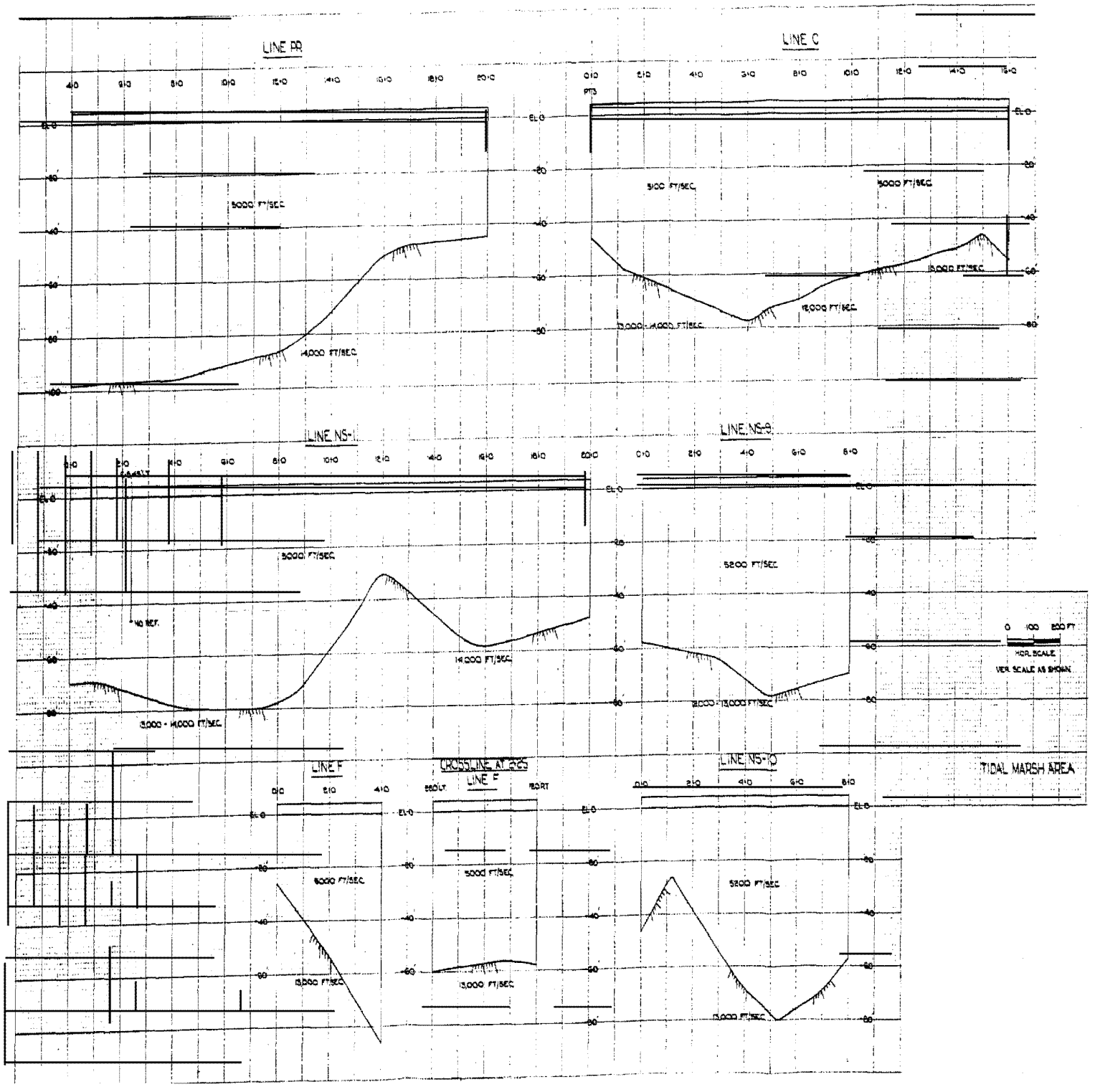
PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE
SEABROOK STATION
FINAL SAFETY ANALYSIS REPORT

