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UHRIG,R.E. Florida Power & Light Co.
RECIP.NAME RECIPIENT AFFILIATION
EISENHUT,D.G. Division of Licensing

SUBJECT: Forwards interpretation of processed data ne marine sejsmic investigation conducted during Jul 1981. Changes to FSAR resulting from interpretation of data will be included in Amend 10 of FSAR.

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	NRR/DSI/CSB	09	1	1	NRR/DSI/ETSB	12	1	1
	NRR/DSI/ICSB	16	1	1	NRR/DSI/PSB	19	1	1
	NRR/DSI/RAB	22	1	1	NRR/DSI/RSB	23	1	1
	NRR/DST/LGB	33	1	1	REG FILE	04	1	1
	RGN2		2	2	RM/DDAMI/MIB		1	0
EXTERNAL:	ACRS	41	10	10	BNL(AMDTS ONLY)		1	1
	DMB/DSS (AMDTS)		1	1	FEMA-REP DIV	39	1	1
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	NSIC	05	1	1	NTIS		1	1

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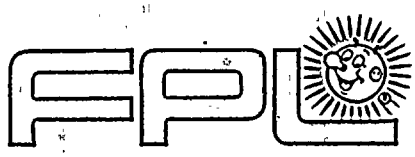

FLORIDA POWER & LIGHT COMPANY

July 15, 1982
L-82-290

Office of Nuclear Reactor Regulations
Attention: Mr. Darrell G. Eisenhut, Director
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Eisenhut:

Re: St. Lucie Unit No. 2
Docket No. 50-389
Marine Seismic Investigation
Interpretation of Processed Data

In July of 1981 FPL conducted a marine seismic investigation in the vicinity of the St. Lucie site. After a preliminary review of the results of that investigation, the NRC staff requested that the collected data be filtered and processed. All the seismic lines for which data was available on magnetic tape (lines 3, 4, 4.1, 5, 5.1, 6B, 6.1, 7 and a portion of 8.1) have been processed. The interpretations of these lines are enclosed herewith as figures 2.5-42p through 2.5-42aa.

Also enclosed you will find FSAR text pages 2.5-40 and 2.5-40a and insert "A" noting the change to the FSAR resulting from the interpretation of the processed data. This change will be included in amendment 10 of the FSAR.

Very truly yours,

Robert E Uhrig

Robert E. Uhrig
Vice President
Advanced Systems and Technology

REU/RAK/cab

cc: J. P. O'reilly, Region II
Harold F. Reis, Esquire

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a horizontal distance of approximately two miles (1.4°dip). In the area just south of Sebastian Inlet, a monoclinal downwarp occurs as shown on Figures 2.5-42i, 2.5-42j, and 2.5-42k. In this area, the top of limestone slopes downward from elevation minus 200 to minus 700 ft. at a point two miles to the east (2.9°dip). Figure 2.5-42c shows a monoclinal downwarp under Big Mud Creek adjacent to the site with closure on the order of 150 ft over a horizontal distance of one mile (1.7°dip).

Local variations in depth to the top of the reflector (Suwannee limestone) were the basic for the hypothesized faults in Martin County and Indian River County. In Indian River County, one of the faults hypothesized by Bermes, and which showed apparent offsets in limestone on the order of 225 ft., was investigated by reflection profile lines crossing between three key boring locations. This area is described above as an area of warping near Sebastian Inlet. The reflection profile shows locally strong dips of up to 250 ft. per mile in the top of the limestone. This variation correlates with logs of the three borings used by Bermes, and the reflection profiles show continuous beds with no evidence of faulting. | 7

The reflection profile crossing Vernon's postulated extention of Lichtler's fault in Martin County provides only sketchy data for subsurface structure determination. However, as shown on Figure 2.5-42o, the data has the same pattern of reflectors as found throughout the seismic reflection survey. | 0

The decrease in elevation in the top of limestone to the southeast is typical of the regional dip, and shows an elevation decrease of about 100 ft. eastward over a horizontal distance of approximately three miles. This is consistent with variations in elevation of the top of limestone found in the adjacent St Lucie Inlet. Therefore, it is concluded that faulting does not exist at this location. | 0

Following assimilation of the aforementioned data, a meeting was held (1974) with Bermes and Lichtler to discuss the correlation and significance of this additional data relative to previously published structure. Both Bermes and Lichtler agree that no significant offsets exist anywhere along the approximately 50 miles of reflection profiles.

In the 1981 survey, five seismic reflectors were traced throughout the survey area. These reflectors were correlated with borings on Hutchinson Island and the mainland (MF-3, MF-28, MF-31, MF-35 and SLF-28) (Figure 2.5-15). The three upper reflectors lie within the Hawthorne Formation but were not correlatable to any particular horizon due to the absence of distinguishing characteristics in geophysical logs throughout the Hawthorne Formation. The two lower reflectors correspond to the base of the Hawthorne Formation (top of limestone) and to the top of the Ocala Group. As observed in the 1974 study, all reflecting horizons increase in depth to the southeast. | 7

No faulting was observed on any of the seismic profiles within the resolution of the recording system, which is 10-15 ft. The most prominent features on the profiles are monoclinal flexures and undulations in the reflectors. ~~These are most apparent on lines 2, 3, 5 and 6(B) (Figures 2.5-42p, 2.5-42q, 2.5-42u and 2.5-42w. The dip of the upper horizons (base of Hawthorne Formation and above) on these features averages 150 ft. per~~ mile

INSERT "A"

INSERT "A" CONTINUED

~~but increases to over 400 ft. per mile on line 2 and line 6(B). The top of the Ocala Group generally has a steeper dip than the overlying horizons (Figures 2.5-42p, 2.5-42q, 2.5-42u and 2.5-42w, and reaches about 550 to 850 ft. per mile on lines 2 and 6(B) (Figures 2.5-42p and 2.5-42w).~~ 7

The faulting proposed by Armstrong(80) was defined on the basis of three sets of boring profiles, with east-west alignments, located north of St Lucie Inlet in Martin County. The following strata were postulated by Armstrong as being offset by the fault: The Ocala Group (Eocene), the "Unnamed Limestone" (Early Oligocene) and the Hawthorne Formation (Late Oligocene-Early Miocene). The offsets Armstrong attributed to faulting vary between the different horizons and from one profile to another. The "Unnamed Limestone" was first defined by Mooney(108) on the basis of cuttings and fossil evidence. Armstrong(80) divided the "Unnamed Limestone" into an "A" and a "B" unit and used a phosphorite bed in the "B" unit as a marker on gamma logs. The upper surface of the "Unnamed Limestone" is an unconformity which represents an erosion surface during the Oligocene.

The seismic reflection profiles were correlated with several of the same wells used by Armstrong in defining his fault (MF-3, MF-31, MF-28 and MF-35). The base of the Hawthorne Formation shown on the interpreted depth sections (Figures 2.5-42p through 2.5-42aa) corresponds to the top of the Armstrong's "Unnamed Limestone" and the top of the Ocala Group corresponds to Armstrong's top of Ocala. Seismic profile lines 4, 5, 6, and 7 (Figures 2.5-42s, 2.5-42u, 2.5-42w and 2.5-42y cross the Fault of the hypothesized Hutchinson Island Fault and show no offset in the strata Armstrong postulated as being faulted. The changes in elevations of strata between wells used by Armstrong in defining his fault would necessitate dips of up to 450 ft. per mile in the Hawthorne Formation and of up to 750 ft. per mile in the Ocala Group if no fault was present. The seismic data indicate that these magnitudes in dips are present in the study area and that the undulations of the strata are widespread in the area.

In summary, a sequence of roughly parallel layers in a fairly uniform pattern has been traced from St Lucie Inlet south of the St Lucie plant, northward and adjacent to the plant site, to Sebastian Inlet, approximately 30 miles north of the plant site. No faults of any kind were found in the sediment sequence; however, several areas of localized and possibly connected warping were found. 7 0

Warping apparently took place from the Eocene to middle Miocene Epochs, as evidenced in the various relationships of bedding in the Miocene Hawthorne formation to the limestone surface below. There does not appear to be any evidence for recent warping since the seismic reflector identified as top of the Miocene (Hawthorne) appeared to be nearly horizontal over the entire survey area. 0

Utilizing all of the data obtained, it is concluded that faulting does not exist in the vicinity of the St Lucie plant. 4

