FE285
WIRE DRAG

Diagram No. 1117

NOAA FORM 76-35A

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SERVICE

DESCRIPTIVE REPORT

Type of Survey Hydrographic

Field No. R/H-20-5-77

Registery No. FE-285WD

LOCALITY

State Texas

General Locality Gulf of Mexico

Sublocality Offshore Freeport

1977

CHIEF OF PARTY
LCDR R.V.Smart

LIBRARY & ARCHIVES

DATE January 14, 1987

☆U.S. GOV. PRINTING OFFICE: 1985—566-054

FE285
WIRE DRAG

a-3
CHTS
11321
11330
11300
11340
411

TO SIGN OFF SEE
"RECORD OF APPLICATION"

FORM C&GS-537
(5-66)

U.S. DEPARTMENT OF COMMERCE
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
COAST AND GEODETIC SURVEY

REGISTER NO.

FE-285WD

HYDROGRAPHIC TITLE SHEET

INSTRUCTIONS - The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

FIELD NO.

R/H-
20-5-77, ~~20-6-77, 20-8-77~~

State TEXAS

General locality GULF OF MEXICO

Locality ~~SEADOCK~~ Offshore Freeport

Scale 1:20,000 & 1:40,000 (smooth plot) Date of survey 9 June- 29 October 1977

Instructions dated 22 April 1977 Project No. OPR- 479-RU/HE-1977

Vessel RUDE & HECK

Chief of party R. V. SMART, LCDR., NOAA

Surveyed by LCDR. R.V. SMART, LCDR. T. W. RUSZALA, LTJG. K.G. VADNAIS, LTJG. C.E. GROSS, ENS. S.P. De Bow, ENS. M.A. CLASSICK

Soundings taken by ~~echo sounder, hand lead, pole~~ wire drag

Graphic record scaled by N/A

Graphic record checked by N/A

Protracted by N/A Automated plot by Calcomp 618 plotter (AMC), Rough plot only

~~Soundings penciled~~ Verification by Evaluation and Analysis Group, AMC

Soundings in ~~Fathoms~~ XXXXX feet at ~~MLW~~ ~~MLLW~~ XXXX ~~predicted tides~~ (smooth tides) Gulf Coast Low Water Datum

REMARKS:

STANDARDS CK'D 1-20-87 C.Loy

AWOIS and SURF ✓ 1/89 SB

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* = Data removed from the Descriptive Report and filed with the field records.

DESCRIPTIVE REPORT
TO ACCOMPANY FE-285WD
WIRE DRAG FIELD NDS. 20-5-77, ~~20-6-77, 20-8-77~~
SEADOCK, ~~LOOP, SAFTEY FAIRWAYS~~
GULF OF MEXICO
1977
LT. CDR. R. V. SMART
NOAA SHIPS RUDE & HECK

A. AUTHORITY

This project was authorized under Project Instructions OPR-479-RU/HE-77, Wire Drag, Gulf of Mexico Investigations, dated 22 April, 1977 and amended by Change No. 1 dated 29 September, 1977.

B. CHARACTER AND LIMITS OF WORK

The purpose of this ~~work~~ project was to conduct wire drag operations on the pre-construction phase of Seadock and Loop Deepwater port facilities off of Freeport, Texas and Grand Isle, Louisiana, respectively.

The area covered during the project consisted of four items (#1, #3, #5, & #5a) contained in the Seadock area on Chart 11300.

C. CONTROL - RAYDIST AND DEL NORTE STATIONS

Raydist DR-S Range-Range control was the primary control used during the survey. The stations operated on a frequency of 3294.4 KHZ which provided a lane width of 45.481635 meters. Two raydist shore stations were used, one at the southern end of Galveston Island (designated H-1-TX-77) and located at Lat. 29°14"33.0460"N and Long. 94°52'08.3688"W (RED). The other station (GREEN) was located at the U.S. Army Corp of Engineers, Brazos River Floodgates in Freeport, Texas, designated H-2-TX-77) at Lat. 28°53'49.9729"N, and Long. 95°-22'56.3698"W. — These stations could not be verified — See sections 2.a. and 4. of the Modified Evaluation Report.

In addition to Raydist, three Del Norte trisponder stations were used in order to facilitate in calibration of the Raydist unit on board the RUDE. One unit was located at a fishing pier in Surfside, Texas at Lat. 28°57'27.9041" and Long. 95°16'24.3318. The second station was located at the U.S. Coast Guard base in Freeport, Texas at Lat. 28°56'27.73"N and Long. 95°18'03.7624". The final station was erected atop the grean Raydist station in Freeport, Texas at Lat. 28°53'49.9729"N and Long. 95°22'56.3698"W. — These stations could not be verified — See sections 2.a. and 4. of the Modified Evaluation Report.

Radar ranges between the two vessels were recorded each fix. Along with the bearings to the ships, this puts a limit on any lane ambiguity, if one vessel's Raydist control remains good.

The radar ranges were interpolated between guarter mile range-rings, and their accuracy is considered accurate to within about 0.05 nautical miles.

D. SHORE SIGNALS AND CALIBRATION

Calibration of the Raydist was accomplished, primarily, through the use of sextant angles to shore signals of known co-ordinates.

In addition, a Del Norte net was used to facilitate calibration at night and also to check the Raydist unit during suspected lane loss. Calculation of the red and green lane values from this information was accomplished through the use of an HP-65 programable calculator. The shore signals and Del Norte tris-ponder sites were as follows;

ACE-Freeport Municipal Tank, 1954
Lat. 28°57'05."721N, X=3165 894.03
Long. 95°21'13."334W, Y=424 765.16

FUN-East Freeport Stafford Chemical Company Tank, 1931
Lat. 28°56'55."376N, X=3171 394.35
Long. 95°20'11."715W, Y=423 891.82

AIM-Dow Chemical Company PLANT A Shop Water Tank, 1954
Lat. 28°56'45"826N, X=3176 185.67
Long. 95°19'18."135W, Y=423 077.30

WAD-Dow Chemical Company PLANT A Organic Water Tank, 1954
Lat. 28°56'47."542N, X 3178 512.12
Long. 95°18'51."873W, Y= 423 323.96

ION-Freeport East Jetty Light (Freeport Entrance Light 6)
Lat. 28°55'40."7608N, X=3187044.56
Long. 95°17'18."1897W, Y=416 846.07 Unverified *

COD-Freeport West Jetty Light (Freeport Entrance Light 7)
Lat. 28°55'41."432N, X=3186 198.07
Long. 95°17'27."6971W, Y= 416 887.03 Unverified *

EVA-Fishing Pier (end)
Lat. 78°57'26."1275N, X=3191636.79
Long. 95°16'22."6625W, Y=427638.87 Unverified *

DEL NORTE REMOTE UNITS

Code 74 Station - Atop Green Raydist Tower
Lat. 28°53'49"973N, X= 3157356.88
Long. 95°22'56."3698W, Y= 404721.19 Unverified *

Code 72 Station - Atop C.G. Base Freeport Building
Lat. 28°56'27."73N, X=3182847.29
Long. 95°18'03."7624W, Y= 421459.00 Unverified *

* = Station which could not be verified as no data could be found.
See sections 2.a. and 4. of the Modified Evaluation Report.

Code 78 Station - Located Atop Fishing Pier
Lat. 28°57'27."9041, X= 3191482.867
Long. 95°16'24."3318, Y=427813.473

Unverified – no data could be found on this station – See sections 2.a. and 4. of the Modified Evaluation Report.

NOTE: X and Y in Feet.

E. RAYDIST LANE LOSS

Throughout the project, lane loss due to thunderstorms and other atmospheric conditions was a limiting factor affecting quality data accumulation. Since the working grounds were approximately 48 miles from the Raydist stations at times, any small amount of thunderstorm activity would cause the ships to lose lock on the signals. For this reason, a minimum of 30 days of production were lost.

An apparent inshore effect caused the ships to lose lock on the Raydist signal on H, M, and N days. This problem was frequently encountered when the ships would anchor at night off of the calibration area in order to calibrate at daylight. In the interim, both ships lost lock on the signal and after calibration the discrepancy was computed.