PROFILE
SEISMIC SURVEY

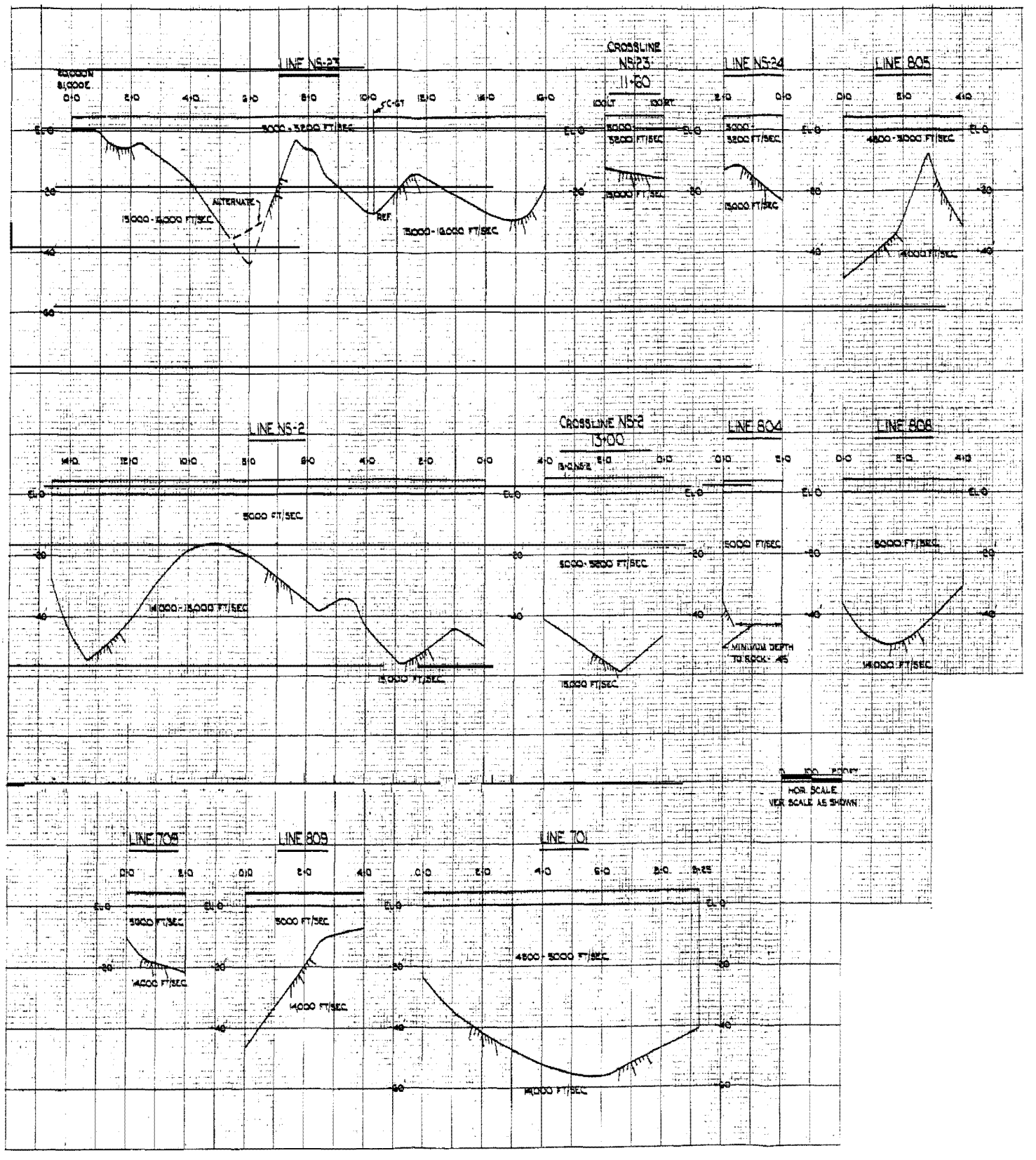
FIG. 2E-4	SH.3	SB 1 & 2



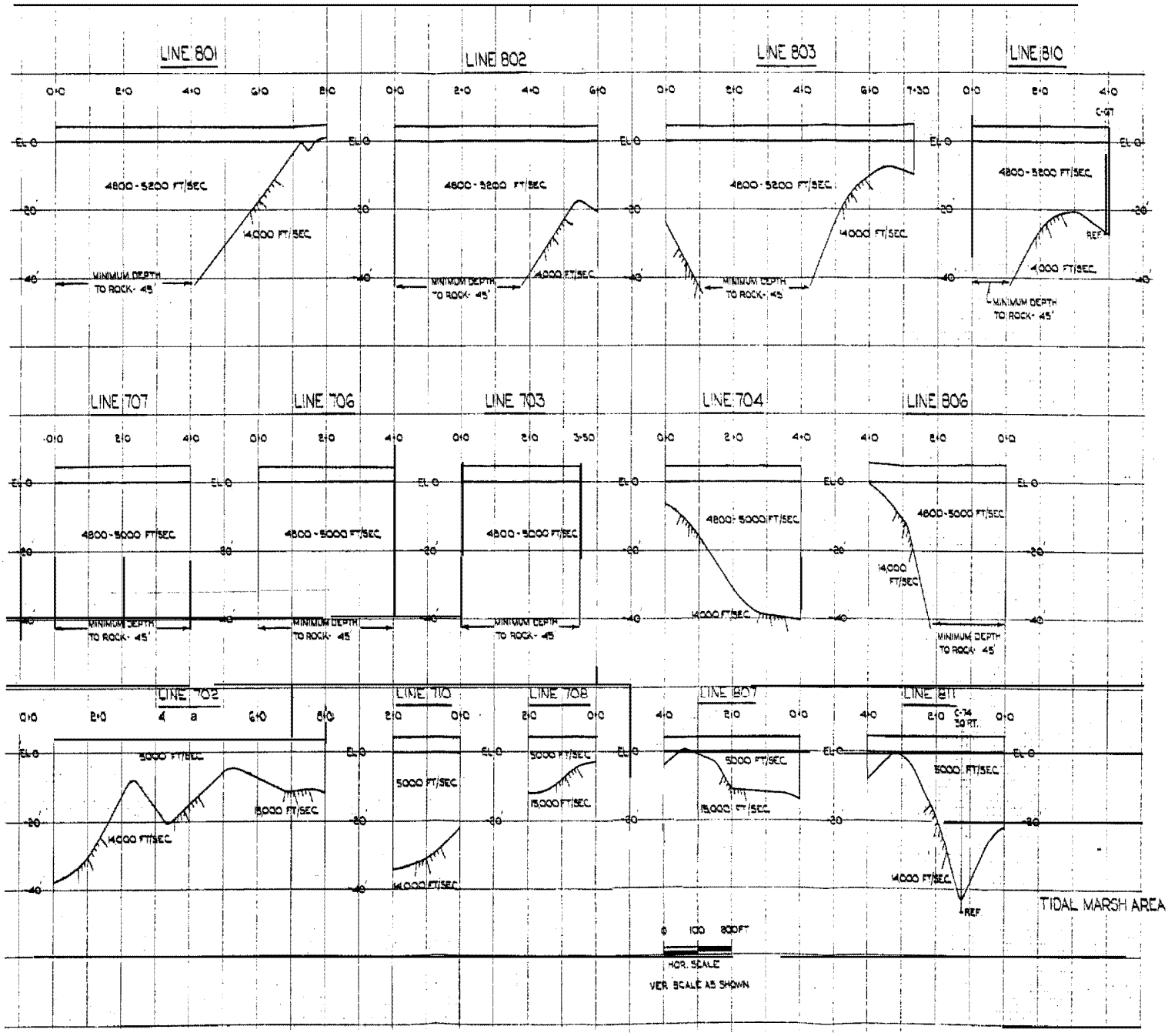
PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE SEABROOK STATION FINAL SAFETY ANALYSIS REPORT	TIDAL MARSH AREA PROFILE SEISMIC SURVEY		
	FIG. 2E-4	SH.4	SB 1 & 2



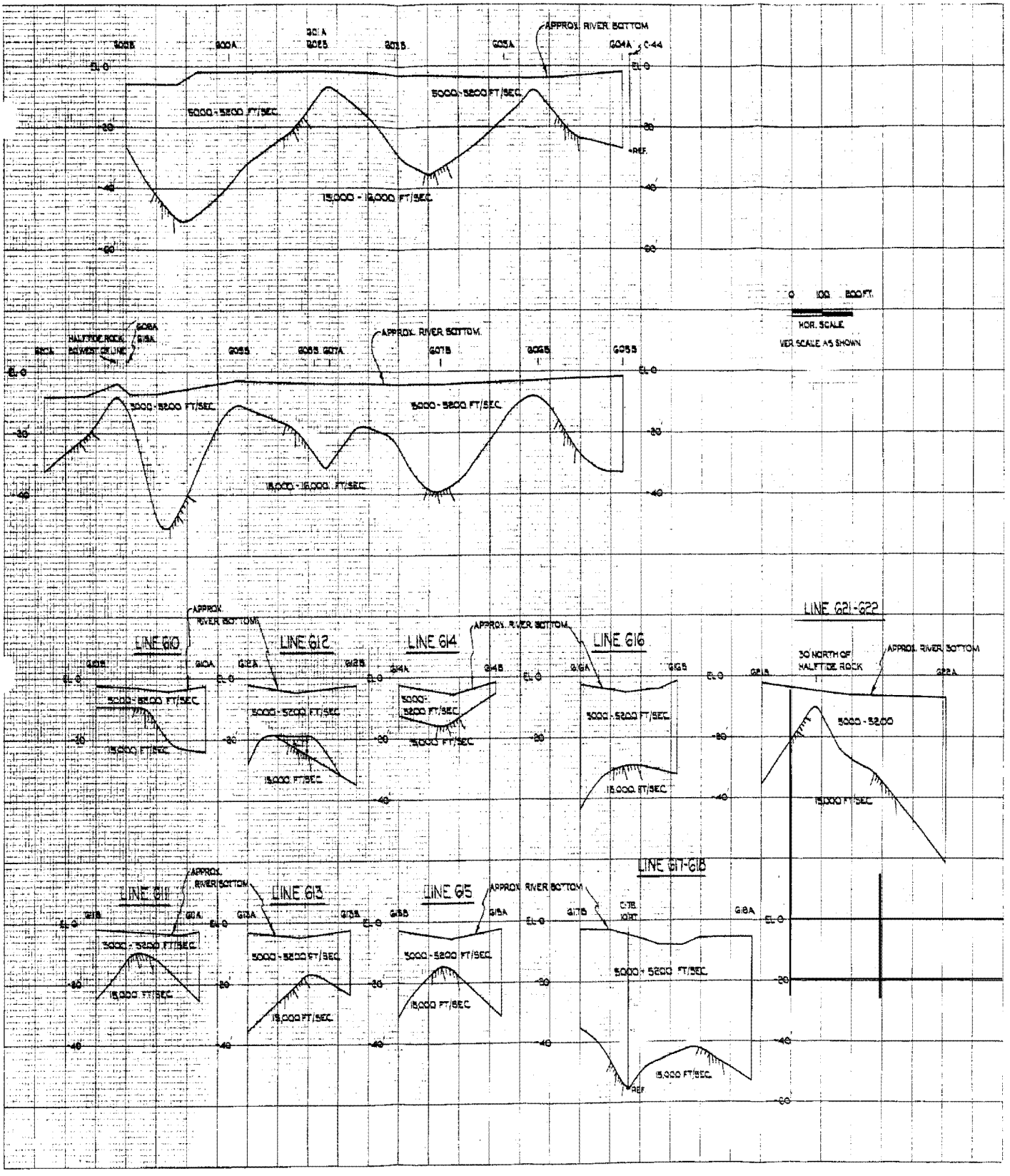
PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE SEABROOK STATION FINAL SAFETY ANALYSIS REPORT	TIDAL MARSH AREA PROFILE SEISMIC SURVEY
	FIG 2E-4 SH. 5 SB 1&2