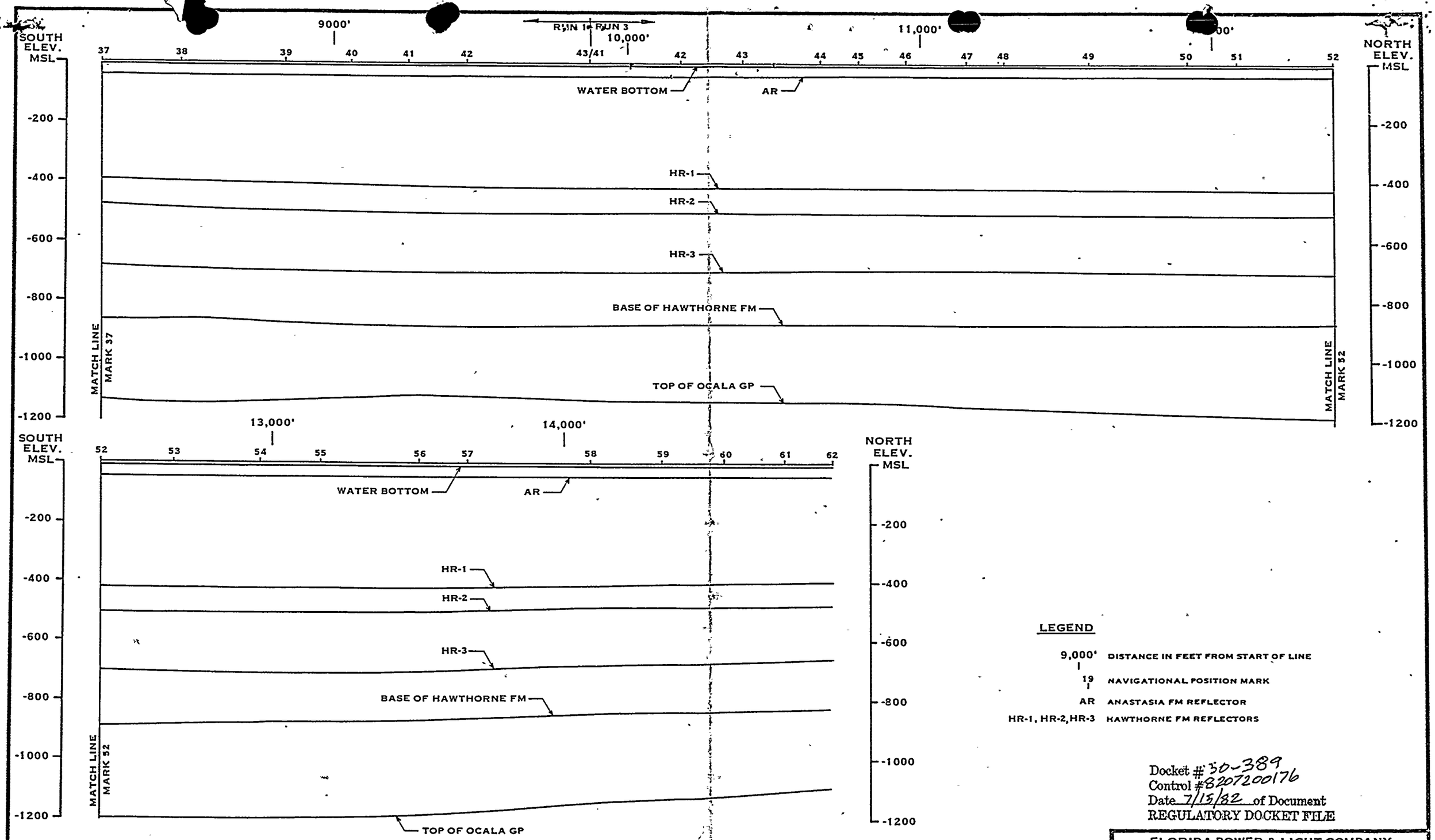
2.5.3.3 Capable Faults

No capable faults have been recognized within the 200 mile-radius circle around the site. 4

Insert "A" to St. Lucie Unit 2 FSAR

Pages 2.5-40 and 2.5-40a

These flexures are most apparent on lines 2, 3, and 6(b) (Figures 2.5-42p, q, and w). The apparent dip of the base of the Hawthorne Formation averages about 59 feet per mile and ranges from over 400 to nearly 1,000 feet per mile at certain points along lines 2, 3, 4 and 9 (Figures 2.5-42p, q, s and aa). The apparent dip of the top of the Ocala Group, which is generally steeper than the dips of the overlying horizons, averages about 123 feet per mile but reaches over 1,000 feet per mile on lines 2 and 9 (Figures 2.5-42p and aa).

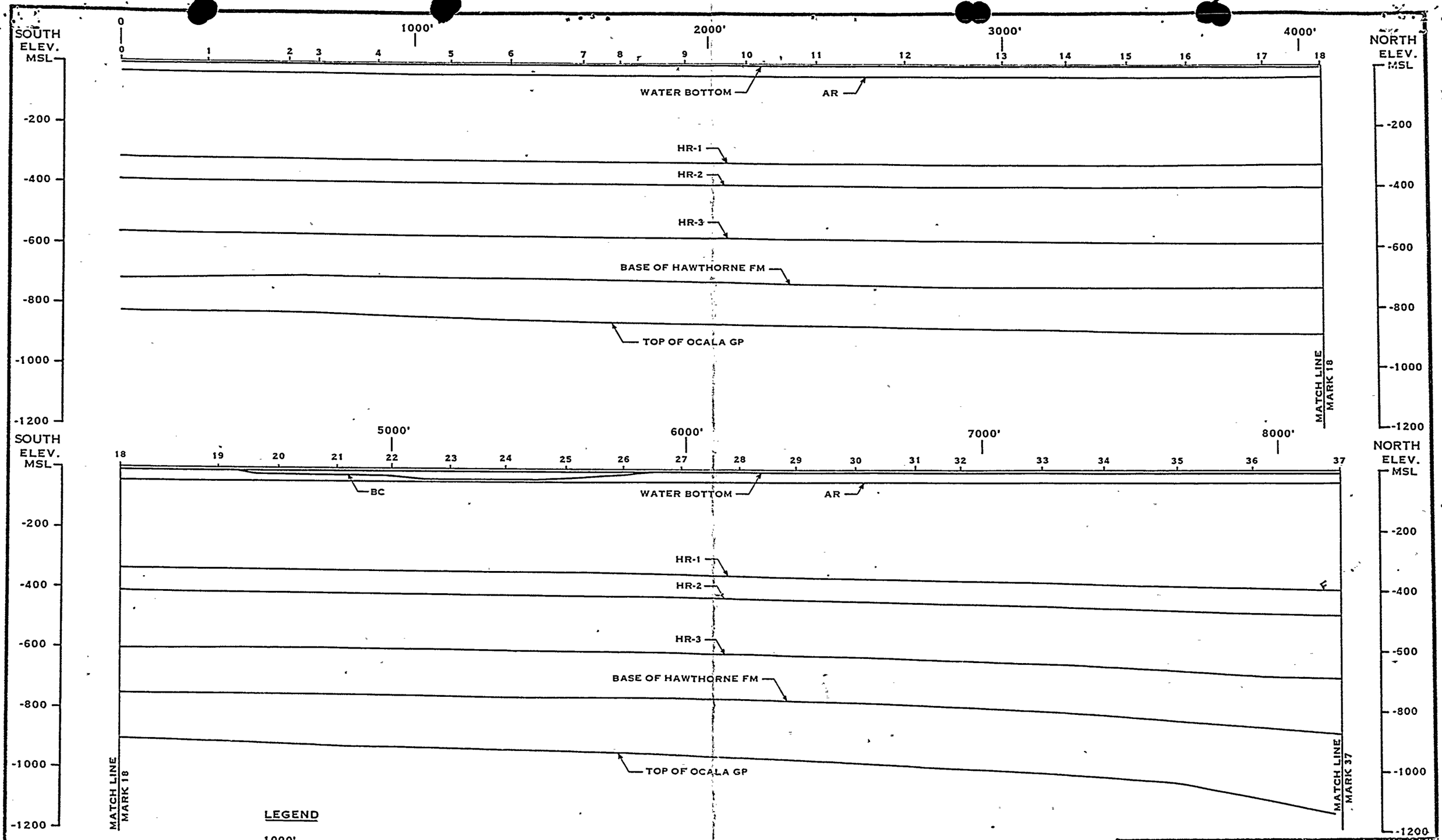


LEGEND

9,000'	DISTANCE IN FEET FROM START OF LINE
19	NAVIGATIONAL POSITION MARK
AR	ANASTASIA FM REFLECTOR
HR-1, HR-2, HR-3	HAWTHORNE FM REFLECTORS

FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

SEISMIC PROFILE - LINE 9
AIRGUN ENERGY SOURCE
SHEET 2 OF 2
FIGURE 2.5-42aa



LEGEND

1000' |	DISTANCE IN FEET FROM START OF LINE		
19 |	NAVIGATIONAL POSITION MARK	AR	ANASTASIA FM REFLECTOR
BC	BURIED CHANNEL	HR-1, HR-2, HR-3	HAWTHORNE FM REFLECTORS