F. DATES OF SURVEY

The actual survey began in the Seadock work area on 9 June 1977 and was ended on 29 October 1977.

G. TIDE REDUCERS – Smooth Tides have been applied to all the verified survey data.

Field reduction of each day's data was done using predicted tides for Galveston, Texas with the following correctors applied:

	Time		Height Ratio
Items 1, 2, & 3	H.W.=1 hr., 37 min	L.W.=1 hr., 38 min.	0.93
Items 4,5, & 5a	H.W.=1 hr., 54 min	L.W.=1 hr., 55 min.	0.93

H. JUNCTIONS AND SPLITS - None

I. INCOMPLETE ITEMS

According to the project instructions, a total of 18 items were to be surveyed this season, 6 of which were in the Seadock area. Due to uncontrollable circumstances (weather, electronics failure, etc.) only Items 1, 3, 5 and 5a were completed this season. One drag was run on Item 2 but it had to be rejected.

J. CURRENTS AND WINDS

Currents in the area were minimal most of the season and had very little effect on the drag. At the start of the season,

it was thought that excessive lifts were due to subsurface layered currents. However, it was later discovered that the vertical component of the short towline (1000 feet) in relation to depth and length of the drag was the reason for the lifts. This problem was rectified by lengthening the towline to 1400 feet, removing toggles from the towline, and adding an extra shackle to each toggle on the ground wire.

Even though it was thought that currents in this area of the Gulf of Mexico were negligible, a current test was run each time the ships arrived at the working grounds. After a number of these tests, it was found that the maximum velocity in the area was not greater than 0.2 knots.

Being 40-50 miles offshore for most of the project, the ships were virtually at the mercy of the weather. Localized thunderstorms would appear without warning causing the ships to lose lock on the Raydist signal. On the other hand, winds consistently blowing in excess of 15 knots were encountered on many days of the project. With a wind of this intensity from the south or southeast, the seas would build in excess of 3 feet due to unlimited fetch. Consequently, effective wire drag could not be accomplished due to excessive lifts and the ships would have to wait for the seas and winds to subside.

K. DIVING PROCEDURES

Diving procedures on this project pertained only to Item 5a since it was the only item of the project where a hang was encountered. Partial wet suits were worn due to the warm water. Visibility ranged from 10 to 30 feet and least depths were determined using both digital and oil filled depth gages. *Least depths from diver wrist depth gages are not acceptable in meeting survey standards.*

L. TESTING

Testing results were recorded in both the rough and smooth tester volumes. The rough tester records the actual height of the mark on the tester pole after pick-up. In the smooth tester record, the test was recorded corrected to the wire depth. The smooth test record shows the actual lift and sag.

In the smooth test record an asterick (*) next to the section indicates the test came from the HECK's Launch - 20.

Definition of a sag miss: A test in which the tester rod has definitely been thrown in ahead of the ground wire, and picked up after the ground wire has passed yet has no marks on the pole. The wire is assumed to have passed underneath the tester rod and the test is considered valid providing a maximum value for the amount of lift present.

Definition of a TOB: TOB refers to "tester on bottom". It is a test result that occurs when the tester rod shows signs of having touched the ocean floor. Lifts associated with this type of test generally are not accepted because of the uncertainity as to where the ground wire struck the rod. It is likely that if the tester rod is stuck in the ocean floor the ground wire might first ride up the rod until enough force is generated to push the rod away.

M. GENERAL NOTES

It is important to know that the ships are moving properly at the close of the drag. Before Raydist it was difficult to see if the ships were moving without taking a complete fix. The Raydist's saw tooth recorder gives a permanent record of movement of the ships at all times. The Raydist strip chart was checked at the end of each drag to ascertain proper ship movement before the drag was aborted.

By the use of the saw tooth strip chart, one can tell the path of the ships between fixes. This fact may be important in specific cases where it is possible that between fixes the proper overlapping may not have been met.

Relative Pen Lengths: In most cases, the three strip chart pens were not exactly the same length, making proper interpretation of the record impossible without the appropriate adjustments. Relative pen lengths, entered on the strip charts by means of completing a rubber stamp, were noted each day.

All buoy and tester uprights were personally verified correct by the Officer-in-Charge before the project began. Those buoy and tester uprights which were used were verified correct to 125 feet (maximum use was 121 feet on "V" day).

N. DISCREPANCIES AND COMPARISON WITH RECENT CHARTS

Any discrepancies and comparison with recent charts are noted in the recommendations section of the item description at a later time in this report. See also section 7. of the Modified Evaluation Report.

O. PERSONNEL AND EQUIPMENT

During this survey the RUDE & HECK acted as quide and end vessel respectively. Both vessels are equipped with Raytheon DE-723 fathometers for recon hydro. Both of the vessels Bristol launches were utilized as drag tenders. Bearings to the end buoys and opposite vessel were made on Sperry Gyro Repeaters. Standard wire drag equipment was used throughout this survey. The officers participating were:
LCDR R. V. Smart, LCDR T. W. Ruszala, LTJG K. G. Vadnais, LTJG C. E. Gross, ENS S. P. De Bow, and ENS M. A. Classick.

~~Lt. Cdr. R.V. Smart, Lt. Cdr. T. Ruszala, Lt. (JG) K. G. Vadnais, Lt. (JG) C. Gross, Ens. S. P. DeBow and Ens. M. A. Classick.~~

P. APPROVAL

All records of this survey, including smooth plotting, except for the addition of the effective depths (which must await smooth tides) and the drafting of a composite A & D sheet, are hereby approved. The field work was personally supervised by the undersigned. The boat sheets and records were inspected daily. The survey is considered complete and adequate for charting.

Submitted by:

Samuel P. DeBow, Jr.

S.P. DeBow, Jr.
Operations Officer
NOAA Ships RUDE & HECK

Approved by:

Robert V. Smart, LT. COR., NOAA

R. V. Smart
Commanding Officer
NOAA Ships RUDE & HECK

II. ITEM 1

A. Statement on Item 1

Item 1 consisted of a 22-foot wreck charted at Lat. 28°36', Long. 95°03' in 96 feet of water.

B. Groundings and Hangs

There were no hangs encountered during the dates of coverage, A-F days inclusive.

C. Noted Occurances During Survey

At the start of the survey excessive lifts were encountered during the drags. These lifts were thought to be caused by subsurface currents in the area. Since there was no evidence to this effect, the command decided to vary the length between sections and vary the length of the towline until an acceptable level of lifts were encountered.

On "D" day, a power failure at the green station caused both of the vessels to gain one lane on the green rate. Since the lane gain was noticed between Positions 14 and 15, an additional lane was added to the green rate plots for the rest of the drag. In addition, extra overlap was allowed on the drags of "F" day in order to guarantee complete coverage of the area in question. — This explanation is confusing by stating that one lane was gained and was thus corrected by adding one lane. In the field records the appropriate lane corrections were made to the data by the field personnel.

D. Summary

Item 1 was covered to a one mile radius circle about the given position of the wreck. There was no evidence of a hang throughout the ~~drags~~ investigation.

E. Recommendations

Although clearing an area by wire drag does not disprove the existance of a possible wreck, consideration should be given to changing the wreck to a Position Doubtful (PD) rather than the Position Approximate (PA) which exists on the chart (11300) at this time. The item is properly charted as a non-dangerous wreck since an effective depth, based on ~~predicted~~ smooth tides, of 90-~~1/2~~ feet was the shoalest ~~reported~~ obtained over the item.

Concur - See section 7.a.1) of the Modified Evaluation Report.

III. ITEM 5

A. Statement on Item 5

Item 5 was the wreck of the 55-foot trawler "SINTPAT" reportedly burned and sunk in 80 feet of water at Lat. 28°24'N, Long. 94°54'W. Since the reported depth of 80 feet is inconsistent with the hydrography in the area, the position or depth may be in error. — Concur.

B. Grounding and Hangs

There were no groundings or hangs encountered during the dates of coverage, i.e. "G" through "L" days inclusive.

