

7160

Diag'd. on Diag. Ch. No. 78-2

Form 504

U. S. COAST AND GEODETIC SURVEY
DEPARTMENT OF COMMERCE

DESCRIPTIVE REPORT

Type of Survey HYDROGRAPHIC
Field No. CQ-1846 Office No. H-7160

LOCALITY
State VIRGINIA
General locality JAMES RIVER
Locality BURWELL BAY

1946-47-48

CHIEF OF PARTY

E. B. LATHAM & R. R. MOORE

LIBRARY & ARCHIVES

DATE DECEMBER 8, 1948

7160

DEPARTMENT OF COMMERCE

U. S. COAST AND GEODETIC SURVEY

HYDROGRAPHIC TITLE SHEET

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

REG. NO. - H-7160

REGISTER NO. H-7160

Field No. CO-1846

State VIRGINIA

General locality JAMES RIVER

Locality BURWELL BAY

Scale 1:10,000 Date of survey 4 December 1946-30 Oct. 1947
5 April - 11 May 1948

Instructions dated 11 Oct. 1940; Supp. 17 Nov. 1942; 13 Sept. 1944; 12 March 1948

Vessel COWIE

Chief of party Ronald R. Moore & E. B. Latham

Surveyed by E. B. Latham, R. R. Moore, R. C. Rowse, C. A. Schoene

Soundings taken by fathometer, ~~grapho-recorder~~, hand lead, ~~etc~~ Pole

Fathograms scaled by

Fathograms checked by

Protracted by A. Kaupa

Soundings penciled by A. Kaupa

Soundings in ~~2000~~ feet at MLW ~~MLW~~

REMARKS: This report covers that part of the work done during the

1946-47-48 working season.

DESCRIPTIVE REPORT

Hydrographic Sheet - Field No. Co - 1846
Office No. H - 7160

Ship COWIE R. R. Moore, Comdg.

Scale 1:10,000

A. This survey was made under instructions for Project No. CS- 255 dated 11 October 1940, and supplemental instructions dated 17 November 1942 and 13 September 1944.

B. The survey was started on 4 December 1946 in the Warwick River. The work was discontinued after three days sounding and was resumed on 30 September 1947 and again discontinued on 30 October 1947 on account of lack of funds.

The limits of the area surveyed are from Latitude 37°-07' south to a junction with sheet H-6928 (1943-44), and sheet H-7162 (1946-47) of the Pagan River. It extends from the eastern shore of the James River west to a line parallel to and $\frac{1}{2}$ mile west of Rocklanding Shoal Channel. It extends from the south shore of Burwell Bay north to Latitude 37°-03'. The area surveyed includes the Warwick River.

C. This survey was made by Launch 102 and the 25 ft. skiff. Two 808 fathometers were used in Launch 102, 57S and 118S. All the sounding done with the skiff in 1947 was with the sounding pole except j-day, 22 October 1947, when the Bludworth Depth Recorder was used in conjunction with the pole. The skiff was used principally in the shoal areas adjacent to the shoreline and in the Warwick River. An 808 fathometer was used in the skiff for the sounding in the Warwick River during December 1946.

D. A portable automatic tide gage was maintained at Menchville in Deep Creek during December 1946 and used for the reduction of the soundings in the Warwick River.

Mean Low Water on the tide staff was 1.7 feet.

A portable automatic tide gage was established at Sadlers' Wharf in Burwell Bay (near Rushmere) 29 September 1947 and maintained until 30 October 1947. This gage was used to reduce the soundings for all the soundings during this period.

Mean Low Water on the tide staff at Burwell Bay is 3.7 feet.

E. The smooth sheet was plotted by the Norfolk Processing Office.

F. The control for this survey was based on triangulation executed by various chiefs of party from 1909 to 1938.

Topographic stations were located by photo-compilation method and are from Topo sheets T-8060, T-8061, T-8068 and T-8069. & T-8059
(All of 1941-42)

Hydrographic stations were located by sextant fixes or sextant cuts from Triangulation stations.

- G. The shoreline is from the topographic sheets noted above. The shoreline is in good general agreement with that shown on the topographic sheets.
- H. Soundings were taken with recording fathometers of the 808 and Bludworth types. The sounding pole was used exclusively in some of the shoal areas inshore. Bar checks were taken two or three times each day, near the beginning, middle, and end of the days work. From the bar checks, curves were drawn for the correction of the soundings. (*Bar checks filed with fathograms*)
- I. Sounding lines were controlled by three point fixes taken on hydrographic signals at intervals averaging $1\frac{1}{2}$ minutes. For the soundings in the northern half of the Warwick River, no positions were taken. The boat sheet should be consulted for this work.
- J. This survey is complete and adequate to supersede all prior surveys in this area. (*See TP 7C, Review.*)

There are no holidays or excessive differences.

In general the spacing of the sounding lines is approximately 80 meters. On the flats of less than 6 feet in depth the spacing is approximately 160 meters. In areas where the bottom is very irregular, intermediate lines were run.

The areas inside the fish trap lines are filled with traps, most of them without nets at the time of the survey. Many of the trap stakes are broken off near the water line and are a menace to the navigation of small boats.

- K. The percentage of crosslines is approximately 8%. The crossings are generally in good agreement in so far as predicted tides were used for the plotting of soundings.