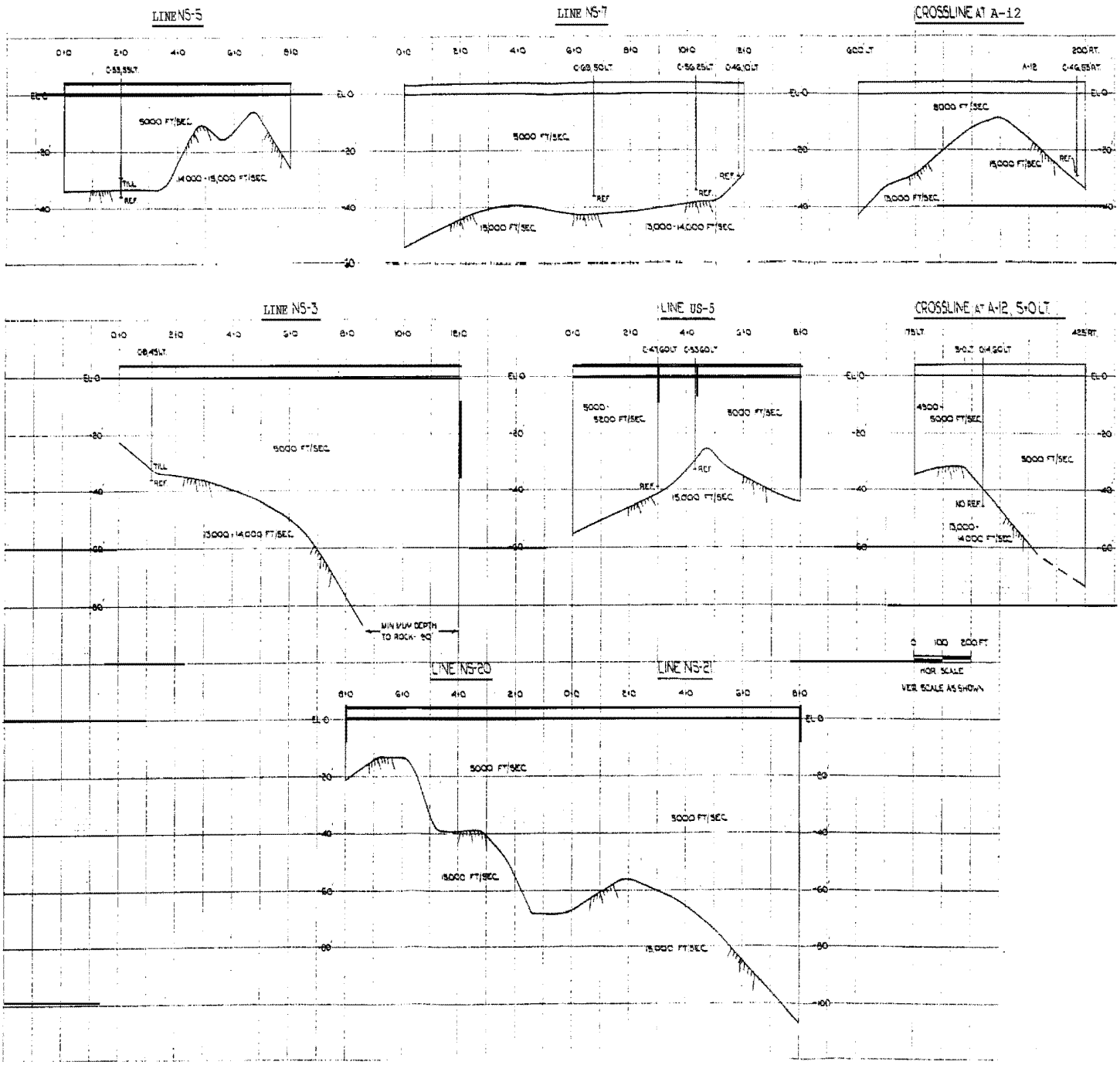
PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE SEABROOK STATION FINAL SAFETY ANALYSIS REPORT	TIDAL MARSH AREA PROFILE SEISMIC SURVEY		
	FIG. 2E-4	SH.6	SR 1 & 2



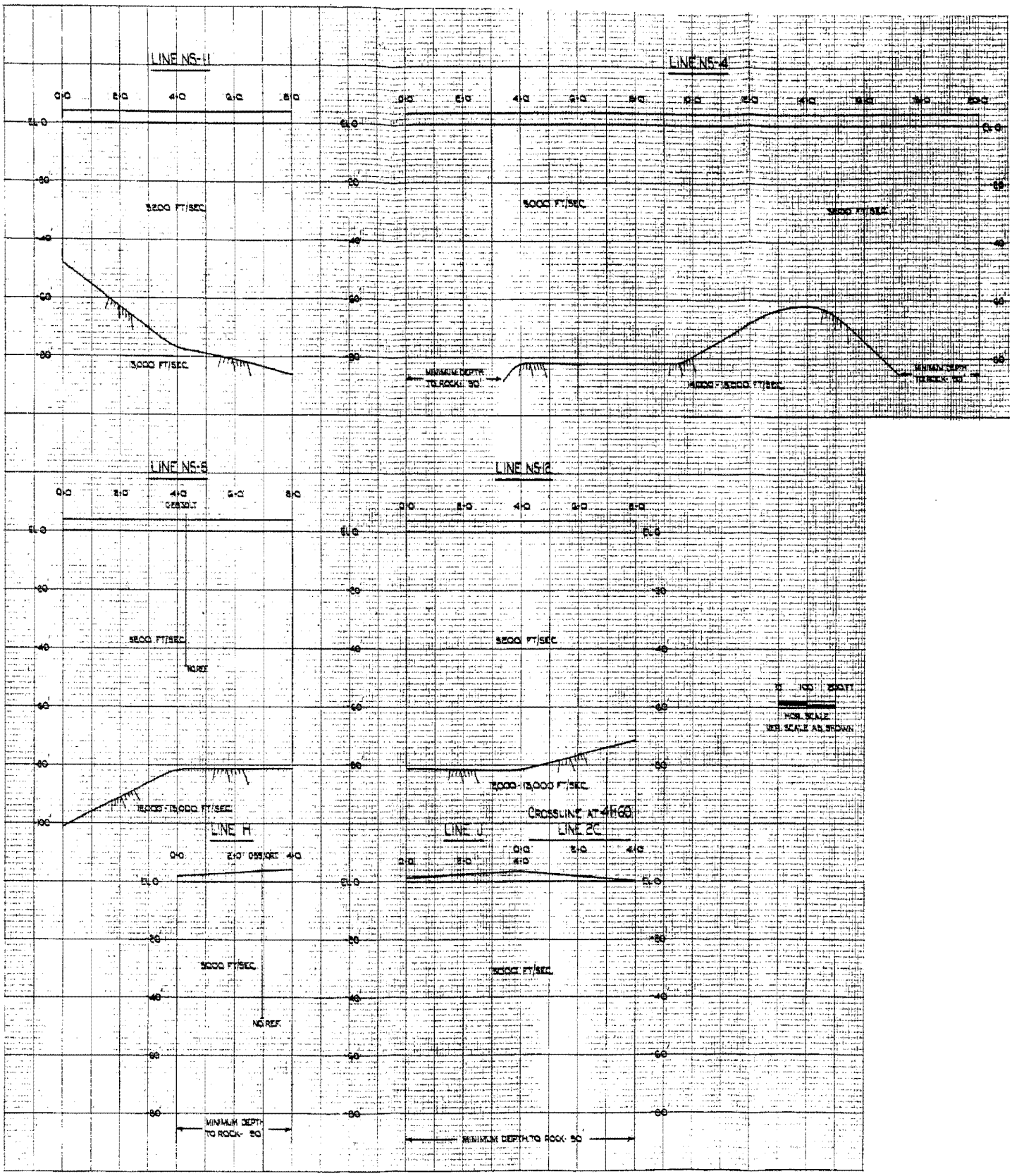
PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE SEABROOK STATION FINAL SAFETY ANALYSIS REPORT	TIDAL MARSH AREA PROFILE SEISMIC SURVEY		
	FIG. 2E-4	SH.7	SB 1 & 2



PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE SEABROOK STATION FINAL SAFETY ANALYSIS REPORT	TIDAL MARSH AREA PROFILE SEISMIC SURVEY		
	FIG 2E-4	SH.8	SB 1 & 2