C. Noted Occurances During the Survey

The first drag on the item, G-1, was rejected due to extreme lifts. On the second drag of the day, the lifts were again some what excessive. In an effort to reduce these lifts, the towline was lengthened to 1400 feet and the speed of the drag was decreased. As a result, lifts decreased substantially and this method was utilized for the rest of the project.

The drag on "H" day was rejected due to Raydist lane loss before closing calibration. This loss was discovered on the red signal by passing a marker buoy close abeam at the termination of the drag.

On "J" day lane continuity was checked on the marker buoy at the end of the drags. However, while steaming the 30 miles inshore in order to calibrate, thunderstorms destroyed the lock held by both vessels. Since the marker buoy established good lane count at the worksite, the data was kept and sufficient overlap was provided on adjoining strips.

The data accumulation on "L" day was hindered by the fact that the HECK's gyro repeaters had failed. A procedure was adopted by obtaining the relative bearings and noting the master gyro-heading of the ship, both of which were recorded on the HECK and reduced to true bearing for the automatic data system. Reciprocal bearings checked by the RUDE agreed with those calculated from the HECK.

D. Summary

Item 5 was covered to a one mile radius circle about the given position of the wreck. There was no evidence of a hang throughout the ~~drag.~~ investigation

E. Recommendations

At the present time, the item is denoted on the chart as a sunken wreck dangerous to surface navigation with a "Position Approximate" symbol attached. Again, clearing an item by wire drag does not disprove the existance of a wreck. However, the least effective depth ~~found~~ obtained over the area in question was 115 3/4 feet, corrected ~~to predicted~~ for smooth tides. This fact could warrant the removal of the "Dangerous to surface Navigation" symbol. Also, the area was swept in a one-mile radius so that a "Position Doubtful" (PD) symbol could be considered adequate for this item.

Concur - See section 7.a.3) of the Modified Evaluation Report.

IV. ITEM 3

A. Statement on Item 3

Item 3 was reported to be a dangerous wreck, the F/V "Sadie S", located at Lat. 28°30'N, Long. 94°54'W.

B. Groundings and Hangs

One grounding was encountered on one of the rejected strips of "Q" day (Y.D. 255). However, this was expected as tides had fallen due to the slow progress of the drag and the buoy uprights were set very close to the ocean floor. Since the drag was eventually rejected, the grounding was not looked into at length because of the expectation of the event.

This grounding was examined during processing and is not in conflict with either prior or subsequent hydrography.

C. Noted Occurances During Survey

The initial four drags on the item, two strips on both "M" and "N" days, were rejected due to the fact that lane loss was discovered at the close of the second drag of "N" day. Since we were in the working grounds on both days and a closing calibration was not completed before the loss, the data was rejected.

The first drag on "P" and "Q" days were rejected due to reoccuring problems with the Raydist units and thunderstorm activity. A total of six drags were rejected until one was acceptable without lane loss.

Drag P-1 was the first acceptable drag, yet a fouled upright was discovered during the drag. This caused a voided area from Position 1 to Position 25. After that position, lifts were found to be acceptable and the data was kept. The second drag of "P" day was run with the intention of providing coverage of the voided area.

On "R" day, the guide vessel had apparently lost 8 lanes on their red signal. As a result, single vessel control was used to obtain the guide vessel position. The single vessel control distances were calculated on the HP-65 programmagle calculator. Extra overlap was provided on additional strips to ensure coverage of the item.

"S" day was a day utilized as the initial investigation of the F/V First Mate which sank in the Seadock work area. This vessel later became Item 5a.

The initial drags on "U" day were rejected due to lane loss. However, the drag completed on the following day completed Item 3.

Not part of Item #3 investigation

D. Summary

Item 3 was covered to a one mile radius about the given position of the wreck. There was no evidence of a hang throughout the survey on this item.

E. Recommendations

As was the case for Item 5, this item has a "Sunken wreck dangerous to surface Navigation" symbol on the present chart. Since it was found that the least effective depth over the item was 108 feet, it seems reasonable that this wreck can also be charted as a non-dangerous wreck.— Concur - See section 7.a.2) of the Modified Evaluation Report.

V. ITEM 5a

A. Statement on Item 5a

Item 5a was the F/V "First Mate" sunk in Lat. 28°21.77'N, Long. 94°48.45'W reported by the RUDE & HECK as sinking on September 22, 1977, in approximately 130 feet of water. This item was added to the original project instructions by the amended Change No. 1, dated 29 September 1977.

B. Groundings and Hangs

The two drags of "W" day, V-1 and V-2, hung the item at an effective depth of ~~104~~ 117 feet and 97 feet, respectively. The least depth found on the wreck from diver investigation was approximately 93 feet by diver's wrist depth gage which is not acceptable for charting. The vessel was hung at position Lat. 28°21.78'N, Long. 94°48.'45W in 134 feet of water.

Two clearing strips were run on "W" day with a clearing depth of 93 feet and 92-1/2 feet respectively. However, the second drag of the day created ambiguity due to the fact that a temporary hang could have been encountered. This will be explained at length in the next section.

The item was also intentionally hung on drag X-1 at a depth of ~~94-1/2~~ 95 feet.

C. Noted Occurances During The Survey

On the initial hang of the item, V-1, divers attained a least depth by the use of a digital depth gage and conventional oil filled depth gages.— not acceptable for charting.

The second drag, V-2, was run in an easterly direction, the opposite direction to the first drag, and was intended to hang the item in the opposite direction. Since no lifts were encountered well before the hang was indicated, an effective depth of 97 feet was found at the hang.

Drag W-1, was a clearing strip in one direction over this item. An effective depth of 93 feet was attained over the position of the initial hang of the item.

Drag W-2 was a reversal of drag W-1. The drag was believed to be acceptable in the field, however, upon receipt of the smooth plot, a temporary hang could have been encountered between Postions 20 to 25. This discrepancy was believed to be caused by the ships change in speed during the drag. Although this fact was not disproven in the field, the command feels as though it was not a temporary hang. However, since ambiguity does arise, the second clearing strip should not be accepted. On the other hand, diver investigation proved that the mast could be hung from any direction. Therefore, since the object was not smooth sloping, it is felt that one clearing strip is adequate for this item. The vessels' speed was reduced at position 20 and increased at position 25. There is no indication of unusual behavior in the buoys that would indicate a possible hang. The wreck position was not passed until position 27 of this drag. The clearance depth of strip W-2 is considered valid.

The final drag on this item, X-1, was run with the intention of hanging the top of the mast, 3 feet below the depth at which it was cleared on "W" day. Diver investigation of the hang revealed that the wire had hung the mast approximately 1-1/2 feet below the top. The effective depth at this time was ~~94 1/2~~ 95 feet, thus making 93 feet the shoalest point on the mast. — Concur; however, the 92-foot clearance by strip W-2 is the clearance depth recommended for charting.

D. Summary

The three hanging drags located the wreck at the same position each time. It is felt that the ~~least~~ clearance depth of 92 feet is adequate for charting since the wreck was intact with an approximate 15° port list.

E. Recommendations

It is believed that the position of the wreck is exact for charting purposes. All three hangs placed the wreck at the exact same position each time. This command feels as though the clearing depth of 92 feet is adequate. Since the mast was erect, and not a smooth sloping object, it is felt that the clearing strip in one direction is sufficient for charting purposes. — The minimum clearance of 92 feet is recommended for charting. See section 7.a.4) of the Modified Evaluation Report.

IV. ITEM 2

A. Statement on Item 2

One drag was run at the end of the season on Item 2. The drag was Y-1 but had to be rejected due to the fact that a lane discrepancy existed on the HECK and an upright was set at the wrong depth. Since this was the only drag done on the item and a large voided area existed because of the fouled upright, the drag was rejected. Investigation on a future date seems to be more reasonable.

Item 2. is considered as an uninvestigated item. All uninvestigated items of this project are recommended to be retained as presently charted and should be reassigned at an opportune time.

