

9894

Diagram No. LS-5

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey Hydrographic
Field No. HSB-20-2-80
Office No..... H-9894

LOCALITY

State Michigan
General Locality Lake Huron
Locality Offshore-Stoneport to
Adams Point

19 80

CHIEF OF PARTY
LCDR G.W. Jamerson

LIBRARY & ARCHIVES

DATE April 15, 1982

☆U.S. GOV. PRINTING OFFICE: 1980-768-230

Area 17

CHTS

14869 + INSET

14864

14880

14850

*to sign off on
Record of Application*

9894

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HYDROGRAPHIC TITLE SHEET

H-9894

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.

HSB-20-2-80

State Michigan

General locality Lake Huron

Locality ~~Approaches to~~
Vicinity of Presque Isle Harbor Offshore Stoneport to Adams Point

Scale 1:20,000 Date of survey 14 JUL to 6 AUG 1980

Instructions dated March 31, 1980 Project No. OPR-X115-WH/HSB-80

Vessel NOAA Launch 1255

Chief of party Lt. Cdr. George W. Jamerson, NOAA

Surveyed by Lt. David A. Waltz, NOAA

Soundings taken by echo sounder, ~~hand held type~~

Graphic record scaled by SW, RLK, RFT, DAW

Graphic record checked by SW, RLK, RFT, DAW, Verification Branch (AMC)
Field-hydroplot

Protracted by _____ Automated plot by AMC-Xynetics 1200
Smooth Sheet Xynetics 1201 (AMC)

Verification by Verification Branch, AMC

Soundings in ~~fathoms~~ feet at MEW MEW IGLD-LWD 576.8 feet

REMARKS: SW - Steve Weisner

RLK - Reginald Keene

RFT - Randy Trefethen

DAW - David Waltz

Notes and changes in red ink made during verification by the verifier.

STANDARDS CL'D 8-31-84

C. Loy.

All Tides are GMT.

DESCRIPTIVE REPORT
TO ACCOMPANY
HYDROGRAPHIC SURVEY H-9894
HSB-20-2-80

Scale: 1:20,000

Chief of Party: Lt. Cdr. George W. Jamerson

Officer-in-Charge: Lt. David A. Waltz

Hydrographic Surveys Branch, Hydrographic Field Party Four
Launch 1255

A. PROJECT

This survey was accomplished under project instructions ✓
OPR-X115-WH/HSB-80, dated March 31, 1980, and amended by the
following changes:

- Change No. 1 dated April 4, 1980
- Change No. 2 dated April 11, 1980
- Change No. 3 dated April 23, 1980
- Change No. 4 dated May 21, 1980
- Change No. 5 dated July 16, 1980

B. AREA SURVEYED

The survey area was in Lake Huron, in the vicinity of ✓
Presque Isle Harbor, Michigan, and was bounded by the follow-
ing points:

Lat. 45°17.6'N	Long. 83° ^{23.8} 24.0 'W
Lat. 45°22.0 ⁸ 'N	Long. 83°30.0'W
Lat. 45°24.0'N	Long. 83°40.0'W
Lat. 45°27.0'N	Long. 83°38.6'W
Lat. 45°23.0'N	Long. 83°26.0'W
Lat. 45°22.9'N	Long. 83° ¹¹ 20 .4'W

This survey was conducted from July 14, 1980 to August 6,
1980, Julian Dates 196 to 219, inclusive.

C. SOUNDING VESSEL

All soundings obtained on this survey were obtained from ✓
NOAA Launch 1255. (VESNO 1255). All survey records are annotated
with the vessel number 1255.

D. SOUNDING EQUIPMENT AND CORRECTIONS TO ECHO SOUNDINGS

The following Raytheon fathometer equipment was used ✓
during the survey:

JD 196 - 199	Recorder	Model #DE-723D Serial #37018
	ECU	Model #DE-723D Serial #2132
	Digitizer	Model DDM Serial #1907
JD 204	Recorder	Model #DE-723D Serial #37018
	ECU	Model #DE-723D Serial #2131
	Digitizer	Model DDM Serial #1907
JD 210 - 219	Recorder	Model #DE-723D Serial #37018
	ECU	Model #DE-723D Serial #2132
	Digitizer	Model DDM Serial #1907

No unusual problems were encountered with this equipment. ✓
 The fathometer was monitored continuously while sounding and was under constant adjustment to insure that no initial corrections were necessary. A digital phase checker was used at the beginning of the survey to adjust all scales. Settlement and squat tests on Launch 1255 were run on July 8, 1979, at Calcite, Michigan. The results of these tests are included in the appendices to this report. Settlement and squat corrections will be applied via the TC/TI tape during plotting of the smooth sheet at the Atlantic Marine Center and were not applied to the field sheets. ^{CONCU}

Velocity and instrument corrections were determined by bar check and TDC casts. TDC casts were taken at the following locations and dates: ✓

JD 191	Lat. 45°39'18"N	Long. 84°06'06"W
JD 199	Lat. 45°24'24"N	Long. 83°29'12"W
JD 204	Lat. 45°22'18"N	Long. 83°26'48"W
JD 214	Lat. 45°22'18"N	Long. 83°23'00"W

Velocity corrections from these casts were grouped such that no sounding would be in error by more than 0.25% from velocity causes. All correctors below depths actually observed were extrapolated from straight line extensions of the velocity curves. ✓

Supporting velocity correction data is included in the appendices. Actual observed TDC values are recorded in the sounding volume. ✓

JD 196 - 199 Recorder Model #DE-723D, Serial #37018
 ECU Model #DE-723D, Serial #2132
 Digitizer Model DDM, Serial #1907

JD 204 Recorder Model #DE-723D, Serial #37018
 ECU Model #DE-723D, Serial #2131
 Digitizer Model #DDM, Serial #1907

JD 210 - 219 Recorder Model #DE-723D, Serial #37018
 ECU Model #DE-723D, Serial #2132
 Digitizer Model DDM, Serial #1907

No unusual problems were encountered with this equipment. The fathometer was monitored continuously while sounding and was under constant adjustment to insure that no initial corrections were necessary. A digital phase checker was used at the beginning of the survey to adjust all scales. Settlement and squat tests on Launch 1255 were run on July 8, 1979, at Calcite, Michigan. The results of these tests are included in the appendices to this report. Settlement and squat corrections will be applied via the TC/TI tape during plotting of the smooth sheet at the Atlantic Marine Center and were not applied to the field sheets.