- L. No previous survey with which to compare. The junctions with Sheets H-6928 and H-7162, scale 1:10,000 ^{are} satisfactory, also H-7174 (1948)
(1943-44) (1946-47)

- M. Comparison with chart No. 529, print date 6/30/47. In general, the present survey is in good agreement with the chart in so far as predicted tides were used for the reduction of soundings. | *see TP 6A, Review.*

In Latitude $37^{\circ}-03.3^{\prime}$, Longitude $76^{\circ}-35.82^{\prime}$ a sounding of 9 ft. was obtained where a sounding of 12 ft. is shown on the chart. In Latitude $37^{\circ}-03.0^{\prime}$, Longitude $76^{\circ}-35.5^{\prime}$, a deep was found with the greatest sounding of ~~46~~⁴⁵ ft. This deep is not shown on the chart. *It has no navigational value.*

In the areas west of Rocklanding Shoal Channel, east of the south entrance to Rocklanding Shoal Channel, and north and west of Days Pt. there are numerous shell banks. Since the Oystermen are constantly working on these banks, the depths are constantly changing.

N. No new dangers to navigation were found on this survey.

/s/ Charles A. Schoene
Lieut. (USC&GS)

P. Fixed Aids to Navigation: None.

Floating Aids to Navigation:

NAME	Latitude	Longitude	Depth	Pos.No.
James River Buoy 12 10/2/47	37-03.17 ⁰⁹	76-34.78 ⁶	42.8	38C Loh102
James River Lighted Bell Buoy 11 10/2/47	37-03.16 ⁰⁷	76-34.80 ³¹	16.6	39C "
James River Lighted Buoy 9 10/2/47	37-03.13	76-33.77	27.6	40C "
James River Lighted Buoy 10 10/2/47	37-03.24	76-33.80 ⁶¹	26.6	41C "
White Shoal South Channel Buoy 3 10/2/47	37-02.00	76-34.00 ^{33.98}	16.0	101g "
Burwell Bay Buoy 4 10/20/47	37-02.38 ²⁸	76-38.45	11.6	51p "
Burwell Bay Buoy 1 10/21/47	37-02.77 ⁷⁸	76-36.29	18.5	1h Skiff
James River Lighted Buoy 13 10/21/47	37-03.32	76-35.64	22.0	2h "
James River Lighted Bell Buoy 14 10/21/47	37-03.30	76-35.48	22.8	3h "
James River Buoy 15 10/21/47	37-04.01 ⁰²	76-36.13	17.3	4h "
James River Lighted Buoy 16 10/21/47	37-04.10	76-36.05 ⁰⁴	21.8	5h "
James River Lighted Buoy 17 10/21/47	37-04.72	76-36.63 ²²	19.8	6h "
James River Bell Buoy 18 10/21/47	37-04.86	76-36.57	13.3	7h "
James River Buoy 19 10/21/47	37-05.51 ⁵⁰	76-37.20 ²¹	24.3	8h "
James River Lighted Buoy 20 10/21/47	37-05.59	76-37.10 ¹¹	26.8	9h "
James River Buoy (Lighted) 21 10/21/47	37-06.32 ³³	76-37.74	26.1	10h "
James River Buoy 22 10/21/47	37-06.35	76-37.83 ³⁴	16.6	11h "
Burwell Bay Buoy 6	37-03.10	76-38.91	12.6	2q Lch.102
Burwell Bay Buoy 7	37-05.78	76-38.89	14.4	18X

NOTE BY CHIEF OF PARTY.

This sheet is not finished but can be considered complete within the area covered. A few signals used during the past season will have to be recovered and rebuilt when work is resumed. *Completed 10 1948.*

The shoals east of the southern entrance to Rocklanding Channel are shell banks, and during the period of the survey, there were about one hundred and fifty small boats tonging for oysters in the vicinity.

The area inside the 6 foot curve around Day's Point is covered with numerous small shoals as can be seen by the fathograms. Numerous pole soundings were obtained on these shoals.

The area west of the Rocklanding Channel was evidently used as a dumping ground and is very broken. The shoal spots here are shell banks and numerous oyster boats were in evidence. 50 meter lines were run in this area.

All these areas are covered with fish traps in different stages of repair.

Ronald R. Moore

Ronald R. Moore
Lieut. Comdr., USC&GS
Chief of Party.

TIDAL NOTE

For the work in the Warwick River, a portable automatic tide gage was installed at the dock at Menchville, Deep Creek. Mean low water corresponds with a height of 1.7 feet on the tide staff.

When field work was resumed, a portable automatic tide gage was installed on Sadlers Dock, Burwell Bay and maintained until field work closed for the season. Mean low water corresponds to a height of 3.7 feet on the tide staff.

LIST OF CONTROL STATIONS ✓

Triangulation Stations.

White Shoal L. H. 1909	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	SHO	
Llewellyn VCF 1938	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	WEL
Tower, Warwick River 1938	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	WAR
Eustis VCF 1938	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	TIS
Jack VCF 1937	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	JACK
Patch VCF 1937	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	PAT
Curtis Pt. Tower F.P. 1938	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	CUR
Camp VCF 1937	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	CAMP
Jail USE 1930	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	USE
Snell USE 1938	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NEL
Tower, South of Marshy Pt. F.P. 1938	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	MAR
Cedar VCF 1938	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	DAR
Upton Farm Barn N.E. Gable, 1938	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	UP
The Rocks, Barn N. Gable, 1938	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	GAB
No. 506 VCF 1938	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	COM
*Extra, 1938	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Point of Shoals, 1938	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	POINT

*Not used as hydrographic Signal.