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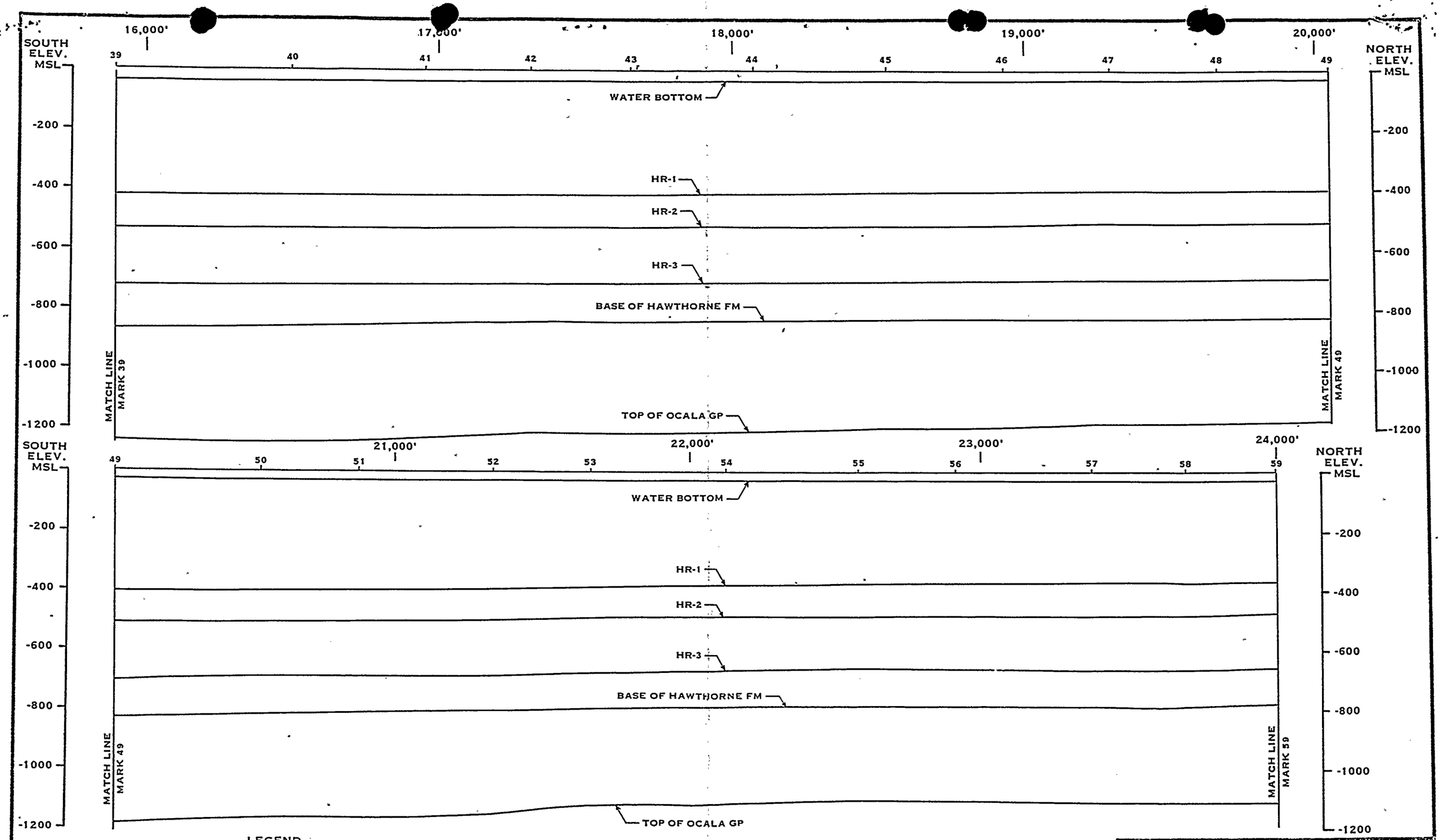
SEISMIC PROFILE - LINE 9
AIRGUN ENERGY SOURCE
SHEET 1 OF 2
FIGURE 2 5-42aa



LEGEND

16,000' — DISTANCE IN FEET FROM START OF LINE

41 — NAVIGATIONAL POSITION MARK

HR-1, HR-2, HR-3 — HAWTHORNE FM REFLECTORS

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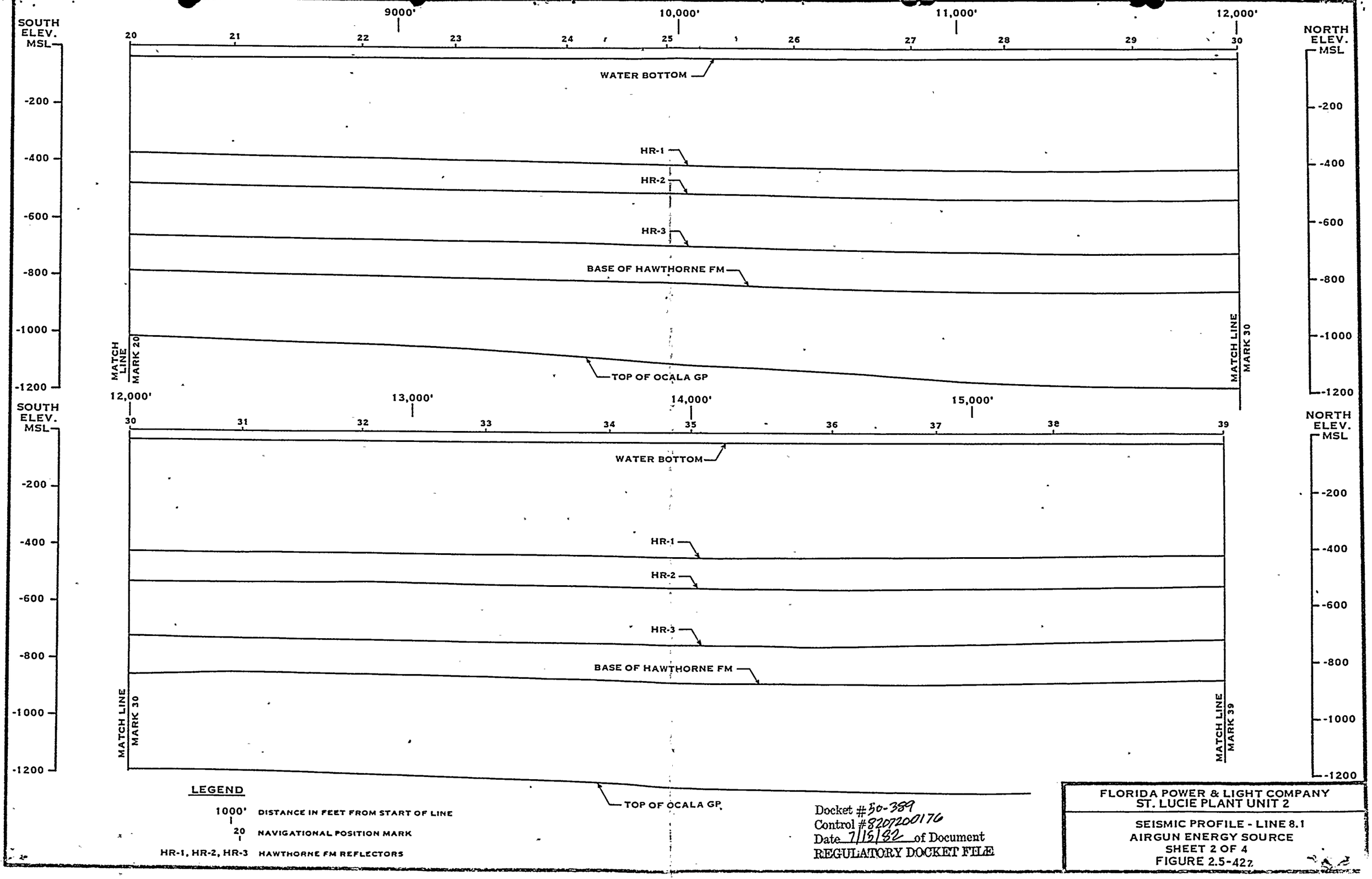
ST. LUCIE PLANT UNIT 2

SEISMIC PROFILE - LINE 8.1
AIRGUN ENERGY SOURCE
SHEET 3 OF 4
FIGURE 2.5-42z



LEGEND

1000' — DISTANCE IN FEET FROM START OF LINE

20 — NAVIGATIONAL POSITION MARK

HR-1, HR-2, HR-3 — HAWTHORNE FM REFLECTORS

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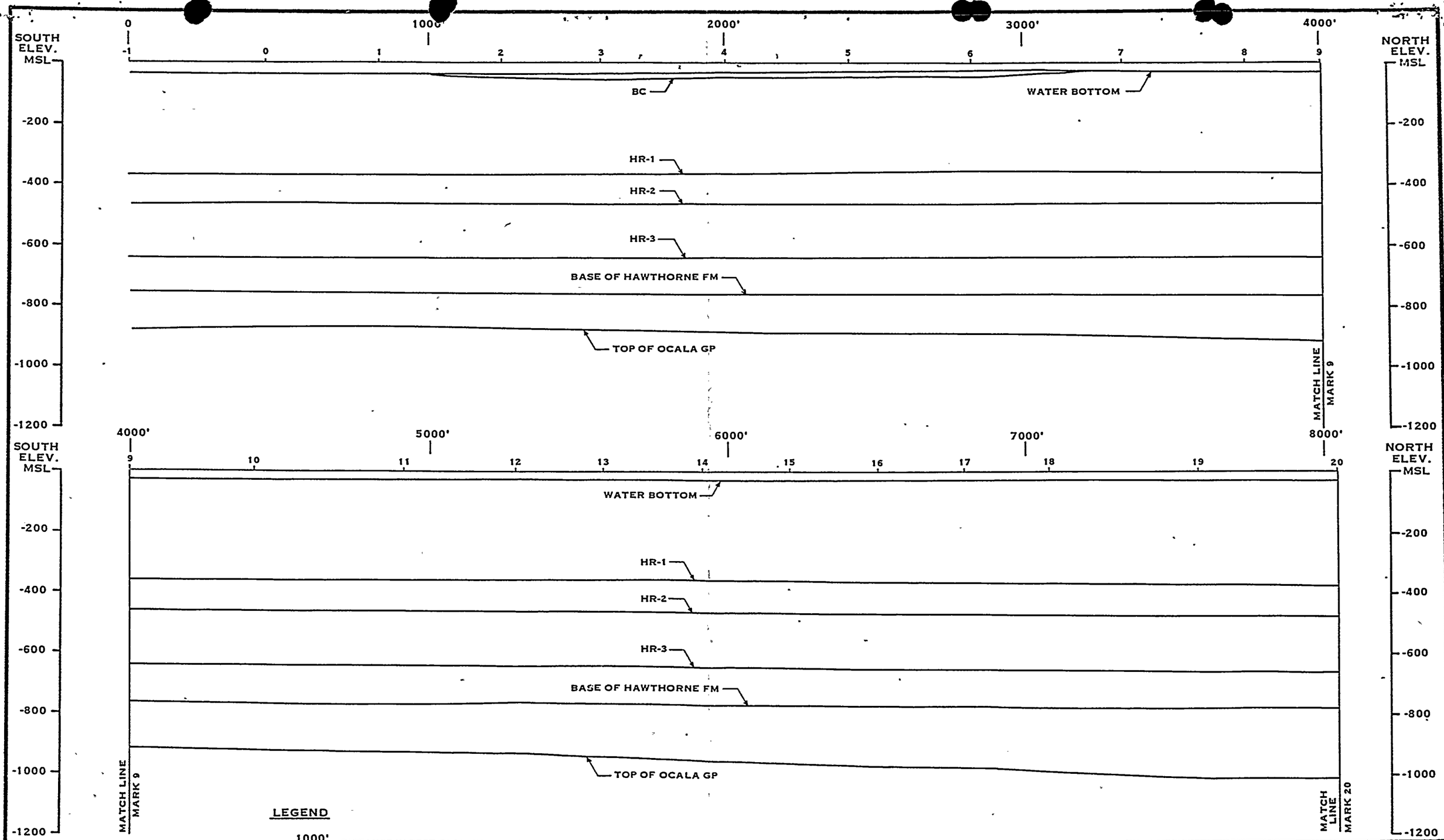
ST. LUCIE PLANT UNIT 2

