H10625

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey: Multibeam/Side Scan

Field No.: A

Registry No.: H-10625

LOCALITY

State: New York

General Locality: East River

Sublocality: Hart Island to Wards Island

1995

CHIEF OF PARTY
Walter Simmons (SAIC)

LIBRARY & ARCHIVES

DATE: October 20, 1997

NOAA FORM 77-28 (11-72)	U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	REGISTRY NO. H-10625
	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. A

State NEW YORK

General locality EAST RIVER

Locality HART ISLAND TO WARDS ISLAND

Scale 1:10,000 Date of survey June 26 - July 9, 1995; Nov 6 - Nov 12, 1995 June - July; November 1995

Instructions dated September 30, 1994 as amended Project No. OPR-B389-CN

Vessel M/V ATLANTIC SURVEYOR

Chief of party WALTER SIMMONS

Surveyed by J. Miller; S. Ferguson; A. Gagnon; D. Allen; J. Kiernan; P. Selvitelli; R. Watson; L. Gates; E. DeAngelo; J. Case; A. Maddock; S. Cook; R. Franchuck; T. Hamel;

Soundings taken by (echo sounder) hand lead, pole MULTIBEAM RESON SEABAT 9002

Graphic record scaled by Survey Personnel

Graphic record checked by Survey Personnel

Evaluation ~~Protracted~~ by JEFFREY A. FERGUSON Automated plot by HP 650 ~~J. Kiernan~~

Verification by D. Reifsteck

Soundings in fathoms (meters) feet at MLW (MLLW) and decimeters

REMARKS: * Contract # 50-DGNC-4-00035
Contractor Name: Science Applications International Corp.;
221 Third Street; Newport, R. I. 02840;
Subcontractor Name: Ocean Surveys Inc.;
91 Shefield Street; Old Saybrook; CT 06475

Smooth Sheet Production Date/Time 05/16/96 16:55 Time Reference : UTC

NOAA FORM 77-28 SUPERSEDES FORM C&GS-537.

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* Marginal notes and revisions to the Descriptive Report were generated at the Pacific Hydrographic Branch during review of the contractor's survey work.

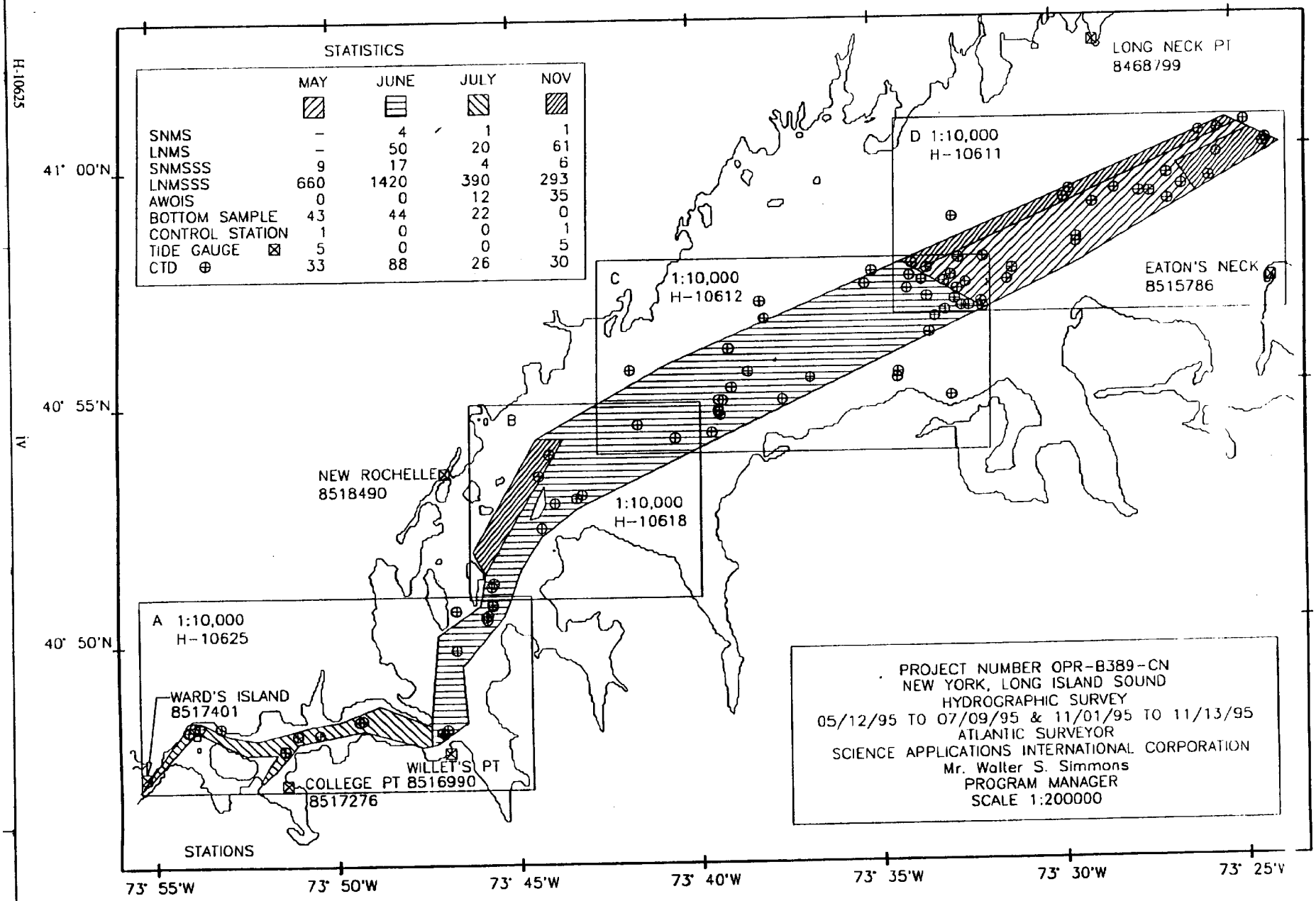
SUPPLEMENTAL REPORTS ARCHIVED WITH SURVEY DATA (SEE SECTION T. OF DR)

INDEX OF SHEETS

The Progress Sketch on the following page indicates:

1. Smooth Sheet Layout
2. Surveys and Registry Numbers
3. Tide Gauge Locations
4. CTD (Sound Velocity) Stations
5. Work Accomplished by Month

PROGRESS SKETCH



Science Applications International Corporation (SAIC) warrants only that the survey data acquired by SAIC and delivered to NOAA under Contract 50-DGNC-4-00035 reflect the state of the sea floor in existence on the day and at the time the survey was conducted.

Page

Descriptive Report to Accompany
Hydrographic Survey H-10625

A. PROJECT ✓

Project number: OPR-B389-CN

Dates of instructions:		
	30 September 1994	Original
	21 March 1995	Modification #1
	03 April 1995	Modification #2
	06 June 1995	Modification #3
	23 June 1995	Project limit definition, Execution Rocks
	10 July 1995	Modification #4
	07 September 1995	Modification #5
	07 November 1995	56-DGNC-6-13003

Sheet letter: A
Registry number: H-10625
Purpose: Obtain 100% multibeam sonar coverage and 200% side scan sonar coverage within the survey area limits

B. AREA SURVEYED See Eval Rpt, Section B

General locality: East River, Hart Island to Wards Island. Main navigation channel, bounded approximately by the following positions:

Lat.	Long.
40° 50.90'N,	073° 45.90'W
40° 50.90'N,	073° 45.10'W
40° 50.48'N,	073° 45.35'W
40° 49.45'N,	073° 46.52'W
40° 48.25'N,	073° 46.43'W
40° 47.82'N,	073° 47.28'W
40° 47.77'N,	073° 47.65'W
40° 48.15'N,	073° 49.25'W
40° 47.90'N,	073° 51.08'W
40° 47.32'N,	073° 51.75'W
40° 47.08'N,	073° 52.08'W
40° 47.12'N,	073° 52.12'W
40° 47.67'N,	073° 51.63'W
40° 47.68'N,	073° 52.52'W
40° 48.17'N,	073° 53.77'W
40° 48.15'N,	073° 53.97'W
40° 46.95'N,	073° 55.25'W
40° 47.03'N,	073° 55.35'W
40° 48.27'N,	073° 54.10'W
40° 48.32'N,	073° 53.68'W
40° 48.05'N,	073° 53.00'W

40° 47.93'N, 073° 52.20'W
40° 48.22'N, 073° 50.70'W
40° 48.30'N, 073° 49.08'W
40° 48.62'N, 073° 48.80'W
40° 48.17'N, 073° 47.37'W
40° 50.10'N, 073° 47.12'W
40° 50.68'N, 073° 45.95'W

Dates of data acquisition: 26 June (day 177) through 27 June 1995 (day 178)
29 June (day 180) through 09 July 1995 (day 190)
06 November (day 310) through 09 November 1995 (day 313)
12 November 1995 (day 316)

C. SURVEY VESSELS ✓

The M/V ATLANTIC SURVEYOR (ID# D582365) was the platform for all multibeam sonar, side scan sonar, sound velocity and bottom sampling operations. Data acquisition and post processing systems were mounted in CONEX containers which were welded in place on the aft deck. The gyro compass was mounted in the pilot house, and the TSS335B motion sensor was mounted on the aft end of the deck house just above the main deck.

Multibeam sounder transducers were mounted back to back on a plate at the bottom of a stainless steel pipe at the starboard waist. Bearing plates were welded to the main deck, and a stabilizing alignment bracket was welded to the side of the boat. The primary GPS navigation antenna was mounted directly above the transducer pole and the reference GPS antenna was mounted just inboard on the same mount.

The vessel layout is depicted in Figures C-1, C-2, C-3, and C-4, the coordinate systems in use are shown in Figure C-5, and the vessel offsets are shown in Table C-1 and C-2. The Reference Point for the entire system was located on the transducer pole at the water line. For surveys conducted from May through July 1995, the transducer depth was recorded as 2.20 meters, therefore the pole was marked with the Reference Point at 2.20 meters. During survey operations conducted from September through November, 1995, the transducer depth was recorded as 2.30 meters and the pole was marked accordingly.

As discussed in the Phase IIA Summary Report, the IHSS, the RESON, and the TSS-335B all have different coordinate systems, and therefore care must be taken when inputting correctors to the system. The IHSS considers "z" to be positive down, while both the RESON and TSS consider "z" positive up. Both the IHSS and TSS consider "x" positive forward, the RESON considers "x" as positive athwartships to starboard. IHSS considers "y" positive athwartships to starboard, the TSS considers "y" positive athwartships to port and the RESON considers "y" as positive forward.

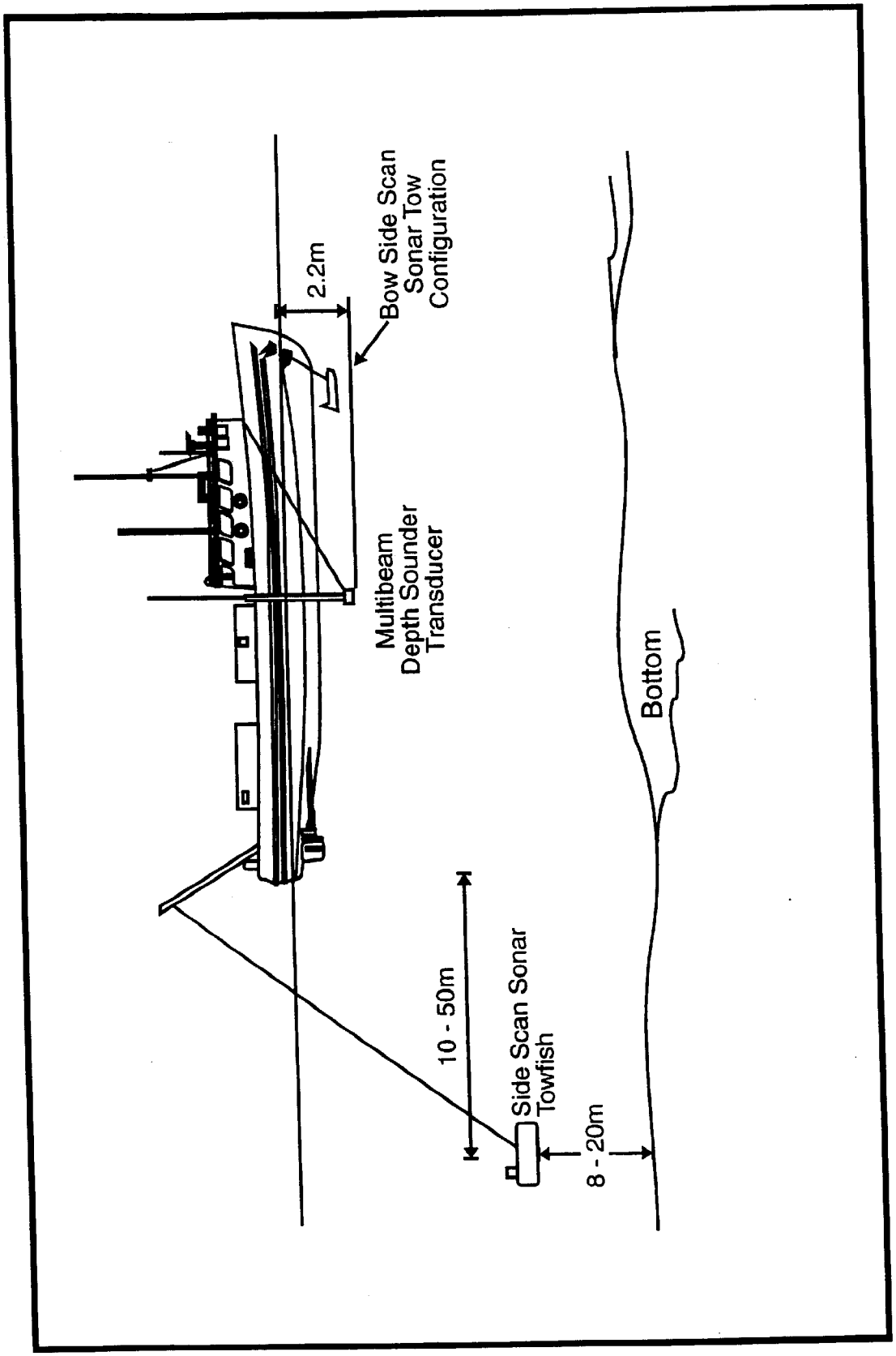


Figure C-1. Configuration of M/V Atlantic Surveyor During Survey Operations (May 14 - July 9, 1995)