Topographic Stations

BEA	END	PIN	DIP	STACK	TRI	ABE	CORN	TANK	MIL	BUN	EX	CEDAR
DEAD	HIGH	NAT	CON	MAD	RED	TEN	PEG	NAN	GUS	*PILE		

Hydrographic Stations

NIL	PILE	BIN	GAL	DUCK	EGG	POL	LOP	LAG	PAR	SLIM	RET	BUSH	RAP	
MIG	NET	PLAT	FIG	OFF	NUB	DOT	BO	SLIME	LUF	FAL	TED	RUT	FEN	DAD

Sheet H-7160

Hydrographic Signals (Cont)

*PILE (N End of Islet off Day Pt.)			<u>OFF</u>	
MAR	51-14	Taken from T-8061	MAR	33.10
WEL			USE	
SHO	43-52		SHO	64.45
WAR-WEL	35-53		USE - CUR	06-56
 <u>GAL</u>			<u>NUB</u>	
MAR	55-25		MAR	34.15
WEL			USE	
SHO	46-01		CUR	06-11
WAR-WEL	39-11		NAN - MAR	71-40
 <u>NIG</u>			<u>DOT</u>	
MAR	56-55		NAN	21-04
WEL			POINT	
SHO	46.18		MAR	51.10
WAR-WEL	40-20		MAR - CUR	40-12

Sheet H-7160

Hydrographic Signals (Cont)

<u>EGG</u>	38-00 → corr. from field cut book	<u>BO</u>	
MAR	37-55	NAN	22-28
CUR		POINT	
SHO	67-12	MAR	50-00
WAR-CUR	19-46	POINT-USE	84-08
		POINT-CUR	89-23
<u>NET</u>		<u>SLIME</u>	
MAR	29-52	COM	41-25
USE		POINT	
CUR	08-45	MAR	44-51
USE-SHO	73-56	POINT-CUR	81-56
<u>PLAT</u>		<u>LUF</u>	
MAR	31-04	COM	42-55
USE		POINT	
CUR	08-14	MAR	42-30
USE-SHO	71-14	POINT-CUR	78-50
<u>FIG</u>		<u>FAL</u>	
MAR	32-21	COM	44-21
USE		POINT	
SHO	68-02	RED	109-25
USE-CUR	07-34	POINT-CUR	75-20

TED
~~COM 08-20~~
~~PEG~~
~~POINT 37-17~~
~~Pt-CUR 71-54~~

At Triangulation Station 506 VCF (COM)
 Rock Barn N. Gable - LUF 06-39
 FAL 09-59
 TED 13-28
 RUT 19-48
 FEN 26-01
 DAD 30-30

Plotted on cuts from Δ stations

RUT
~~COM 08-25~~
~~PEG~~
~~POINT 38-43~~
~~POINT-CUR 68-53~~
~~POINT-RED 101-28~~

At Signal CORN
 Rocks Barn N. Gable - SLIM 07-38
 LUF 12-01
 FAL 16-46
 TED 21-36
 RUT 29-23
 FEN 38-27
 DAD 46-29
 BO-Rocks Barn, N. Gable 04-41

DAD
 GUS 22-50
 POINT
 RED 94.50
 BIP-POINT 20-32

At Fish Trap
 CUR 96-56
 GAB
 CORN 143-56
 GAB-COM 84-40

FEN
 DIP 16-42
 POINT
 RED 07-50

Rocks Barn, N. Gable - SLIM 18-04
 LUF 26-58
 FAL 35-59

HYDROGRAPHIC SIGNALS

RAP	3 cuts Vol 3 p 66 At Tri. Station SNELL RAP-MAR 00-33 At Tri. Station Pt. of Shoals Lt. Ho RAP-SNELL 08-35			
BUSH	RET 10-14 MIL SNELL 23-35	Cut at Tri. Station SNELL - MAR-BUSH 15-30		
RET	UP 85-17 SNELL MIL 25-29 SNELL-MAR 43-00	Cut at SNELL MAR-RET 126-00		
SLIM	TRI 128-38 SNELL MAR 24-11 UP-SNELL 102-17	Cut at SNELL MAR-SLIM 145-28		
PAR	UP 112-24 TRI SNELL	Cut from Pt. of Shoals Lt. Ho. SNELL-PAR 10-10		
LAG	CUR 35-48 USE UP 43-36 USE-SHO 02-24			
LOP	TRI 142-41 CUR SHO 45-44 CUR-USE 45-06	Cut from Point SNELL-LOP 15-25		
POL	SNELL 136-38 CUR SHO 58-09 CUR-USE 54-10	Cut from Point SNELL-POL 18-40		

Location of Topo. Signal "PIN"
At air-photo signal no. 226.
Angle PIN-WEL 89-30
Distance to PIN - 50 Ft. (15.2 meters)

Location of Topo. Signal "CORN"
At triangulation station Pt. Of Shoals
Angle PEG - CORN - 0-00
Distance to CORN - 5.03 meters

Location of Topo. signal "EX"
At triangulation station EXTRA
Angle- POINT - EX -- 22-42
Distance to EX -- 105.50 meters

Fathometer Corrections

Instead of obtaining corrections for each day from the bar checks for that day, the corrections for each depth of all bar checks were listed and the average corrections used for the reduction of soundings. A separate list being made for each recorder used.