SEISMIC PROFILE - LINE 8.1
AIRGUN ENERGY SOURCE
SHEET 2 OF 4
FIGURE 2.5-42z



LEGEND

1000'	DISTANCE IN FEET FROM START OF LINE
19	NAVIGATIONAL POSITION MARK
BC	BURIED CHANNEL
HR-1, HR-2, HR-3	HAWTHORNE FM REFLECTORS

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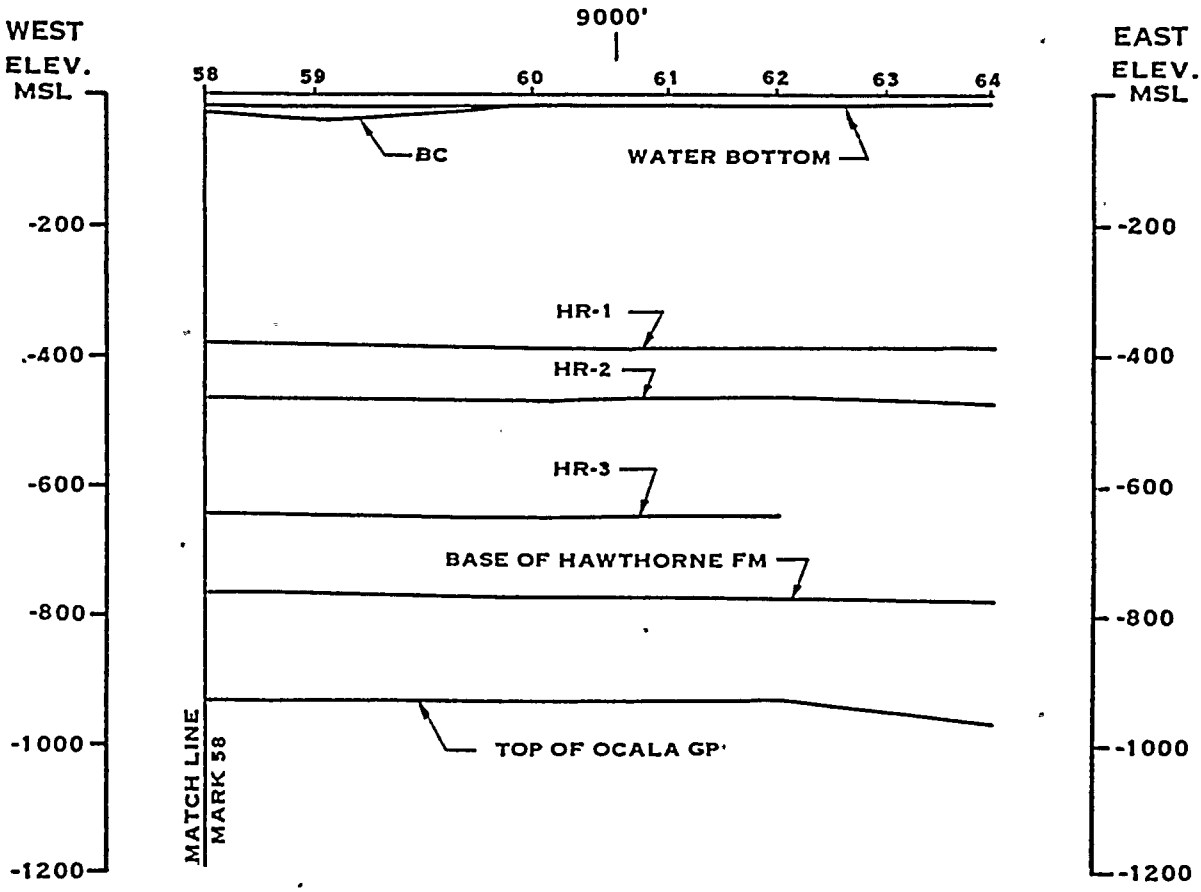
FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

SEISMIC PROFILE - LINE 8.1
AIRGUN ENERGY SOURCE
SHEET 1 OF 4
FIGURE 2.5-42z



LEGEND

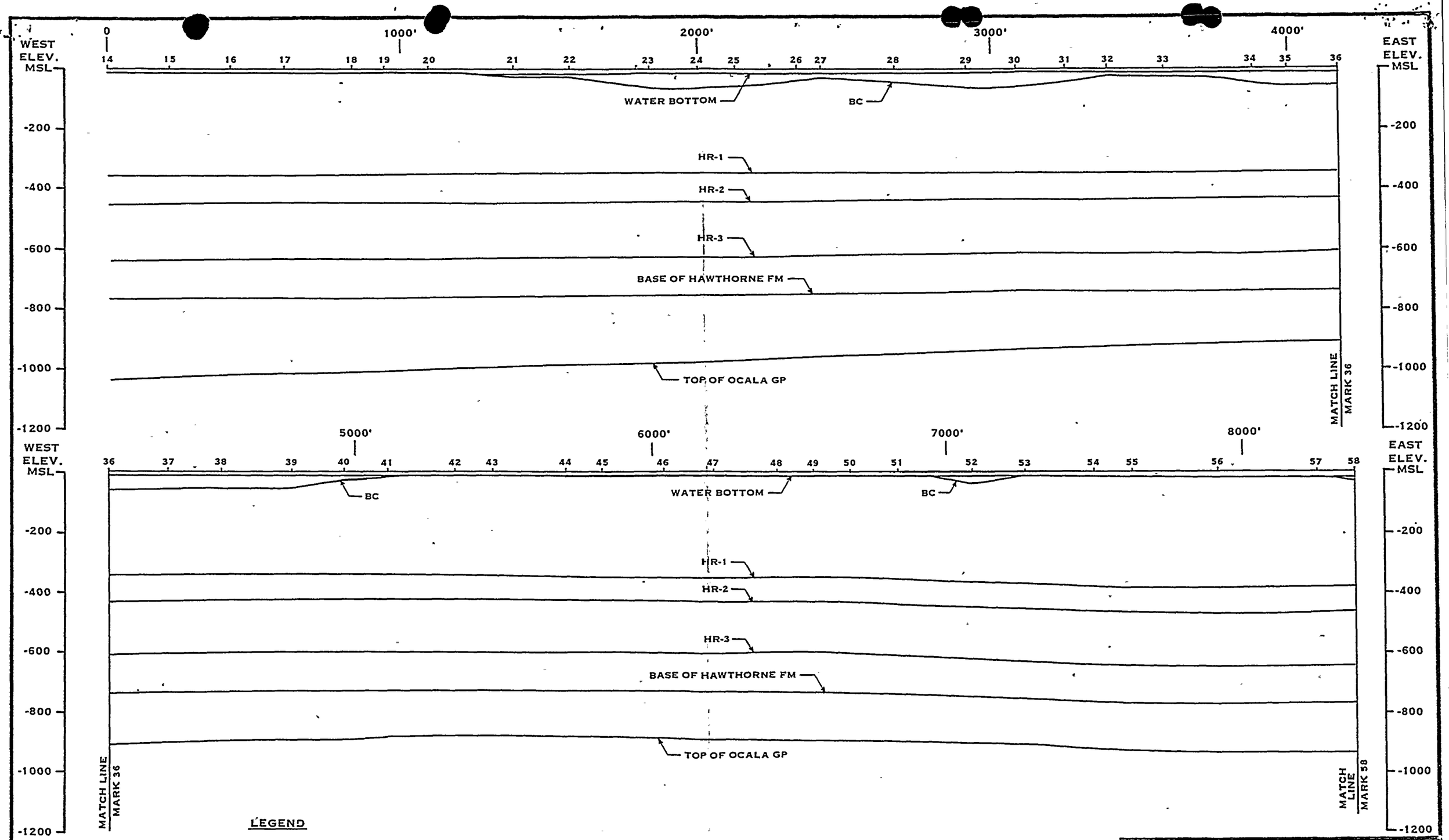
9000'	DISTANCE IN FEET FROM START OF LINE
61	NAVIGATIONAL POSITION MARK
BC	BURIED CHANNEL
HR-1, HR-2, HR-3	HAWTHORNE FM REFLECTORS

NOTE

BOTTOM CONDITIONS CAUSED LOSS OF SIGNAL BETWEEN POSITION MARKS 63 AND 73

FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

SEISMIC PROFILE - LINE 7
AIRGUN ENERGY SOURCE
SHEET 2 OF 2
FIGURE 2.5-42y



LEGEND

1000'	DISTANCE IN FEET FROM START OF LINE
19	NAVIGATIONAL POSITION MARK
BC	BURIED CHANNEL
HR-1, HR-2, HR-3	HAWTHORNE FM REFLECTORS