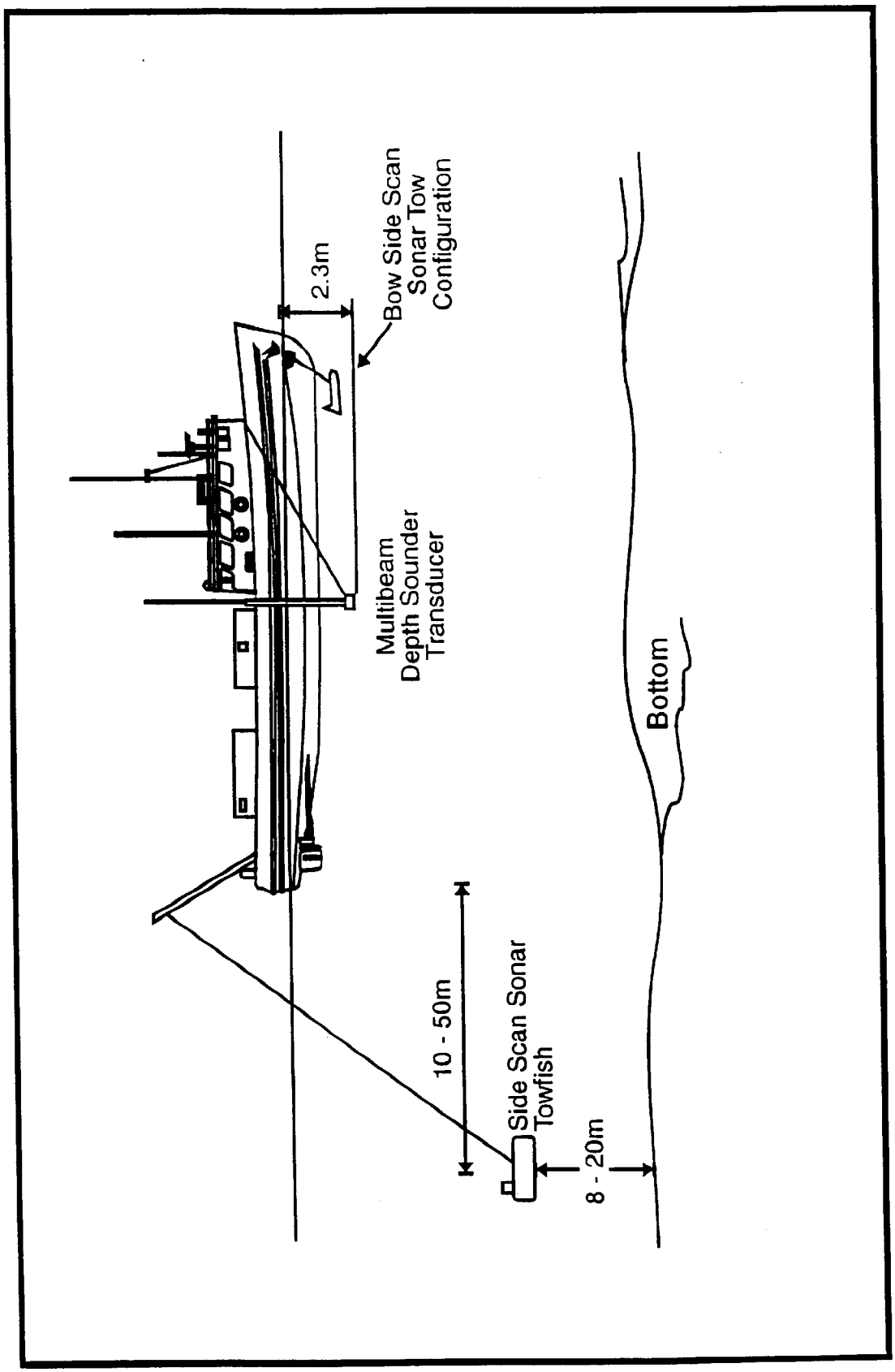


Figure C-2. Configuration of M/V Atlantic Surveyor During Survey Operations (Sept. 19 - Nov. 13, 1995)

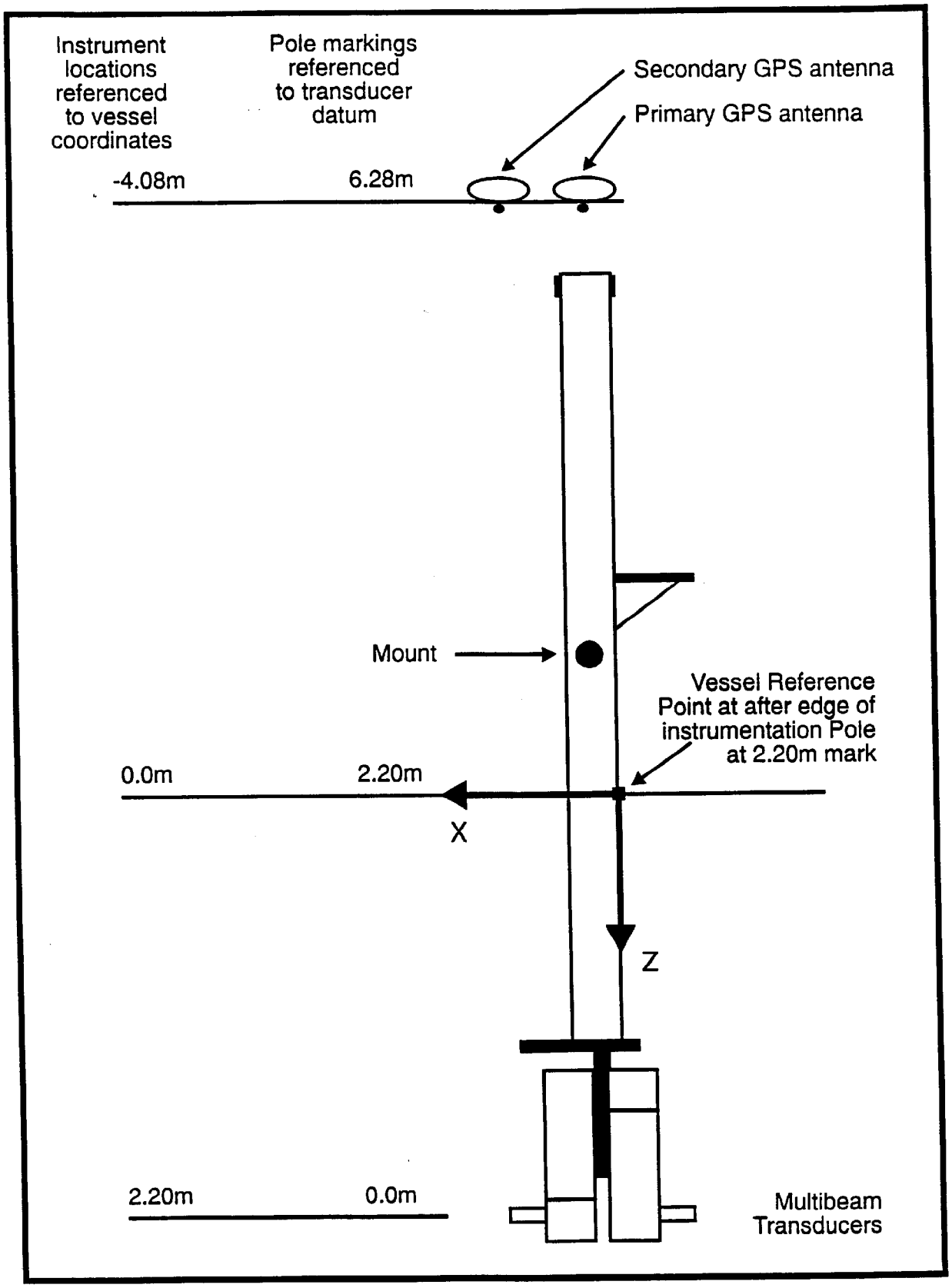


Figure C-3. Configuration of Multibeam Transducer Pole (May 14 - July 9, 1995)

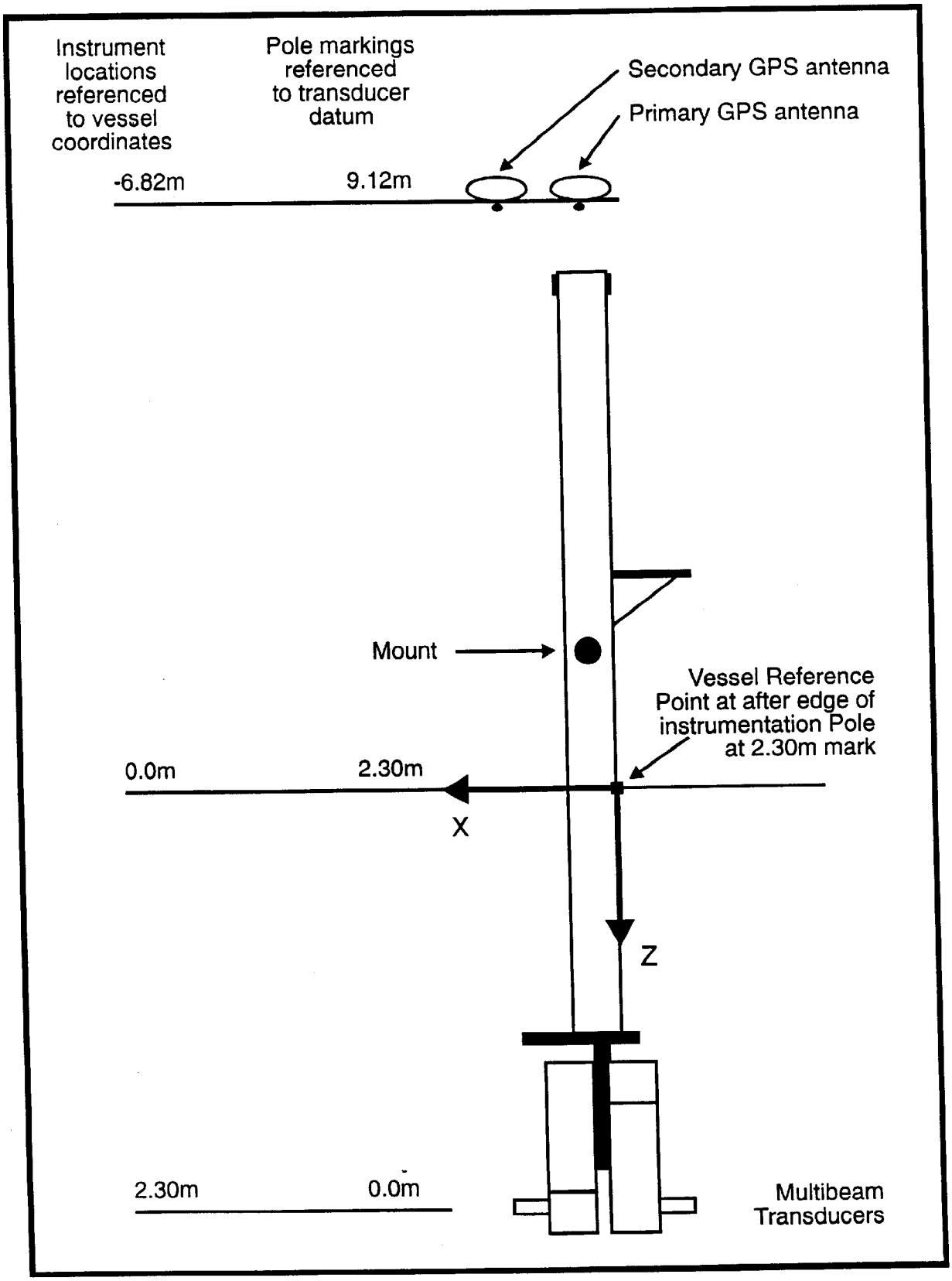


Figure C-4. Configuration of Multibeam Transducer Pole (Oct. 3 - Nov. 13, 1995)

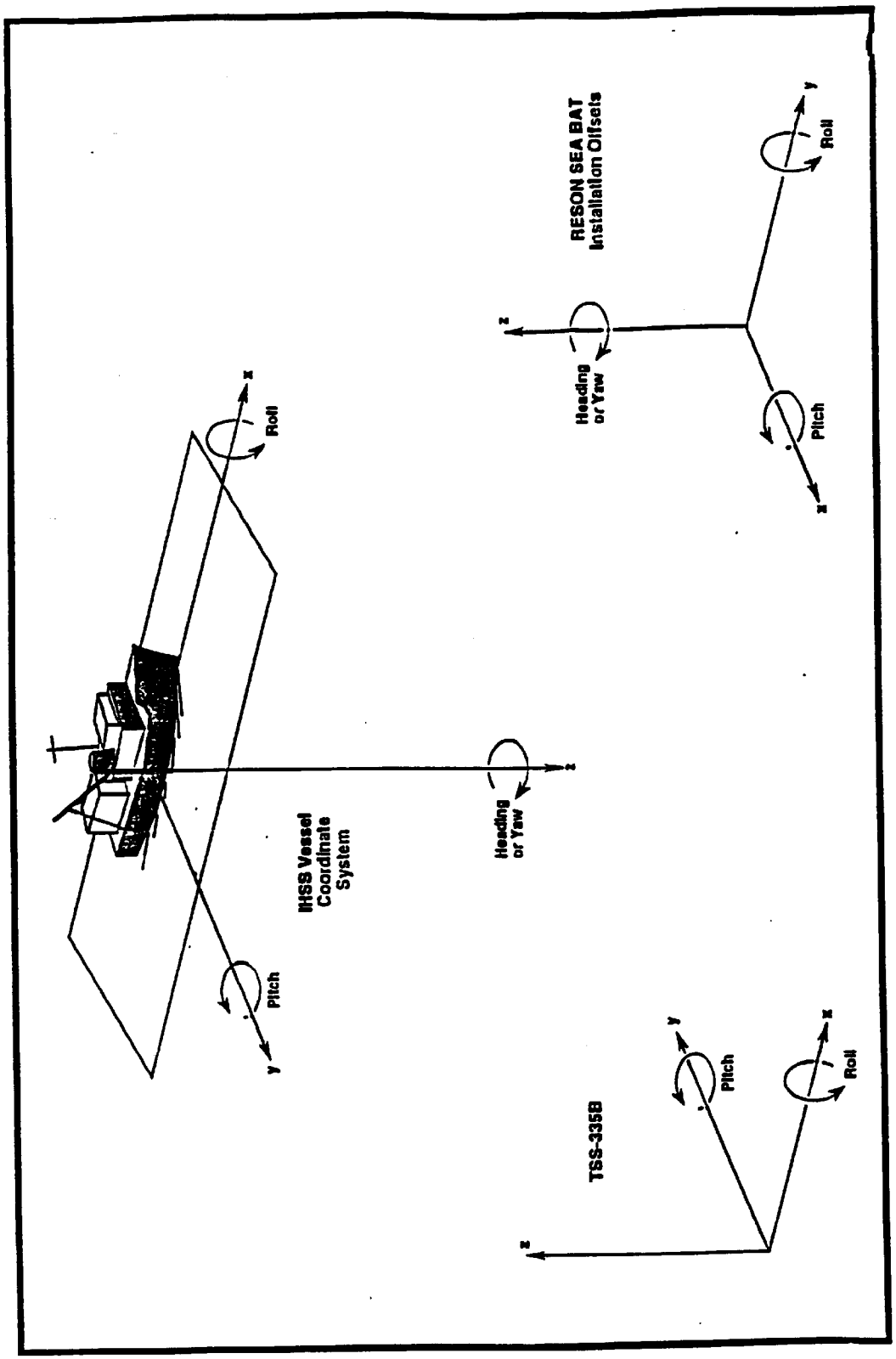


Figure C-5. Relevant IHSS Instrument Coordinate Systems

Table C-1. Antenna and Transducer Locations Relative to Vessel Reference Point (May 14 - July 9, 1995)

Sensor	Offset in IHSS	IHSS Coordinate Value, m	Offset in RESON 6042	RESON Coordinate Value, m
Multibeam	x	0	x(port)	-0.07
	y	0	y(port)	+0.11
	z	0	z(port)	-2.20
			x(stbd)	+0.07
			y(stbd)	-0.02
			z(stbd)	-2.20
Trimble 4000DS	x	0		
	y	0		
	z	-4.08		
TSS335B	x			-3.204
	y			+3.169
	z			+1.200
Sidescan Tow PT	x	16.2		
starboard bow	y	-1.8		
	z	-0.6		
Sidescan Tow PT	x	-15.90		
"A" frame aft	y	-2.46		
	z	-5.18		

Table C-2. Antenna and Transducer Locations Relative to Vessel Reference Point (Oct. 3 - Nov. 13, 1995)

Sensor	Offset in IHSS	IHSS Coordinate Value, m	Offset in RESON 6042	Reson Coordinate Value, m
Multibeam	x	0	x(port)	-0.07
	y	0	y(port)	+0.11
	z	0	z(port)	-2.30
			x(stbd)	+0.07
			y(stbd)	-0.02
			z(stbd)	-2.30
Trimble 4000DS	x	0		
	y	0		
	z	-6.82		
TSS-335B	x			-3.020
	y			+3.320
	z			+1.300
Side scan Tow PT	x	-15.90		
"A" frame aft	y	-2.46		
	z	-5.18		

Note that offsets relative to depth measurement are input to the RESON, while those for navigation are input to the IHSS.