STOCK NO. 37
(4-30-57)
NAVMC-DC 28424

ATTACHMENT IIa

DATE	DAY LETTER	STRIP	VOL. #	POSITIONS	L.N.M.	S.N.M.	RED CORR.	GREEN CORR.	LENGTH OF DRAG	SMOOTH PLOT	REMARKS
8 JUNE	A	1	1	32	2.9	2.0			6000		Commence work on Item 1
9 June	B	1	1	29	1.7	1.4			6000		Excessive lifts encountered, apparent layered currents
18 JULY	C	1	1	15	1.7	1.2			6000		
19 JULY	D	1	1	30	2.7	2.3			6000		Lane gained between positions 14-15
21 JULY	E	1	1	17	1.6	1.2			6000		
22 JULY	F	1	1	32	2.6	2.0			7200		
	F	2	2	25	2.3	1.4			4200		REDRAG OF A-day
27 JULY	G	1	2	18							Excessive lifts- not used
	G	2	2	36	2.6	2.1			6000		Initial drag of item 5
28 JULY	H	1	2								Lane loss- not used
4 AUGUST	J	1	2	40	3.0	2.1			6000		
	J	2	3	33	2.7	1.6			6000		
9 AUG	K	1	3	36	2.7	1.4			4800		
	K	2	3	22	2.2	1.1			3600		
11 Aug	L	1	3	16	1.0	0.6			4800		Coverage of holiday on G day
	L	2	3	17	1.2	0.7			4800		" " "
17 AUG	M	1	4								Lane loss - not used
	M	2	4								" "
18 AUG	N	1	4								Lane loss - not used
20 SEPT	P	1	5	35	2.8	1.7			4800		FIRST strip of Item 3
	P	2	5	13	1.2	0.7			4800		
21 SEPT	Q	1	6	32	2.7	1.6			4800		
22 SEPT	R	1	6	32	2.8	2.2			4800		Single vessel control
23 SEPT	S	1	6	0	0	0			N/R		Original investigation on F/M " FIRST MATE "

STOCK NO. 37
(4-30-57)
ORM-DC 28424

ATTACHMENT IIb

DATE	DAY LETTER	STRIP	VOL. #	POSITIONS	L.N.M.	S.N.M.	RED CORR.	GREEN CORR.	LENGTH OF DRAG	SMOOTH PLOT	REMARKS
5 OCT	T	1	6	25	2.6	1.6			4800		Lane loss - RUDE closes with Del Norte - HECK Circles
5 Oct	T	2	6	20	2.3	1.4			4800		
14 OCT	U	1	6	15	1.5	0.8			4800		Coverage of holiday- Finish item
18 OCT	V	1	7	19	1.1	0.5			3200		Begin work on F/V "MATE"- Hang
	V	2	7	24	0.9	0.4			3200		Re- Hang Item 5a
19 OCT	W	1	7	15	1.4	0.6			3200		Clearing Strip on Item 5a
	W	2	7	16	0.9	0.4			3200		" " " " "
20 OCT	X	1	7	16	0.9	0.4			3200		Final Hang Of 5a- Diver Inves.
28 OCT	Y	1	7	28							Lane loss - Not used

ATTACHMENT III

OCK NO. 37 (4-30-57) NMDC 28424 OSITION NO. AY LETTER	BUOY NO.	LAT.	LONG.	GROUNDED EFF. DEPTH	CLEARED BY DAY STRIP NO.	CLEARED EFF. DEPTH	SOUNDING	CHARTED DEPTH		REMARKS
V-1	4-5	~~28°21.78~~	~~94°48.45~~		W-1 W-2	93 92				Original hang of "FIRST MATE"
		28°21'46.4"	94°48' 27.1"							
V-2	4-5	~~28°21.78~~	~~94°48.45~~		W-1	93				Hang in opposite direction
					W-2	92				
X-1	2-3	~~28°21.78~~	~~94°48.45~~		~~N/A~~					Final hang of "FIRST MATE"

G.P.'s of Items (SEADOCK)

1. 28°36' N, 95°03' W
2. 28°33.5' N, 95°21.0' W
3. 28°30' N, 94°54' W
4. 28°24' N, 95°18' W
5. 28°24' N, 94°54' W

5a. 28°21.77' N, 94°48.45' W

G.P's of Signals

1.	28°57'05.721" N ✓ 95°21'13.334" W ✓	FREEPORT MUNICIPAL TANK, 1954
2.	28°56'55.376" N ✓ 95°20'11.755" W ✓	EAST FREEPORT STAFFORD CHEMICAL COMPANY TANK, 1931
3.	28°56'45.826" N ✓ 95°19'18.135" W ✓	DOW CHEMICAL COMPANY, PLANT A SHOP WATER TANK, 1954
4.	28°56'47.542" N ✓ 95°18'51.873" W ✓	DOW CHEMICAL COMPANY, PLANT A ORGANIC WATER TANK, 1954
5.	28°55'40.761" N 95°17'18.190" W	FREEPORT EAST JETTY LIGHT (Freeport Entrance Light 6)
6.	28°55'41.432" N 95°17'27.697" W	FREEPORT WEST JETTY LIGHT (Freeport Entrance Light 7)
7.	28°57'26.128" N 95°16'22.663" W	FISHING PIER (end)

Unverified

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY

November 20, 1979

TIDE NOTE FOR HYDROGRAPHIC SHEET

Processing Division: Atlantic Marine Center:

Hourly heights are approved for

Tide Station Used (NOAA Form 77-12): 877-1510 Galveston Pleasure Pier, TX

Period: June 8 - October 28, 1977

HYDROGRAPHIC SHEET: FE-285WD R/H 20-5-77, ~~20-6-77, 20-8-77~~

OPR: 479

Locality: Gulf of Mexico, off Texas coast

Plane of reference (Gulf Coast Low Water Datum): 2.86 ft.

Height of Mean High Water above Plane of Reference is
2.1 ft. - Galveston Pleasure Pier

REMARKS: Recommended zoning:

Apply +30 minute time correction and range ratio x0.86.

James R Hubbard
Chief, Datums and Information Branch

NOAA FORM 76-155
(11-72)

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

GEOGRAPHIC NAMES

SURVEY NUMBER

FE-285 WD

Name on Survey	A ON CHART NO. 11330	B ON PREVIOUS SURVEY NO.	C ON U.S. QUADRANGLE MAPS	D FROM LOCAL INFORMATION	E ON LOCAL MAPS	F P.O. GUIDE OR MAP	G RAND MCNALLY ATLAS	H U.S. LIGHT LIST	K	
FREEPORT (title)	✓									1
GULF OF MEXICO (title)	✓									2
TEXAS (title)	✓									3
										4
										5
										6
										7
										8
										9
										10
										11
										12
										13
										14
										15
										16
				Approved:						17
										18
				Charles E. Harrington						19
				Chief Geographer - N/CG25						20
				SEP 23 1986						21
										22
										23
										24
										25

NOAA FORM 76-155 SUPERSEDES C&GS 197

HYDROGRAPHIC SURVEY STATISTICS
REGISTRY NO.: FE-285WD

Number of positions	1286
Number of soundings	N/A
Number of control stations	11

	TIME-HOURS	DATE COMPLETED
Preprocessing Examination		
Verification of Field Data	147	13 SEPT 1986
Quality Control Checks		
Evaluation and Analysis	61	4 NOV 1986
Final Inspection	3	31 OCT 1986
TOTAL TIME	211	
Marine Center Approval		4 NOV 1986

Transmittal letter of survey and survey records will be included in the Descriptive Report to identify the records accompanying the survey.