One equipment problem occurred which requires note. On several days, distinctive paired spikes appeared on the fathogram. These spikes occurred at somewhat regular intervals and were more pronounced at deeper depth scales. The problem could not be corrected by swapping either ECU or recorder, and so was assumed to be caused by some electrical or acoustic interference from other systems on the sounding vessel. The frequency and voltage meters on the fathometer recorder showed steady readings while the spikes were occurring. An example of the spikes are found between positions 1456 and 1458 on JD 219.

Velocity and instrument corrections were determined by bar check and TDC casts. TDC casts were taken at the following locations and dates:

JD 191	Lat. 45°39'18"N	Long. 84°06'06"W
JD 199	Lat. 45°24'24"N	Long. 83°29'12"W
JD 204	Lat. 45°22'18"N	Long. 83°26'48"W
JD 214	Lat. 45°22'18"N	Long. 83°23'00"W

Velocity corrections from these casts were grouped such that no sounding would be in error by more than 0.25% from velocity causes. All correctors below depths actually observed were extrapolated from straight line extensions of the velocity curves.

Supporting velocity correction data is included in the appendices. Actual observed TDC values are recorded in the sounding volume.

A bar check taken in calm water was graphed against a TDC curve of the same date, on JD 191. A displacement of the two curves of about 0.2 foot was observed. Another bar check on JD 120 was graphed against the JD 214 TDC cast. Although the shapes of these curves do not match as well as on JD 191, an average displacement of about 0.2 foot is also evident. This +0.2 foot displacement is equal to the combined residual instrument error plus draft error and will be applied as a correction via the TC/TI tape.

The TDC used for this survey was a Martec Model 101-10, Serial 477. The bar check apparatus used chain to suspend the bar and was measured against a steel tape before and after the field season in Lake Huron. A zero chain correction resulted from these measurements.

E. SURVEY SHEETS

The field sheets were prepared in the field using a PDP8/e computer and a DP-3 Complot plotter. Work sheets, field sheets, and overlay sheets are included with this survey. Mainscheme hydrography is plotted on the smooth field sheet while cross-lines, developments, and bottom samples are shown on the overlay sheets. A printout of the parameter tapes for the field sheets is included in the appendices. The smooth sheet will be plotted and verification accomplished for this survey at the Atlantic Marine Center using the Harris/7 computer and the ~~Xynetics 1201~~ plotter.
Xynetics 1201 Plotter

F. CONTROL STATIONS

Horizontal control stations used during this survey were either existing geodetic control published by NGS or were established by Hydrographic Surveys Branch or Operations Division, AMC, to third order standards or better. All stations are referred to the North American 1927 Datum. A list of all control stations used during this survey is included in the Appendices.

G. HYDROGRAPHIC POSITION CONTROL

The method used to control this survey was the Argo DM-54 medium range system, operating in the range-range mode. The following equipment was used:

Mobile Station - Launch 1255:

ALU Serial #A047851

RPU Serial #R0379121

CDU Serial #C037940

Power Supply Serial #V0379112

Strip Chart Serial #S097960

Pattern One Station - H-13A-MI-79 (Hydroplot Station #200) ✓
ALU Serial #A0379119
RPU Serial #R0379116
Power Supply Serial #V0478108

Pattern Two Station - Tour (1980) (Hydroplot Station #100) ✓
ALU Serial #A047849
RPU Serial #R0377107
Power Supply Serial #V0379122

All ARGO stations used 37-foot Shakespeare whip antennas. ✓
Smoothing code two was used throughout the survey, except for
a short period of one day when code four was used. The ARGO
system worked extremely well, with no equipment failures at all.
The only problems encountered were due to electrical inter-
ference from thunderstorms. Lane counts were lost on several
days for this reason, but at no time was hydrography continued
after such problems without first recalibrating the system.

The control equipment was calibration^{ad} ~~by~~ twice daily^{by} ✓
sex-
tant calibrations, visibility permitting. Hydroplot program
RK561 was used to compute calibration fixes. An average of
four fixes with less than five meter inverse was required for
a complete calibration.

All daily calibrations were performed in the vicinity of ✓
Rogers City, Michigan, which is on the western end of the survey
area. When horizontal control stations became available (on
JD 221) calibrations were performed on the eastern end of the
survey area, near Stoneport, Michigan. A difference in the
partial correctors was observed to be 0.12 lane for Pattern
One, and 0.18 lane for Pattern Two. These differences were
confirmed by calibrations on JD 225. The difference in partial
correctors was applied on the electronic corrector tapes for
hydrography run on the eastern end of the survey area. Partial
correctors for hydrography on the western end of the survey
were obtained from calibrations obtained in that area.

The cause of these differences in correctors is not known. ✓
The signal path from Pattern One did cross a small land area
(the Presque Isle Peninsula) for hydrography on the eastern
end of the survey. Pattern Two involved no land path at all,
however, and calibration differences were observed to be
greater for that signal than for Pattern One. No equipment
change or malfunction occurred during the survey that would
affect the problem. Brief experimentation was made "off-line"
on changes to signal propagation velocity that might affect
the observed difference in calibrations. No changes in the
calibration difference was observed for different propagation
velocities.