D. AUTOMATED DATA ACQUISITION AND PROCESSING ✓ SEE EVAL. RPT, SECT. D

The following SAIC IHSS software modules were used in the real time acquisition of MULTIBEAM data during the spring survey operation May 14 - July 9, 1995):

Program	Modification Date
ap9	May 20, 1995
auto_archive	May 4, 1995
cbatdtc	May 11, 1995
	May 13, 1995
	May 15, 1995
cbatout	May 11, 1995
	May 13, 1995
	May 15, 1995
chutil	May 9, 1995
datamgr	May 4, 1995
dtc_data_display	May 4, 1995
eoscandtc	May 10, 1995
	May 18, 1995
	May 30, 1995
filemgr	May 4, 1995
irig-b pdd	May 8, 1995
kfstub	May 5, 1995
klein595	May 8, 1995
	May 23, 1995
mbmgr	May 4, 1995
	May 18, 1995
mergeserve	May 4, 1995
	May 27, 1995
messagemgr	May 4, 1995
mk32	Apr 26, 1995
navmgr	May 5, 1995
	May 17, 1995
	May 28, 1995
nms	May 9, 1995
ntimesrv	Apr 06, 1995
kflog	Apr 10, 1995
	May 18, 1995
	May 30, 1995
helm_display	May 05, 1995
	May 17, 1995
	May 28, 1995
rtkfst	Apr 29, 1995
setclock	Apr 22, 1995
sb_sssv	Apr 26, 1995
	May 22, 1995
spmgr	May 05, 1995
stateb	May 04, 1995
stateb	May 04, 1995
strip	May 09, 1995
svpmon	May 04, 1995
swathplot	May 04, 1995
sync_os2	Apr 23, 1995
sync_ux	May 04, 1995

Program	Modification Date
syscon	May 04, 1995
teltx	May 04, 1995
telrx	May 04, 1995
timechk telrx	May 04, 1995
tr4000	May 08, 1995
	May 16, 1995
tr4ref	May 08, 1995
	May 16, 1995
tss335b	May 08, 1995
utilitymgr	May 04, 1995

The following Polaris Imaging and SAIC IHSS software modules were used in real time acquisition of SIDE SCAN Data during the spring survey operation (May 14 - July 9, 1995):

Program	Modification Date
eoscan.exe	May 15, 1995
sonar.bin	May 15, 1995
eoscan.cfg	May 15, 1995
sonar.bin/eoscan.exe	May 16, 1995
sonar.bin/eoscan.exe	May 17, 1995
eoscan.cfg	May 18,1995
sonar.bin/eoscan.cfg	May 19, 1995
DSP Card (Hardware), eoscan.exe	May 21, 1995
eoscan.exe, eoscan.cfg	June 13 ,1995

The following SAIC IHSS software modules were used in the real-time acquisition of MULTIBEAM data during the fall survey operation (September 19 - November 13, 1995):

Program	Modification Date
ap9	May 20, 1995
auto_archive	May 4, 1995
cbatdtc	May 15, 1995
cbatout	May 15, 1995
chutil	May 9, 1995
datamgr	May 4, 1995
dtc_data_display	May 4, 1995
eoscandtc	Sept. 19, 1995
eoscandtc	Sept. 23, 1995
filemgr	May 4, 1995
irig-b pdd	May 8, 1995
kfstub	May 5, 1995
klein595	May 23, 1995
mbmgr	May 18, 1995
mergeserve	May 27, 1995
messagemgr	May 4, 1995
mk32	Apr 26, 1995
navmgr	May 28, 1995
nms	May 9, 1995
ntimesrv	Apr 06, 1995
kflog	May 30, 1995
helm_display	May 28, 1995
rtkfst	Apr 29, 1995
seabird seasoft (4.210)	Feb. 23, 1995
setclock	Apr 22, 1995
sb_sssv	May 22, 1995
spmgr	May 05, 1995
stateb	May 04, 1995
strip	May 09, 1995
svpmon	May 04, 1995

Program	Modification Date
swathplot	May 04, 1995
sync_os2	Apr 23, 1995
sync_ux	May 04, 1995
syscon	May 04, 1995
Teltx	May 04, 1995
telrx	May 04, 1995
timechk telrx	May 04, 1995
tr4000	May 16, 1995
tr4ref	May 16, 1995
tss335b	May 08, 1995
utilitymgr	May 04, 1995

The following Polaris Imaging and SAIC IHSS software modules were used in real-time acquisition of SIDE SCAN Data during the fall survey operation (September 19 - November 13, 1995):

Program	Modification Date
eoscan.exe	May 15, 1995
sonar.bin	May 15, 1995
eoscan.cfg	May 15, 1995
sonar.bin/eoscan.exe	May 17, 1995
eoscan.cfg	May 18,1995
sonar.bin/eoscan.cfg	May 19, 1995
DSP Card (Hardware), eoscan.exe	May 21, 1995
eoscan.exe, eoscan.cfg	June 13 ,1995

The following SAIC software modules were used in the processing of all data.

Program	Modification Date
appcors	May 17, 1995
applydft	July 26, 1995
applysqt	July 26, 1995
chutil	May 05, 1995
corrtarg	August 1995
corrtarg	Sept. 18, 1995
corrtarg	Oct. 17, 1995
datamgr	May 4, 1995
datasumm	Aug. 15, 1995
examgyro	Jun 22, 1995
exammb	May 19, 1995
gsf2hdcs	May 22, 1995
gsfedit	Sept. 4, 1995
gsfupdat	June 30, 1995
MBHAT>check_cover	Sept. 19, 1995
MBHAT>check_z	Nov. 21, 1995
MBHAT> contact_dxf	Jan 5, 1996
MBHAT>cover_dxf	Nov. 16, 1995
MBHAT>feature_gsf	Nov. 16, 1995
MBHAT> get_contact	Nov. 8, 1995
MBHAT>init_sheet	July 19, 1995
MBHAT>junction	Oct. 23, 1995
MBHAT>main_x_diff	June 29, 1995
MBHAT>make_contours	Dec 22, 1995
MBHAT>make_final_contours	Nov. 3, 1995
MBHAT>makeacadpcx	July 20, 1995
MBHAT>new_select	Jan 5, 1996
MBHAT>new_ss_cover	Nov. 28, 1995
MBHAT>noaagsf	Nov. 8, 1995
MBHAT>set_eoflag	Oct. 2, 1995
MBHAT>target_dxf	Jan. 5, 1996
MBHAT>track_dxf	July 20, 1995
MBHAT>update_contact	Nov. 6, 1995

Program	Modification Date
MBHAT>view3d	July 21, 1995
MBHAT>ztogsf	Oct. 5, 1995
navup	Sept. 19, 1995
rangeflt	Sept. 4, 1995
rangeflt	Oct. 5, 1995
refdraft	Sept. 20, 1995
resetflg	Sept. 18, 1995
resonflt	May 05, 1995
setsound	July 25, 1995
swathmap	May 05, 1995
tid2hmps	May 17, 1995

Throughout this descriptive report wherever software is mentioned (in bold print) the most current version of the software available was used.

E. SONAR EQUIPMENT (Side scan sonar operations) ✓

The following side scan sonar equipment was used for the entire Sheet A survey:

- Klein 595 Side Scan Sonar Recorder, Klein Associates, Serial Number 658.
- Klein 595 Dual Frequency Towfish, Klein Associates, Serial Number 700.
- Klein 595 Dual Frequency Towfish, Klein Associates, Serial Number 894.
- Eoscan Digital Side Scan Recording and Target Analysis, Polaris Imaging, Serial Number 10270A.

The vertical beam width of the Klein 595 side scan was 40° at 3dB. A depression angle of 20° was used on the tow fish. The dual frequency fish had the 500 kHz frequency disabled, and the 100 kHz frequency was used at all times.

Side scan operations were conducted in water depths ranging from 8.5 meters to 19 meters. Point of deployment of the tow fish was the center A-frame at the stern of the vessel on JDs 182 (after 20:38:16), 183, 184, 185, 186, 187, 188, 189 (to 19:27:47), 310, and the starboard bow on all other days. The 75 meter range scale was used throughout the survey. Since the range scale was chosen to be 75 m, the survey vessel's speed was maintained at six knots or less.

The side scan altitude off the bottom was maintained between 6 and 15 m for the 75 m range scale setting when towing astern. The amount of cable deployed was determined by using the 1-meter markings on the cable. As the cable length was adjusted to maintain the proper fish altitude, the operator would note the markings on the cable and enter the amount of cable deployed for layback calculations.

When towing at the starboard bow, the side scan was deployed with a fixed cable length of either 5 or 6 meters. This cable length and the bow tow point parameters were entered into the real-time system for layback calculations.

To verify that the side scan signal reached the full extent of the slant range setting, records were checked for location of known objects at the far edge of the slant range. Lobster pots were also useful as confidence checks because they were good sonar targets which extended across the area of coverage.

Side-Scan Target and Feature Processing

For a full discussion of side scan processing programs, refer to the Phase IIA Summary Report, and for complete Sheet A processing lists, to the Sheet A Processing Summary Report.

Sheet A side scan targets were collected with the **Eoscan_DTC**, versions as described in Section D of this report. Layback was not independently recorded in the records collected during the spring deployment, while layback was included in records from the November deployment. Target and fish positions prior to Sept. 23 are calculated with the original layback equation and those after this date use the revised layback equation, as described in the Phase IIA Summary Report.

For the targets collected during the spring deployment, all targets were read into an Excel spreadsheet, which calculated slant range and target height. Using the output listing from the spreadsheet, two side-scan processors reviewed each graphic record and the associated target file. Additions, corrections and deletions of target ranges, shadows, and times were agreed upon and entered into the spreadsheet. The positions, corrected ranges, and target heights for selected targets, which were selected by the Hydrographer because of suspect positions, were recalculated using the August **corr_targ** program. It should be noted that the target heights for these recalculated targets are overestimated due to an error in this version of the **corr_targ** program. These heights were not recalculated because the information was used to establish target-to-feature correlation as described below

All Sheet A targets collected during the November deployment were read into a revised Excel spreadsheet, which calculated only slant range. Using the output listing from the spreadsheet, two side-scan processors reviewed each graphic record and the associated target file. Additions, corrections and deletions of target ranges, shadows, and times were agreed upon and entered into the spreadsheet. The **corr_targ** program (Oct 17) was then run to update target positions, ranges, and heights for these targets .

Targets were correlated with multibeam features using the **get_contact** program, which produces the *afeature* file and modifies the *atargets.ctv* file. Correlations were made in two phases. First, targets collected during the spring deployment were processed as described above and correlated with features during July and August 1995 in order to provide recommendations for item investigation. Because feature-to-target correlations were made and features selected at this time, targets collected during the spring were not reprocessed with a revised layback estimate nor using the updated **corr_targ** program, which calculates target height correctly. The second processing phase was during November when 50 additional targets were identified; these were processed as described above and added to the *atargets.ctv* file. In addition 16 targets associated with reconstructed navigation times were added to the *atargets.ctv* file.

There are 264 features and 1739 targets for Sheet A. Each feature was reevaluated with reference to its position and relation to soundings on the smoothsheet. *Afeature* and *atargets.ctv* files were combined into the the *aupdate.out* file using **update_contact** to provide a correlated features-to-targets listing. The *afeatgsf.out* file was created using the **feature_gsf** program, which traces a feature to a multibeam file, ping and beam number. 248 features were correlated directly to corresponding multibeam 1xIHO least depths using the **feature_gsf** program; 12 1xIHO features were correlated with multibeam least depths using the **gsfedit**

program; 1 feature was correlated to 2xIHO least depths using the **feature_gsf** program; 2 features were correlated with 2xIHO least depths using the **gsfedit** program. 1 feature was not correlated with a multibeam least depth because it lies outside of the multibeam coverage; however it was included as a feature because it had a significant (4m) height based upon its side scan image.

After completion of item investigations, the target/feature correlations were redone using all multibeam data with final correctors applied. As a result, some features were judged non-significant and removed from the features list. In some cases, non-significant features had been placed on the list and were therefore removed. In other cases item investigation resulted in 1xIHO depths which showed features to be non-significant. The following features were removed from the features list as non-significant: Concur

Feat. #	Latitude	Longitude	Least Depth	Feature Type	1 or 2 x IHO	Description
1	40 50.88718N	73 45.88361W	11.89	ROCK	1	Contact in 12.0m on slope, approx. 20m horiz. distance from 11.9m depth
2	40 50.88826N	73 45.83163W	17.63	ROCK	1	Contact in 17.8m on slope, approx. 10m horiz. distance from 17.4m depth
6	40 50.76518N	73 45.84388W	17.98	ROCK	1	Contact in 18.8m on slope, approx. 12m horiz. distance from 17.8m depth
7	40 50.77208N	73 45.88363W	13.34	ROCK	1	Contact in 14.0m on slope, approx. 15m horiz. distance from 13.3m depth
10	40 50.75010N	73 45.84986W	16.17	ROCK	1	Removed due to close proximity to other features
17	40 50.64776N	73 45.88233W	19.42	ROCK	1	Contact in 20.1m on slope, approx. 10m horiz. distance from 19.0m depth
20	40 50.54833N	73 46.08917W	16.98	ROCK	2	Contact in 17.9m on slope, approx. 10m horiz. distance from 17.0m depth
22	40 50.48736N	73 46.19778W	12.62	OBSTR	1	Contact in 13.5m on slope, approx. 10m horiz. distance from 12.6m depth
23	40 50.41248N	73 46.32230W	10.59	ROCK	1	Contact in 11.0m on slope, approx. 15m horiz. distance from 10.5m depth
26	40 50.15494N	73 46.95826W	6.95	OBSTR	1	Contact in 7.6m on slope, approx. 10m horiz. distance from 6.9m depth
27	40 50.14891N	73 46.99849W	5.44	OBSTR	1	5.44m in 5.8m on slope
36	40 50.47572N	73 45.86704W	31.16	ROCK	1	Contact in 31.6m
42	40 50.08878N	73 46.68337W	14.05	ROCK	1	Contact in 15.3m and approx. 30m from Feature #43. 12.9m
45	40 50.39267N	73 45.98960W	28.06	ROCK	2	Contact in 28.6m
46	40 50.42638N	73 46.00322W	25.99	ROCK	1	Contact in 26.6m
56	40 49.99732N	73 46.01328W	11.01	ROCK	1	Contact in 11.6m on slope, approx. 25m horiz. distance from 11.0m depth
61	40 49.43826N	73 46.55588W	5.2	ROCK	1	Contact in 5.8m on slope, approx. 15m to 5.0m depth
65	40 49.38566N	73 46.53616W	5.67	ROCK	1	Contact in 6.1m on slope, approx. 8m horiz. distance from 5.5m depth
79	40 49.49197N	73 46.62533W	8.02	ROCK	1	Contact approx. 15m from 7.5m Rk
82	40 49.53254N	73 46.62600W	8.59	ROCK	1	Contact in 9.3m on slope, approx. 25m horiz. distance from 8.5m depth
89	40 50.50063N	73 45.31861W	8.52	ROCK	1	Contact in 9.1m on slope
102	40 50.32620N	73 45.44500W	0	ROCK	2	Outside survey area and no multibeam data