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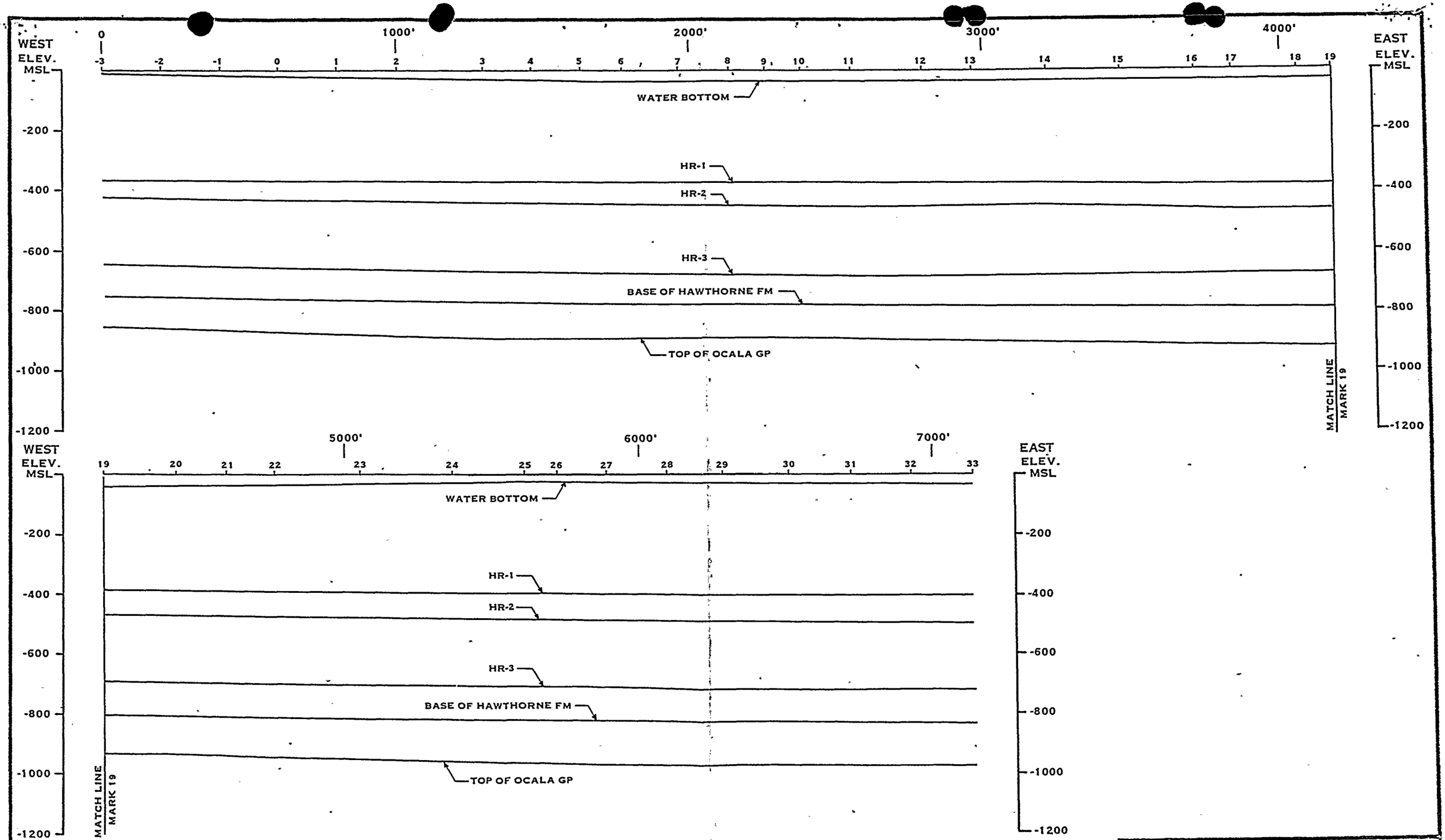
ST. LUCIE PLANT UNIT 2

SEISMIC PROFILE - LINE 7
AIRGUN ENERGY SOURCE
SHEET 1 OF 2
FIGURE 2.5-42y



LEGEND

1000'	DISTANCE IN FEET FROM START OF LINE
19	NAVIGATIONAL POSITION MARK
HR-1, HR-2, HR-3	HAWTHORNE FM REFLECTORS

FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

SEISMIC PROFILE - LINE S.1
AIRGUN ENERGY SOURCE

FIGURE 2.5-42

WEST ELEV. MSL

0 1000 2000' 3000' 4000'

10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27

BC WATER BOTTOM AR

HR-1

HR-2

HR-3

BASE OF HAWTHORNE FM

TOP OF OCALA GP

-200 -400 -600 -800 -1000 -1200

EAST ELEV. MSL

MATCH LINE MARK 27

WEST ELEV. MSL

5000' 6000' 7000'

27 28 29 30 31 32 33 34 35 36 37 38 39

WATER BOTTOM AR BC

HR-1

HR-2

HR-3

BASE OF HAWTHORNE FM

TOP OF OCALA GP

-200 -400 -600 -800 -1000 -1200

EAST ELEV. MSL

MATCH LINE MARK 27

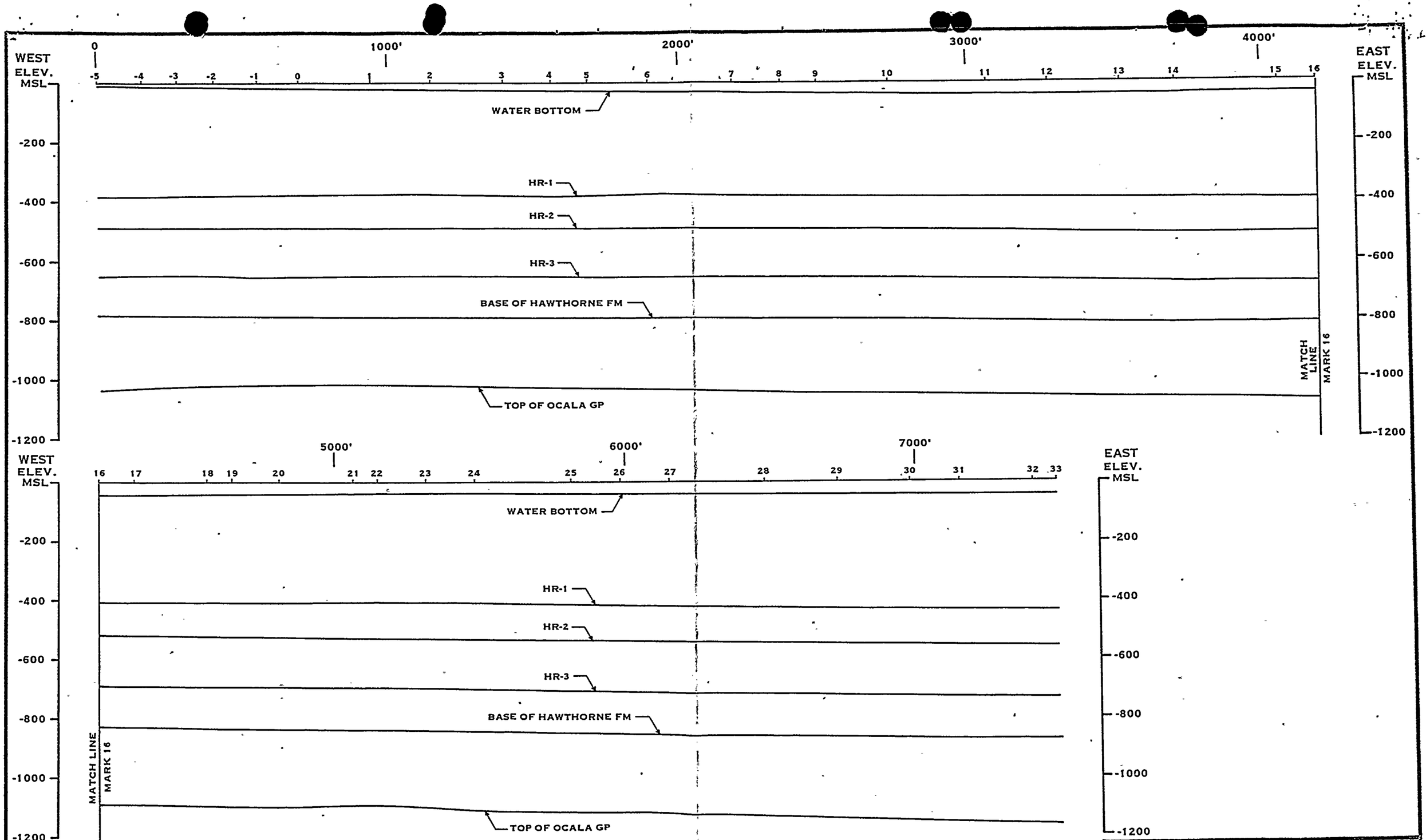
LEGEND

1000'	DISTANCE IN FEET FROM START OF LINE
19	NAVIGATIONAL POSITION MARK
BC	BURIED CHANNEL
AR	ANASTASIA FM REFLECTOR
HR-1, HR-2, HR-3	HAWTHORNE FM REFLECTORS

FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

SEISMIC PROFILE - LINE 6B
AIRGUN ENERGY SOURCE

FIGURE 2.5-42w



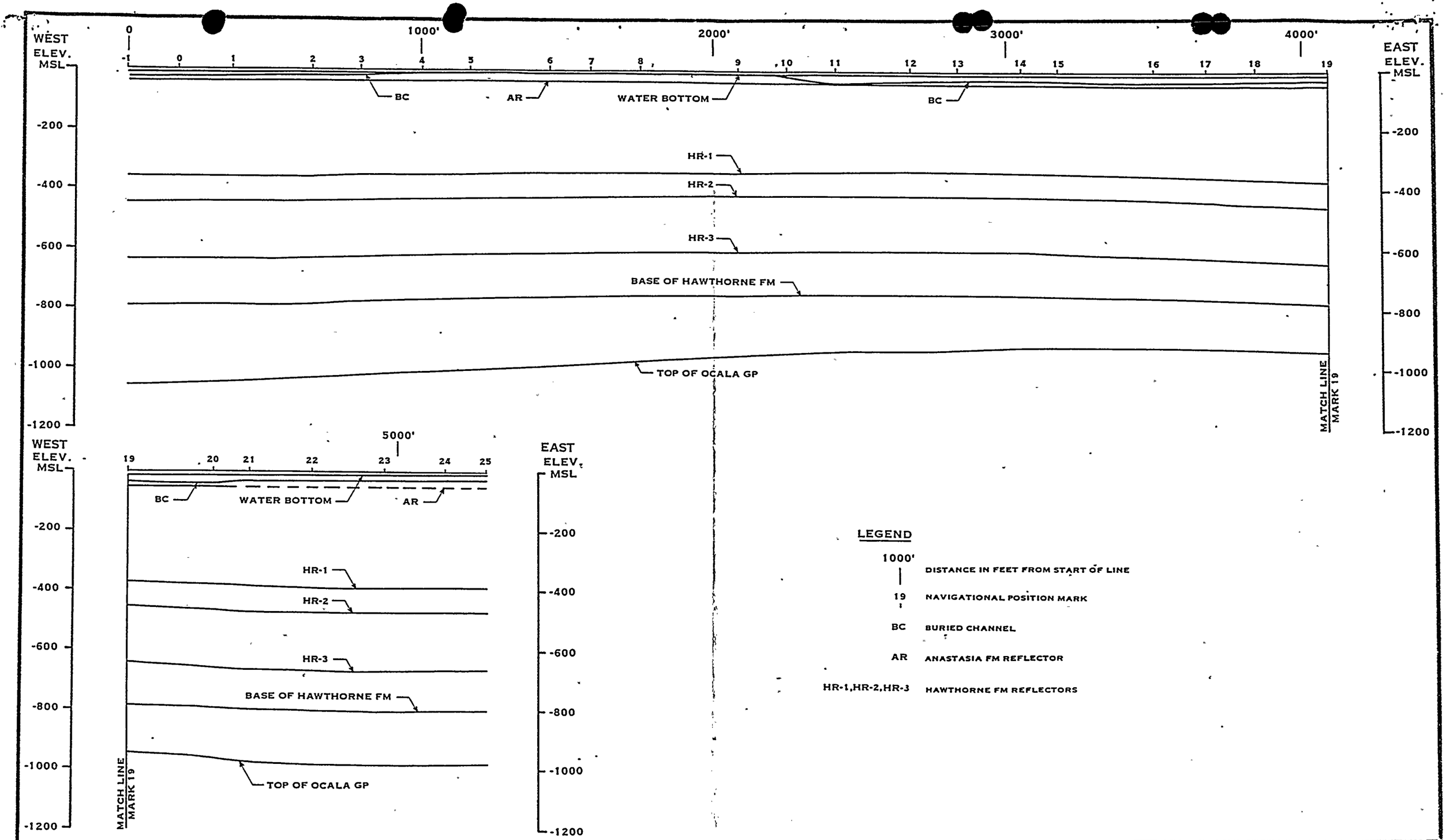
LEGEND

1000'	DISTANCE IN FEET FROM START OF LINE
19	NAVIGATIONAL POSITION MARK
HR-1, HR-2, HR-3	HAWTHORNE FM REFLECTORS

FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

SEISMIC PROFILE - LINE 5.1
AIRGUN ENERGY SOURCE

FIGURE 2.5-42v



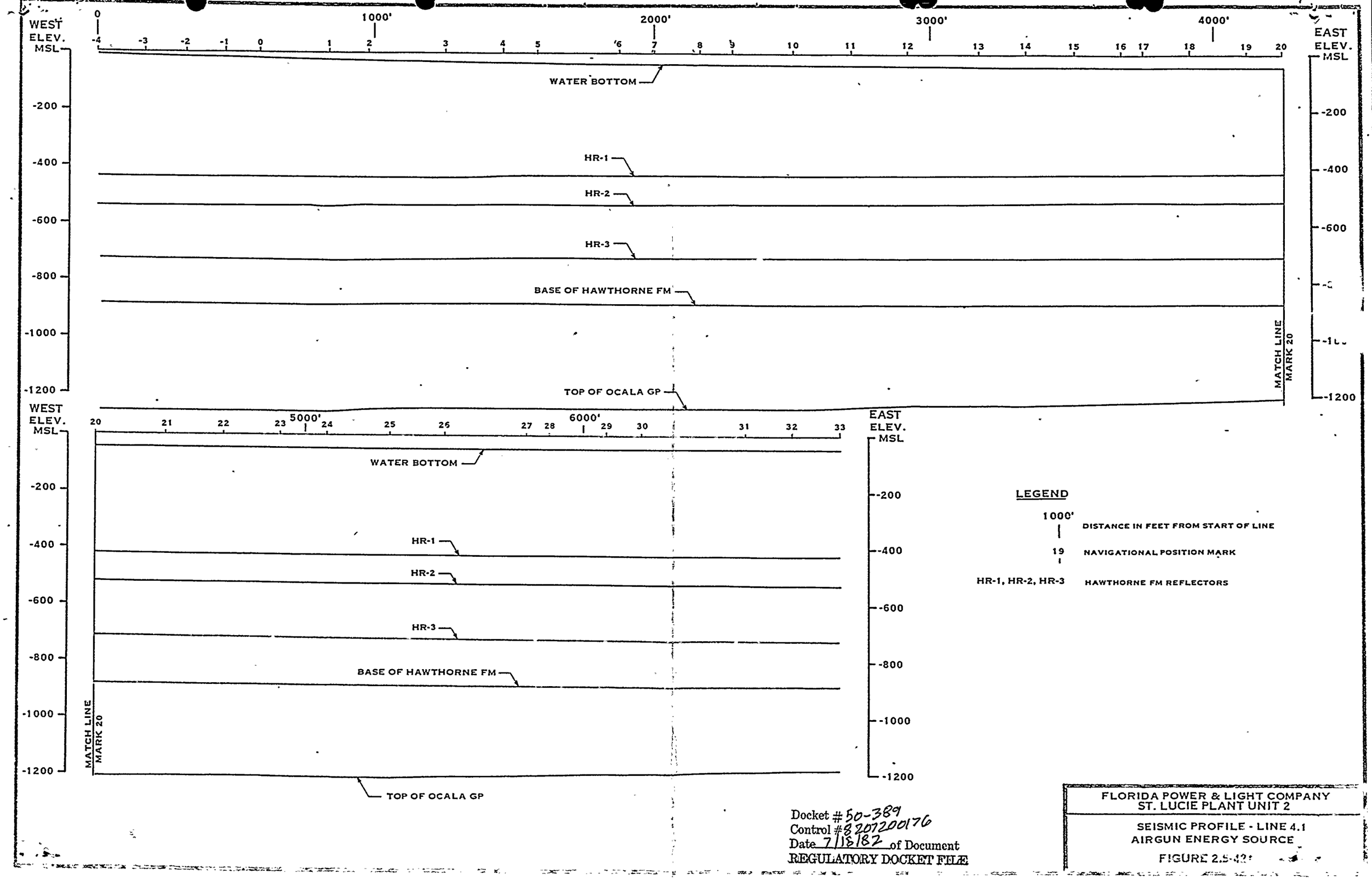
LEGEND

1000'	DISTANCE IN FEET FROM START OF LINE
19	NAVIGATIONAL POSITION MARK
BC	BURIED CHANNEL
AR	ANASTASIA FM REFLECTOR
HR-1,HR-2,HR-3	HAWTHORNE FM REFLECTORS

FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

SEISMIC PROFILE - LINE 5
AIRGUN ENERGY SOURCE

FIGURE 2.5-42u



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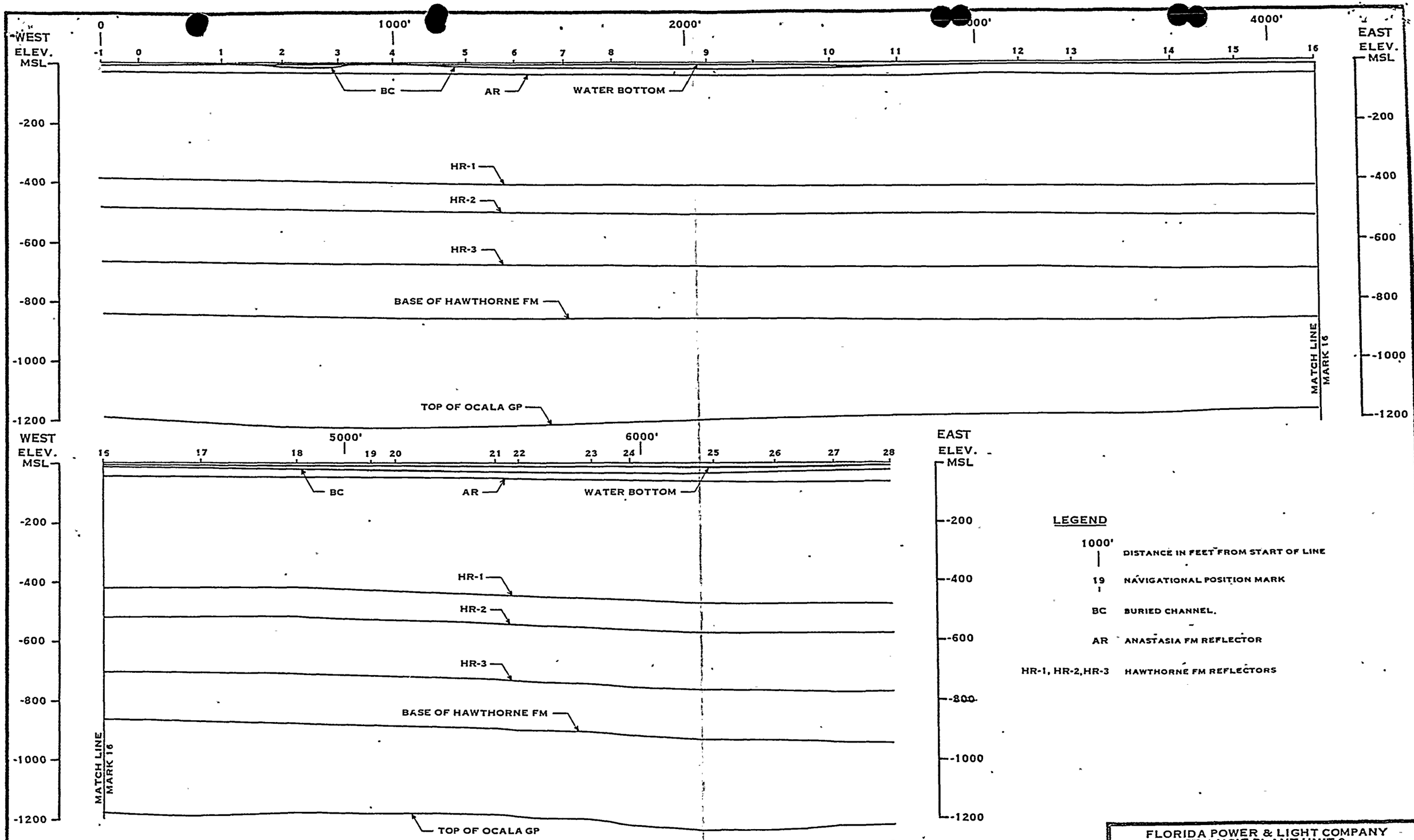
SEISMIC PROFILE - LINE 4.1
AIRGUN ENERGY SOURCE

FIGURE 2.5-42



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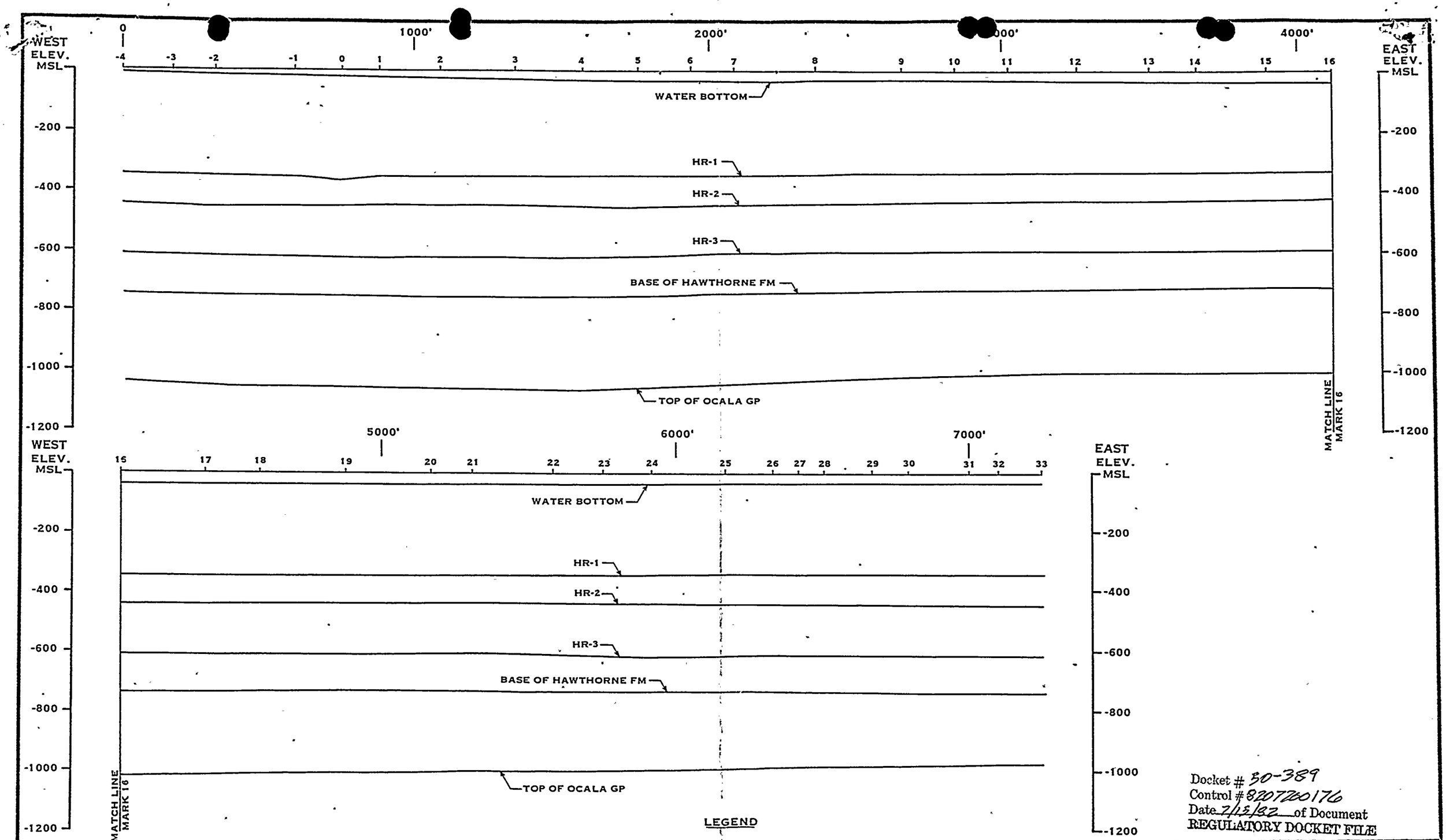
SEISMIC PROFILE - LINE 4
AIRGUN ENERGY SOURCE

FIGURE 2.5-42s



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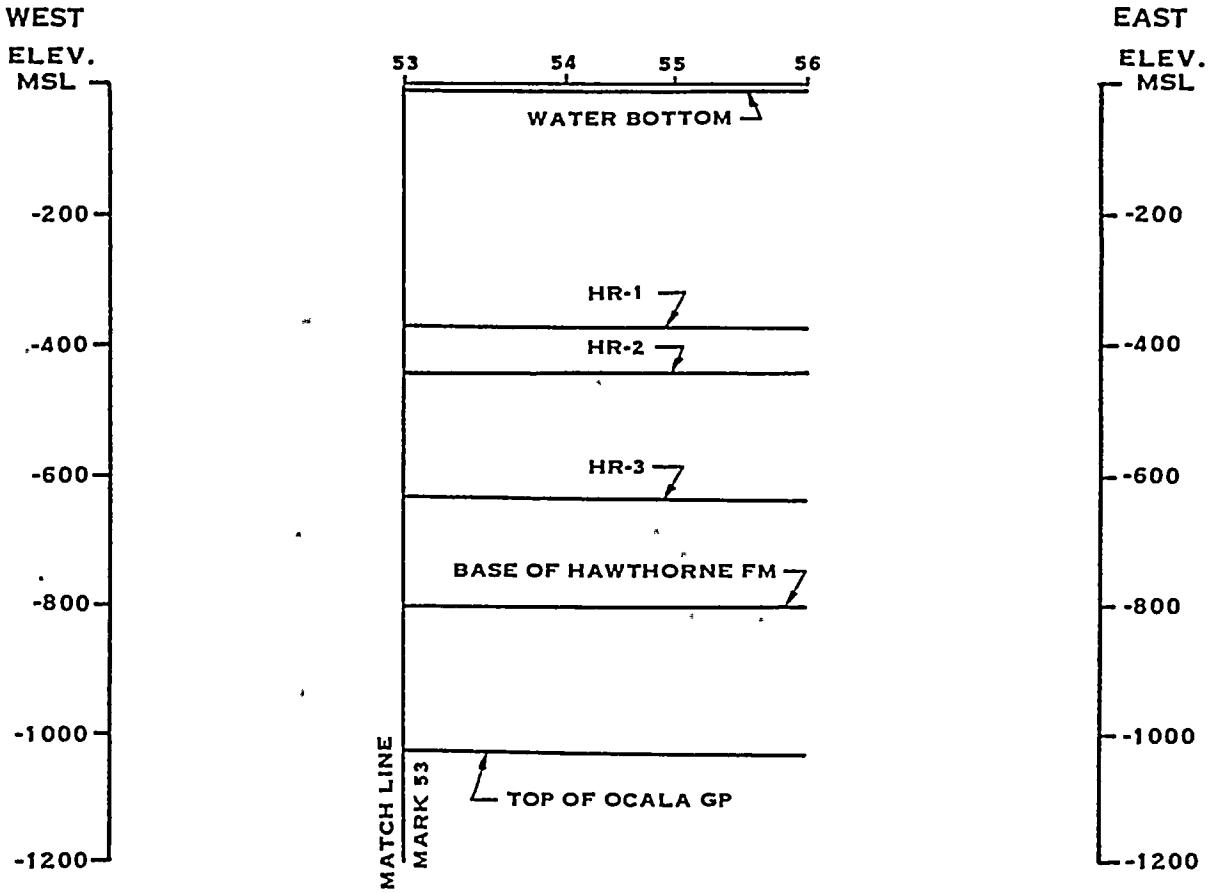
SEISMIC PROFILE - LINE 3.1
AIRGUN ENERGY SOURCE