Most of the bar checks were taken where there was considerable current and at deeper depths, at times, an echo was difficult to receive. As there were probably variations in the temperature and salinity during the time of the survey, it was considered that the average correction would be a better value than the individual one. *(fathometer corrections filed with fathograms.)*

The final corrections are listed below:

Fathometer 57 S

Launch 102 a,b,c,d days

"A" Scale		"B" Scale	
Corr.	Depths	Corr.	Depths
0.0 ft.	0.0 - 39.0 ft.	- 0.4 ft.	Up to 42.0 ft.
- 0.2 ft.	39.1 - 45.0 ft.	- 0.6 ft.	42.1 - 55.0 ft.
- 0.4 ft.	45.1 - 50.0 ft.	- 0.8 ft.	55.1 - 68.0 ft.
- 0.6 ft.	50.1 - 55.0 ft.		
- 0.8 ft.	55.1 - Up.		

Fathometer 118 S.

Launch 102 e,f,g,h,j,k,l,m,n,p days

"A" Scale	
Corr.	Depths
0.0 ft.	0.0 ft. - 5.0 ft.
- 0.2 ft.	5.1 ft. - 20.0 ft.
- 0.4 ft.	20.1 ft. - 36.0 ft.
- 0.6 ft.	36.1 ft. - 53.0 ft.
- 0.8 ft.	53.1 ft. Up.

Fathometer 78B

Skiff j day

No Correction

Fathometer 67S

Skiff a,b,c days

No correction from numerous pole checks

STATISTICS

VOL. NO.	DATE	NO. POS.	STATUTE MILES	H.L. & POLE SOUNDINGS	DAY	BOAT
1	4 December 1946	165	18.3	83	a	Skiff
1	5 December 1946	129	18.4	29	b	Skiff
2	10 December 1946	62	7.0	32	c	Skiff
3	30 September 1947	121	15.3	--	a	Launch 102
3	1 October 1947	204	29.6	--	b	Launch 102
2	1 October 1947	107	11.0	732	d	Skiff
2	2 October 1947	94	11.6	700	e	Skiff
3 & 4	2 October 1947	225	31.5	4	c	Launch 102
4	3 October 1947	114	14.7	---	d	Launch 102
2	3 October 1947	12	3.0	75	f	Skiff
4 & 5	7 October 1947	144	21.0	--	e	Launch 102
5	8 October 1947	231	39.4	--	f	Launch 102
5 & 6	16 October 1947	113	17.3	1	g	Launch 102
7	17 October 1947	99	12.2	787	g	Skiff
6	20 October 1947	106	14.7	2	h	Launch 102
7	21 October 1947	11	----	11	h	Skiff
6 & 8	21 October 1947	210	37.8	--	j	Launch 102
7 & 9	22 October 1947	229	22.2	228	j	Skiff
8	23 October 1947	232	37.3	--	k	Launch 102
8 & 10	27 October 1947	88	13.4	--	l	Launch 102
10	28 October 1947	219	33.5	--	m	Launch 102
9	29 October 1947	88	11.7	691	k	Skiff
10 & 11	29 October 1947	246	37.1	--	n	Launch 102
11	30 October 1947	197	25.0	43	p	Launch 102
TOTALS		----- 3446	483.0	3418		

Total Area --- 15.5 Square Statute Miles.

ADDENDUM

To accompany

HYDROGRAPHIC SURVEY H-7160 (Field No. Co-1846)

Soundings Lat. 37-04.5 Long. 76-34.0

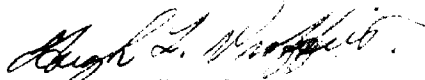
In this general area, pole soundings taken from the "ARK" average about one foot deeper at crossings than fathometer soundings. The Officer-in-charge believed this was caused by the pole sinking in very soft mud.

Crossings
adequate.

Buoys Lat 37-06.3 Long. 76-37.7


Navigating buoys (FL) W 21 and N-22 were transferred directly from smooth sheet H-7174. The fixes on the latter sheet were much stronger and were taken at a more recent date.

Respectfully submitted,


Hugh L. Proffitt
Cartographer

Norfolk, Va.
15 Nov. 1948

Approved and forwarded



Earl O. Heaton
Supervisor, Southeastern District.

DESCRIPTIVE REPORT

TO ACCOMPANY HYDROGRAPHIC SURVEY H-7160 (Field No. Co-1846)

SHIP "COWIE"
E. B. Latham, Comdg.

Scale 1:10,000

A. PROJECT

Project CS - 255 Instructions dated 12 March 1948 ✓

B. SURVEY LIMITS AND DATES

General locality Burwell Bay, James River, Va.
Survey limits, Lat. 37 -02 to 06, Long. 76-31 to 41
Dates, 1948 Season - 5 April 1948 to 11 May 1948 ✓
Junctions, on the north H-7174 (scale 1:10,000), on the
south, H-6928 (scale 1:10,000)

C. VESSEL AND EQUIPMENT

General survey by Launch No. 102, using 808 Recording Fathometer ✓
No. 57 S and special shoal water work by Ark using 808 Recording
Fathometer No. 118 S and pole.

Launches were operated from Ship COWIE, Launch operated at
generally 600 to 900 RPM speed 4-5.5 knots tactical diameter ✓
approximately 25 yards at these speeds. Ark operated one
outboard motor full speed but with muffler on (on account of
noise conditions) Speed 3-3½ knots tactical diameter variable
with state of sea.