The signal propagation velocity used for this survey was 299,350 km/sec, as directed by the Hydrographic Manual. The actual ARGO frequency used was 1648.60 KHz. A dummy frequency of 1650.36 KHz was used on the hydroplot signal tape, and was derived by the method given in the Hydrographic Manual, Section 4.4.3.4.

An abstract of all calibration values is included in the appendices, and actual calibration printouts are located in the survey records.

H. SHORELINE

There was no shoreline delineated on this survey.

I. CROSSLINES See Verification Report, section 3. a.

Crosslines constitute 15% of the mainscheme hydrography. 74% of all crossings agree within one foot and 95% within three feet. No soundings disagree at crossing by more than six feet. The reason for these disagreements is believed to be due to unapplied changes in water level because of wind set-up, and to steep bottom topography in areas of larger disagreement.

J. JUNCTIONS See Verification Report, section 5.

This survey junctions with the following surveys:

H-9850 (1979-80) to the east
H-9720 (1977) to the north
H-9845 (1979) to the west
H-2021 (1958) to the southwest
H-2020 (1958) to the south
H-2019 (1958) to the south ~~not considered contemporary surveys~~
H-2018 (1958) to the southeast
H-1853 (1947) to the south ~~used as prior survey~~

The present survey junctions well with these surveys. 62% of the Lake Survey Center soundings agree within one foot, and 90% agree within three feet. No Lake Survey junction disagrees more than about six feet, and these disagreements are thought to be because of steep bottom topography and un-predicted water level changes.

Survey H-9720 (1977) was completed by the NOAA Ship MT MITCHELL, and H-9845 (1979) was accomplished by NOAA Launch 1255. Both these surveys junction well with the present survey. 74% of these junctions agree within one foot and 98% agree within three feet. H-9850 (1979-80) also agrees very well.

The hydrographer recommends that in the junction areas, the soundings from the present survey be charted.

K. COMPARISON WITH PRIOR SURVEYS See Verification Report, section 6. + QC Remarks

The survey area was covered by two prior surveys:

- ~~LS~~^{LS}-1181 (1909) 1:20,000 scale
- ~~LS~~^{LS}-1182 (1909) 1:20,000 scale

The present survey agreed generally well with these surveys, with 85% of all depths compared being within three feet. Most areas of larger disagreement (between ten and fifteen feet) occurred in the deeper offshore areas of the survey. Agreement on inshore soundings was relatively good. In all cases, the soundings from the present survey should be charted in lieu of the prior survey soundings.

These surveys were not transferred to an overlay sheet but were compared directly, using a light table.

L. COMPARISON WITH THE CHART See Verification Report, section 7.

There were no presurvey review items within the survey limits.

This survey was compared to Charts ~~14860~~¹⁴⁸⁶⁰ (26th Edition, June 24, 1978), ~~14864~~¹⁴⁸⁶⁴ (20th Edition, March 25, 1978), ~~14880~~¹⁴⁸⁸⁰ (25th Edition, October 20, 1979) and chart 14869 (21st Edition, November 25, 1978). Chart 14864 was enlarged to 1:20,000 scale for a direct overlay comparison.

The following changes in charted depths were detected:

(1) A charted 168-foot sounding surveyed in 130³ feet at 45°25'12"N, 83°38'24"W. *118' sounding to the north and southeast*

(2) A charted 66-foot sounding surveyed in 118 feet. A development utilizing 100m line spacing was run over this feature. Location is 45°23'54"N, 83°34'00"W. *the development was run in the wrong location. Development run at lat. 45°23'54", long. 83°55'00". See Verification Report, Section 7. a. 1.* *Charted Sounding considered invalid.*

(3) A charted *180-foot sounding surveyed to be in 170 feet at 45°21'36"N, 83°24'42"W. *from prior survey LS-1181 (1909) 1:20,000 ✓

(4) A charted *162-foot depth surveyed to be in 150⁴⁹ feet at 45°20'42"N, and 83°23'30"W. *from prior survey LS-1181 (1909) 1:20,000 ✓

Recommendation: In all cases above, chart the soundings ✓ from the present survey. *concur*

A discrepancy was found to Chart 14860 involving Calcite Light (LL #1326). This light is incorrectly charted as a fixed green light. It should be charted as a fixed red as shown in the Light List. *Outside the limits of this survey; however, chart number 14864, 21st Edition, May 3, 1980 has this and shown correctly. Insufficient information provided in order to verify hydrographers statement. However, Verifications comment incorrect as the aid is not charted.*

Also charted on 14860 is a privately maintained fixed red light at Presque Isle Harbor, Michigan. This light is no longer being maintained. More prominent lights for this harbor are the front and rear range lights.

Insufficient information provided Light List has 1 buoy, 2 Range Lights and Presque Isle Light - all are charted and all are on the present survey.

Recommendation: Chart range lights (Light List #1317 and 1318) as shown in the Light List.

M. ADEQUACY OF SURVEY *See Verification Report, section 6.*

This survey is complete and adequate to supersede prior surveys for charting in the common areas.

N. AIDS TO NAVIGATION

There was only one floating aid to navigation within the survey area. This aid was located on JD 199 by position no. 723, with check angle. This aid, a red nun lettered "2", adequately serves the purpose for which it was intended.

Fixed aids to navigation are reported on Form 76-40 in the Appendix.

O. STATISTICS

Number of Positions	1686
Nautical Miles Sounding Line	369
Nautical Miles of Crossline	67
Nautical Miles of Development	6
Total Miles of Hydrography	442
Bottom Samples	37
Bar Checks	2
TDC Casts	4

P. MISCELLANEOUS

None.

Q. RECOMMENDATIONS

See Section L for specific recommendations.