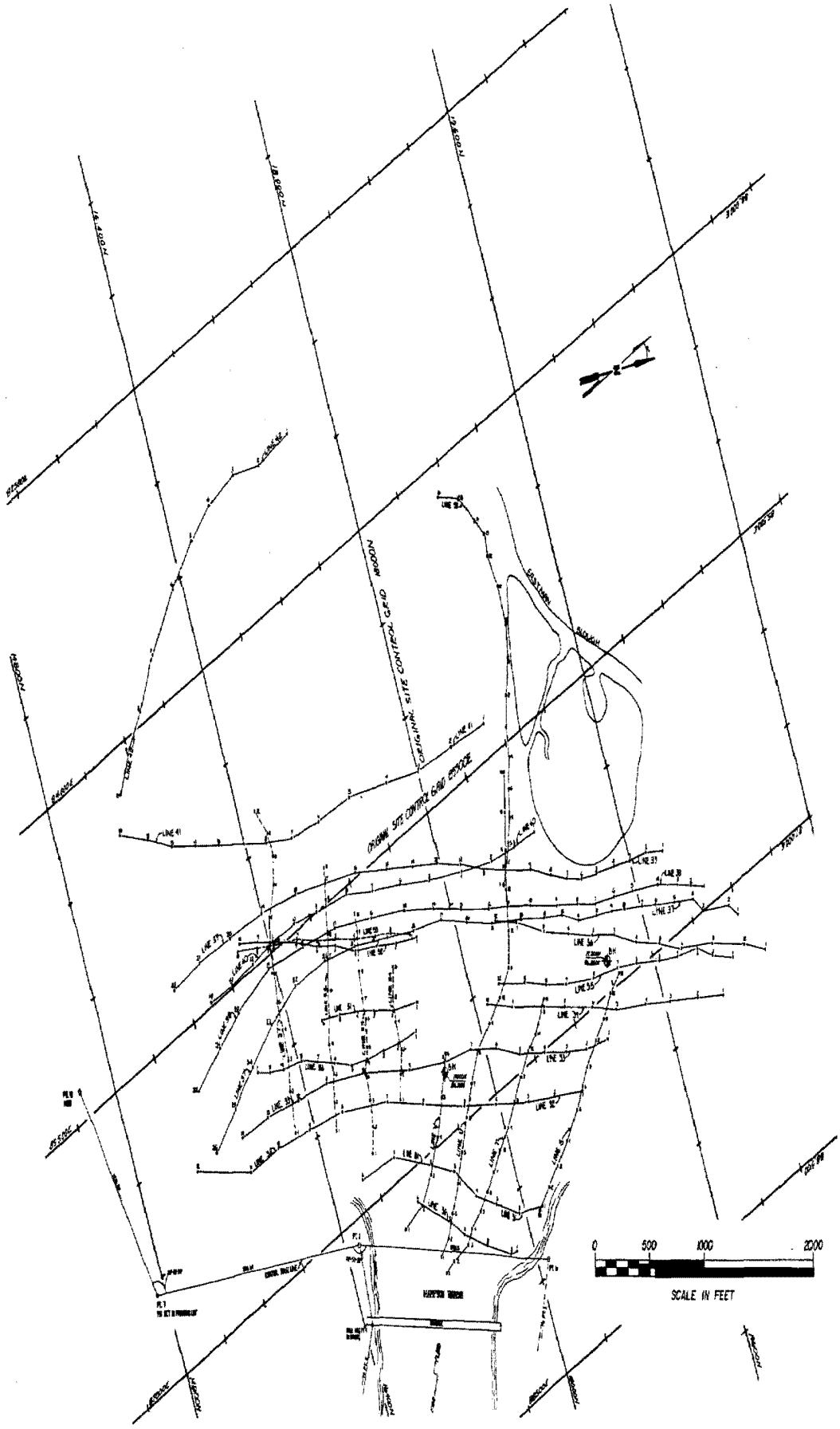
PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE SEABROOK STATION FINAL SAFETY ANALYSIS REPORT	TIDAL MARSH AREA PROFILE SEISMIC SURVEY		
	FIG. 2E-4	SH.9	SB 1 & 2



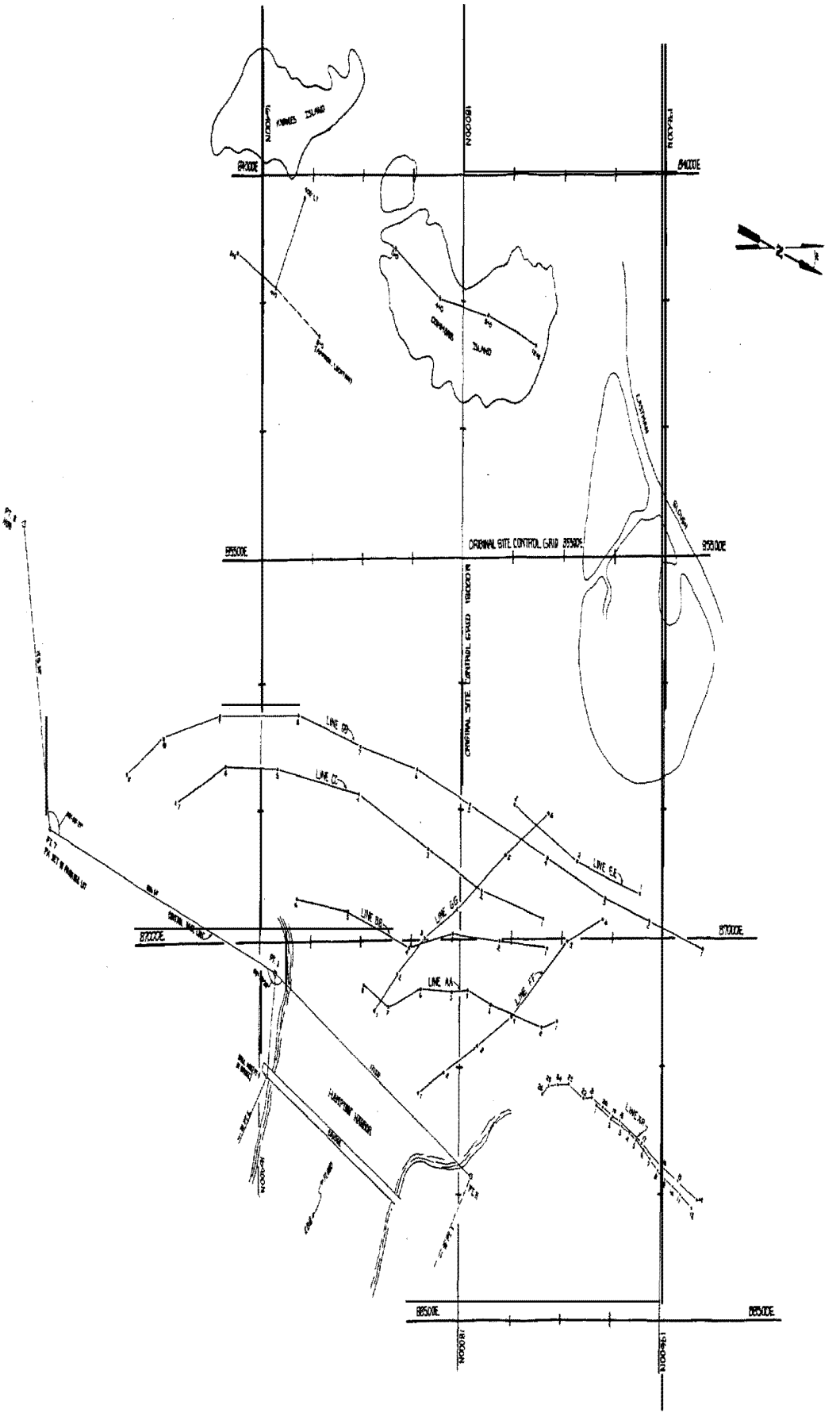
PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE SEABROOK STATION FINAL SAFETY ANALYSIS REPORT	TIDAL MARSH AREA PROFILE SEISMIC SURVEY		
	FIG 2E4	SH.10	SS 1 & 2

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE SEABROOK STATION FINAL SAFETY ANALYSIS REPORT	HAMPTON HARBOR AREA BOTTOM CONTOUR MAP SEISMIC SURVEY
	FIG. 2E-5 / SB 1 & 2