D. TIDE AND CURRENT STATIONS

Auto. Portable tide gage established at Burwell Bay and Standard ✓
Tide Gage(s) at Hampton Roads and/or Hopewell, James River, Va.

Before beginning season's work the Chief of Party visited the
Standard Gage at Hopewell, Virginia, and determined that the
gage was operating satisfactorily. The Auto. Portable Gage at
Burwell Bay failed to operate for the period that hydrography
was done on 23 April. Field reducers were entered by hourly
heights supplied by Supervisor S. E. District for Hampton Roads
with corrections interpolated from simultaneous observations on
22 and 24 April.

E. SMOOTH SHEET

The smooth sheet was made by hand at the Norfolk Processing Office. The shore line and signals were transferred by the usual methods. The shoreline and topographic details have been verified in accordance with paragraph 757 of the Hydrographic Manual.

F. CONTROL STATIONS

The triangulation stations were established at various times and co-ordinated by the party of H. E. Finnegan in 1938. Topographic signals DOG, COO and BUG were taken from graphic control survey T-7070. ⁽¹⁹⁴²⁾ The remainder of the topographic signals were taken from air-photo compilations T-8060, 8061, 8068, and 8069. ^(all of 1941-) Hydrographic signals were located by three point fixes and cuts ⁽¹⁹⁴⁴⁾ from triangulation stations.

G. SHORE LINE AND TOPOGRAPHY

The shoreline and topographic details were taken from air-photo compilations ~~T-8060, T-8061, T-8068 and T-8069~~, ~~T-8059~~ ^(all of 1941), T-8311 (1944) and T-8312 (1944).

H. SOUNDINGS

Depths were measured with the 808 Recording Fathometer and pole. Echo corrections were determined by bar checks in accordance with the Hydrographic Manual. A considerable number of unsatisfactory bar checks were taken at the beginning of the work, due to inadequate equipment. This applies particularly to work done with launch 102. The best value for the bar checks that could be determined from all information at hand was entered. Comparison of these values with those determined satisfactorily allowing for initial having been set wrongly, were compared with, and it was found that the two values differed between extreme limits of 0.2 feet too deep to 0.5 ft. too shoal. This latter limit (0.5') too shoal, was approached very seldom and the majority of final values lie between 0.2 ft. deep to 0.3 ft. shoal. It is felt that this variation may have been due to changing conditions of water temperature and salinity, and the opinion is expressed that the echo reducers are satisfactory despite the poor appearance of the bar checks. *(Bar cks filed with fathograms)*

Bar-check corrections as applied to Sdg. records considered satisfactory.

I. CONTROL OF HYDROGRAPHY

Standard methods of control using 3-point fixes on shore signals were used throughout the area sounded. Considerable difficulty in obtaining satisfactory fixes resulted from the presence of the moth ball fleet, and systems of lines were altered from those specified in the instructions on account of this difficulty.

J. ADEQUACY OF SURVEY

Survey is complete and adequate to supersede prior surveys. Some deviation from specified line spacing has resulted from the presence of the moth ball fleet, it being patently impossible to run sounding lines through anchored ships. These holidays, however, do not occur in critical areas and do not detract from the adequate number of soundings required for charting purposes.

The amount of line splitting, development, etc., done over Point of Shoals, represents a concession to perfectionist principles, inasmuch as the commercial importance of the area consists solely on the ability of the area to grow oysters.

Junctions with recent adjoining surveys are adequate and satisfactory. *(See TP 4 Review)*

K. CROSSLINES

Crosslines percentage is 15-20%. Excess is due in part to necessity of adopting different systems on account of moth ball fleet difficulties and adverse conditions of visibility encountered. There are a number of apparent unsatisfactory crossings on the Boat Sheet. The most unsatisfactory were compared after entering final corrections, and it is believed that the smooth plotting and final reducers will bring the crossings into satisfactory agreement. *(Crossings considered adequate.)*

L. COMPARISON WITH PRIOR SURVEYS AND CHARTED DEPTHS

Survey is not in agreement with charted depths. Channel along the south side of Burwell Bay has shoaled 3 to 5 ft. probably due to the dredging of the Rocklanding Cut. *TPSA Review*

Charted soundings not verified and considered of sufficient importance to warrant extensive investigations are: the 1 foot sounding Lat. 37-03.28, Long. 76-36.31 could not be verified and should be expunged from the chart. *Charted out of position.* *See TP 8 A Review*

1 foot sounding Lat. 37-05.94, Long. 76-38.18 could not be verified and should be expunged. *See TP 5 A Review*

Investigation was made of extensive hatched areas assumed to represent bare at low water, or at lowest tide in the vicinity of Lat. 37-04.4 in E.W. direction at minus (0.2) tide, and it was found that there were no bare areas there. Tide ripples were noted, however, and sounding line ^{was} run as near the axis of the shoal area causing the ripples, as could be estimated. *See TP 5 A, B side of chart Review*

This representation should be expunged from the chart. ✓

All other extremely shoal areas on the chart are believed to have been removed by oystermen and not to exist, and should be expunged. ✓

Survey of Rocklanding Shoal by Army Engineers is/was in progress. ✓

N. DANGERS AND SHOALS

The entire area of Burwell Bay has and does contain numerous fish traps, boat mooring stakes, etc. A number of underwater obstructions were discovered during the survey and doubtless many are present and undiscovered. Inasmuch as the area outside Rocklanding Cut is of very little importance to commercial navigation and offers few if any attractions to the pleasure boatman, it is recommended that the area be avoided by persons not having local knowledge.