R. AUTOMATED DATA PROCESSING

The following Hydroplot system programs were used during this survey:

PROGRAM

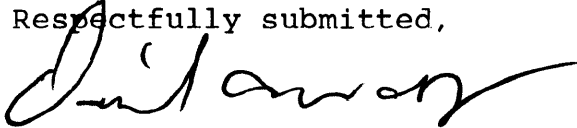
VERSION

RK111	Range-Range Real Time Hydroplot	1/30/76
RK201	Grid, Signal & Lattice Plot	4/18/75
RK211	Range-Range Non-Real Time Plot	1/15/76
RK300	Utility Computations	2/05/76
RK330	Data Reformat and Check	5/04/76
PM360	Electronic Corrector Abstract	2/02/76
RK530	Layer Corrections for Velocity	5/10/76
RK561	H/R Geodetic Calibration	2/19/75
AM602	Extended Line Oriented Editor	5/20/75

S. REFERENCE TO REPORTS

Horizontal Control Report OPR-X115-HFP-79.

Respectfully submitted,



Lt. David A. Waltz, NOAA
OIC, HFP-4

FIELD WATER LEVEL NOTE

Actual water levels were not applied on the field sheet.
ADR water level gages were installed at the following locations:

<u>SITE AND NUMBER</u>	<u>LOCATION</u>	<u>PERIOD</u>
Cheboygan, MI 907-5076	45°38'50"N 84°28'14"W	8 July 1980 to End of Survey
Presque Isle Harbor, MI 907-5069	45°20'27"N 83°29'10"W	3 July 1980 to End of Survey

The permanent water level station at Detour, Michigan (907-5099) should also be used to provide data required to reduce soundings on this survey.

Contract observers were used for all gages, and a direct line of communication between field unit and observer was maintained. Eastern Daylight Time was used for temporary gage annotation.



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SURVEY

Atlantic Marine Center
439 West York Street
Norfolk, Virginia 23510

September 29, 1980 CAM11/GWJ

TO: Mr. Phillip C. Morris
Chief, Water Levels Branch, OA/C234

FROM: *Robert Lewis*
Lt. Cdr. George W. Jamerson
Chief, Hydrographic Surveys Branch

SUBJECT: Request for Water Level Data

Please furnish smooth water level correctors and zoning information to Atlantic Marine Center, Processing Division, OA/CAM3, for Survey H-9894 (HSB-20-2-80), OPR-X115-WH/HSB-80, Lake Huron, for the dates and times below:

<u>JULIAN DAY, 1980</u>	<u>HYDRO BEGINS GMT</u>	<u>HYDRO ENDS GMT</u>
196	1440	2248
198	1203	2205
199	1107	2253
204	1041	1934
210	1209	2014
211	1214	1714
214	1109	2206
219	1047	2343

The times listed include two hours before and after actual times of hydrography.



VELOCITY TAPE PRINTOUT HSB-20-2-30 H-9394

TAPE ONE

000300 0 0000 0001 000 125500 009394
001020 1 0005
001210 1 0010
001700 1 0020
002100 1 0030
999999 0 0000

↑

TAPE TWO

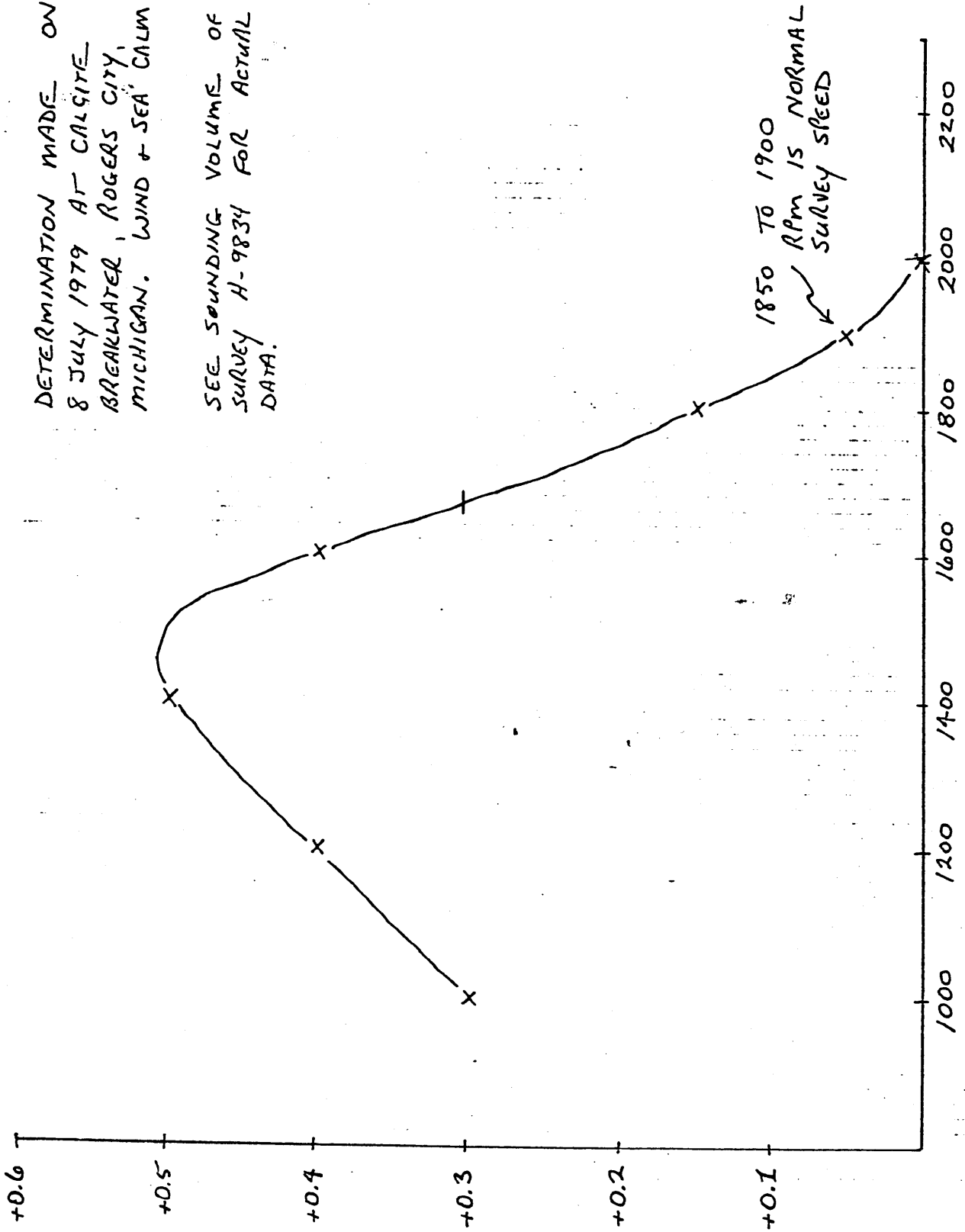
000160 0 0000 0002 000 125500 009394
000660 0 0005
000970 0 0000
001190 1 0005
001320 1 0010
001550 1 0015
001730 1 0020
001920 1 0025
002000 1 0030
999999 0 0000