OK

✓107	40 49.64268N	73 46.36496W	6.33	ROCK	1	Contact in 6.8m on slope, approx. 10m horiz. distance from 6.3m depth
✓125	40 48.18250N	73 47.25539W	18.3	ROCK	1	Contact in 18.9m on slope, approx. 15m horiz. distance from 17.0m depth
✓127	40 48.15858N	73 47.28850W	20.16	OBSTR	1	Contact in 20.6m on slope, approx. 10m horiz. distance from 20.1m depth
✓130	40 47.84957N	73 47.30410W	15.6	ROCK	1	Contact in 16.3m on slope, approx. 10m horiz. distance from 15.0m depth
✓136	40 48.35009N	73 48.81578W	13.95	ROCK	1	Contact in 14.8m on slope, approx. 20m horiz. distance from 13.9m depth
✓143	40 48.13445N	73 48.39362W	11.47	ROCK	1	Contact in 11.7m
✓151	40 48.03244N	73 48.85986W	0	WRECK	2	Outside survey area and no multibeam data
✓172	40 47.92863N	73 51.61492W	10.9	ROCK	1	Contact in 11.0m
✓175	40 47.87937N	73 51.60794W	10.76	ROCK	1	Contact in 11.0m
✓176	40 47.88546N	73 51.56659W	10.79	ROCK	1	Contact in 10.9m
✓183	40 47.95191N	73 50.91109W	12.43	ROCK	1	Contact in 12.6m on slope, approx. 25m horiz. distance from 12.4m depth
✓187	40 47.92579N	73 50.99902W	11.41	ROCK	1	Contact in 11.8m on slope, approx. 15m horiz. distance from 11.0m depth
✓194	40 48.11663N	73 49.37593W	0	OBSTR	2	Outside survey area and no multibeam data
✓195	40 48.05636N	73 49.84880W	17.3	OBSTR	2	Contact in 18.0m on slope
✓200	40 47.73120N	73 51.38147W	16.32	ROCK	1	Contact in 16.7m
✓211	40 48.19219N	73 53.59348W	16.97	ROCK	1	Contact in 17.2m and at toe of slope
✓212	40 48.24618N	73 53.64453W	16.22	ROCK	1	Contact in 16.6m on slope, approx. 10m horiz. distance from 15.3m depth
✓215	40 48.14625N	73 53.36740W	22.35	ROCK	1	Contact in 23.0m and less than 50m from 21.0m depth
✓217	40 48.12244N	73 53.25324W	15.49	ROCK	1	Contact in 15.6m on slope, approx. 10m horiz. distance from 14.8m depth
✓223	40 48.02993N	73 53.07626W	13.66	ROCK	1	Contact in 14.0m on slope, approx. 10m horiz. distance from 13.0m depth
✓225	40 47.99623N	73 53.05691W	12.04	ROCK	1	Contact in 13.0m and less than 50m from Feature 224, 12.0m depth and Feature 227, 11.7m depth
✓226	40 48.00650N	73 53.05602W	12.31	ROCK	1	Contact in 13.0m and less than 50m from Feature 224, 12.0m depth and Feature 227, 11.7m depth
✓241	40 48.03141N	73 52.89840W	15.88	ROCK	2	Position approx. 35m from 13.5m depth, 50m from 12.0m depth and 60m horiz. distance from Feature 247, 12.3m depth
✓245	40 48.06236N	73 53.02381W	20.71	ROCK	1	Contact in 21.6m on slope, approx. 20m horiz. distance from 19.7m depth
✓249	40 47.97319N	73 52.85671W	12.28	ROCK	1	Contact in 12.6m on slope
✓261	40 48.09551N	73 53.14843W	10.65	ROCK	1	Contact in 11.2m
✓267	40 48.31252N	73 53.62990W	10.47	ROCK	2	Contact in 10.6m
✓271	40 47.99462N	73 53.33502W	10.47	ROCK	1	Contact in 11.5m on slope, approx. 10m horiz. distance from 10.4m depth
✓273	40 48.03318N	73 53.35648W	13.33 13.74	ROCK	1	Contact in 13.1m on slope, approx. 10m horiz. distance from 13.0m depth
✓283	40 48.01539N	73 53.19313W	~~13.41~~	ROCK	1	Contact less than 30m from Feature 297, 12.6m Rk
✓298	40 48.18603N	73 54.02108W	13.41	ROCK	1	Contact in 14.6m and approx. 30m from Feature 297, 12.6m Rk
✓313	40 47.48378N	73 54.80714W	10.97	ROCK	1	Contact in 11.1m
✓322	40 47.51724N	73 54.68214W	11.45	ROCK	1	Contact in 11.7m on slope, approx. 20m horiz. distance from 11.3m depth

342	40 48.29324N	73 49.81191W	11.32	ROCK	1	Contact in 11.5m on slope, approx. 10m horiz. distance from 11.0m depth
345	40 48.26253N	73 49.87221W	10.16	ROCK	1	Contact in 10.4m on slope, approx. 5m horiz. distance from 9.2m depth
348	40 48.17434N	73 49.70590W	21.85	ROCK	1	Contact in 22.3m on slope, approx. 50m horiz. distance from 21.0m
349	40 48.17127N	73 49.66754W	23.18	ROCK	1	Contact in 23.7m
350	40 48.15238N	73 47.62934W	13.62	OBSTR	1	Contact in close proximity the Throgs Neck Bridge
357	40 48.25600N	73 49.81541W	14.94	OBSTR	2	Contact in 15.0m on slope, approx. 10m horiz. distance from 14.9m depth
360	40 48.00429N	73 52.82844W	18.72	ROCK	1	Contact in 19.3m on slope, approx. 30m horiz. distance from 17.1m depth

Side Scan Coverage Analysis

Side scan coverage for Sheet A was 300% or more for at least 95% of the area. The side scan lines in Sheet A were, in general, run with line spacings of 40-50 meters and a side scan range setting of 75 m, providing the required 200% side scan coverage with at least a 25% overlap of lines, as shown on the side scan coverage plot. At times when the side scan sonar was deployed over the bow (the range was still 75m), restricted ranges were used as indicated in the Sheet A Processing and Multibeam Summary Report and the *assl.recon* and *assl.norecon* files.

Coverage was calculated using the **new_ss_cover** program (see Phase IIA Summary Report for discussion of paramater settings) with settings of a=20, r=30, p=30, and b=10. Two **new_ss_cover** iterations were done using the *assl.norecon* with *aeos.lst* and *assl.recon* with *aeos.recon_lst* files as inputs in order to allow input of reconstructed Eoscan navigation data. Eoscan files were flagged for suspect navigation times in order to reconstruct navigation periods under bridges or when differential GPS was disabled and the flagged files were used to determine side scan coverage as shown in the *aeos.lst* file. Reconstructed Eoscan navigation data are listed in the *aeos.recon_lst* file. The *assl.norecon* file indicates all times periods of flagged and reconstructed navigation as do the analog side scan records.

F. SOUNDING EQUIPMENT

The following components were used for acquisition of multibeam bathymetric data:

- RESON SeaBat 9002 multibeam system consisting of:
  - Two SeaBat Transducers, Serial Numbers port 332217, starboard 332202, starboard 214010
  - Two SeaBat 9001 Processors, Serial Numbers 6597 and 5230
  - SeaBat 6042 Controller and Processing Unit, Serial Number 590 P0 794-387

Occasional power fluctuations affected the Sperry Mk 32 gyrocompass for periods of approximately 0.01 seconds. These fluctuations were identified and corrected in processing using the program **examgyro**.

A lead line made of Kevlar line with a 35-pound steel plate as a weight was used for checking the center beams of the multibeam echo sounder. The line was marked in feet and was calibrated against a steel tape.

G. CORRECTIONS TO SOUNDINGS ✓ SEE EVAL. RPT., SECT. G

Speed of sound ALSO, SEE DR SECTION O.

The following systems were used to determine sound velocity profiles for corrections to multibeam sonar soundings.

- Sea-Bird Electronics, Inc., Model 19 CTD, Serial Number 1801, Calibration Date 08 March 1995, (CTW in file names).
- Sea-Bird Electronics, Inc., Model 19 CTD, Serial Number 565, Calibration Date 11 April 1995, (CTG in file names).

Speed of sound profiles were computed from casts taken with the Sea-Bird Electronics, Inc. Model 19 CTD's. The primary unit was SBE19 #1801. Daily confidence checks were obtained from simultaneous casts with the primary CTD and with SBE19 #565. All profiles were computed using **SBE Term19** software. Computed profiles were copied to the **IHSS** for comparison on the screen. A selected profile was applied to the system, recorded, and sent to the RESON 6042 where a refraction lookup table was computed for application of depth, angle and range correctors to the multibeam sounding data. If sounding depths exceeded the cast depth, the 6042 used the bottom of the table to extend correctors below the table. Reference pages 34-35 regarding depth and position errors.
Positions and dates of all casts are shown in Table G-1. Confidence check profiles from simultaneous casts were compared using the multibeam display program and were, in general, identical. If the comparison was not satisfactory, at least one more profile was done.

Table G-1. CTD Files and Locations ✓

CTD File Name	Confidence Check	Apply to Reson	Cast Depth (m)	Latitude	Longitude	
ctw17704.cnv		X	30	40 53.86N	73 43.93W	Plots outside survey area
ctw17801.cnv	X	X	34	40 50.70N	73 45.63W	
ctg17802.cnv	X		34	40 50.70N	73 45.63W	
ctw17803.cnv		X	33	40 50.40N	73 49.79W	
ctw18001.cnv	X	X	35	40 50.41N	73 45.77W	
ctg18001.cnv	X		35	40 50.41N	73 45.77W	
ctw18002.cnv			35	40 52.22N	73 44.27W	Plots outside survey area
ctw18003.cnv		X	35	40 50.75N	73 45.69W	
ctw18101.cnv	X	X	32	40 50.50N	73 45.77W	
ctg18102.cnv	X		33	40 50.50N	73 45.77W	
ctw18102.cnv	X		34	40 48.02N	73 47.12W	
ctw18103.cnv		X	34	40 48.17N	73 47.12W	
ctw18104.cnv		X	26	40 49.78N	73 46.65W	

ctw18201.cnv	X	X	34	40 50.50N	73 45.77W	
ctg18202.cnv	X		34	40 50.50N	73 45.77W	
ctw18203.cnv		X	30	40 48.11N	73 46.96W	
ctw18204.cnv		X	34	40 48.34N	73 49.39W	
ctw18205.cnv		X	17.7	40 47.74N	73 51.47W	
ctw18206.cnv		X	23	40 48.06N	73 50.78W	
ctw18301.cnv		X	25	40 48.28N	73 53.94W	
ctw18302.cnv		X	36	40 50.61N	73 46.64W	
ctw18401.cnv		X	37	40 50.46N	73 45.82W	
ctg18402.cnv	X		37	40 50.46N	73 45.82W	
ctw18403.cnv		X	34	40 48.04N	73 47.15W	
ctw18404.cnv			35	40 48.31N	73 49.52W	
ctw18405.cnv		X	35	40 48.32N	73 49.36W	
ctg18501.cnv	X		35	40 48.32N	73 49.57W	
ctw18502.cnv	X		35	40 48.32N	73 49.57W	
ctg18503.cnv	X		35	40 48.32N	73 49.37W	
ctw18504.cnv	X	X	35	40 48.32N	73 49.37W	
ctw18505.cnv		X	33	40 48.32N	73 49.37W	
ctw18601.cnv	X		25	40 48.05N	73 51.10W	
ctg18601.cnv	X		25	40 48.05N	73 51.10W	
ctg18603.cnv	X		25	40 48.05N	73 51.10W	
ctw18604.cnv		X	25	40 48.05N	73 51.10W	
ctw18605.cnv		X	25	40 48.24N	73 53.20W	
ctw18606.cnv		X	18	40 47.72N	73 51.45W	
ctg18701.cnv		X	24	40 48.05N	73 51.10W	
ctw18702.cnv	X	X	24	40 48.05N	73 51.10W	
ctw18703.cnv		X	29	40 48.27N	73 53.80W	
ctw18704.cnv	X		28	40 48.40N	73 49.30W	
ctg18705.cnv		X	26	40 48.40N	73 49.30W	
ctg18801.cnv	X		34	40 48.05N	73 47.10W	
ctw18803.cnv		X	34	40 48.05N	73 47.10W	
ctw18804.cnv		X	32	40 48.29N	73 49.36W	
ctw18805.cnv		X	25	40 48.18N	73 54.40W	
ctw18901.cnv		X	34	40 50.73N	73 45.64W	
ctw18902.cnv		X	35	40 48.34N	73 49.28W	
ctw19001.cnv		X	25	40 47.96N	73 47.11W	
ctw31101.cnv		X	8	40 50.54N	73 46.81W	Plots outside survey area
ctw31102.cnv		X	35	40 50.60N	73 45.70W	
ctw31204.cnv		X	32	40 48.30N	73 49.36W	
ctw31301.cnv		X	35	40 50.56N	73 45.79W	
ctw31303.cnv		X	28	40 48.40N	73 49.40W	
ctw31506.cnv		X	15	40 54.50N	73 43.00W	Plots outside survey area
ctw31601.cnv		X	30	40 48.27N	73 49.12W	

Corrections determined from vertical casts

Leadline comparisons to multibeam center beam soundings were made weekly to verify the transducer draft and echo sounder instrument correctors. For each comparison, a CTD cast was taken and the sound velocity profile loaded into the **IHSS** and the RESON 6042. Ten leadline readings were recorded along with the UTC time of observation while the **IHSS** recorded the multibeam readings. **Exammb** was used to find the port and starboard center beam readings for the time of each leadline reading.

The results of these readings were entered into a spreadsheet along with the draft reading from the transducer pole and any squat corrector which may have been entered in the **IHSS**. The spreadsheet applied a calibration corrector to the leadline readings and converted the readings from feet to meters. It also applied correctors to the port and starboard multibeam readings for the difference between the observed draft and reference point (2.20 meter - spring, 2.30 meter - fall), and for any settlement and squat inadvertently left in the **IHSS**.

Each corrected cast depth was compared to the simultaneous multibeam readings and correctors were calculated by the spreadsheet. The ten comparisons were averaged for each transducer and the standard deviations were computed.

During the May - July, 1995, deployment, comparisons revealed a consistent system bias with the multibeam soundings being too shallow by 0.11 meters. Correctors of +0.11 meters were applied to all May - July, 1995, multibeam soundings in post processing. Records of the comparisons are included in the Phase IIA Summary Report.

During the autumn 1995 deployment, the mean of the results for six sets of comparisons resulted in a corrector of 0.006 meters for each transducer. Therefore, no instrument or draft corrector was applied to soundings for this deployment. The leadline comparisons are included in the Phase IIA Summary Report.

Static draft

At a minimum, the static draft was observed on a daily basis by reading the markings on the transducer pole while the vessel was stationary. If the static draft value changed from the previously noted value, the new value was entered into the RESON system. The static draft value was recorded at the beginning of a GSF file or whenever values in the header were changed. All results are reported in the Sheet A Processing and Multibeam Data Summary.

Settlement and squat

Measurements of settlement and squat were conducted at the breakwater north of Coddington Cove, Narragansett Bay, Rhode Island on May 5, 1995, in 14 meters of water. The results were compiled into a lookup table of the vessel's engine rpm vs settlement and squat. Rpm settings were entered into the Multibeam parameters by the real-time system operator, the computer applied settlement and squat correctors interpolated from the lookup table, and recorded it in the "Depth Corrector" field of the GSF data file for each ping. All results are reported in the Phase IIA Summary Report.

Roll, Pitch and Heading ✓

The following sensors were used for acquisition of Roll, Pitch and Heading data:

- TSS-335B Vertical Reference Units, Serial Numbers 001615 and 583
- Sperry MK32 Gyrocompass, Serial Number 208

The TSS-335B Vertical Reference Units and their corresponding junction boxes, were used for heave, roll, and pitch. The accuracy of the sensor was 5% of 1 m or 5 cm for heave; ± 0.10° dynamic accuracy for roll and pitch, and ± 0.05° static accuracy for roll and pitch. The Sperry MK32 was used for heading. The dynamic heading accuracy of the unit at 3 sigma was 0.6° times the secant of latitude.

Heading, roll, and pitch biases were determined in a series of tests performed in Long Island Sound for the spring survey, and in Narragansett Bay for the fall survey prior to the start of the surveys. Appropriate biases were redetermined each time a transducer or Vertical Reference Unit was changed. Prior to conducting any of the tests, a CTD cast was taken to determine the sound velocity profile and entered into the RESON system. In the RESON 6042 the port and starboard roll biases were initially set to +30° and -30° respectively, heading biases were initially set to 0° and 180°, and pitch biases were set to 0. In the IHSS heading biases were set to 0.

The roll bias test was run first in an area with relatively flat bottom. The range scale was set to 100 meters. Three lines were run spaced 40 meters apart and each line was run in both directions. The data from parallel lines in the same direction were used for roll bias calculations for each head separately; the ideal data set was positioned so that the depths from the center beams from a transducer were compared against the depths of the mid-swath beams. Tidal corrections were applied to all data before roll corrections were calculated using routines in the **MBHAT** software. Results are reported in the Phase IIA Accuracy and Alignment Report and in the Phase IIA Summary Report.