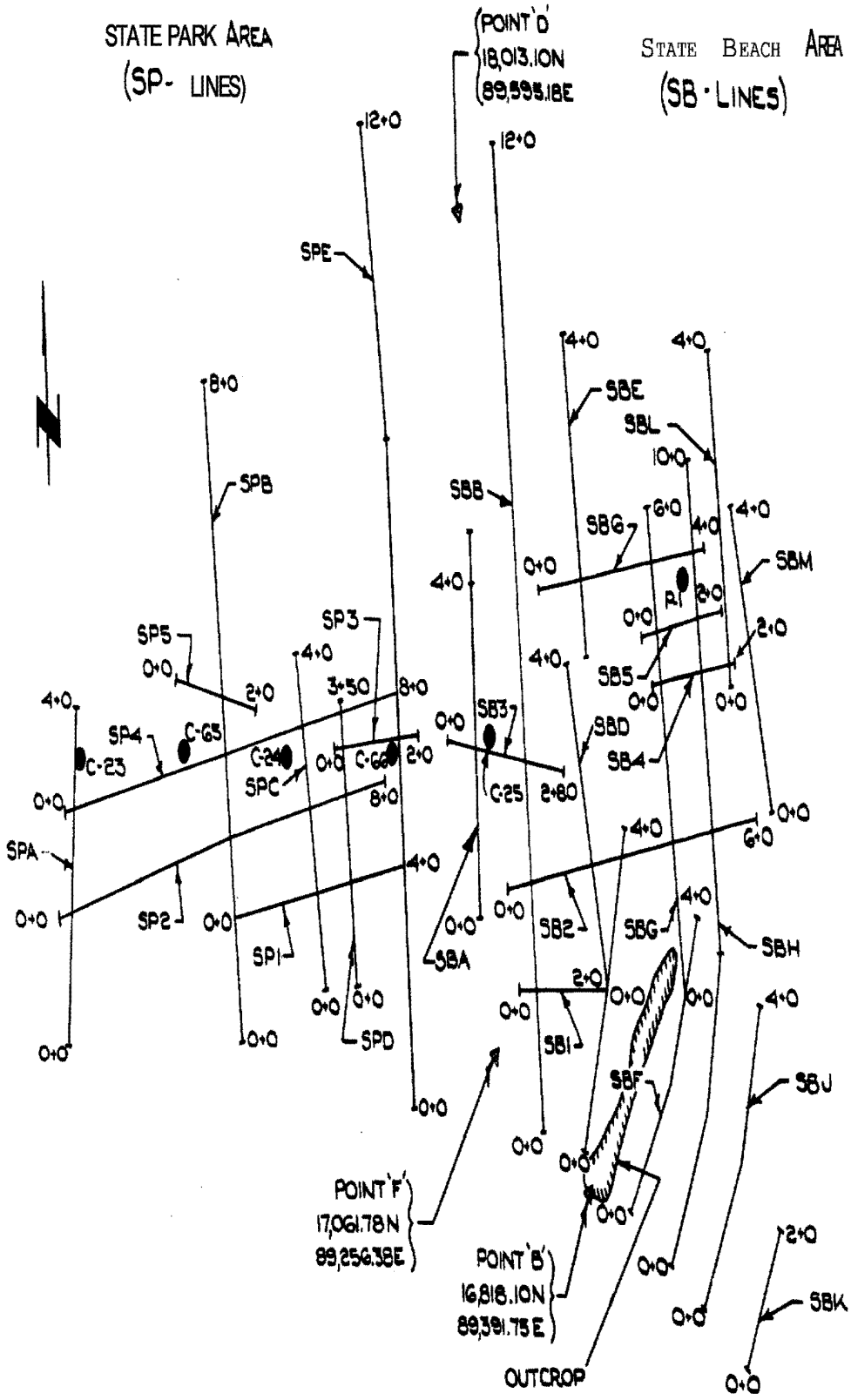
PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE SEABROOK STATION FINAL SAFETY ANALYSIS REPORT	HAMPTON HARBOR AREA BEDROCK CONTOUR MAP SEISMIC SURVEY
	FIG. 2E-6 | SB 1 & 2



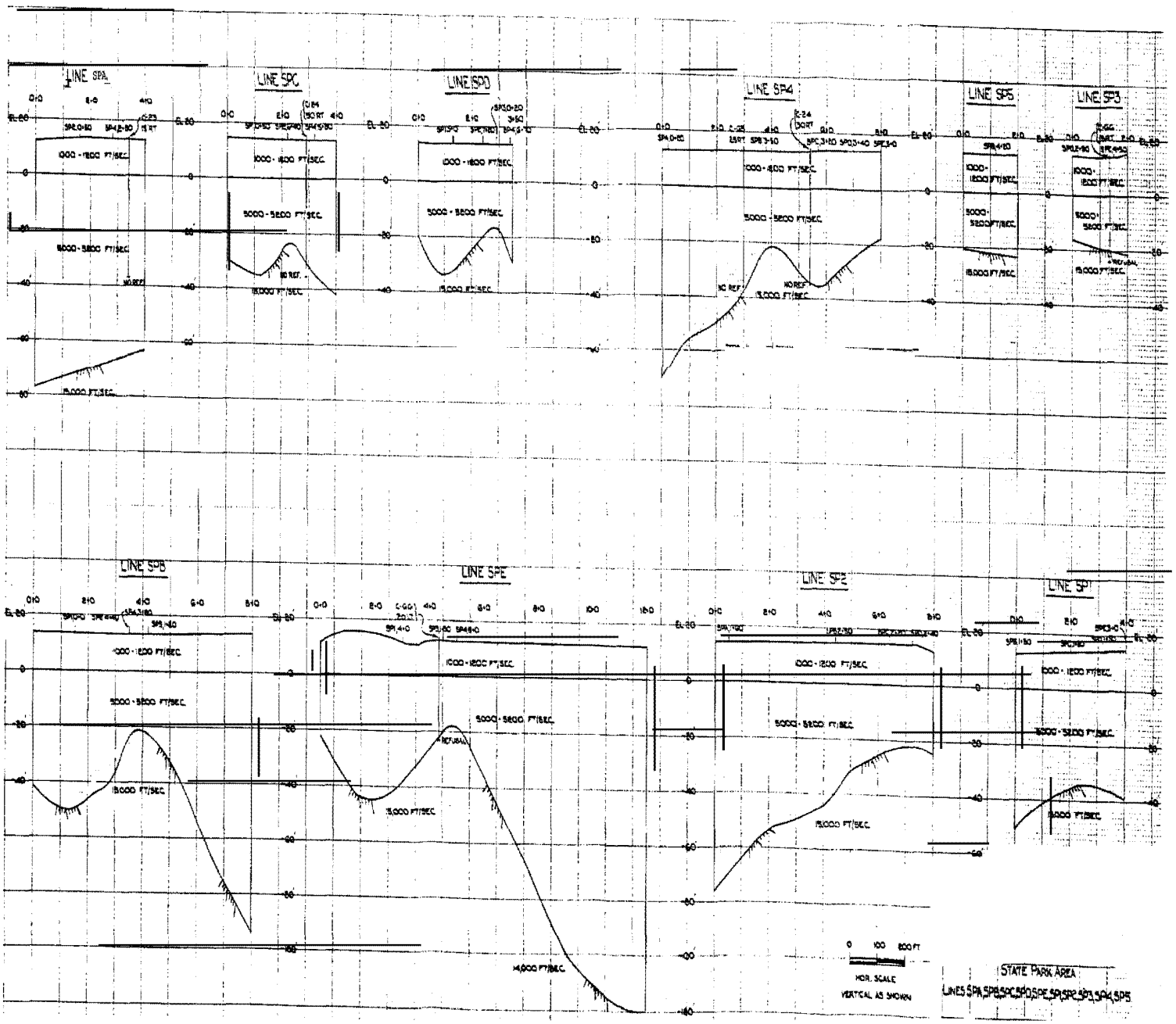
PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE SEABROOK STATION FINAL SAFETY ANALYSIS REPORT	HAMPTON HARBOR AREA TRACK MAP - REFLECTION SEISMIC SURVEY	
	FIG. 2E-7	SB 1 & 2



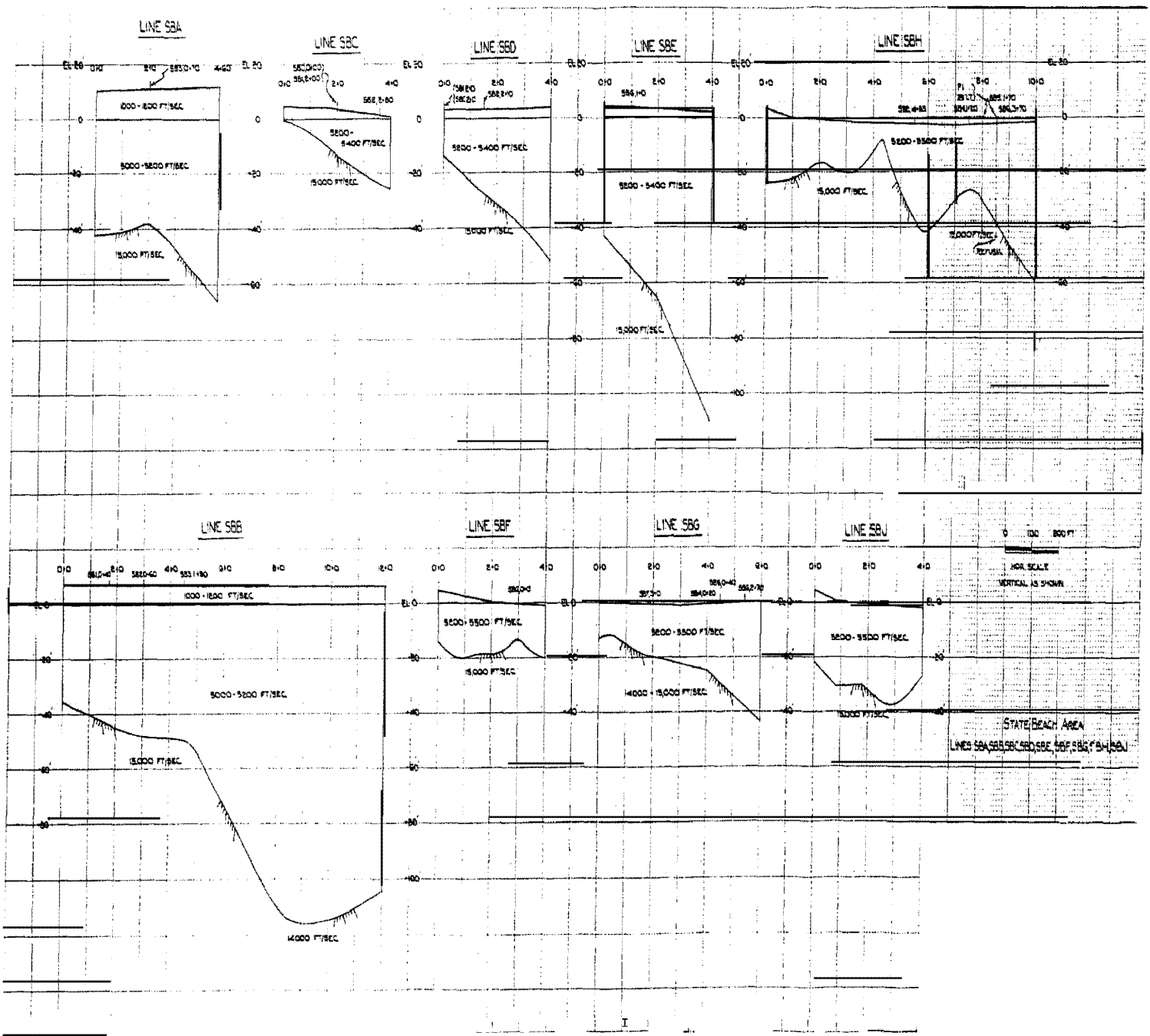
PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE SEABROOK STATION FINAL SAFETY ANALYSIS REPORT	HAMPTON HARBOR AREA TRACK MAP - REFRACTION SEISMIC SURVEY	
	FIG. 2E-8	SB 1 & 2