ATLANTIC MARINE CENTER
MODIFIED EVALUATION REPORT

SURVEY NO.: FE-285WD FIELD NO.: R/H-20-5-77

Texas, Gulf of Mexico, Offshore Freeport

SURVEYED: June 9 through October 29, 1977

SCALE: 1:20,000 and 1:40,000 (smooth plot) PROJECT NO.: OPR-479-RU/HE-77

SOUNDINGS: Wire Drag CONTROL: Raydist (Range-Range)

Chief of Party.....R. V. Smart

Surveyed by.....T. W. Ruszala
.....K. G. Vadnais
.....C. E. Gross
.....S. P. De Bow
.....M. A. Classick

1. INTRODUCTION

a. The purpose of this survey is adequately defined in the Descriptive Report and the Project Instructions. Only Presurvey Review Items #1 (AWOIS #00255), #3 (AWOIS #00245), #5 (AWOIS #00236), and #5a (AWOIS #00227) were investigated by this survey. Processing of this survey has been modified so that only the verified hang, clearance and accompanying note on the wreck located, and the least clearance depths over the areas cleared by wire drag have been smooth plotted. This modified and limited processing is considered complete in regard to nautical charting requirements.

b. A plot of the one verified hang, clearance and accompanying note and three plots of areas cleared by wire drag were generated and are attached to this report. These plots are considered the final plots or smooth sheets for this survey.

c. Corrections and notes made by the evaluator to the Descriptive Report are denoted in red ink.

2. CONTROL AND SHORELINE

a. Four horizontal control stations used during this survey for calibrations are of Third Order, Class I accuracy or better, and are established on the North American Datum of 1927. One of these four stations contained a small error in the listed geographic position. Seven horizontal control stations (including the two Raydist station sites) could not

be verified. Positioning methods are adequately discussed in the Descriptive Report. Calibration methods are adequately discussed in the Descriptive Report but the field calibrations can only be partially verified as the field calibration records are incomplete. Control and calibration procedures are further addressed in section 4. of this report.

b. No shoreline exists within the limits of this survey.

3. HYDROGRAPHY

No sounding data was gathered during this survey.

4. CONDITION OF SURVEY

The adequacy of the final field sheets, survey records, and reports, and conformity to the requirements of the HYDROGRAPHIC MANUAL and the WIRE DRAG MANUAL were not considered during the modified processing of this survey except position control and calibration procedures and documentation. Position control was plagued with lane losses/gains throughout this survey. In most cases the electronic positioning problems or the extent of the problems were not evident until closing calibrations. The strip chart records are not sufficient to resolve the control problems. Some calibrations of the Raydist systems were done by comparison with Del Norte range-range positioning which was not calibrated at any time during this survey. The Raydist stations and the Del Norte stations used could not be verified as no records of their establishment could be found. Calibrations are incomplete in documentation and annotation. Calibration data for many of the survey days could not be found. Therefore, verification of position correctors and verification of lane losses/gains was not accomplished during processing. Only obvious positional errors were corrected during verification. These control and calibration problems adversely affect the quality and reliability of this survey; however, the wreck located by this survey was found in the same position on three separate days and the clearances gained over this wreck and over the other assigned items investigated were by sufficient overlap to justify the charting conclusions made in section 7. of this report.

5. JUNCTIONS

There are no junctions on this survey.

6. COMPARISON WITH SURVEYS

a. PRIOR SURVEYS

H-6291 (1937) 1:80,000
H-6398a (1938) 1:40,000

These prior surveys are common to the entire present survey. No conflicts exist between prior hydrography and present effective depths. Prior hydrography ranges from 2 to 15 feet deeper than present survey effective depths within the common areas (except the area of Item #5a where the present survey clearance over the wreck is 42 feet shoaler than prior hydrography). Presurvey Review Item #5a (AWOIS #00227), the sunken wreck of the fishing vessel FIRST MATE, was not in existence at the time of the prior surveys; therefore, no conflict exists between prior hydrography and present hang and clearance depths on this wreck. Subsequent survey H-9885 (1980) is common to the entire investigations of Presurvey Review Items #1 (AWOIS #00255) and #3 (AWOIS #00245) and supersedes all prior hydrography within the common areas of these investigations.

It is not the intent of the present survey to supersede but only to supplement prior hydrography.

b. SUBSEQUENT SURVEY H-9885 (1980) 1:40,000

Subsequent survey H-9885 (1980) is common to the entire areas of investigation of Presurvey Review Items #1 (AWOIS #00255) and #3 (AWOIS #00245). Presurvey Review Items #5 (AWOIS #00236) and #5a (AWOIS #00227) are not common to any subsequent hydrographic surveys.

Within the common area of Presurvey Review Item #1 (AWOIS #00255) subsequent hydrography ranges from 7 to 11 feet deeper than the present survey clearance depth of 89 feet. No conflicts exist between present effective depths and subsequent hydrography except a submerged obstruction and a floating aid to navigation. The conflicting submerged obstruction and floating aid to navigation on survey H-9885 (1980) are common to an area cleared by 89 feet on the present survey. The obstruction is a submerged well in Latitude 28°35'57.02"N, Longitude 95°04'06.16"W with a shoalest sounding of 86 feet. This submerged well is identified in the U. S. Coast Guard (Eighth District) Offshore, Oil, Gas, Mineral and Related Structures including Sub-Sea Installations Listing as Tenneco 166 2 (TOC-GA-391-A&B). The floating aid to navigation, labeled as "HO 391#1", is the watch or station buoy for this submerged well and is privately maintained. It is unknown when the submerged well and buoy were established in this area but the present survey sufficiently proves that they did not exist at the time of present wire drag survey

operations. See section 7. of this report for charting recommendations.

Within the common area of Presurvey Review Item #3 (AWOIS #00245) subsequent hydrography ranges from 4 to 11 feet deeper than the present survey clearance depth of 108 feet. No conflicts exist between subsequent hydrography and present effective depths.

7. COMPARISON WITH CHARTS 11300 (19th Ed., Oct. 23, 1976)
11300 (26th Ed., Aug. 17, 1985)
11321 (17th Ed., Jan. 17, 1976)
11321 (22nd Ed., Jun. 16, 1984)
11330 (3rd Ed., Sept. 14, 1985)

a. HYDROGRAPHY

The charted hydrography originates with the previously discussed prior and subsequent surveys. The previously discussed prior and subsequent surveys require no further consideration. Attention is directed to the following:

1) Presurvey Review Item #1 (AWOIS #00255), a charted nondangerous sunken wreck, position approximate in Latitude 28°36'N, Longitude 95°03'W, originated with Local Notice to Mariners No. 68 of 1965 and is identified as a 22-foot vessel which burned and sank in June of 1965. This wreck is presently charted (the 1984 and 1985 editions of the charts) as a nondangerous sunken wreck, position doubtful, in its previously reported position from advance information from the present survey (FE-285WD). This wreck was not found by the present survey. The present survey cleared a search area exceeding the required one nautical mile radius circle of search around the reported position by a minimum effective depth of 89 feet; however, within the required search area the minimum clearance depth obtained is 90 feet. As the clearance depth ranges from 6 to 10 feet shoaler than the hydrography within the assigned circle of search, this wreck is not considered disproved. It is recommended that this item be charted in its reported position as a nondangerous sunken wreck, position doubtful, with a label in parentheses: (cleared 90 feet).

[90] wk PD

Subsequent hydrographic survey H-9885 (1980) located a submerged well in Latitude 28°35'57"N, Longitude 95°04'06"W and a watch or station buoy within the the area cleared by this investigation. The current edition (1984) of chart 11321 shows two platforms labeled "TOC-GA-391-A&B" and no buoy in this position. The current editions of the other charts common to this area do not have any platforms, submerged wells, or buoys charted in this position. It is recommended that the chart compiler research the status of these charted platforms and reflect the most current available information on all affected charts.

2) Presurvey Review Item #3 (AWOIS #00245), a charted dangerous sunken wreck, position approximate in Latitude 28°30'N, Longitude 94°54'W, originated with Local Notice to Mariners No. 126 of 1966 and is identified as the wreck of the SADIE S, a fishing vessel built in 1953, U. S. Coast Guard Registry No. 0265287, 63 gross tons, 58.7 feet in length, a beam of 18.5 feet, a moulded depth of 8.2 feet, and was sunk in November of 1966. This wreck is presently charted (the 1985 editions of the charts) as a nondangerous sunken wreck, position doubtful in the previously reported position from advance information from the present survey (FE-285WD). This wreck was not found by the present survey. The present survey cleared a search area exceeding the one nautical mile radius circle of search around the reported position by a minimum effective depth of 108 feet. As the clearance depth ranges from 4 to 11 feet shoaler than hydrography within the common area, this wreck is not considered disproved. Given the vessel's size and the clearance depths off the bottom, it is doubtful that the vessel is in the area surveyed. It is recommended that this item be charted as a nondangerous sunken wreck, position doubtful, with a label in parentheses: (cleared 108 feet).