After the roll biases were calculated and entered into the RESON system, the pitch bias test was conducted. The pitch test was conducted on multiple reciprocal runs of a single line perpendicular to a slope of approximately five degrees. The range scale of the RESON was set to 50 meters and vessel's speed was maintained approximately constant. Pitch biases were computed by comparing runs in opposite directions. Tidal corrections were applied to all data before pitch corrections were calculated using routines in the **MBHAT** software. Results are reported in the Phase IIA Accuracy and Alignment Report and in the Phase IIA Summary Report.

After measurement, calculation, and entry of the pitch bias correctors, heading bias tests were conducted. For the heading bias test 5 parallel lines were run in opposing directions so that the inner beams from a transducer head overlay the intermediate or outer beams of the same head. The heading bias was then determined by measuring the distance between equal depths and calculating the angle subtended by that distance. Tidal corrections were applied to all data before heading corrections were calculated using routines in the **MBHAT** software. Results are reported in the Phase IIA Accuracy and Alignment Report and in the Phase IIA Summary Report.

Roll, pitch, and heading biases applied in H-10625 are shown in Table G-2.

Table G-2. Roll, Pitch, and Heading Bias

	Days 177-190		Days 310-311		Days 312-313		Day 316	
	Port	Starboard	Port	Starboard	Port	Starboard	Port	Starboard
Roll	+29.98	-29.59	+30.095	-29.051	+29.795	-29.180	+29.985	-29.044
Pitch	-0.16	-0.13	-1.079	-0.511	-1.887	-1.428	-2.062	-1.847
Heading	-1.65	-1.65	+1.25	+1.25	+1.25	+1.25	+1.25	+1.25

Tide and water level correctors ✓

The reference stations for H-10625 were Willets Point, NY (851-6990) and Bridgeport, CT (846-7150).

Smooth sheet soundings were corrected for water level through application of observed data from the New Rochelle, NY (851-8490), College Point, NY (851-7276), Wards Island, NY (851-7401), and the Willets Point, NY (851-6990) stations. A staff MLLW datum was computed at each new station by simultaneous comparison with Willets Point, NY (851-6990) and with Bridgeport, CT (846-7150) using the NOAA Form 248 method prescribed by Marmer (Tidal Datum Planes, Spec. Pub. 135, U.S. Dept. of Commerce). The simultaneous comparison computations are included in the Phase IIA Summary Report - Tides.

The boundaries of tide zones used are listed in the Phase IIA Summary Report - Tides. Gage readings were recorded in relation to staff zero; therefore, the MLLW datum height was subtracted from gage readings before applying the time and ratio correctors.

Full data for all project water level gages are in the Phase IIA Summary Report - Tides.

H. CONTROL STATIONS ✓ SEE EVAL. RPT., SECT. H

Horizontal datum was the North American Datum (NAD) 1983.

Two existing first order horizontal control stations were used. A DGPS reference station was established at station MANRESA 1983 (LX7443) to provide primary navigation control for hydrographic positioning. Station ZIEGLER 1932 (LX3804) was used to check the DGPS performance. Horizontal control data are included in the Phase IIA Summary Reports.

I. HYDROGRAPHIC POSITION CONTROL ✓

SEE EVAL. RPT., SECT. I

The following equipment was used for positioning:

- Trimble 4000 GPS Receiver, Serial Numbers 3504A09516, antenna 0080176651
- Magnavox MX50R Differential Beacon Receiver, Serial Number 154
- Trimble 4000 GPS Receiver, Serial Number 3430A07030
- DGPS shore station [OSI], Serial Number 3433A07356

The primary hydrographic positioning control equipment was a Trimble 4000 GPS using differential correctors from the contractor established station at MANRESA 1983 (LX7443). In the western part of the survey the U.S. Coast Guard station at Sandy Hook, NJ, was used as the primary DGPS because receipt of its correctors was more reliable. During those times MANRESA was used as the reference station for confidence checks. HDOP, number of satellites, elevation of satellites, and age of correctors were monitored so that the resulting hydrographic positioning control met the specifications. Concur

Positioning confidence checks were established by recording a separate (reference) Trimble DGPS using correctors from the U.S. Coast Guard station at Montauk, NY, or the U.S. Coast Guard station at Sandy Hook, NJ. A real time monitor raised an alarm when the two DGPS positions differed by more than 10 meters horizontally. During all times when differential correctors were being received, positioning confidence checks were well within tolerance. Concur

During daily post processing, the reference DGPS positioning was substituted for the primary DGPS positioning during those times when the reference met the specifications, but the primary did not.

J. SHORELINE - Not Applicable ✓

K. CROSSLINES ✓

Crosslines constituted approximately 5% of the mainscheme length. Comparisons of all crossing data in the 1xIHO swaths, using **MBHAT** software, show that more than 98.5% of comparisons are within 50 centimeters over all types of bottom. Larger differences occurred in areas of steep slopes, rocks, wrecks, and obstructions. Differences were almost equally divided among positive and negative differences. More than 95.7% of differences were within 30 centimeters.

Table K-1. Junction Analysis Mainscheme - Crosslines

Category	Count	Percent	Total Percent
to 10 cm	432002	64.21	64.21
to 20 cm	166437	24.74	88.94
to 30 cm	45820	6.81	95.75
to 40 cm	13441	2.00	97.75
to 50 cm	5637	0.84	98.59
to 60 cm	3048	0.45	99.04
to 70 cm	1877	0.28	99.32
to 80 cm	1127	0.17	99.49
to 90 cm	785	0.12	99.61
to 100 cm	608	0.09	99.70
> 100 cm	2040	0.30	100.00
Total Counts = 672822			

L. JUNCTIONS ✓ SEE EVAL. RPT., SECT. L.

Junction comparisons were made with surveys: H-10346 1:10,000 scale 1990
H-10618 1:10,000 scale 1995
H-10514 1:10,000 SCALE 1994

Relative locations are shown in Figure L-1 and in the INDEX OF SHEETS, p. iv.

Comparisons were accomplished using MBHAT software to compare each of the 22 H-10346 soundings to all H-10625 soundings occurring within a 5x5 meter cell encompassing the junction sounding. The comparisons show a shoaling of 0.3 to 0.4 m since 1990. Comparisons to the 1934 surveys indicate a continued shoaling in this area of as much as 3 m since 1934. Junctioning results are shown in Table L-1.

Table L-1. Junction Analysis H-10625 & H-10346

Category	Count	Percent	Total Percent
to 10 cm	39	6.27	6.27
to 20 cm	102	16.40	22.67
to 30 cm	186	29.90	52.57
to 40 cm	143	22.99	75.56
to 50 cm	75	12.06	87.62
to 60 cm	48	7.72	95.34
to 70 cm	26	4.18	99.52
to 80 cm	3	0.48	100.00
to 90 cm			
to 100 cm			
> 100 cm			
Total Counts = 622			

Junction comparison of H-10625and H-10618 shows more than 87% of comparisons within 20cm, more than 97.4% within 30cm and more than 99.9% within 50cm. Larger differences occurred in areas of steep slopes, rocks, wrecks, and obstructions. Table L-2 shows the results of comparisons of all soundings common to the two surveys.

Table L-2. Junction Analysis H-10625 & H-10618

Category	Count	Percent	Total Percent
to 10 cm	67406	56.63	56.63
to 20 cm	36223	30.43	87.06
to 30 cm	12358	10.38	97.45
to 40 cm	2512	2.11	99.56
to 50 cm	426	0.36	99.92
to 60 cm	67	0.06	99.97
to 70 cm	21	0.02	99.99
to 80 cm	3	0.00	99.99
to 90 cm	2	0.00	99.99
to 100 cm	4	0.00	100.00
> 100 cm	3	0.00	100.00
Total Counts = 119025			

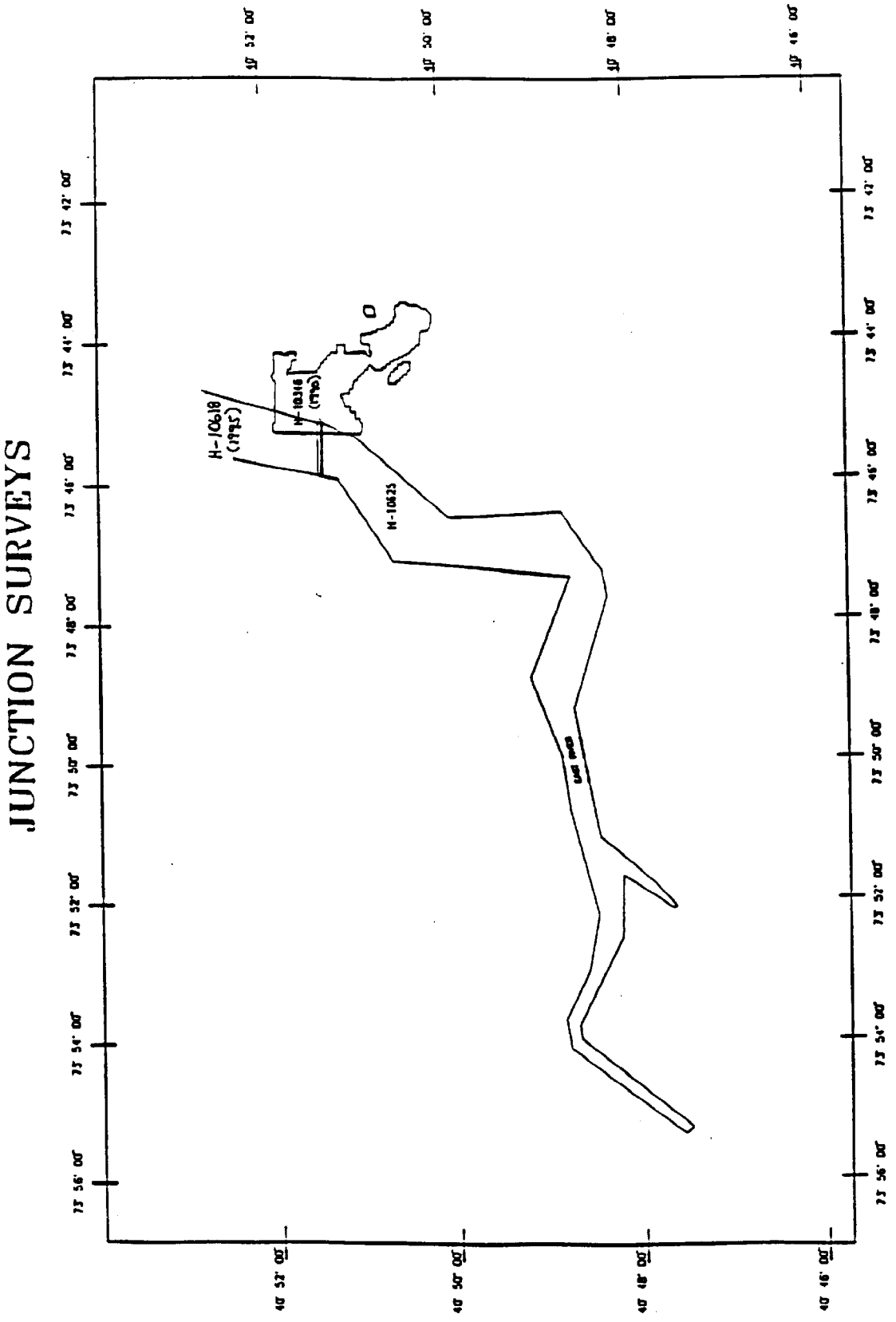


Figure L-1. Junction Surveys

M. COMPARISON WITH PRIOR SURVEYS ✓ SEE EVAL. RPT., SECT. M.

Data from H-10625 were compared to prior surveys with the following results:

H-5333 (1933) 1:10,000 Scale

The 1995 data show that in the East River, between 073° 50.0'W and 073° 50.5'W, some depths were 3 - 9 ft (1-2.7 m) shoaler than the data from survey of 1933. Near 40° 47.97'N, 073° 51.15'W, was an area approximately 6 ft (1.8 m) shoaler than the survey of 1933. Concur

Between 40° 47.65'N, 073° 51.5'W and 40° 47.1'N, 073° 52.1'W, on the west side, near the La Guardia Airport approach light pier, this survey had soundings 3 - 15 ft (1-4.6 m) shoaler than the 1933 survey. The remainder of this area was in general agreement with the 1933 data. Concur

One survey line on H-5333 was consistently deeper than the present survey by about 3 ft (1 m) between 40° 47.77'N, 073° 51.89'W and 40° 47.78'N, 073° 52.74'W. Surrounding lines agreed with the present survey except in a small area near 40° 47.82'N, 073° 52.39'W where soundings were now 5 - 20 ft (1.5 - 6.1 m) shoaler than in 1933. 20 ft diff. due to RK on present survey not found in 1933.

In 40° 48.2'N, 073° 52.73'W was a 9 ft (2.7 m) sounding carried forward from survey H-3778 (1915WD). This sounding was in depths of 58 ft in 1933. The 1995 data showed the depth to be 57 ft (17.4 m). Soundings along this edge of the survey indicate that the 30 ft depth curve may have shifted to the north in this area. Concur. 9ft disproved.

Between 073° 53.0'W and 073° 54.0'W the north side of the channel was deeper and the south side was shoaler than in 1933. This is typically the result of currents eroding the outer bank and depositing on the inner bank of a turn. Along the north shore the depths were now greater by 10 - 25 ft (3-7.6 m). The 1995 survey shows much more detail and reveals more existing rocks than have any prior surveys. Concur

H-5333 (1933) had a sounding 4 ft in 40° 48.12'N, 073° 53.17'W which was now in depths of 31 ft (9.6 m). Concur. 4 ft disproved.

The sounding 23 ft carried forward from BP21451 (1927) in 40° 47.85'N, 073° 52.91'W was now in depths of 43 ft (13.2 m), but a sounding ~~22~~ 21 ft (6.6 m) Rock (feature #206, 1xIHO) was found in 40° 47.88692'N, 073° 52.869'W. Concur

From 073° 54.0'W to 073° 54.6'W the surveys were in general agreement. However, along the east side of the channel the 1995 data show the depths to be 3 - 20 ft (1 - 6 m) greater than in 1933. Concur

H-5546 (1934) 1:10,000 Scale and H-5547 (1934) 1:10,000 Scale

South of Throgs Neck was an area of shoaling, extending to around 40° 48.00'N, 073° 47.50'W, with depths 3 - 4.3 m (10 - 14 ft) shoaler than in the survey of 1934. Concur

The area south of Hart Island's southern point, and extending south and west to approximately 40° 50.25'N, 073° 46.33'W, shows significant shoaling of 1.9 - 5.2 m (6 - 17 ft). Near 40°

50.25'N, 073° 46.77'W, was an area of shoaling on the order of 4.6 - 6.1 m (15 - 20 ft) in a relatively confined location. — Concur

Between City Island and Hart Island, the 1933 data show a sounding of 9.2 m (30 ft) in 40° 50.30'N, 073° 46.62'W whereas the data from 1995 show the depth to be 12.6 m (41 ft). An obstruction with least depth of 6.7 m (22 ft) was found in 40° 50.35780'N, 073° 46.59952'W, about 130 m (426 ft) at 034° true from the 30 ft sounding. — Chart 22 Obstn with danger curve and blue tint.

In the area of 40° 49.73'N, 073° 46.65'W was a shoal that seems to have migrated south. The 1995 data show the depth to be 3 - 4.6 m (10 - 15 ft) greater than the 1934 data. The shoal was now located around 40° 49.40'N, 073° 46.85'W and had a depth of approximately 1 - 2.8 m (3 - 9 ft) shoaler the 1934 data. ✓ Concur

North of Whitestone Point, around 40° 48.43'N, 073° 49.25'W, was a small area of shoaling. The 1995 sounding data shows the depth to be 3.3 - 4.3 m (11 - 14 ft) shoaler than the data from 1934. ✓ Concur

Nineteen AWOIS items were within the survey area. Results of investigation were:

AWOIS # 4272 • TYPE: Full RADIUS: 500m

Rock with least depth 6.7 m (22 ft) by multibeam echosounder (feature #289, 1xIHO) found in 40° 47.66151'N, 073° 52.20695'W. Position was 93 m (305 ft) at 322° true from the charted 18 - foot sounding, and 38 m (125 ft) at 240° true from the charted obstruction ED.