NOAA 1255

SETTLEMENT & SQUAT

DETERMINATION MADE ON
8 JULY 1979 AT CALGITE
BREAKWATER, ROGERS CITY,
MICHIGAN. WIND & SEA CALM

SEE SOUNDING VOLUME OF
SURVEY H-9834 FOR ACTUAL
DATA.



- DAW

TC/TI TAPE PRINTOUT H-9394

8

164012 0 0002 0001 196 125500 001980
130913 0 0002 0002 214 125500 001980
144557 0 0005
150909 0 0002
232300 0 0002 0002 350 125500 001980

8

SIGNAL TAPE PRINTOUT HSB-20-2-30 H-9394

001	7	45	24	55069	033	49	11739	139	0000	000000	ROGERS CITY MUNICIPAL ROGERS CITY MUNICIPAL WATER TANK, 1956	No. 813, 1956
004	7	45	25	02997	033	46	22979	139	0000	000000	CALCITE BREAKWATER LIGHT	(1956)
005	7	45	24	36049	033	47	12012	139	0000	000000	CALCITE LIGHT	NO 816, 1956 (1956)
003	7	45	26	01365	033	49	50657	139	0000	000000	H-17-mi-78	(1978) FIELD POSN
100	7	45	57	49261	033	59	37629	250	0000	165036	TOUR	(1980) FIELD POSN
200	7	45	29	11010	033	54	43336	250	0000	165036	H-13A-mi-77	(1977)
555	7	45	17	43152 ³	033	25	03301	139	0000	000000	*STONEPORT LIGHT	(1980)
543	7	45	19	50497 ⁶	033	27	43373 ⁸⁰	139	0000	000000	*H-22B-mi-79	(1979)
546	7	45	21	23359	033	29	32373	139	0000	000000	*PRESQUE ISLE LIGHTHOUSE	
551	7	45	20	31218 ⁴	033	23	41768 ¹	139	0000	000000	*OLD PRESQUE ISLE LIGHT	(1980) House

FOR VERIFICATION OF ABOVE G.P.'S SEE OPERATIONS DIVISION (J. SHEA)
OR HSB SUPPORT SECTION (B. DE CROIX)

These stations checked against NGS file 03/29/82 LGC

RESPONSIBLE PERSONNEL	
TYPE OF ACTION	NAME
OBJECTS INSPECTED FROM SEAWARD	
POSITIONS DETERMINED AND/OR VERIFIED	
FORMS ORIGINATED BY QUALITY CONTROL AND REVIEW GROUP AND FINAL REVIEW ACTIVITIES	

ORIGINATOR
 PHOTO FIELD PARTY
 HYDROGRAPHIC PARTY
 GEODETIC PARTY
 OTHER (Specify)

FIELD ACTIVITY REPRESENTATIVE
 OFFICE ACTIVITY REPRESENTATIVE

REVIEWER
 QUALITY CONTROL AND REVIEW GROUP REPRESENTATIVE

INSTRUCTIONS FOR ENTRIES UNDER 'METHOD AND DATE OF LOCATION'
 (Consult Photogrammetric Instructions No. 64.)

OFFICE

I. OFFICE IDENTIFIED AND LOCATED OBJECTS

Enter the number and date (including month, day, and year) of the photograph used to identify and locate the object.
 EXAMPLE: 75E(C)6042
 8-12-75

FIELD

I. NEW POSITION DETERMINED OR VERIFIED

Enter the applicable data by symbols as follows:

- F - Field
- L - Located
- V - Verified
- 1 - Triangulation
- 2 - Traverse
- 3 - Intersection
- 4 - Resection
- 5 - Field Identified
- 6 - Theodolite
- 7 - Planetable
- 8 - Sextant

A. Field positions* require entry of method of location and date of field work.

EXAMPLE: F-2-6-L
 8-12-75

*FIELD POSITIONS are determined by field observations based entirely upon ground survey methods.

FIELD (Cont'd)

B. Photogrammetric field positions** require entry of method of location or verification, date of field work and number of the photograph used to locate or identify the object.
 EXAMPLE: P-8-V
 8-12-75
 74L(C)2982

II. TRIANGULATION STATION RECOVERED

When a landmark or aid which is also a triangulation station is recovered, enter 'Triang. Rec.' with date of recovery.

EXAMPLE: Triang. Rec.
 8-12-75

III. POSITION VERIFIED VISUALLY ON PHOTOGRAPH

Enter 'V-Vis.' and date.

EXAMPLE: V-Vis.
 8-12-75

**PHOTOGAMMETRIC FIELD POSITIONS are dependent entirely, or in part, upon control established by photogrammetric methods.