108 wk PD

3) Presurvey review Item #5 (AWOIS #00236), a charted dangerous sunken wreck, position approximate in Latitude 28°24'N, Longitude 94°54'W originated with Local Notice to Mariners No. 87 of 1966 and is identified as the wreck of the SINTPAT, a 55-foot long trawler which burned and sank in July of 1966. The wreck was reported as being sunk in 80 feet of water and the depths in the area of the reported position are 122 to 129 feet which indicates the strong possibility of an erroneous reported position. This wreck is presently charted (the 1985 editions of the charts) as a nondangerous wreck, position doubtful in the previously reported position from advance information from the present survey (FE-285WD). This wreck was not found by the present survey. The present survey cleared a search area exceeding the required one nautical mile radius circle of search around the reported position by a minimum effective depth of 113 feet. As the clearance depth ranges from 9 to 16 feet shoaler than the hydrography within the common area, this wreck is not considered disproved. It is recommended that this item be charted as a nondangerous sunken wreck, position doubtful, with a label in parentheses: (cleared 113 feet).

113 wk PD

4) Presurvey Review Item #5a (AWOIS #00227) originated with a report of a vessel sinking on September 22, 1977 by the NOAA Ships RUDE and HECK during this survey (FE-285WD). This wreck is identified as the fishing vessel (trawler) FIRST MATE (U. S. Coast Guard Registry # 0279126) and is described as a wooden vessel, 48 gross tons, 53.9 feet in length, a beam of 18.2 feet, and a moulded depth of 7.3 feet. This wreck is presently charted (the 1985

editions of the charts) as a 93-foot (15-fathom) depth on a wreck in Latitude 28°21.77'N, Longitude 94°48.45'W from advance information from the present survey (FE-285WD). The present survey located this wreck in Latitude 28°21'46.4"N (28°21.77'N), Longitude 94°48'27.1"W (94°48.45'W) in depths of 134 feet. This wreck was hung in two directions by a least effective depth of 95 feet and cleared in two directions by a minimum effective depth of 92 feet. It is recommended that this item be charted as a nondangerous sunken wreck, cleared by 92 feet, in the position determined by the present survey.

b. Aids To Navigation

Two fixed aids to navigation were used as visual control (calibration) stations and are listed in section D. and Attachment IV.C. of the Descriptive Report. No floating aids to navigation were located by this survey and no floating aids are charted within the common area of this survey.

8. COMPLIANCE WITH INSTRUCTIONS

Compliance of this survey with the Project Instructions was not considered during this modified processing.

9. ADDITIONAL FIELD WORK

In general the adequacy of this survey was not considered during modified processing, except as it serves charting needs. No additional field work on the items completed by this survey is recommended.

10. MISCELLANEOUS

a. No splits exist within the areas covered by this survey. Overlap of adjacent strips is adequate within all the areas cleared by wire drag on the present survey.

b. The survey field records are incomplete as the Guide Vessel data, journals, and effective depth diagrams could not be found in the survey's volumes for part of "F" day, all of "G" and "H" days, and part of "J" day. Strips F-2, G-2, and J-1 are valid strips used in clearance of Presurvey Review Items #1 and #5. The lack of this survey information hampered the processing of this survey; however, the End Vessel volumes and records, the field strips, the lift records, and the Descriptive Report supplied sufficient information to process and plot this data under the modified processing procedures.

c. The wire drag data smooth plotted and attached to this report for Presurvey Review Items #1, #3, and #5 was smooth plotted at the 1:40,000 scale to facilitate the

inclusion of the smooth plots in this report on 8½" by 11" mylar sheets. The plot of Presurvey Review Item #5a was smooth plotted at the 1:20,000 scale. This is consistent with section 2.6. of the Project Instructions.

Maurice B. Hickson, III
Cartographer
Modified and Limited Verification of Field Data
Modified and Limited Evaluation and Analysis

INSPECTION REPORT
FE-285WD

The completed survey has been inspected with regard to survey coverage, investigation of hangs and clearance depths, cartographic symbolization, and verification or disproval of charted data. The survey complies with National Ocean Service requirements except as noted in the Evaluation Report. The survey records comply with NOS requirements except where noted in the Evaluation Report.