Recommend removal of danger circle, blue tint and label Obstn ED charted in 40° 47.67'N, 073° 52.22'W, and charting of 6.7 m (22 ft) rock in survey position. Concur. Chart 22 Rk with danger circle and blue tint.

AWOIS # 4274 • TYPE: Full RADIUS: 500m

Investigation with 100% multibeam and 200% sidescan coverage did not reveal any wreck within 500 m of charted dangerous wreck ED. Bottom was rocky and numerous significant rocks were detected and positioned. Charted depth of 10.6 m (35 ft) was confirmed by multibeam soundings.

Recommend removal of danger curve, blue tint, wreck symbol and label ED charted in 40° 47.95'N, 073° 53.04'W. Concur. Search conducted to limits of safe navigation. Item disproved. Chart this area Based on present Survey information.

AWOIS # 4275 • TYPE: Full RADIUS 500m

Wreck with least depth 17.4 m (57 ft) by multibeam echosounder (feature #301, 1xIHO) found in 40° 47.91539'N, 073° 54.32427'W. Position was 127 m (417 ft) at 213° true from the reported AWOIS position. There was no indication of charted wreck at AWOIS position.

Recommend removal of danger curve, blue tint and wreck symbol charted in 40° 47.97'N, 073° 54.27'W and charting a sounding 17.4 m (57 ft) with type Wk in survey position.

Concur
Chart 57 Wk with danger curve and blue tint.

AWOIS # 4276 TYPE: Full RADIUS: 500m

Investigation with 100% multibeam and 200% sidescan coverage did not reveal any wreck within 500 meters of charted wreck ED. An uncharted wreck with least depth 16.9 m (55 ft) by multibeam echosounder (feature #255, 1xIHO) found in 40° 47.90824'N, 073° 52.62167'W. Position was 616 m (2021 ft) at 111° true from the reported AWOIS position. Bottom was rocky and numerous rocks were detected. Charted wreck plots between 12 Rk and 18.5 Rk as found by the present survey.
Recommend removal of danger curve, blue tint, wreck symbol and label ED charted in 40° 48.03'N, 073° 53.03'W, and charting a sounding 16.8 m (55 ft) with type Wk in survey position. Concur. Chart 55 wk with danger curve and blue tint.

AWOIS # 4382 TYPE: Unassigned RADIUS 100m

No wreck found at the charted position, however the footprint of a former wreck can be seen in both multibeam and sidescan records. A wreck with least depth 13.3 m (43 ft) by multibeam echosounder (feature #124, 1xIHO) found in 40° 49.29873'N, 073° 47.15890'W. Position was 220 m (721 ft) south of the reported AWOIS position.

Recommend removal of danger circle, blue tint, sounding ~~33~~ 43 42 ft and label Wk charted in 40° 49.42'N, 073° 47.14'W and charting a sounding 13.3 m (43 ft) with type Wk in survey position. Note added to H-DRAWING
Do not concur. AWOIS resolved by AHP survey H-10541 New item. Chart 43 ft wk @ 40° 49.29873'N, 073° 47.15890'W with danger curve and blue tint.

AWOIS # 4386 TYPE: Information RADIUS: 100m

Investigation with 100% multibeam and 200% sidescan coverage did not reveal any elevated objects within the search radius. The bottom was flat with a depth of 18.8 m (62 ft) by multibeam echosounder.

Recommend removal of danger circle, blue tint and sounding 57 ft with type Obstn charted in 40° 49.99'N, 073° 46.31'W. Concur, Item ~~resolved~~ disproved. Chart this area based on the present survey information.

AWOIS # 4389 TYPE: Full RADIUS: 200m

Obstruction with least depth 20 m (65 ft) by multibeam echosounder (feature #58, 1xIHO) found in 40° 50.28084'N, 073° 45.79170'W. An item investigation was done with multibeam echo sounder and the depth 20 m (65 ft) was confirmed.

Recommend removal of danger curve, blue tint and sounding cleared to 54 ft with type Obstn charted in 40° 50.28'N, 073° 45.80'W and charting a sounding 20 m (65 ft) with type Obstn in survey position. Concur. Add danger curve and blue tint.

AWOIS # 4416 TYPE: Information RADIUS:

Rock
~~Obstruction~~ with least depth 13.8 m (45 ft) by multibeam echosounder (feature #120, 1xIHO) found in 40° 49.02528'N, 073° 46.90635'W.

Recommend removal of danger curve, blue tint and sounding 45 ft with type Rk charted in 40° 49.02'N, 073° 46.91'W and charting a sounding 13.8 m (45 ft) Rk in survey position. Chart 45 Rk with danger curve and blue tint.
Positions within error allowance.
∴ Item found at charted position.

AWOIS # 4417 • TYPE: Full RADIUS: 100m

Rock with least depth 10.7 m (35 ft) by multibeam echosounder (feature #352, 1xIHO) found in 40° 49.98478'N, 073° 46.76640'W.

Recommend removal of danger curve, blue tint and sounding cleared to 32 ft with type Rk charted in 40° 49.99'N, 073° 46.77'W and charting a sounding 10.7 m (35 ft) with type Rk in survey position. Concur. Chart 35 Rk with danger curve and blue tint.

AWOIS # 4418 • TYPE: Information RADIUS: 200m

Rock with least depth 8.3 m (27 ft) by multibeam echosounder (feature #41, 1xIHO) found in 40° 50.19976'N, 073° 46.65071'W.

Recommend removal of danger curve, blue tint and sounding 25 with type Rk charted in 40° 50.21'N, 073° 46.65'W and charting a sounding 8.3 m (27 ft) Rk in survey position. Concur Chart 27 Rk with danger curve and blue tint.

AWOIS # 6326 TYPE: Full RADIUS: 500m

Wreck with least depth 5.5 m (18 ft), feature #153 (2xIHO), found in 40° 48.32302'N, 073° 49.81492'W. This wreck is not on the smooth sheet. The Government Contracting Officer's Technical Representative directed no further work. Do not concur. AWOIS unassigned. Resolved by AHP survey H-10541. Note added to H Drawing

Recommend removal of danger curve, blue tint, and wreck symbol charted in 40° 48.29'N, 073° 49.82'W and charting a sounding 5.5 m (18 ft) with type Wk in survey position. Do not concur. Chart based on information in survey H-10541.

AWOIS # 6354 • TYPE: Full RADIUS: 500m

Numerous significant rocks were found within the search area. Recommend removal of danger curve, blue tint and symbol for dangerous underwater rock of uncertain depth with label RK (18 ft rep) charted in 40° 49.49'N, 073° 46.54'W and charting a selection from rocks in the following positions: Concur. Item resolved. Chart 4.4 Rk (Hft.) in lieu of Rk (18ft rep). Item 69

Feat. #	Latitude North	Longitude West	Feature Least Depth	Feature Type	1x or 2x IHO	Multibeam File Name	Ping #	Beam #	MB Depth
✓57	40 50.00570	073 45.99034	9.72	ROCK	1	mba95313.d01	21648	51	9.72
✓60	40 49.42620	073 46.58454	7.43	ROCK	1	mba95184.d01	58894	21	7.43
✓62	40 49.44576	073 46.54858	3.66	ROCK	1	mba95181.d05	10727	7	3.66
✓63	40 49.42018	073 46.53057	3.23	ROCK	1	mba95184.d03	35815	35	3.23
✓64	40 49.43471	073 46.52465	3.16	ROCK	1	mba95181.d05	15227	13	3.16
✓66	40 49.46031	073 46.54268	4.08	ROCK	1	mba95184.d03	35420	34	4.08
68	40 49.47302	073 46.57090	5.55	ROCK	1	mba95181.d01	27608	39	5.55
✓69	40 49.48106	073 46.56503	4.47	ROCK	1	mba95181.d01	27555	20	4.47
✓70	40 49.48952	073 46.54638	5.16	ROCK	1	mba95184.d01	23006	50	5.16
71	40 49.48733	073 46.59123	6.8	ROCK	1	mba95182.d01	17784	39	6.8
✓76	40 49.53547	073 46.54483	6.06	ROCK	1	mba95181.d01	27204	26	6.06
✓78	40 49.49405	073 46.61387	7.57	ROCK	1	mba95181.d05	25695	24	7.57

12 ft on H-DRAW.

10 ft on H-DRAW.

80	40 49.50024	073 46.58530	6.63	ROCK	1	mba95181.d05	25902	1	6.63
84	40 49.52656	073 46.52362	5.59	ROCK	1	mba95181.d05	26501	34	5.59
85	40 49.50082	073 46.53975	5.19	ROCK	1	mba95181.d05	15912	33	5.19
91	40 49.61980	073 46.70192	13.67	OBSTR	1	mba95313.d03	49078	6	13.67
96	40 49.63846	073 46.62478	9.94	ROCK	1	mba95182.d03	23362	38	9.94
98	40 49.65263	073 46.63586	10.16	ROCK	1	mba95313.d03	49404	8	10.16
103	40 49.70398	073 46.43354	12.42	ROCK	1	mba95313.d01	43391	30	12.42
104	40 49.65913	073 46.27856	6.72	ROCK	1	mba95181.d05	29022	28	6.72
106	40 49.63877	073 46.34864	5.61	ROCK	1	mba95181.d05	41655	25	5.61
129	40 48.27527	073 46.46482	6.64	ROCK	1	mba95184.d03	114296	40	6.64
131	40 49.60017	073 46.37998	4.58	ROCK	1	mba95181.d05	27979	33	4.58
Shaded rows indicate features not plotted on smooth sheet.									

AWOIS # 6500 TYPE: full RADIUS: 100m

Rock with least depth 14.6 m (48 ft) by multibeam echosounder (feature #30, 1xIHO) found in 40° 50.10367'N, 073° 46.71299'W.

Recommend removal of danger curve, blue tint and sounding cleared to 45 ft with type Rk charted in 40° 50.10'N, 073° 46.74'W and charting a sounding 14.6 m (48 ft) with type Rk in survey position. Do not Concur. 42 ft Rk found within search radius. Remove 45 ft Rk charted and chart 42 ft Rk @ 40° 50.08'N 073° 46.66'W with danger curve and blue tint.

AWOIS # 6501 TYPE: Full RADIUS: 100m

Wreck with least depth 20.3 m (66 ft) by multibeam echosounder (feature #31, 1xIHO) found in 40° 50.12354'N, 073° 46.70337'W.

Recommend removal of danger circle, blue tint, sunken wreck symbol and label PA (cleared 45 ft) charted in 40° 50.12'N, 073° 46.75'W and charting a sounding 20.3 m (66 ft) with type Wk in survey position. Concur. Add danger curve and blue tint.

AWOIS # 6502 TYPE: Information RADIUS: 100m

Rock with least depth 10.7 m (35 ft) by multibeam echosounder (feature #33, 1xIHO) found in 40° 50.17281'N, 073° 46.60497'W.

Recommend removal of danger curve, blue tint and sounding 28 ft with type Rk charted in 40° 50.17'N, 073° 46.61'W and charting a sounding 10.7 m (35 ft) with type Rk in survey position. Do not Concur. 27 ft RK found within search radius. Remove 28 ft Rk charted and chart 27 ft Rk @ 40° 50.2'N 073° 46.65'W.

AWOIS # 6504 TYPE: Information RADIUS 100m

Wreck with least depth 15.5 m (51 ft) by multibeam echosounder (feature #24, 1xIHO) found in 40° 50.22716'N, 073° 46.73560'W.

Recommend removal of danger circle, blue tint, sounding 48 ft and label Wk charted in 40° 50.23'N, 073° 46.74'W and charting a sounding 15.5 m (51 ft) with type Wk in survey position. Concur Add danger curve and blue tint.

AWOIS # 7450 TYPE: Information RADIUS 100m

Obstruction with least depth 15.1 m (49 ft) by multibeam echosounder (feature #119, 1xIHO) found in 40° 49.00630N, 073° 46.95011'W.

Recommend removal of danger circle, blue tint, sounding 49 ft and label Obstn charted in 40° 49.01'N, 073° 46.95'W and charting a sounding 15.1 m (49 ft) with type Obstn in survey position. Concur Charted Item confirmed. Chart 49 Obstn with danger circle and blue tint.

AWOIS # 7694 TYPE: Full RADIUS 300m

Obstruction with least depth 24.9 m (81 ft) by multibeam echosounder (feature #356, 1xIHO) found in 40° 48.09875'N, 073° 50.03370'W. This was 77 m (252 ft) at 138° true from the AWOIS position.

Recommend removal of danger circle, blue tint and label Obstn charted in 40° 48.13'N, 073° 50.07'W and charting a sounding 24.9 m (81 ft) with type Obstn in survey position. Concur.
Southern quarter of search area not covered.
The position of AWOIS #7694 was in 26 m of water. However, Obst found. Features nearest to the charted position were:

Feat. #	Latitude North	Longitude West	Feature Least Depth	Feature Type	1x or 2x IHO	Multibeam File Name	Ping #	Beam #	MB Depth	
✓157	40 48.23767	073 49.98147	13.16	ROCK	1	mba95185.d03	65709	30	13.16	ON H DRAWING
✓158	40 48.22987	073 49.96098	13.74	ROCK	1	mba95316.d02	17456	53	13.74	
✓159	40 48.19134	073 49.99651	23.17	ROCK	1	mba95185.d03	29598	54	23.17	
✓160	40 48.16330	073 49.94864	18.89	WRECK	1	mba95185.d03	74961	28	18.89	ON H DRAWING
✓161	40 48.11606	073 49.92740	22.46	ROCK	1	mba95185.d04	21824	60	22.46	
✓181	40 48.03015	073 50.20066	17.79	ROCK	1	mba95312.d04	8026	51	17.79	ON H DRAWING
196	40 48.04462	073 49.92082	17.22	OBSTR	2	mba95185.d04	93311	31	17.2	- plotted on revision overlay
✓356	40 48.09875	073 50.03370	24.9	OBSTR	1	mba95185.d04	22345	16	24.9	ON H DRAWING
Shaded rows indicate features not plotted on smooth sheet.										

Chart most signif. items in above table.

AWOIS # 8787 TYPE: Full RADIUS 100m

Investigation with 100% multibeam and 200% sidescan coverage did not reveal any 15 ft soundings within 100 meters of charted sounding 15 ft. Danger to Navigation Reports dated September 12, 1995, and January 10, 1996, covered this area. Shoalest depth was 5.6 m (18 ft) obstruction (feature #142, 1xIHO) in 40° 48.45420'N, 073° 49.27068'W.

Recommend removal of sounding 15 ft charted in 40° 48.45'N, 073° 49.27'W, and charting sounding 5.6 m (18 ft) Obstn in survey position. ~~Do not~~ Concur with charting recommendation.
North half of radius not surveyed.
Item unresolved.

N. COMPARISON WITH THE CHART

H-10625 was compared with Chart 12339, 39th Edition, February 11, 1995 and with Chart 12366, 24th Edition, March 25, 1995.

Soundings in H-10625 were consistent with the charts from the Hell Gate Railroad Bridge in the East River to the northern sheet limit between Hart Island and Barker Point in Long Island Sound except in three noted areas, and in the case of wrecks, rocks and obstructions.

In Anchorage No. 6 on the north side of the East River between the Bronx-Whitestone Bridge and the Throgs Neck Bridge, shoaling was detected between the 20 foot and 40 foot contours. See Danger to Navigation Reports dated September 12, 1995, and January 10, 1996, in Appendix A. Concur

Along the south side of the survey between 073° 48.8'W and 073° 50.7'W survey depths are 4 - 20 ft (1.2 - 6.1 m) deeper than charted. Also along the south side of the survey between 073° 46.8'W and 073° 48.2'W survey depths are 4 - 20 ft (1.2 - 6.1 m) deeper than charted. Concur

A wreck was found in the side scan coverage but outside the multibeam coverage in 40° 48.038'N, 073° 48.861'W with a height of 13 ft (4.1 m) off the bottom (feature #364). Position and height off bottom are estimated from the side scan records. This wreck is not shown on the smooth sheet. Closest selected sounding = 29ft

O. ADEQUACY OF SURVEY

Chart as 16 ft WK ~~(AT)~~ @ 40° 48.038'N 073° 48.861'W 4.9 WK(16') has been added to correction overlay. Add Danger Curve and bluetint.