RESPONSIBLE PERSONNEL	
TYPE OF ACTION	NAME
OBJECTS INSPECTED FROM SEAWARD	<input type="checkbox"/> PHOTO FIELD PARTY <input type="checkbox"/> HYDROGRAPHIC PARTY <input type="checkbox"/> GEODETIC PARTY <input type="checkbox"/> OTHER (Specify)
POSITIONS DETERMINED AND/OR VERIFIED	FIELD ACTIVITY REPRESENTATIVE
FORMS ORIGINATED BY QUALITY CONTROL AND REVIEW GROUP AND FINAL REVIEW ACTIVITIES	<input type="checkbox"/> REVIEWER <input type="checkbox"/> QUALITY CONTROL AND REVIEW GROUP REPRESENTATIVE
INSTRUCTIONS FOR ENTRIES UNDER 'METHOD AND DATE OF LOCATION' (Consult Photogrammetric Instructions No. 64,	
OFFICE I. OFFICE IDENTIFIED AND LOCATED OBJECTS Enter the number and date (including month, day, and year) of the photograph used to identify and locate the object. EXAMPLE: 75E(C)6042 8-12-75	FIELD (Cont'd) B. Photogrammetric field positions** require entry of method of location or verification, date of field work and number of the photograph used to locate or identify the object. EXAMPLE: P-8-V 8-12-75 74L(C)2982
FIELD I. NEW POSITION DETERMINED OR VERIFIED Enter the applicable data by symbols as follows: F - Field L - Located V - Verified 1 - Triangulation 2 - Traverse 3 - Intersection 4 - Resection 5 - Field Identified 6 - Theodolite 7 - Planetable 8 - Sextant A. Field positions* require entry of method of location and date of field work. EXAMPLE: F-2-6-L 8-12-75 *FIELD POSITIONS are determined by field observations based entirely upon ground survey methods.	II. TRIANGULATION STATION RECOVERED When a landmark or aid which is also a triangulation station is recovered, enter 'Triang. Rec.' with date of recovery. EXAMPLE: Triang. Rec. 8-12-75 III. POSITION VERIFIED VISUALLY ON PHOTOGRAPH Enter 'V-Vis.' and date. EXAMPLE: V-Vis. 8-12-75 **PHOTOGAMMETRIC FIELD POSITIONS are dependent entirely, or in part, upon control established by photogrammetric methods.

APPROVAL SHEET
Survey H-9894
HSB-20-2-80

The hydrographic records transmitted with this report are complete and adequate to supersede prior surveys for charting and no additional work is recommended.

Direct daily supervision was not given by me during the field work.

Approved and forwarded,



George W. Jamerson
Lt. Cdr., NOAA
Chief, Hydrographic Surveys Branch

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

WATER LEVEL NOTE FOR HYDROGRAPHIC SHEET

Processing Division: Atlantic Marine Center: CAM3

Hourly heights are approved for

Water Level Station Used: Presque Isle, Michigan (907-5069)

Period: July 14, 1980 to August 6, 1980

HYDROGRAPHIC SHEET: H-9894

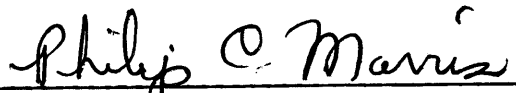
OPR-X115-WH/HSB-80

Locality: Lake Huron

Plane of reference: Low Water Datum (IGLD 1955 : 576.8 Feet)

Remarks:

Zoning not required. Data from other gages on Lake Huron indicates
no unusual water level movement during the survey period.


Chief, Water Level Branch

GEOGRAPHIC NAMES

H-9894

Name on Survey	Source of Name											
	A	B	C	D	E	F	G	H	K			
	ON CHART NO.	ON PREVIOUS SURVEY NO.	ON U.S. QUADRANGLE MAPS	FROM LOCAL INFORMATION	ON LOCAL MAPS	P.O. GUIDE OR MAP	GRAND McNALLY ATLAS	U.S. LIGHT LIST				
ADAMS POINT ✓												1
BLACK POINT ✓												2
LAKE HURON ✓												3
NORTH ALBANY POINT ✓												4
NORTH BAY ✓												5
OBSERVATORY POINT ✓												6
PRESQUE ISLE ✓												7
PRESQUE ISLE HARBOR ✓												8
SOUTH ALBANY POINT ✓												9
STONEPORT ✓												10
THOMPSONS HARBOR ✓												11
												12
												13
												14
												15
												16
												17
												18
												19
												20
												21
												22
												23
												24
												25

Approved:

Chris E. Harrington
Chief Geographer - CG2x5

2 MARCH 1983

APPROVAL SHEET
FOR
SURVEY H-9894

- A. All revisions and additions made on the smooth sheet during verification have been entered in the magnetic tape records for this survey. A new final position printout has/~~XXXXXX~~ been made. A new final sounding printout has/~~XXXXXX~~ been made.
- B. The verified smooth sheet has been inspected, is complete, and meets the requirements of the HYDROGRAPHIC MANUAL. Exceptions are listed in the Verification Report.

Date: April 1, 1982


Chief, Verification Branch

REGISTRY NO. H-9894

The magnetic tape containing the data for this survey has not been corrected to reflect the changes made during evaluation and review.