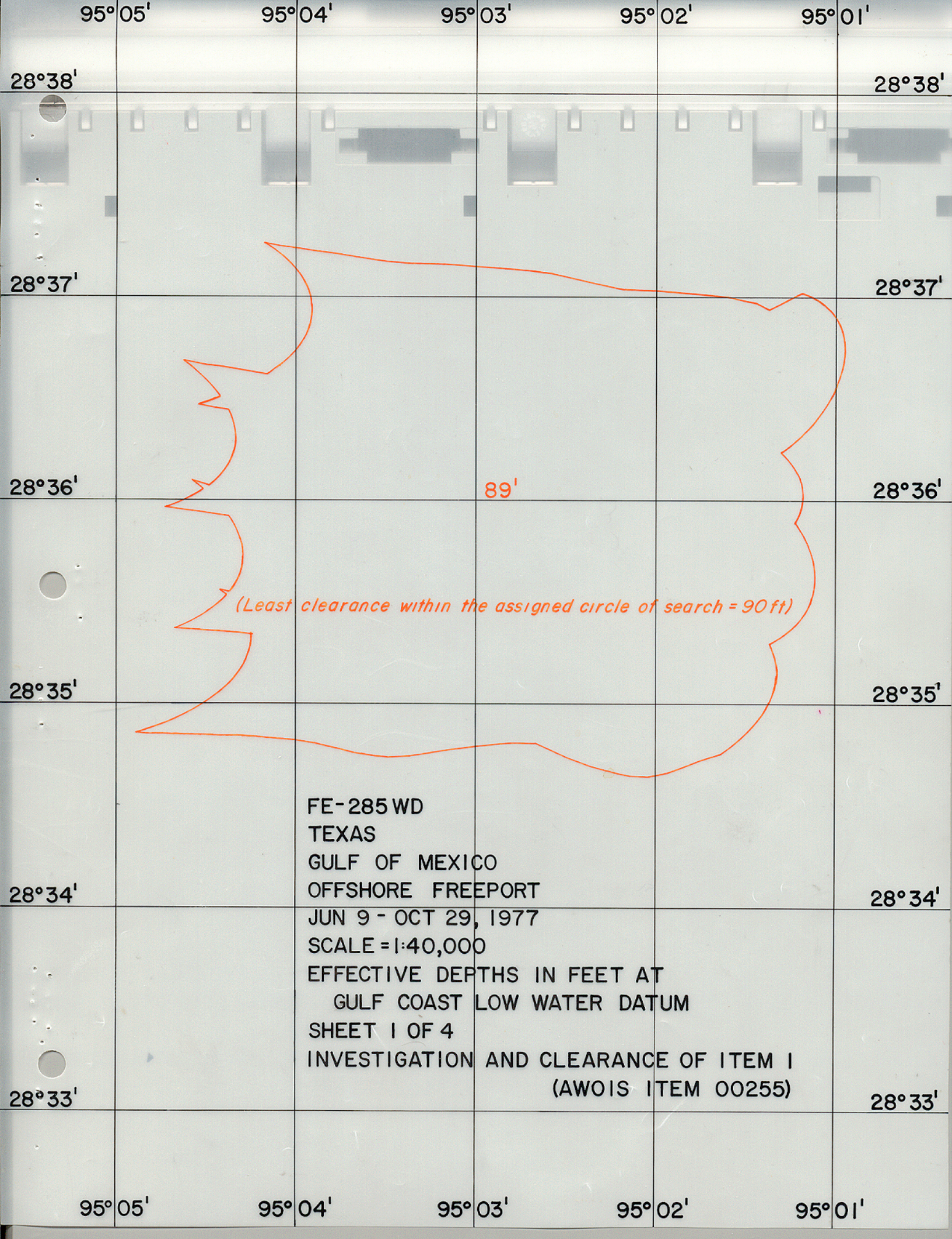
Inspected

R. D. Sanocki
Chief, Hydrographic Surveys
Processing Section
Hydrographic Surveys Branch

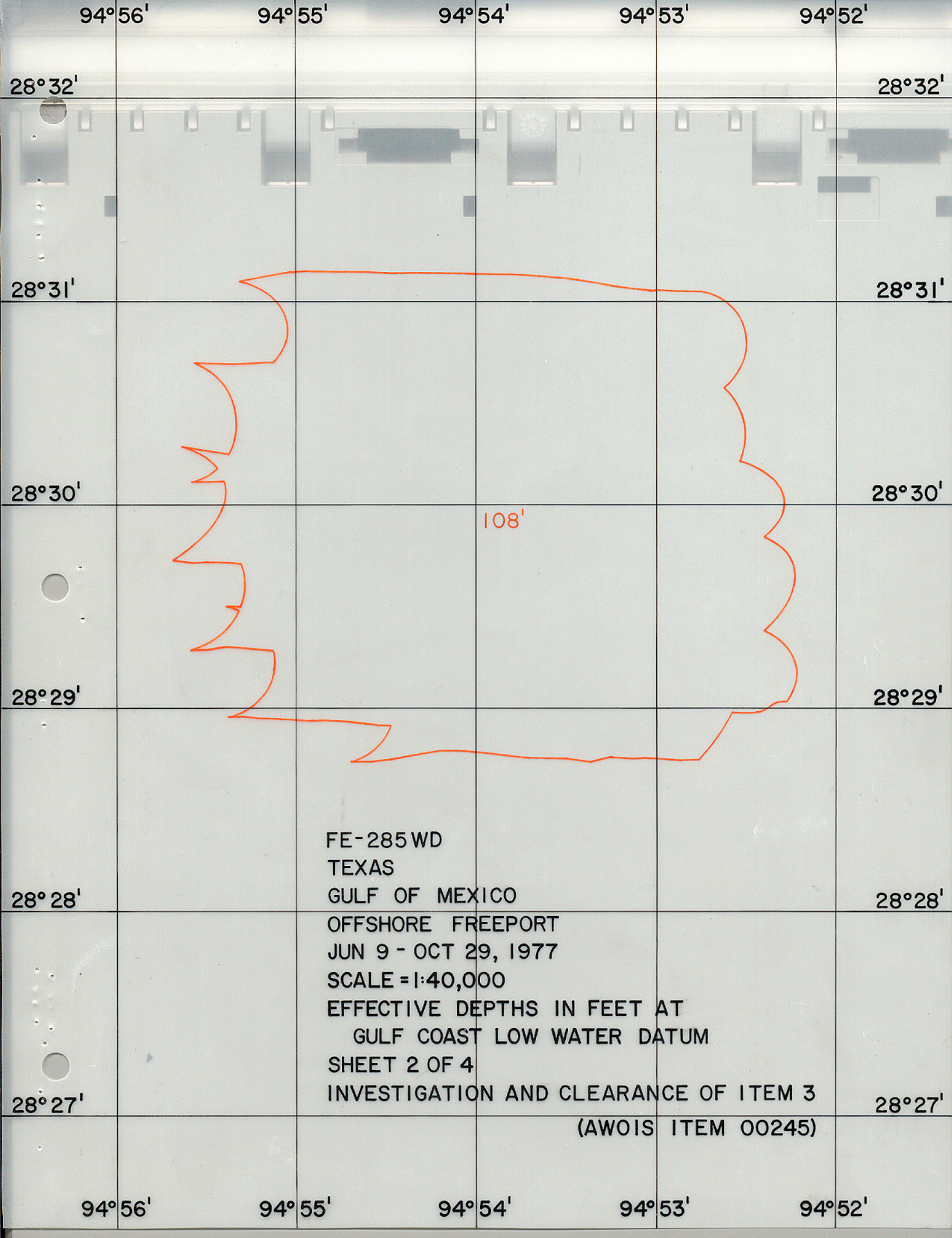
David B. MacFarland, Jr., CDR, NOAA
Chief, Hydrographic Surveys Branch

Approved November 4, 1986

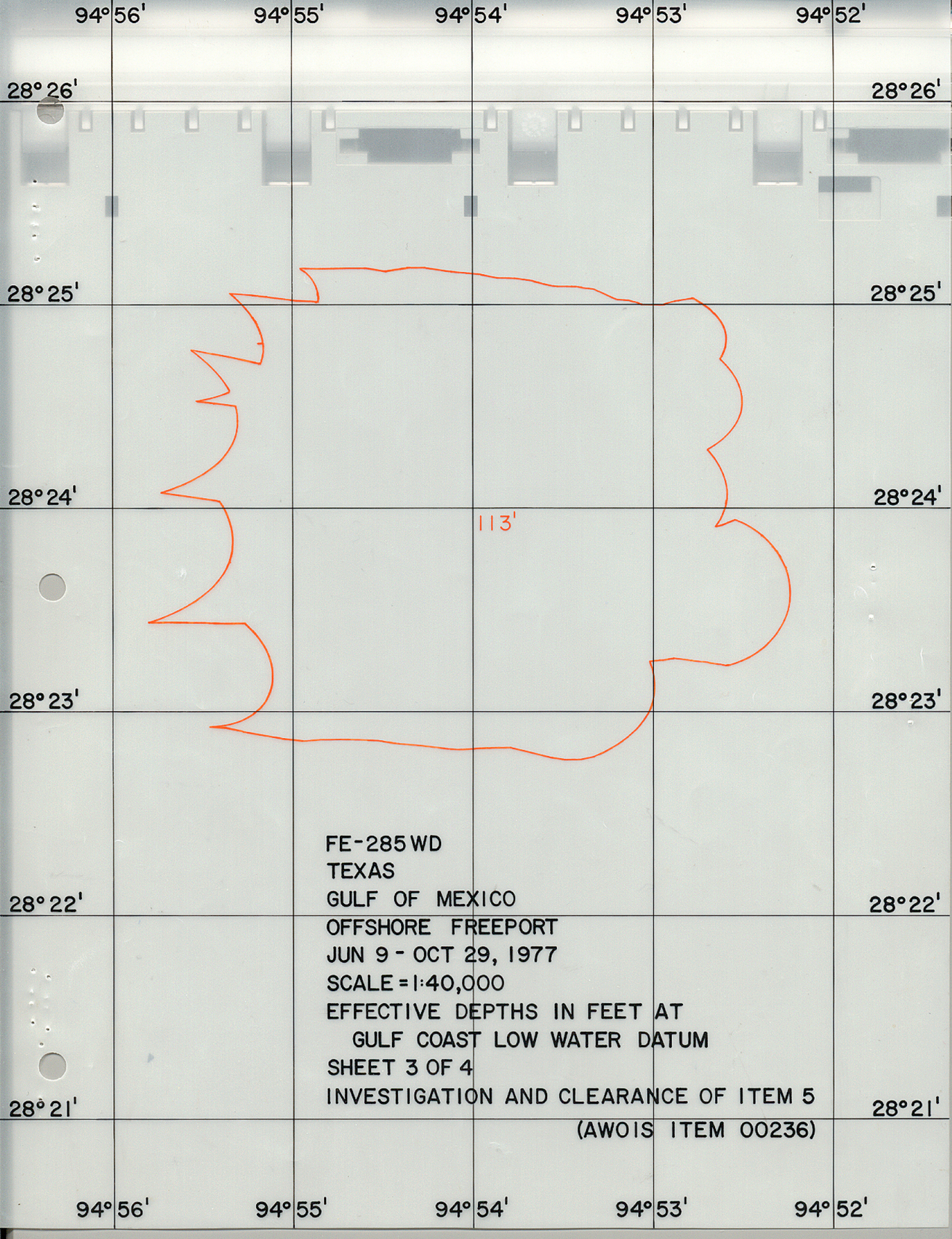
Ray E. Moses, RADM, NOAA
Director, Atlantic Marine Center