O. COAST PILOT INFORMATION

The area is of no commercial importance, no wharves suitable for use are in the area. Most satisfactory anchorage used by the ship was near black can buoy No. C-7, taking advantage of the shelter afforded by the moth ball fleet. Ship anchored also SSW of "Ruins of Old Lighthouse", and near buoy N-6.

No natural channels are recommended. ✓

P. AIDS TO NAVIGATION

	<u>Buoy</u>	<u>Located</u>	<u>Lat.</u>	<u>Long.</u>	<u>Sdg.</u>	<u>Pos.</u>	<u>Boat</u>
#	Burwell Bay Buoy 4	Apr. 6, 1948	37-02.99	76-38.44	10.9	51p 1q	102
	Burwell Bay Buoy 6	"	37-03.10	76-38.91	12.5	2q	"
	Burwell Bay Buoy 7	Apr. 22, 1948	37-05.79	76-38.88	14.5	18x	"

Q. LANDMARKS FOR CHARTS

Landmarks presently charted are correct and adequate. ✓

See locations for these buoys on pp. 3, Desc. Rept. 1946-1947 work.

STATISTICS FOR HYDROGRAPHIC SURVEY H-7180 (PART)

SHIP "COWIE" - - MAY 1948

Project C.S. 255

Day	Vol. No.	Date	No. Positions	Stat. Miles Sounding	Soundings H.L. & Pole	Boat
q	12	4-8-48	179	23.4	7	Launch 102
r	12	4-8-48	111	16.8	4	"
s	13	4-9-48	91	11.3	2	"
t	13	4-15-48	196	30.6	3	"
l	14	4-15-48	183	13.5	768	Ark
u	13 & 15	4-16-48	121	18.4	6	Launch 102
m	14	4-16-48	122	9.8	585	Ark
v	15	4-20-48	129	16.0	2	Launch 102
n	16	4-20-48	150	18.7	2	Ark
p	16	4-21-48	72	11.0	2	Ark
w	15	4-21-48	169	24.7	--	Launch 102
x	17	4-22-48	77	7.4	17	"
y	17	4-23-48	117	16.3	--	"
q	16 & 18	4-23-48	111	10.4	--	Ark
r	18	4-27-48	13	0.7	--	"
s	19	4-28-48	97	12.1	--	Launch 102
aa	17 & 19	4-29-48	218	30.9	14	"
bb	19	4-30-48	100	16.2	2	"
cc	19 & 20	5-4-48	109	14.5	--	"
dd	20	5-5-48	192	23.5	--	"
ee	20	5-6-48	103	15.0	--	"
s	18	5-11-48	53	3.9	--	Ark

TOTALS - - - - - 2723 339.0 1414

Area in Sq. stat. Miles - - 9.8

Records transmitted to Norfolk Processing Office.

Conditions of Records transmitted to the Norfolk Processing Office. ✓

All fathograms scanned and middlers and corrections entered in sounding volumes.

All marigrams labelled, and reducers tabulated and checked.

All bar checks tabulated plotted reducers tabulated and checked.

All Tide corrections entered in sounding volumes and checked.

All echo reducers entered and checked.

All information not available to the Processing Office has (within the limitations of Chief of Party's ability and time available without unduly delaying the progress of Field Work) has been included in the Notes for Descriptive Report.

All critical depth curves have been drawn on the Beat Sheet. Soundings on beat sheet are not reliable on account of faulty initial settings during adjustment to Chief of Party's actions regarding procedure.

Hourly Heights and Heights of High and Low Waters at Burwell Bay Tide Station are not tabulated.

Ester B. Latham,
Chief of Party.

LIST OF SIGNALS
E-7160

(This list of signals covers that part of Survey done in 1948)

TRIANGULATION STATIONS

HOST GHOST, 1938

TOPOGRAPHIC SIGNALS

DOG	* T-7070	TON	Azimuth and distance from EXGRA, 1938
BUG	T-7070	WEN	T-8069
COO	T-7070	MID	T-8069
COD	** T-8069	LAX	T-8069
HEX	T-8069		

(* Graphic control) (** Air-photo compilation)

HYDROGRAPHIC SIGNALS

Cuts and fixes locating these signals may be found in Vol. 12, Pg. 59 to 62

AMO	TIN	YAM	ANT
BOLD	UNK	BOX	FOY
ROT	VOX	CRY	
SOW	WIG	DUB	

ADDENDUM

To accompany

HYDROGRAPHIC SURVEY H-7160 (Field No. Co-1846)

SOUNDINGS Lat. 37-05.9 Long. 76-38.1

Due to the congestion of lines in this area, soundings on s-day (green) are shown on template being forwarded with smooth sheet. These positions have been plotted directly on the smooth sheet and representative soundings have been transferred from the tracing to it.

*Shoalest sdgs
only were
transferred
to smooth
sheet.*

Respectfully submitted,

Hugh L. Proffitt
Hugh L. Proffitt
Cartographer

Norfolk, Va.
15 Nov. 1948

Approved and forwarded

Earl O. Heaton

Earl O. Heaton
Supervisor, Southeastern District.