When the magnetic tape has been updated to reflect the final results of the survey, the following shall be completed:

MAGNETIC TAPE CORRECTED

DATE _____ TIME REQUIRED _____ INITIALS _____

REMARKS:

ATLANTIC MARINE CENTER
VERIFICATION REPORT

REGISTRY NO.: H-9894

FIELD NO.: HSB-20-2-80

Michigan, Lake Huron, ~~Approaches to Presque Isle Harbor~~
offshore - Steepport to Adams Point

SURVEYED: July 14 through August 6, 1980

SCALE: 1:20,000

PROJECT NO.: OPR-X115

SOUNDINGS: DE-723D Fathometer

CONTROL: ARGO (Range-Range)

Chief of Party	G. W. Jamerson
Surveyed by	D. A. Waltz
.....	S. Weisner
.....	R. L. Keene
.....	R. F. Trefethen
Automated Plot by	Xynetics 1201 Plotter (AMC)

1. INTRODUCTION

- a. There were no unusual problems encountered on this survey. ✓
- b. Notes and changes were made in the Descriptive Report during verification. ✓

2. CONTROL AND SHORELINE

- a. The source of control is adequately described in sections F and G of the Descriptive Report. ✓
- b. No contemporary shoreline maps were available for this survey. ✓

3. HYDROGRAPHY

- a. The agreement at crossings on this survey is adequate; depths agree within the limits prescribed by the Hydrographic Manual. ✓
- b. The standard depth curves could be adequately drawn. Dashed curves and supplemental curves were used to better delineate some features. ✓
- c. This survey is considered adequate to delineate the basic bottom configuration and to determine least depths when consideration is given to the supplemental data from the prior surveys that were brought forward to the present survey. Attention is also directed to the items discussed under section 7.a. of this report. ✓

4. CONDITION OF SURVEY

The smooth sheet and accompanying overlays, hydrographic records and reports comply with the Hydrographic Manual with the exceptions listed below:

- a. The lack of notes in the sounding volume and the incomplete nature of the notes found on the raw data printouts detracted from the completeness of the survey (No detached positions were abstracted). ✓

b. Bar checks were not taken in accordance with sections 1.5.2. and 4.9.5.1.1. of the Hydrographic Manual. The bar checks were not used for velocity of sound determination; however, they should have been used to ascertain there was no instrument error.

c. The report on landmarks was not submitted in accordance with section 5.5.1 of the Hydrographic Manual.

5. JUNCTIONS

H-9720 (1977) to the north
H-9845 (1979) to the west
H-9850 (1979-80) to the east

LS 2018 (1958) South
LS 2019 (1958) South
LS 2020 (1958) South
LS 2021 (1958) Southwest

The junction with H-9850 (1979-80) is complete and requires no further work. The junction with H-9845 will require the penciled curves on that survey (H-9845) be inked in agreement with H-9894 (1980). The junction with H-9720 (1977) should be inked to agree with the curves on H-9894 (1980).

There were no contemporary junctional surveys to the south of the present survey. The three surveys LS-2018 (1958), 2019 (1958) and LS-2020 (1958) were not considered as contemporary as the line spacing was not in accordance with the requirements for this scale survey as per section 4.3.4 of the Hydrographic Manual. These surveys are discussed under section 6. of this report. *Line spacing is not a criteria to determine if one survey junctions another.*

6. COMPARISONS WITH PRIOR SURVEYS

- a. LS-1181 (1909) 1:20,000
- LS-1182 (1909) 1:20,000
- LS-1191 (1910) 1:20,000
- LS-1838 (1945) 1:20,000
- LS-1853 (1947) 1:10,000
- ~~LS-1854 (1947) 1:10,000~~
- LS-2018 (1958) 1:10,000
- LS-2019 (1958) 1:5,000
- LS-2020 (1959) 1:10,000

surveys contain noted swept areas

Junction surveys

The above prior surveys from the U.S. Army Corps of Engineers Lake Survey Center were determined to be the most appropriate for comparison purposes in the area common to the present survey.

Para 6 Junction

In general, the prior surveys later than 1945 agree within \pm 2-ft. with the present survey. The prior surveys earlier than 1947 are in agreement within 1 to 8 feet, with the present survey generally being shoaler by these amounts. The basic bottom configuration and least depths are in fair agreement with the present survey providing much more information on the topography of the bottom configuration.

It is reasonable to attribute these differences to improved method of obtaining soundings and to improved control methods.

Several
A large number of bottom characteristics and one sounding were carried forward to the present survey from these prior surveys. The sounding is a 58-ft. depth in approximate Lat. 45° 21' 54", Long. 83° 29' 09", from LS-1181 (1909), the shoalest depth on the present survey is 59 feet, *and*

With the addition of the bottom characteristics and the sounding described above to supplement the present survey, the present survey is adequate to supersede the prior surveys in the common area.

b. Wire-Drag Surveys (*Hydrographic Surveys*)

LS-1181 (1909)
LS-1182 (1909)
LS-1191 (1910)

These surveys are basically hydrographic surveys with wire-drag swept areas portrayed on the most inshore areas of these surveys. There are no conflicts between the effective depths of these wire-drag areas and the present survey.

7. COMPARISON WITH CHARTS #14869 (21st. Edition, November 25, 1978)

a. Hydrography

The charted hydrography (75%) originates with the previously discussed prior surveys and no further consideration for those is required. The remaining 25% or approximately 35 depths originate with sources not ascertainable during verification. All but six of these depths agree within the limits as stated under the comparison with prior surveys section of this report. The six charted sounding discussed below should be researched by the chart compiler as to source and value for consideration of retention on the chart.

1) A 66-ft. charted depth in approximate Lat. $45^{\circ}24'00''$, Long. $83^{\circ}34'02''$. The shoalest depth in this vicinity on the present survey is 126 feet. This item is discussed in the Descriptive Report's section L. item (2). The existence of this charted depth is doubtful.

*66-ft
charted
depth
considered
discredited.
chart depths
on present
survey*

2) A 72-ft. charted depth in approximate Lat. $45^{\circ}22'46''$, Long. $83^{\circ}33'08''$. The shoalest depth in this vicinity on the present survey is 74 feet.

*chart depths
on present
survey*

3) A 60-ft. charted depth in approximate Lat. $45^{\circ}22'24''$, Long. $83^{\circ}34'35''$. The shoalest depth in this area on the present survey is 75 feet. A 57-foot depth was found by the present survey 350 meters to the northwest.