FIGURE 2.5-42r

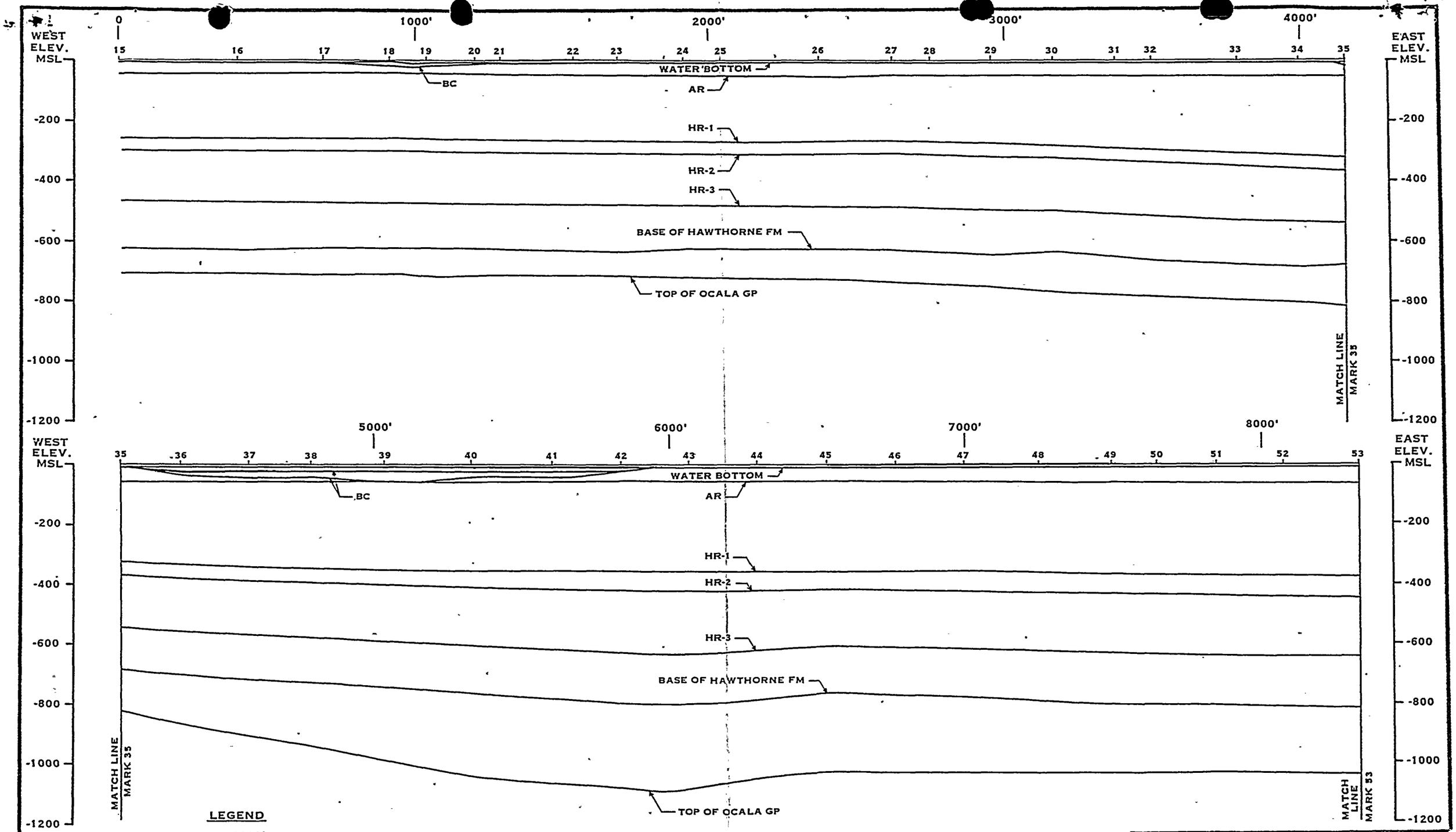


LEGEND

55	NAVIGATIONAL POSITION MARK
HR-1, HR-2, HR-3	HAWTHORNE FM REFLECTORS

FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

SEISMIC PROFILE - LINE 3
AIRGUN ENERGY SOURCE
SHEET 2 OF 2
FIGURE 2.5-42q



LEGEND

1000'	DISTANCE IN FEET FROM START OF LINE
19	NAVIGATIONAL POSITION MARK
BC	BURIED CHANNEL
AR	ANASTASIA FM REFLECTOR
HR-1, HR-2, HR-3	HAWTHORNE FM REFLECTORS

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FLORIDA POWER & LIGHT COMPANY
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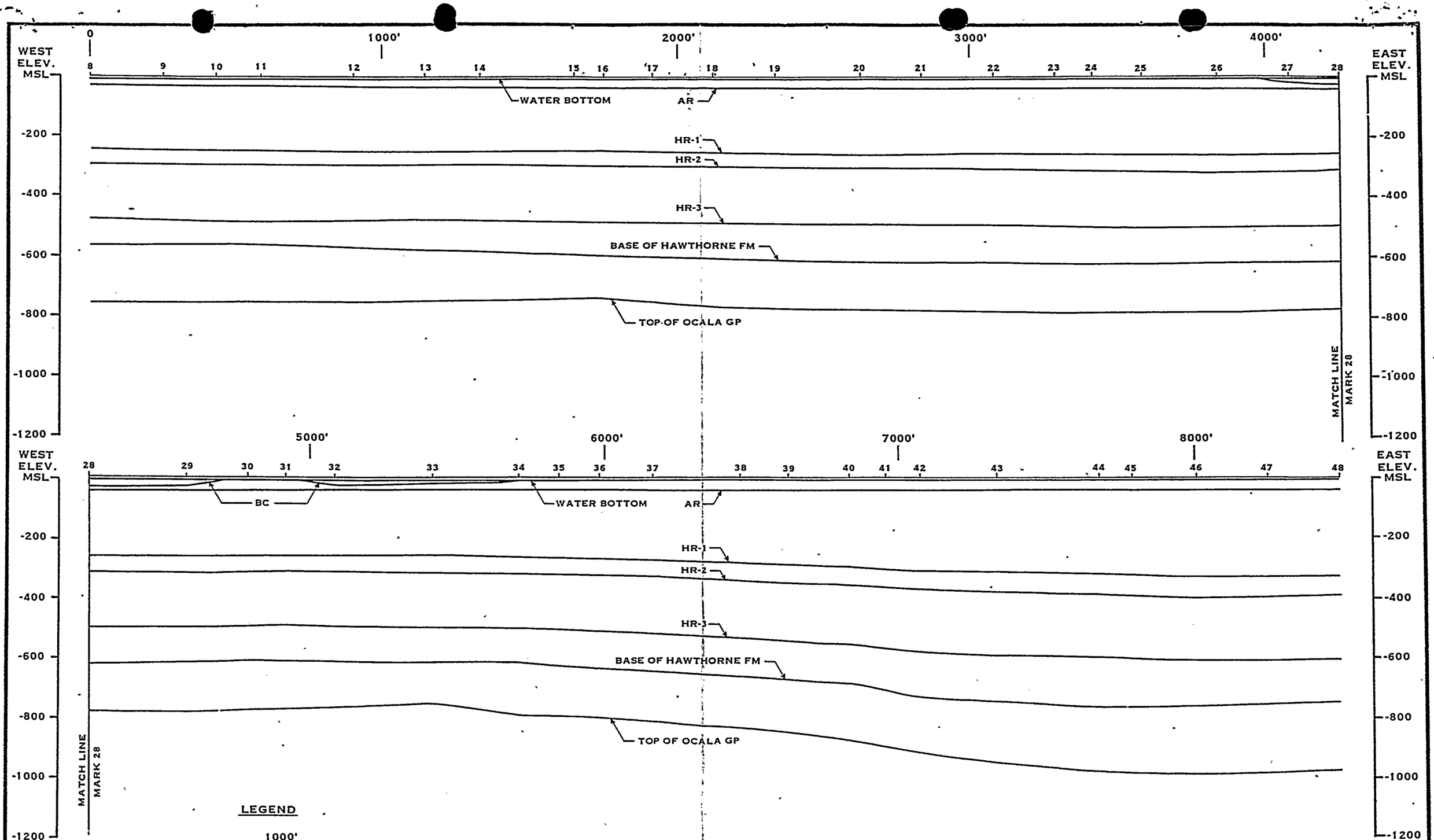
SEISMIC PROFILE - LINE 3
AIRGUN ENERGY SOURCE
SHEET 1 OF 2
FIGURE 2.5-42q



LEGEND

1000'	DISTANCE IN FEET FROM START OF LINE
19	NAVIGATIONAL POSITION MARK
BC	BURIED CHANNEL
AR	ANASTASIA FM REFLECTOR
HR-1, HR-2, HR-3	HAWTHORNE FM REFLECTORS

FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

SEISMIC PROFILE - LINE 2
AIRGUN ENERGY SOURCE

FIGURE 2.5-42p