FE-285 WD
TEXAS
GULF OF MEXICO
OFFSHORE FREEPORT
JUN 9 - OCT 29, 1977
SCALE = 1:40,000
EFFECTIVE DEPTHS IN FEET AT
GULF COAST LOW WATER DATUM
SHEET I OF 4
INVESTIGATION AND CLEARANCE OF ITEM I
(AWOIS ITEM 00255)

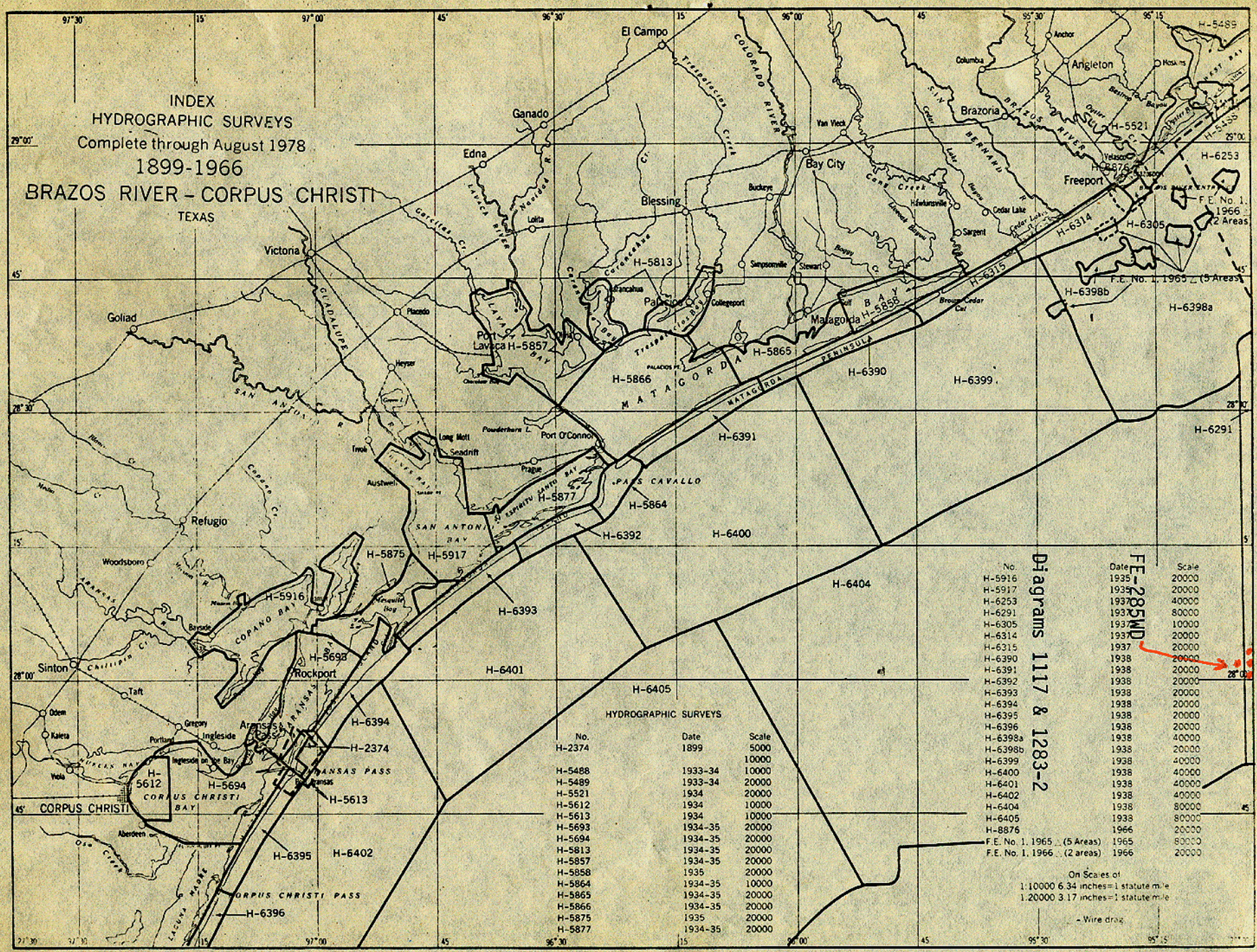


FE-285WD
TEXAS
GULF OF MEXICO
OFFSHORE FREEPORT
JUN 9 - OCT 29, 1977
SCALE = 1:40,000
EFFECTIVE DEPTHS IN FEET AT
GULF COAST LOW WATER DATUM
SHEET 2 OF 4
INVESTIGATION AND CLEARANCE OF ITEM 3
(AWOIS ITEM 00245)



FE-285 WD
TEXAS
GULF OF MEXICO
OFFSHORE FREEPORT
JUN 9 - OCT 29, 1977
SCALE = 1:40,000
EFFECTIVE DEPTHS IN FEET AT
GULF COAST LOW WATER DATUM
SHEET 3 OF 4
INVESTIGATION AND CLEARANCE OF ITEM 5
(AWOIS ITEM 00236)

94° 49'
94° 48'
94° 47'
28° 23'
28°23'
Hang at 95 ft
Cleared by 92 ft
Wreck - F/V FIRST MATE
28°22'
28°22'
9-5
FE-285 WD
TEXAS
GULF OF MEXICO
OFFSHORE FREEPORT
JUN 9 - OCT 29, 1977
28°21'
SCALE = 1:20,000
28°21'
EFFECTIVE DEPTHS IN FEET AT
GULF COAST LOW WATER DATUM
SHEET 4 OF 4
INVESTIGATION AND CLEARANCE OF ITEM 5a
(AWOIS ITEM 00227)
94° 49'
94° 48'
94° 47'



HYDROGRAPHIC SURVEYS

No.	Date	Scale
H-2374	1899	5000
		10000
H-5488	1933-34	10000
H-5489	1933-34	20000
H-5521	1934	20000
H-5612	1934	10000
H-5613	1934	10000
H-5693	1934-35	20000
H-5694	1934-35	20000
H-5813	1934-35	20000
H-5857	1934-35	20000
H-5858	1935	20000
H-5864	1934-35	10000
H-5865	1934-35	20000
H-5866	1934-35	20000
H-5875	1935	20000
H-5877	1934-35	20000

Diagrams 1117 & 1283-2

No.	Date	Scale
H-5916	1935	20000
H-5917	1935	20000
H-6253	1937	40000
H-6291	1937	80000
H-6305	1937	10000
H-6314	1937	20000
H-6315	1937	20000
H-6390	1938	20000
H-6391	1938	20000
H-6392	1938	20000
H-6393	1938	20000
H-6394	1938	20000
H-6395	1938	20000
H-6396	1938	20000
H-6398a	1938	40000
H-6398b	1938	20000
H-6399	1938	40000
H-6400	1938	40000
H-6401	1938	40000
H-6402	1938	40000
H-6404	1938	80000
H-6405	1938	80000
H-8876	1966	20000
F.E. No. 1, 1965 (5 Areas)	1965	80000
F.E. No. 1, 1966 (2 areas)	1966	20000

On Scales of
1:10000 6.34 inches=1 statute mile
1:20000 3.17 inches=1 statute mile

- Wire drag

FE-285WD

DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Ocean Survey
Rockville, Maryland

Hydrographic Index No. 90 C

NOAA FORM 75-96
(10-83)

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

MARINE CHART BRANCH

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. FE-285WD

INSTRUCTIONS

A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart.
1. Letter all information.
2. In "Remarks" column cross out words that do not apply.
3. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.

EXAMINED FOR NM
GDBU
9-25-89 CE

CHART	DATE	CARTOGRAPHER	REMARKS
11340	9/30/87	J. Stuart WW	Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No. #69
11330	3/8/88	CORDTS WW	Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No. 4 4th Ed.
11300	3/8/88	CORDTS WW	Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No. 42 27th Ed.
411	3/8/88	CORDTS WW	Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No. 16 39 Ed.
11321	3/8/88	CORDTS WW	Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No. 31 23rd Ed.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.

SUPERSEDES C&GS FORM 8352 WHICH MAY BE USED