*concur chart
depths from
present survey*

4) A 60-ft charted depth in approximate Lat. $45^{\circ}23'07''$, Long. $83^{\circ}34'57''$. The shoalest depth in this area on the present survey is 85 feet. The existence of this charted depth in this location is doubtful.

*chart depths
from present
survey*

5) A 72-ft. charted depth in approximate Lat. $45^{\circ}23'04''$, Long. $83^{\circ}36'12''$. The shoalest depth in this area on the present survey is 76 feet. A 71-foot depth was found by the present survey 200 meters to the southeast.

Additional information on some of the charted information can be found in section L. of the Descriptive Report. These depths, for the most part, were not investigated by the field unit. They tend to be shoaler than the present survey depths which is the opposite of what was found to be the norm. These depths are not recommended for retention.

The field did not use the most recent edition of chart number 14864 (21st edition, May 3, 1980). It appears that the only difference between the two editions is that on the 21st edition some data has been charted from survey H-9720 (1977). The soundings listed above are on both editions of this chart. ✓

The present survey is considered adequate to supersede the charted hydrography with consideration of the retention of the items listed in this report and when attention is given to the charted items from sources not readily ascertainable at the time of verification. ✓

b. Aids To Navigation

The aids to navigation appear to adequately mark the intended features on the survey. ✓

8. COMPLIANCE WITH INSTRUCTIONS

This survey adequately complies with the Project Instructions, with the exceptions listed elsewhere in this report and the following: ✓

a) The Landmarks were not investigated in accordance with section 4.2.2. of the Project Instructions. ✓

b) The geographic names were not investigated in accordance with section 4.2.4. of the Project Instructions. ✓

9. ADDITIONAL FIELD WORK

This is a good basic survey. Additional field work is not recommended.

Ronald L. Keene

R. L. Keene
Cartographic Technician
Verification of Data

Leroy G. Cram

Leroy G. Cram
Cartographer
Evaluation and Analysis

March 19, 1982

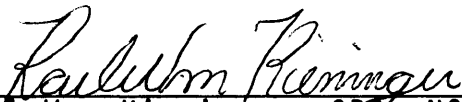
Harry R. Smith

Harry R. Smith
Senior Cartographic Technician
Verification Check

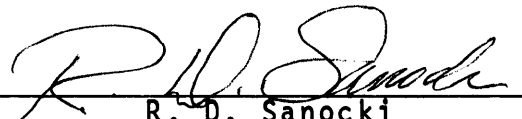
INSPECTION REPORT
H-9894

The completed survey has been inspected by the Hydrographic Inspection Team with regard to survey coverage, delineation of depth contours, development of critical depths, cartographic symbolization, and verification or disproval of charted data. The Verification Report has presented the facts accurately and properly, the procedures used were appropriate, and the recommendations are logical and justifiable. The survey complies with National Ocean Survey requirements except as noted in the Verification Report. The survey records comply with NOS requirements except where noted in the Verification Report. The Hydrographic Inspection Team concurs with the verifier's findings, actions, and recommendations.

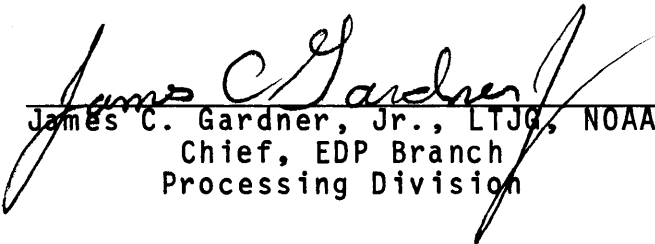
Examined and Approved
Hydrographic Inspection Team



Karl Wm. Kieninger, CDR, NOAA
Chief, Processing Division

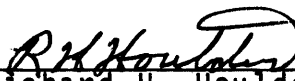


R. D. Sanocki
Chief, Verification Branch
Processing Division



James C. Gardner, Jr., LTJG, NOAA
Chief, EDP Branch
Processing Division

Approved/Forwarded
March 26, 1982



Richard H. Houlder, RADM, NOAA
Director, Atlantic Marine Center



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
CHARTING AND GEODETIC SERVICES
Rockville, Md. 20852

N/CG242:LQ

April 3, 1984

TO: Roy K. Matsushige *RRM*
Chief, Hydrographic Surveys Branch

THRU: Chief, Standards Section *gm*

FROM: Lisa Quinlan *Lisa Quinlan*
Quality Evaluator

SUBJECT: Quality Control Report for Survey H-9894 (1980), Michigan, Lake
Huron, Offshore--Stoneport to Adams Point

A quality control inspection of survey H-9894 was accomplished to monitor the survey for adequacy with respect to data acquisition, delineation of the bottom, determination of least depths, navigational hazards, junctions, sounding line crossings, smooth plotting, decisions made and actions taken by the verifier, and the cartographic presentation of data. In general, the survey was found to conform to National Ocean Service standards and requirements except as stated in the Verifier's Report and the HIT Report.

CC:
N/CG241





**UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration**

NATIONAL OCEAN SERVICE
OFFICE OF CHARTING AND GEODETIC SERVICES
ROCKVILLE, MARYLAND 20852

AUG 8 1984

N/CG241:RWD

TO: N/MOA - Wesley V. Hull

FROM: *for* N/CG2 - C. William Hayes

SUBJECT: Report of Compliance for Survey H-9894

Sign of R. Peters

The smooth sheet and Descriptive Report for survey H-9894 (1980), Michigan, Lake Huron, Offshore--Stoneport to Adams Point, have been reviewed. This survey, except as noted in the Quality Control Report, dated April 3, 1984 (copy attached), and the Hydrographic Survey Inspection Team Report, dated March 26, 1982, is complete and adequate for the purposes intended and is in compliance with Project Instructions OPR-X115-WH/HSB-80, dated March 31, 1980.

Attachment

CC:
N/CG242 w/o att.