STATISTICS FOR HYDROGRAPHIC SURVEY H-7160 (PART)
SHIP "COWIE" - - MAY 1948
Project C.S. 255

Day	Vol. No.	Date	No. Positions	Stat. Miles Sounding	Soundings H.L. & Pole	Boat
q	12	4-6-48	179	23.4	7	Launch 102
r	12	4-8-48	111	16.8	4	"
s	13	4-9-48	91	11.3	2	"
t	13	4-15-48	196	30.6	3	"
l	14	4-15-48	183	13.5	768	Ark
u	13 & 15	4-16-48	121	18.4	6	Launch 102
m	14	4-16-48	122	9.8	585	Ark
v	15	4-20-48	129	16.0	2	Launch 102
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p	16	4-21-48	72	11.0	2	Ark
w	15	4-21-48	169	24.7	--	Launch 102
x	17	4-22-48	77	7.4	17	"
y	17	4-23-48	117	16.3	--	"
q	16 & 18	4-23-48	111	10.4	--	Ark
r	18	4-27-48	13	0.7	--	"
z	19	4-28-48	97	12.1	--	Launch 102
aa	17 & 19	4-29-48	218	30.9	14	"
bb	19	4-30-48	100	16.2	2	"
cc	19 & 20	5-4-48	109	14.5	--	"
dd	20	5-5-48	192	23.5	--	"
ee	20	5-6-48	103	15.0	--	"
s	18	5-11-48	53	3.9	--	Ark
TOTALS - - - - -			2713	339.0	1414	

Area in Sq. stat. Miles - - 9.8

TIDE NOTE FOR HYDROGRAPHIC SHEET

27 December 1948

~~Division of Hydrography and Topography:~~

Division of Charts: R.H. Carstens

Plane of reference approved in
20 volumes of sounding records for

HYDROGRAPHIC SHEET 7160

Locality James River, Virginia

Chief of Party: R.R. Moore in 1946⁴⁷; E.B. Latham in 1948

Plane of reference is Mean low water, reading

- 3.7 ft. on tide staff at Burwell Bay
- 6.9 ft. below B. M. 1(1947)
- 1.7 ft. on tide staff at Menchville
- 9.1 ft. below B.M. 2(1943)
- 2.8 ft. on tide staff at Fort Eustis
- 7.7 ft. below B.M.1(1944)

Height of mean high water above plane of reference is;

- 2.3 ft. at Burwell Bay
- 2.6 ft. at Menchville
- 2.4 ft. at Fort Eustis

Condition of records satisfactory except as noted below:

E.C. McKay

Section
Chief, ~~Division of Tides and Currents.~~

GEOGRAPHIC NAMES

Survey No. **H7160**

Name on Survey	Source											
	A	B	C	D	E	F	G	H	K			
<u>Virginia</u>			(for title)							USGB	1	
<u>James River</u>			"	"						"	2	
<u>Burwell Bay</u>											3	
<u>Point of Shoals</u>											4	
<u>Rocklanding Shoal Channel</u>											5	
<u>Rushmere</u>										USGB	6	
<u>Mulberry Island</u>											7	
<u>Jail Point</u>											8	
<u>Warwick River</u>											9	
<u>Deep Creek</u>											10	
<u>Menchville</u>			(location of one tide staff)								11	
<u>Sadlers Dook</u>				"	"						12	
<u>Days Point</u>										USGB	13	
<u>Curtis Pt.</u>											14	
<u>Jail Cr.</u>											15	
			(names have not been added since sheet has not yet been inked. See chart 529 for application of names).									16
											17	
											18	
											19	
											20	
											21	
											22	
											23	
											24	
											25	
											26	
											27	

Hydrographic Surveys (Chart Division)

HYDROGRAPHIC SURVEY NO. **H. 7160**

Records accompanying survey:

Boat sheets **.3...**; sounding vols. **.20...**; wire drag vols.;
 bomb vols.; graphic recorder rolls **38 in, 18 envel.**
 special reports, etc. **14 Tide Marigrams, 4 sheets - Tides, Hourly heights,**
6 sheets - Tides, curves and corrections sent to Tides.
 **1 overlay**

The following statistics will be submitted with the cartographer's report on the sheet:

Number of positions on sheet		6159	
Number of positions checked		225	
Number of positions revised		2	
Number of soundings revised (refers to depth only)		165	
Number of soundings erroneously spaced		70	
Number of signals erroneously plotted or transferred		0	
Topographic details	Time	4hr	
Junctions	Time	40hr	
Verification of soundings from graphic record	Time	60hr	
Verification by L. LUBBERS Jr.	Total time	517	Date 6/3/49
Reviewed by I. M. Zeskind	Time	123	Date 8-18-49

DIVISION OF CHARTS

REVIEW SECTION - NAUTICAL CHART BRANCH

REVIEW OF HYDROGRAPHIC SURVEY

REGISTRY NO. H-7160

FIELD NO. CO-1846

Virginia, James River, Burwell Bay
Surveyed in Dec. 1946, Oct. 1947, April-May, 1948 Scale 1:10,000
Project No. CS-255

Soundings:

Bludworth Depth Recorder
808 Fathometer
Lead line
Sounding Pole

Control:

Sextant fixes on shore signals

Chief of Party - E. B. Latham and R. R. Moore
Surveyed by - E. B. Latham, R. R. Moore, R.W. Rowse and
C. A. Schoene
Protracted by - A. Kaupa
Soundings plotted by - A. Kaupa
Verified and inked by - L. Lubbers, Jr.
Reviewed by - I. M. Zeskind, August 18, 1949
Inspected by - R. H. Carstens

1. Shoreline and Signals

The shoreline originates with T-8059, T-8060, T-8061, T-8068 and T-8069 of 1941-42. For charting purposes this shoreline is now superseded by T-8311 and T-8312 of 1942-44.