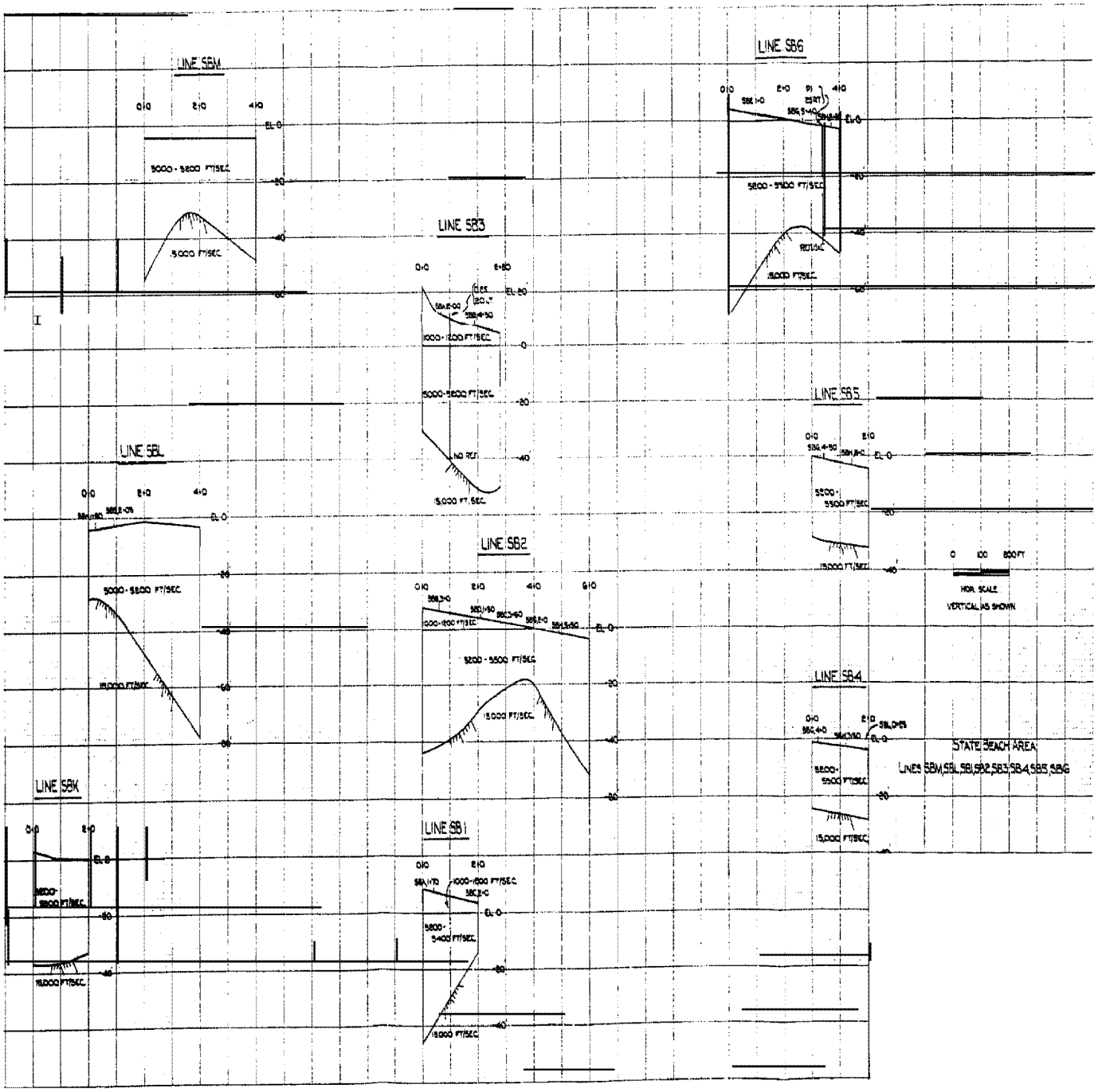
PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE SEABROOK STATION FINAL SAFETY ANALYSIS REPORT	STATE PARK STATE BEACH AREA PLAN MAP SEISMIC SURVEY
	FIG 2E-9 | SB 1 & 2



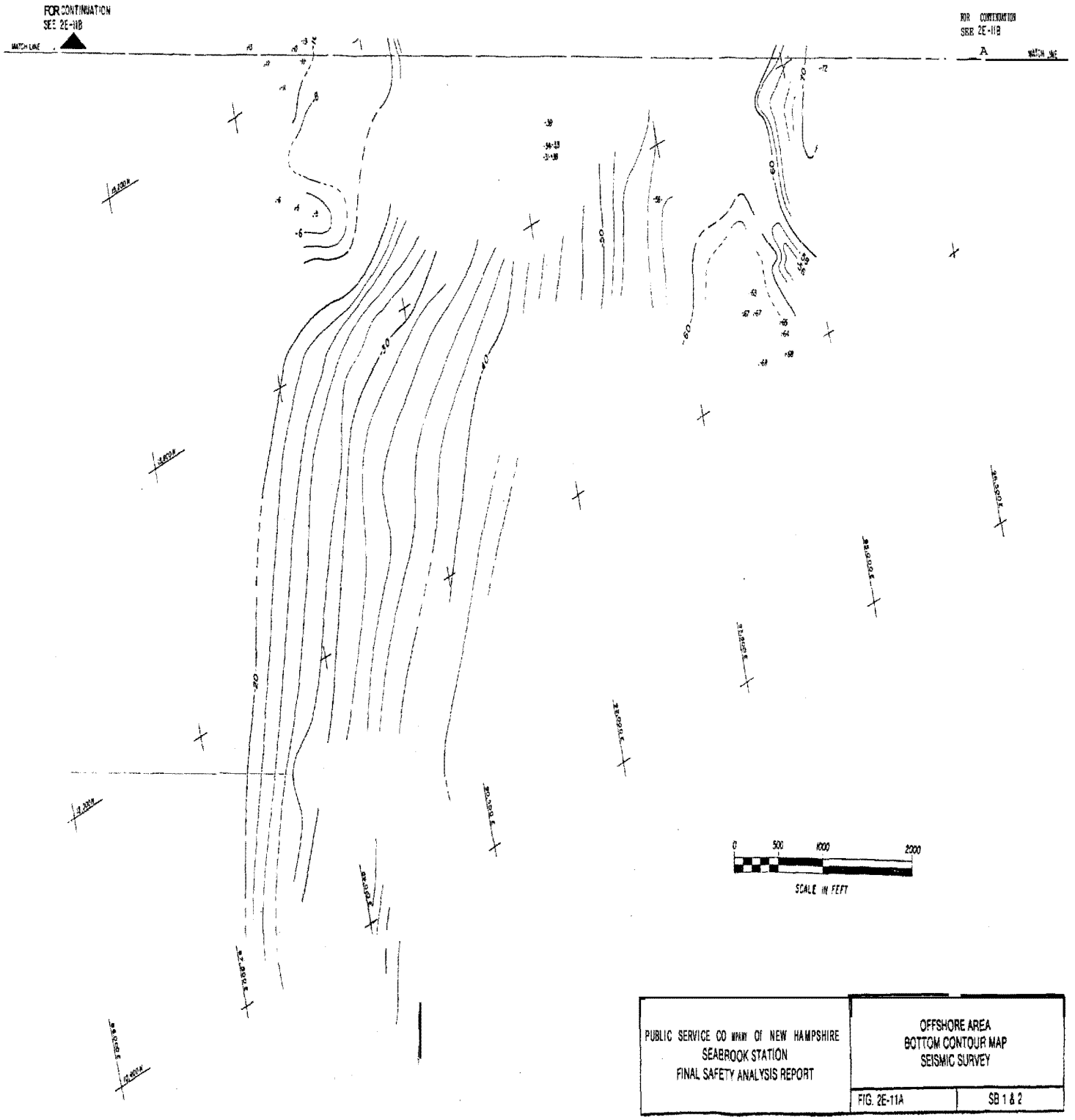
PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE SEABROOK STATION FINAL SAFETY ANALYSIS REPORT	STATE PARK STATE BEACH AREA PROFILE SEISMIC SURVEY
	FIG. 2E-10 SH.1 SB 1 & 2