This survey is complete and adequate to supersede prior surveys.

Concur

Data for all tracks shown on the track plot are included in the accepted survey data. The decision was made to retain these data to provide more 1xIHO coverage. In many cases, the extra lines were run to fill in side scan gaps and the multibeam data were recorded simultaneously.

Soundings corresponding to wrecks, rocks, and obstructions were shown in bold print so that they may be easily related to the corresponding text label. The density of soundings on this survey, while necessary to fairly depict the bottom, made it difficult to place text within the sheet. For that reason, text for features (wrecks, rocks, and obstructions), for floating aids to navigation, and for bottom characteristics were shown in reduced height bold characters. This made them stand out from the soundings and eased their placement. Even so, it was often necessary to deviate from the traditionally preferred placement of text.

No plot on mylar or paper can fully represent the tremendous amount of data which are available in this survey. Manipulation of and viewing of the data with a computer is much more satisfactory for many applications. For example, the ***mbmz*** layer viewed with the **MBHAT** software gives an excellent picture of the shape and character of the bottom.

The designation of wreck, rock, or obstruction was assigned to features from examination of the side scan images and the multibeam data. If a feature could not be clearly judged a wreck or a rock it was designated an obstruction. Two or more side scan processors agreed upon the

designation. The hydrographer and the Government Contracting Officer's Technical Representative reviewed and approved the designations.

Nine significant features were not plotted on the smooth sheet because they would have been overwritten by more critical features, or were not covered by 1xIHO soundings. One wreck was not plotted on the smooth sheet because it was outside the survey area and was only covered by side scan sonar. These 10 features were:

Table O-1. Non-Plotted Features

Feat. #	Latitude North	Longitude West	Feature Least Depth	Feature Type	1x or 2x IHO	Multibeam File Name	Ping #	Beam #	MB Depth
25	40 50.12064	073 46.98876	9.6	ROCK	1	mba95178.d03	3406	36	9.6
68	40 49.47302	073 46.57090	5.5	ROCK	1	mba95181.d01	27608	39	5.5
71	40 49.48733	073 46.59123	6.8	ROCK	1	mba95182.d01	17784	39	6.8
153	40 48.32302	073 49.81492	5.5	WRECK	2	mba95187.d09	24690	104	5.5
196	40 48.04462	073 49.92082	17.2	OBSTR	2	mba95185.d04	93311	31	17.2
243	40 48.05225	073 52.98057	13.1	ROCK	1	mba95185.d06	66290	60	13.1
286	40 48.01449	073 53.10355	13.6	ROCK	1	mba95186.d02	33215	34	13.6
294	40 48.17296	073 54.23767	19.1	WRECK	1	mba95313.d02	98782	72	19.1
359	40 47.95694	073 52.29296	8.9	WRECK	2	mba95185.d06	63581	105	9.0
364	40 48.03814	073 48.86146	?	WRECK	2	no mb here	side scan estimate only		

SEE HOOIS 6326

Plotted on HDWG

Plotted on HDWG

ALL ABOVE FEATURES PLACED ON SMOOTH SHEET OVERLAY

The following discussion provides guidance for evaluation of this survey against the specifications.

Multibeam

On the western edge of the survey from 40° 49.28'N to 40° 50.03'N and at 40° 50.17'N, 073° 46.96'W near City Island, on the eastern edge of the survey near Stepping Stones (40° 49.32'N, 73° 46.51'W to 40° 49.62'N, 73° 46.32'W), on the west side in Flushing Bay at 40° 47.38'N, 073° 51.88'W and at 40° 47.27'N, 073° 51.99'W, and at the north corner near Hell Gate railroad bridge, (40° 47.04'N, 73° 55.34'W) the survey did not extend to the survey bounds because the 5.5 m contour was inside the bounds. It was judged to be not navigationally prudent to extend coverage further in these locations. Concur.

Bridge piers inside the survey bounds precluded multibeam coverage in five locations:

40° 48.28'N, 73° 49.93'W	Bronx-Whitestone Bridge
40° 48.20'N, 73° 47.50'W	Throgs Neck Bridge
40° 47.87'N, 73° 47.62'W	Throgs Neck Bridge
40° 48.11'N, 73° 47.62'W	Throgs Neck Bridge
40° 47.80'N, 73° 47.65'W	Throgs Neck Bridge

Concur

Multibeam coverage gaps exist within the survey area as follows:

40° 47.91'N, 73° 51.90'W 2 x 50 m gap between lines
40° 47.91'N, 73° 51.00'W south side near College Point Reef
40° 48.60'N, 73° 48.80'W moored scows always blocked
40° 48.29'N, 73° 46.44'W four gaps at east edge
40° 48.11'N, 73° 47.62'W east and west sides of Throgs Neck Bridge pier

Side scan coverage was 200% to 300% in all these areas and no features or targets were detected. Concur.

Sound Velocity Corrections ✓

During survey operations four casts were incorrectly applied to the multibeam data and used for depth determination. This occurred due to a design defect in the real-time software that caused it to incorrectly record the name of the current sound velocity profile. The first incorrect cast was applied on day 184, when the profile CTW18204.CNV was downloaded instead of CTW18402.CNV. The second incorrect sound velocity profile was applied on day 189 when CTG17405.CNV was downloaded instead of CTW18901.CNV. The third instance occured on day 189 when CTW18804.CNV was downloaded instead of CTW18805.CNV. The fourth instance of an incorrect sound velocity profile was on day 190 when CTW18901.CNV was downloaded instead of CTW18902.CNV.

The resultant depth and position errors (Table O-2) were estimated by comparing depths as determined by the two Sound Velocity Profiles (SVP) using SAIC's multibeam error model. The model indicates that worst case position error was less 0.22m. The depth data recorded during this time have worst case errors less than 0.10m. The errors are within the budget for 1xIHO standard and were not removed from the data. Concur

Table O-2. Depth and Position Errors Due to Incorrect Sound Velocity Profile

Cast #1 Applied	Cast #2	Beam Angle	Error in Meters		
			X	Y	Z
ctw18204.cnv	ctw18402.cnv	0	0.000	0.000	-0.012
		45	0.000	-0.010	-0.013
ctg17405.cnv	ctw18901.cnv	0	0.000	0.000	0.056
		45	0.000	0.013	0.098
ctw18805.cnv	ctw18804.cnv	0	0.000	0.000	-0.016
		45	0.000	-0.021	-0.011
ctw18901.cnv	ctw18902.cnv	0	0.000	0.000	0.083
		45	0.000	0.212	-0.046

In some cases the sound velocity profile applied did not extend to 95% of the maximum depth observed in the data set. In those cases the RESON SeaBat used the bottom of the sound velocity table to extend corrections to the observed depths greater than the cast depth. To check the validity of this vertical extrapolation, the hydrographer made extrapolations to the bottom using the trend of the bottom of the sound velocity profile to determine the errors resulting from using the RESON extrapolation method. The x, y, z coordinates of maximum soundings in the file were computed at nadir and at 45° off nadir.

The results of these comparisons, Table O-3, show the depth and position errors from using the RESON extrapolation method are less than 1 cm and are within the budget for meeting 1xIHO standards. Concur

Table O-3. Depth and Position Errors Due to Sounding Depth Exceeding Sound Velocity Profile Depth

Dataset	Cast #	Cast Max. Z	Data Max. Z	Delta Z	Beam Angle	Error in Meters		
						X	Y	Z
mba95178.d05	ctw17801.cnv	32.14	35.23	3.09	0	0.000	0.000	0.000
					45	0.000	0.000	0.000
mba95181.d04	ctw18103.cnv	28.23	32.64	4.41	0	0.000	0.000	0.000
					45	0.000	0.000	0.000
mba95182.d04	ctw18203.cnv	29.39	34.17	4.78	0	0.000	0.000	0.000
					45	0.000	0.000	0.000
mba95183.d01	ctw18206.cnv	21.45	26.92	5.47	0	0.000	0.000	0.000
					45	0.000	0.000	0.000
mba95183.d03	ctw18206.cnv	21.45	27.99	6.54	0	0.000	0.000	0.000
					45	0.000	0.000	0.000
mba95186.d01	ctw18604.cnv	23.57	28.87	5.30	0	0.000	0.000	0.000
					45	0.000	0.000	0.000
mba95186.d02	ctw18604.cnv	23.57	34.86	11.29	0	0.000	0.000	0.001
					45	0.000	0.001	0.000
mba95186.d02	ctw18605.cnv	25.46	34.86	9.40	0	0.000	0.000	0.000
					45	0.000	0.001	0.000
mba95186.d03	ctw18605.cnv	25.46	30.27	4.81	0	0.000	0.000	0.000
					45	0.000	0.000	0.000
mba95187.d02	ctw18606.cnv	17.85	28.71	10.86	0	0.000	0.000	0.003
					45	0.000	0.006	0.000
mba95187.d02	ctw18702.cnv	24.01	28.71	4.70	0	0.000	0.000	0.000
					45	0.000	-0.001	0.000
mba95187.d03	ctw18702.cnv	24.01	35.21	11.20	0	0.000	0.000	-0.002
					45	0.000	-0.003	0.000
mba95187.d03	ctw18703.cnv	27.60	35.21	7.61	0	0.000	0.000	0.001
					45	0.000	0.001	0.000
mba95187.d04	ctw18703.cnv	27.60	33.12	5.52	0	0.000	0.000	0.000
					45	0.000	0.001	0.000
mba95189.d04	ctw18901.cnv	31.73	35.00	3.27	0	0.000	0.000	0.000
					45	0.000	0.001	0.000

Side Scan

Side scan coverage for Sheet A was 300% or more for at least 95% of the area. Consequently, those records, which were affected by towfish instability, wake, noise, etc were not included in the data set.

Bridge piers inside the survey bounds also precluded side scan coverage in the areas listed under multibeam above. Side scan coverage extends beyond the multibeam coverage in areas of

shallow water and where the proximity of rocks and structures limited the approach of the survey vessel.

At the northern edge of the survey, in 40°47.97'N, 73° 52.50'W, a gap exists in the 200% side scan coverage where three side scan lines were rejected because problems with the graphic print head resulted in poor quality analog records. Digital side scan data exist for all three of these lines. The side scan line used for 100% analog coverage, JD 185/22:00 to 22:01, was of excellent quality and no targets were identified from this record. In addition there are several multibeam lines which show no significant targets in the area. The area has a steep slope and there are identified features within 200m to both the east and west. The side scan coverage was judged to be adequate for definition of all targets in the area of 100% analog coverage. Concur.

Navigation Reconstruction ✓

Track reconstruction across voids in positioning coverage was performed using a SAIC program called **RECONPM.** The basis for the reconstruction program was a backward/forward Kalman Filter technique

Navigation breaks occurred during the survey operations of Sheet A as the boat passed under the Throgs Neck and Bronx-Whitestone bridges which blocked GPS satellite signals. The time window for each break was identified using a multibeam trackline plot. Data in these initial time windows had flags set "off-line" because of bad navigation during the post processing aboard the Atlantic Surveyor.

During final post processing, the raw GPS data were examined and corrupt data were removed from the *gpa95*.d** files using an ASCII text editor. The data removed were the old positions repeated by the GPS receiver while the satellites were blocked, and the inaccurate data sent as the GPS receiver started to re-acquire the signals. With the erroneous data removed, a section of trackline was generated for each navigation break using the track reconstruction software. These sections are contained in the *rsh95*.d** files and were typically several minutes of data. The *rsh_east_list* and *rsh_west_list* files contain a listing of the reconstructed files.

The Multibeam files were then modified using the **navup** and **gsfup** procedures and a file list was included in the *fl_u_east.lst* and *fl_u_west.lst* list files. The *east.lnl* and *west.lnl* files contain the time windows used for the reconstruction procedures. The reconstruction time frame must be longer than the reconstruction time window to provide valid data to control both ends of the track reconstruction.

Table O-4 lists the GPS, reconstruction and time window data applied to each multibeam file:

Table O-4. Navigation Reconstruction Files

GPS Data File	Reconstructed Data File	Time Window					Multibeam Files
East Bridge-Throgs Neck Bridge							
gpa95182.d03	rsh95182.d00	JD182	14:15:05	to	JD182	14:20:45	mba95182.d04
gpa95182.d03	rsh95182.d02	JD182	14:54:05	to	JD182	14:56:45	mba95182.d04
gpa95182.d03	rsh95182.d03	JD182	15:05:05	to	JD182	15:09:45	mba95182.d04
gpa95182.d03	rsh95182.d04	JD182	15:44:05	to	JD182	15:47:45	mba95182.d04
gpa95182.d03	rsh95182.d05	JD182	15:55:05	to	JD182	15:59:45	mba95182.d04
gpa95182.d05	rsh95182.d06	JD182	17:32:05	to	JD182	17:33:45	mba95182.d86
gpa95182.d05	rsh95182.d07	JD182	18:25:05	to	JD182	18:26:45	mba95182.d86
gpa95184.d04	rsh95184.d00	JD184	14:14:05	to	JD184	14:17:45	mba95184.d05
gpa95184.d04	rsh95184.d02	JD184	14:44:05	to	JD184	14:46:45	mba95184.d05
gpa95184.d04	rsh95184.d03	JD184	14:48:05	to	JD184	14:49:45	mba95184.d05
gpa95184.d04	rsh95184.d12	JD184	14:49:40	to	JD184	14:50:45	mba95184.d05
gpa95184.d04	rsh95184.d04	JD184	15:16:05	to	JD184	15:18:45	mba95184.d05
gpa95184.d04	rsh95184.d05	JD184	15:30:05	to	JD184	15:33:45	mba95184.d05
gpa95184.d04	rsh95184.d06	JD184	16:02:05	to	JD184	16:05:45	mba95184.d05
gpa95184.d04	rsh95184.d07	JD184	16:14:05	to	JD184	16:16:45	mba95184.d05
gpa95184.d04	rsh95184.d08	JD184	16:50:05	to	JD184	16:51:45	mba95184.d05
gpa95184.d04	rsh95184.d09	JD184	17:04:05	to	JD184	17:07:45	mba95184.d05
gpa95184.d04	rsh95184.d10	JD184	17:46:05	to	JD184	17:48:45	mba95184.d05
gpa95184.d04	rsh95184.d11	JD184	18:00:05	to	JD184	18:02:45	mba95184.d06
gpa95001.d01	rsh95001.d00	JD184	18:52:05	to	JD184	18:55:45	mba95184.d56
gpa95001.d01	rsh95001.d02	JD184	19:33:05	to	JD184	19:35:45	mba95184.d56
gpa95001.d01	rsh95001.d03	JD184	19:41:05	to	JD184	19:42:45	mba95184.d56
gpa95189.d04	rsh95189.d04	JD189	20:19:05	to	JD189	20:20:58	mba95189.d04
gpa95189.d04	rsh95189.d05	JD189	23:11:05	to	JD189	23:12:45	mba95189.d04
gpa95312.d05	rsh95312.d03	JD312	20:10:00	to	JD312	20:12:30	mba95312.d06
West Bridge-Bronx-Whitestone Bridge							
gpa95185.d02	NA[1]	JD185	9:43:55	to	JD185	9:46:00	mba95185.d02
gpa95185.d02	NA[1]	JD185	9:46:00	to	JD185	9:50:00	mba95185.d02
gpa95185.d02	NA[1]	JD185	9:50:00	to	JD185	9:53:00	mba95185.d02
gpa95185.d02	NA[1]	JD185	10:21:55	to	JD185	10:24:05	mba95185.d02
gpa95185.d02	rsh95185.d04	JD185	10:26:05	to	JD185	10:26:45	mba95185.d02
gpa95185.d02	rsh95185.d05	JD185	10:46:05	to	JD185	10:47:45	mba95185.d02
gpa95185.d02	NA[1]	JD185	12:06:05	to	JD185	12:09:45	mba95185.d03
gpa95185.d02	rsh95185.d06	JD185	12:27:05	to	JD185	12:29:45	mba95185.d03
gpa95185.d02	rsh95185.d07	JD185	13:31:05	to	JD185	13:33:45	mba95185.d03
gpa95185.d02	rsh95185.d08	JD185	13:52:05	to	JD185	13:53:45	mba95185.d03
gpa95185.d03	rsh95185.d09	JD185	14:48:05	to	JD185	14:49:45	mba95185.d04
gpa95185.d03	rsh95185.d10	JD185	15:10:05	to	JD185	15:11:45	mba95185.d04
gpa95185.d03	rsh95185.d11	JD185	16:04:05	to	JD185	16:05:55	mba95185.d04
gpa95185.d03	rsh95185.d12	JD185	16:35:05	to	JD185	16:37:00	mba95185.d04
gpa95185.d03	rsh95185.d13	JD185	17:35:05	to	JD185	17:36:45	mba95185.d04
gpa95185.d03	rsh95185.d14	JD185	17:56:05	to	JD185	17:57:45	mba95185.d04
gpa95189.d04	rsh95189.d00	JD189	21:08:05	to	JD189	21:10:45	mba95189.d04
gpa95312.d03	rsh95312.d01	JD312	12:31:00	to	JD312	12:33:00	mba95312.d03
gpa95312.d03	rsh95312.d02	JD312	16:34:45	to	JD312	16:37:00	mba95312.d04
gpa95316.d02	rsh95316.d01	JD316	17:21:00	to	JD316	17:23:00	mba95316.d02

[1] Time window used in gsfup procedure only

Navigation reconstruction was done in the same manner for some side scan files. See Section E of this report and the Sheet A Processing and Multibeam Summary Report for details of side scan navigation reconstruction.