The origin of the control is given in the Descriptive Report.

2. Sounding Line Crossings

Depths at crossings are in adequate agreement.

3. Depth Curves and Bottom Configuration

The usual depth curves were adequately delineated.

The bottom is generally smooth, except in the area between Rocklanding Shoal Channel and the natural channel to the west. In this area the bottom is irregular. Many oyster beds are found in the area west of Rocklanding Shoal Channel. The depths over these beds change because of oystering operations.

4. Junctions with Contemporary Surveys

Adequate junctions were effected with H-7174 (1948) on the north, H-7162 (1844-47) on the southeast and H-6928 (1943-47) on the east.

5. Comparison with Prior Surveys

A.	H-529 (1854-55)	1:20,000
	H-530 (1855)	1:20,000
	H-1179a (1871-72)	1:20,000
	<u>H-1179b (1873)</u>	<u>1:20,000</u>

A comparison of these prior surveys with the present survey reveals that many changes in the bottom have occurred in the area west of Rocklanding Shoal Channel.

The dumping of spoil directly west of this channel has caused a shoaling there of as much as 4 ft. The natural channel on the west and south sides of Burwell Bay has shoaled from 4-20 ft., as for example, in lat. 37° 03.75', long. 76° 39.58', where a prior depth of 45 ft. falls in present depths of 23-27 ft. On Point of Shoals and in the vicinity of Days Point, several prior low-water shoals are now covered by 2-5 ft. of water because of oystering operations. An example of this change in depth occurs in the vicinity of lat. 37° 02.4', long. 76° 36.1', where a prior low-water shoal falls in present depths of 1-3 ft.

On the east side of the river the shoreline has accreted as much as 200 meters in the vicinity of lat. 37° 04.7', long. 76° 33.8', and eroded as much as 120 meters in the vicinity of lat. 37° 05.4', long. 76° 34.5'. Elsewhere on the east side of the river, minor changes of 1-2 ft. in depths of 3-20 ft. have taken place, as for example, in the vicinity of lat. 37° 03.35', long. 76° 34.60', where a prior 4-5 ft. shoal falls in present depths of 6-9 ft.

The present survey is adequate to supersede the prior surveys within the common area.

B.	H-3045 (1910)	1:20,000
	<u>H-3045a (1910)</u>	<u>1:20,000</u>

These prior reconnaissance surveys show widely spaced sounding lines over a portion of the natural channel on the west and south sides of Burwell Bay. The comparison reveals changes of as much as 13 ft. in depth, as for example, in lat. 37° 03.48', long. 76° 39.42', where prior depths of 24 ft. fall in present depths of 11 ft.

The present survey is adequate to supersede the prior surveys within the common area.

6. Comparison with Chart 529 (Latest print date 5/2/49)

A. Hydrography

The charted hydrography originates principally with the previously discussed surveys supplemented by information from the present survey before verification together with Corps of Engineers' surveys of 1924 (Bp. 19364) 1942 (Bp. 36548) and 1948 (Bp. 43823). Changes in the bottom have occurred since the prior Engineers' surveys were made, as for example, in lat. $37^{\circ} 05.72'$, long. $76^{\circ} 37.63'$, where a prior depth of 8 ft. falls in present depths of 15-17 ft.

The present survey is adequate to supersede the charted hydrography within the common area.

B. Aids to Navigation

There are no fixed aids to navigation within the limits of the present survey.

The survey positions of floating aids to navigation are in substantial agreement with the charted positions, except for the positions of several buoys which were as much as 250 meters off station. All buoys, however, mark the features intended.

C. Controlling Depth

The present survey depths do not conflict with the charted controlling depth (25 ft.) in Rocklanding Shoal Channel. The charted controlling depth originates with Chart Letter 516 (1948).

7. Condition of Survey

- a. The sounding records and Descriptive Report are complete and comprehensive.
- b. The protracting and plotting was carefully done and is in compliance with the requirements of the Hydrographic Manual.
- c. There are four small unsurveyed areas on the west side of the river in which ships were anchored at the time of the present survey. A small unsurveyed area also exists southeastward from the fish traps in lat. $37^{\circ} 06.05'$, long. $76^{\circ} 35.80'$.


8. Compliance with the Project Instructions

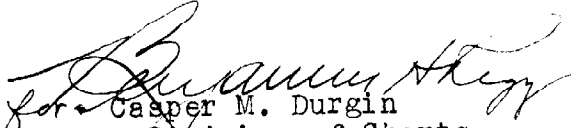
The present survey adequately complies with the Project Instructions.

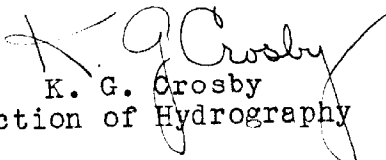
9. Additional Field Work Recommended


This is a good basic survey and no additional field work is recommended.

Examined and approved:


H. R. Edmonston
Chief, Nautical Chart Branch


for Casper M. Durgin
Chief, Division of Charts


K. G. Crosby
Chief, Section of Hydrography


W. M. Scaife
Chief, Division of Coastal Surveys

Completely Applied to Cht. #529 reconstruction after
Verification and (pencil) Review. 10/28/49 McAlinden

C

L-73 (1967)

BP 43823 | China
L 36 (1968)