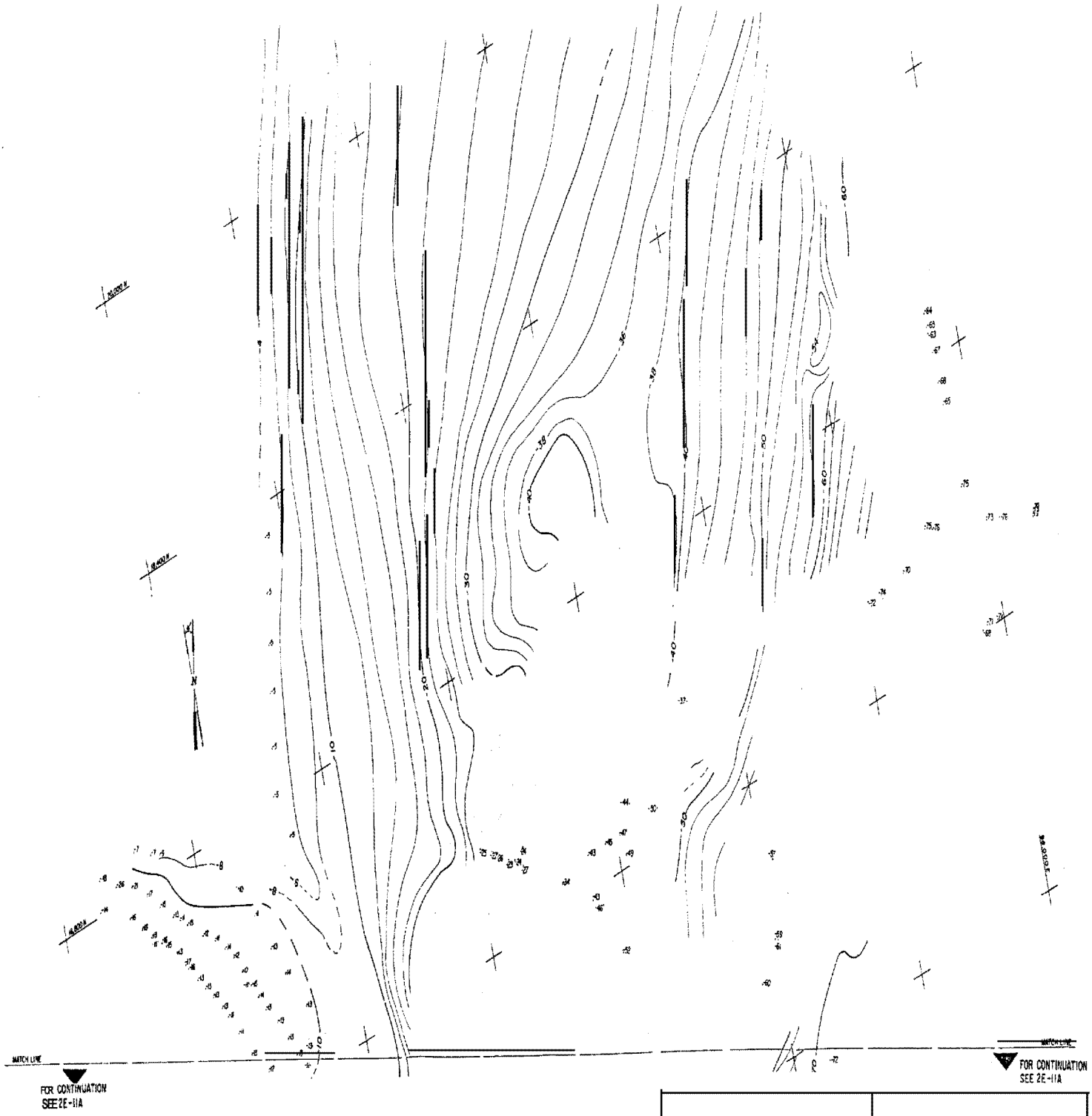
PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE SEABROOK STATION FINAL SAFETY ANALYSIS REPORT	STATE PARK STATE BEACH AREA PROFILE SEISMIC SURVEY		
	FIG. 2E-10	SH2	SB 1 & 2



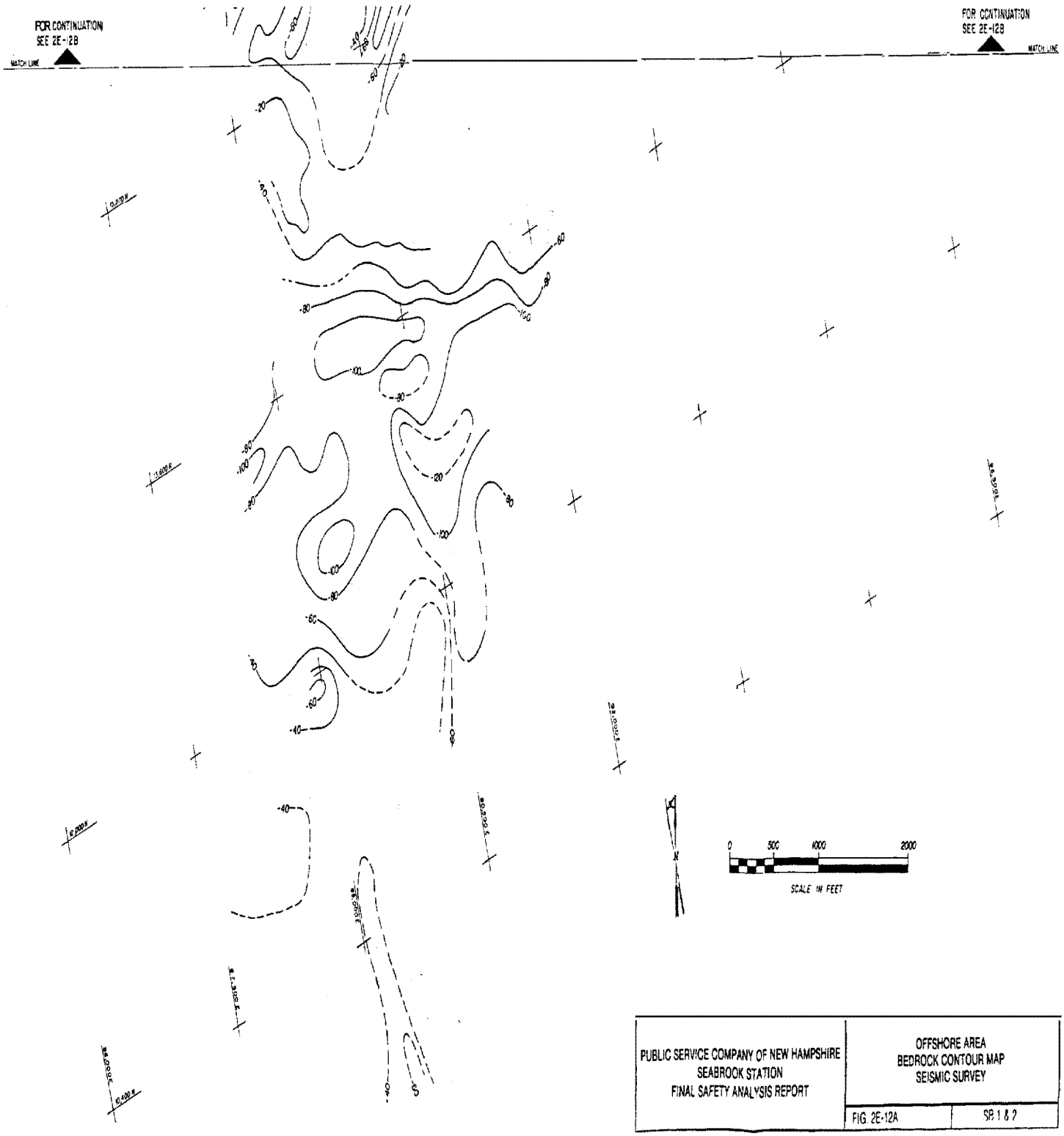
PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE SEABROOK STATION FINAL SAFETY ANALYSIS REPORT	STATE PARK STATE BEACH AREA PROFILE SEISMIC SURVEY		
	FIG. 2E-10	SH.3	SB 1 & 2



PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE SEABROOK STATION FINAL SAFETY ANALYSIS REPORT	OFFSHORE AREA BOTTOM CONTOUR MAP SEISMIC SURVEY
	FIG. 2E-11A | SB 1 & 2



PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE SEABROOK STATION FINAL SAFETY ANALYSIS REPORT	OFFSHORE AREA BOTTOM CONTOUR MAP SEISMIC SURVEY
	FIG 2E-11B SB 1 & 2



PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE SEABROOK STATION FINAL SAFETY ANALYSIS REPORT	OFFSHORE AREA BEDROCK CONTOUR MAP SEISMIC SURVEY	
	FIG. 2E-12A	SB 1 & 2

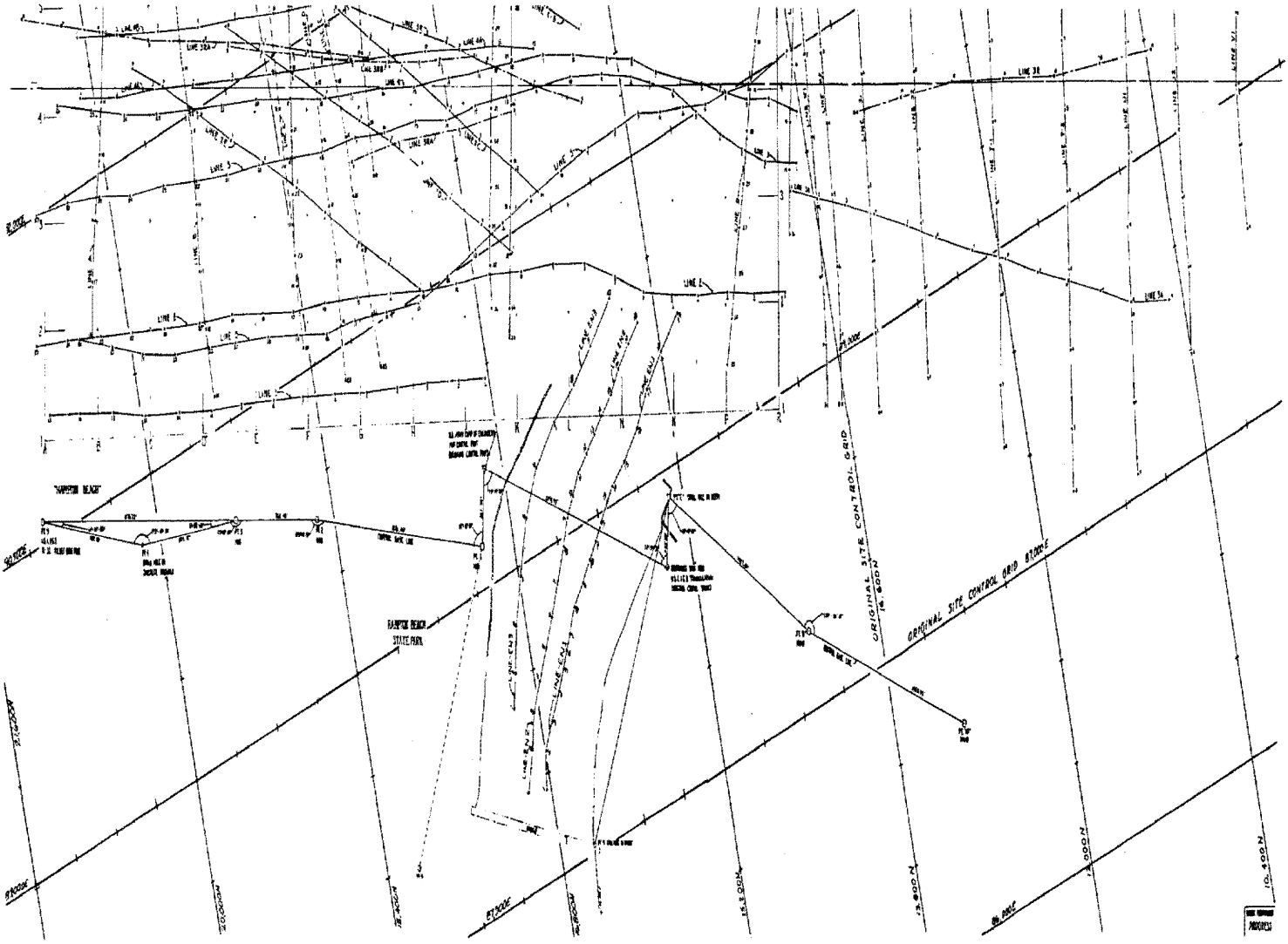
PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE SEABROOK STATION FINAL SAFETY ANALYSIS REPORT	OFFSHORE AREA BEDROCK CONTOUR MAP SEISMIC SURVEY	
	FIG. 2E-12B	SB 1 & 2

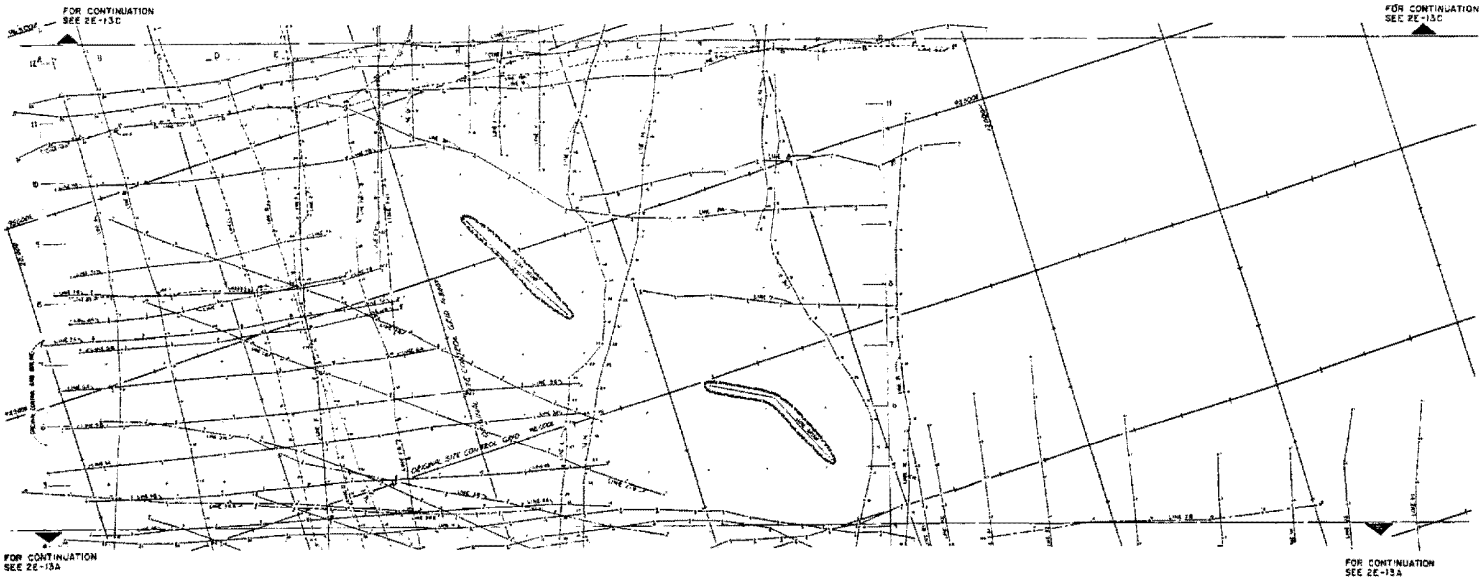
FOR CONTINUATION
SEE 2E-13B

A

FOR CONTINUATION
SEE 2E-13B

A





PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE SEABROOK STATION FINAL SAFETY ANALYSIS REPORT	OFFSHORE AREA TRACK MAP REFLECTION AND REFRACTION SEISMIC SURVEY	
	FIG. 2E-13B	SB 1 & 2