Data was analyzed during office processing at the Pacific Hydrographic Branch and found to be consistent with surrounding hydrographic data.

P. AIDS TO NAVIGATION

The aids to navigation within the survey area adequately serve their apparent purpose, and were on station in agreement with the chart and with Light List, Volume 1, Atlantic Coast as follows:

Hewlett Point Lighted Buoy "29" was on station at 40° 50.513'N, 073° 45.336'W with characteristics Fl G 4s and a green structure. LL#21495

Locust Point Buoy "46A" was on station at 40° 49.444'N, 073° 47.165'W with characteristics Red Nun. LL#21510

Throgs Neck Lighted Bell Buoy "48" was on station at 40° 48.185'N, 073° 47.250'W with characteristics Fl R 4s BELL and a red structure. LL#21515

East River Main Channel Gong Buoy "3" was on station at 40° 47.919'N, 073° 51.079'W with characteristics GONG and a green structure. LL#27225

East River Main Channel Lighted Buoy "5" was on station at 40° 47.784'N, 073° ~~940~~ 51.94'W with characteristics Fl G 2.5s and a green structure. LL#27230

East River Main Channel Lighted Buoy "6" was on station at 40° 47.894'N, 073° 52.220'W with characteristics Fl R 2.5s and a red structure. LL#27235

Flushing Bay Channel Lighted Buoy "1" was on station at 40° 47.585'N, 073° 51.435'W with characteristics Fl G 2.5s and a green structure. LL#27460

Flushing Bay Buoy "2" was on station at 40° 47.605'N, 073° 51.606'W with characteristics Red Nun. LL#27465

Flushing Bay Channel Lighted Buoy "3" was on station at 40° 47.312'N, 073° 51.727'W with characteristics Fl G 4s and a green structure. LL#27470

East River Main Channel Buoy "13" was on station at 40° 47.506'N, 073° 54.659'W with characteristics Green Can. LL#27280

Q. STATISTICS

Survey statistics are as follows:

720	Lineal kilometers of sounding lines
14	Square kilometers of hydrography
11	Days of production
1	Days of weather downtime
1	Days of mechanical, electronic or operational downtime
5	Number of tide stations
56	Number of velocity casts
0	Number of XBT drops

R. MISCELLANEOUS

The full bottom coverage provided by this survey reveals much more detail of the depth and character of the bottom than has been provided by prior surveys. In rocky areas, many rocks were found with shoaler depths than those charted. Depths of rocks found by prior sounding were in agreement. Depths of rocks carried forward from 1930's wire drag were found to be deeper than charted as one might expect. The northeast portion of the survey shows a history of continual shoaling.

S. RECOMMENDATIONS

Based on comparisons with previous surveys and existing charts, it is recommended that the entire common area of charts 12339 and 12366 be reconstructed with data from this survey. Concur

T. REFERRAL TO REPORTS *

- Phase I - NOAA Acquisition of Sounding Data in Western Long Island Sound, Phase I Test Results, December 3, 1994. Submitted to NOAA COTR aboard M/V Beavertail.
- Phase IIA - Phase IIA Accuracy and Alignment Tests - submitted to NOAA COTR aboard M/V Atlantic Surveyor, May 14, 1995.
- Phase IIA - Survey Report - Calibration, Horizontal Control, Real-Time and Processing Procedures, submitted August 21, 1995 to Chief, Pacific, Hydrographic Section; National Ocean Service, NOAA.
- Phase IIA - Summary Report - Tides, submitted August 21, 1995.
- Sheet A Processing and Multibeam Data Summary
- Sheet A Real Time Log Notebook
- Sheet A Sound Velocity Notebook

* PROJECT SPECIFIC REPORTS ARCHIVED WITH SURVEY DATA FOR SURVEY H-10671.
SURVEY SPECIFIC REPORTS ARCHIVED WITH SURVEY DATA FOR SURVEY H-10625

- Sheet A Processing Notebook
- Sheet A Digital Data Listing Notebook
- Sheet A Digital Data
- Sheet A Side Scan Sonar Analog Records
- Sheet A Plots

APPENDIX A:

DANGER TO NAVIGATION REPORTS

ADDED DURING EVALUATION

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of Coast Survey
Silver Spring, Maryland 20910-3282

SUPERSEDED BY LETTER DATED JAN 10, 1996.

SEP 28 1995

ADVANCE INFORMATION

Commander (OAN)
First Coast Guard District
408 Atlantic Avenue
Boston, Massachusetts 02110-3350

Dear Sir:

While conducting hydrographic survey operations in the East River, New York, our contractor discovered a wreck and shoaling between Throgs Neck Bridge and Whitestone Bridge. Attached are Danger to Navigation Reports and a section of chart 12366 indicating the position of these dangers.

Differential GPS, side scan sonar, and multibeam sonar were used to determine the positions and depths. These data are preliminary and subject to office review.

Sincerely,

Jack L. Wallace ACTING for AAA
Andrew A. Armstrong, III
Captain, NOAA
Chief, Hydrographic Surveys Division

Enclosures

cc: OA312 - G. Smith
N/CS26 - D. Romesberg
✓N/CS3X3 - D. Cole
N/CS34 - K. Timmons
DMAHTC

ADVANCE INFORMATION

REPORT OF DANGER TO NAVIGATION

Hydrographic Survey Registry Number: H-10625

State: New York

General Locality: East River

Sublocality: Hart Island to Wards Island

Project Number: OPR-B389-CN

The following item was found during hydrographic survey operations:

Object Discovered: Wreck

Covered 22 feet corrected to Mean Lower Low Water using observed tide correctors.

Affected nautical charts:

Chart Number	Edition		Reported Depth	Charted Horiz. Datum	Geographic Position	
	No.	Date			Latitude	Longitude
12366 12364	24 29	3/25/95 7/23/94	22 ft	NAD 83	40°48'28"N	073°48'3?"W

ADVANCE INFORMATION

REPORT OF DANGER TO NAVIGATION

Hydrographic Survey Registry Number: H-10625

State: New York

General Locality: East River

Sublocality: Hart Island to Wards Island

Project Number: OPR-B389-CN

The following items were found during hydrographic survey operations:

Object Discovered: Shoaling

Depths corrected to Mean Lower Low Water using observed tide correctors.

Affected nautical charts:

Chart Number	Edition		Reported Depth	Charted Horiz. Datum	Geographic Position	
	No.	Date			Latitude	Longitude
12366 12364	24 29	3/25/95 7/23/94	29 ft	NAD 83	40°48'28"N	073°48'39"W
12366 12364	24 29	3/25/95 7/23/94	26 ft	NAD 83	40°48'28"N	073°48'47"W
12366 12364	24 29	3/25/95 7/23/94	26 ft	NAD 83	40°48'32"N	073°48'49"W
12366 12364	24 29	3/25/95 7/23/94	24 ft	NAD 83	40°48'31"N	073°48'59"W
12366 12364	24 29	3/25/95 7/23/94	22 ft	NAD 83	40°48'30"N	073°49'05"W
12366 12364	24 29	3/25/95 7/23/94	22 ft	NAD 83	40°48'32"N	073°49'04"W


ADVANCE INFORMATION
COLLEGE POINT
Flushing Airport
Tallman
Powell Cove
Malba
BRONX-WHITESTONE FIXED BRIDGE
HOR CL 2295 FT
VERT CL 135 FT
Whitestone Pt
WHITESTONE
SPIRE
GREEN DOME
MAGNETIC
VAR 13°15'W (1995)
ANNUAL INCREASE 3'
Beechhurst
Cryders Pt
THROGS NECK BRIDGE
Little Bay
THROGS NECK
TANK
STACK
Yacht Club
Castle Hill
Old Ferry Pt
E A S T R I V E R
F R LTS ON TOWER
F G 48ft 10M "1"
F R 60ft 11M PA
Obstn PA
Subm piles
Sewer
Ruins
CAUTION
SUBMARINE PIPELINES AND
Pipeline Area

ADVANCE
INFORMATION

Science Applications International Corporation
An Employee-Owned Company

September 20, 1995

Lieutenant Commander David A. Cole, NOAA
Field Manager, Contract Hydrographic Surveys
Coast & Geodetic Survey, N/CG24x3
National Ocean Service
1315 East West Highway, SSMC3, Station 6856
Silver Spring, MD 20910

Subject: NOAA Contract 50-DGNC-4-00035: Danger to Navigation Report

Dear Lieutenant Commander Cole:

Science Applications International Corporation (SAIC) has discovered dangers to navigation on Chart 12366 during the survey of East River, NY, under the subject contract. This letter adds one sounding to the letter submitted September 12, 1995.

Shoaling was detected in the anchorage 6 area on the north side of East River between the Bronx-Whitestone Bridge and the Throgs Neck Bridge. Soundings at MLLW, corrected with observed tides at Willet Point Station, and positioned in NAD 1983, were discovered as follows:

Meters	Feet	Latitude	Longitude
9.0	29	40 48 28 N	073 48 39 W
6.9 Wk	22	40 48 32 N	073 48 40 W
8.0	26	40 48 28 N	073 48 47 W
7.9	26	40 48 32 N	073 48 49 W
7.3	24	40 48 31 N	073 48 59 W
6.7	22	40 48 30 N	073 49 05 W
6.9	22	40 48 32 N	073 49 04 W

A copy of a section of Chart 12366 is enclosed.

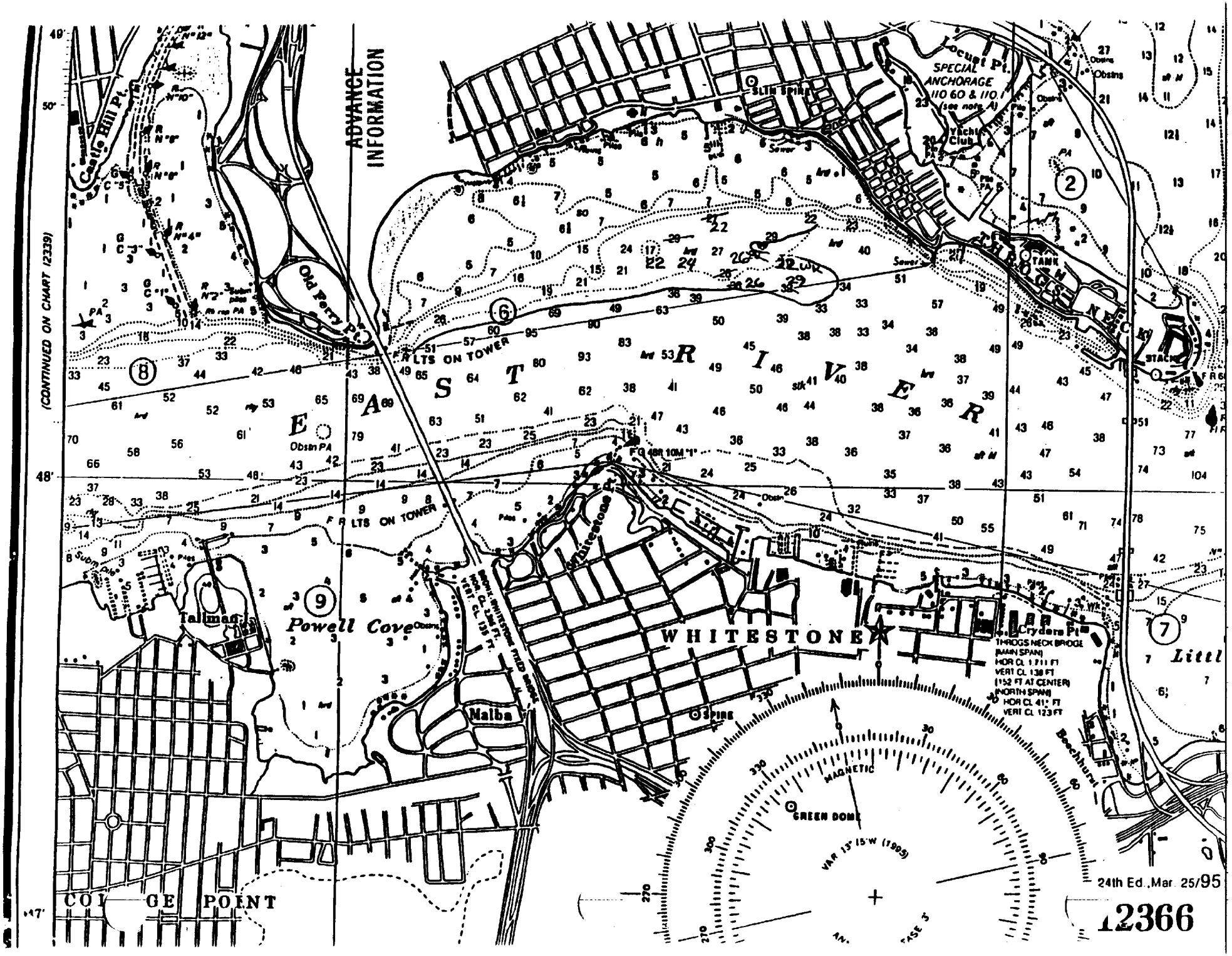
Sincerely,
Science Applications International Corporation

Walter S. Simmons
Program Manager

Enclosure

Admiral's Gate, 221 Third Street, Newport, Rhode Island 02840 Office: (401) 847-4210 FAX: (401) 849-1585

Other SAIC Offices: Albuquerque, Colorado Springs, Dayton, Falls Church, Huntsville, Las Vegas, Los Altos, Los Angeles, McLean, Oak Ridge, Orlando, San Diego, Seattle, Tucson


ADVANCE INFORMATION
(CONTINUED ON CHART 12339)
Castle Hill Pt.
Old Ferry Pt.
Locust Pt.
SPECIAL ANCHORAGE
110 60 & 110 (see note A)
Yacht Club
THROGS NECK
TANK
STACK
FR LTS ON TOWER
STRIVER
Obstn PA
FR LTS ON TOWER
Whitestone Pt.
BROWN-WHITESTONE FIXED BRIDGE
HOR CL 144 FT
VERT CL 135 FT
Talman
Powell Cove
Malba
WHITESTONE
Cryders Pt
THROGS NECK BRIDGE
(MAIN SPAN)
HOR CL 1,711 FT
VERT CL 138 FT
(152 FT AT CENTER)
(NORTH SPAN)
HOR CL 417 FT
VERT CL 123 FT
Beechhurst
Little
COLLEGE POINT
GREEN DOME
MAGNETIC
VAR 13° 15'W (1995)
24th Ed., Mar. 25/95
12366

Science Applications International Corporation
An Employee-Owned Company

SUPERSEDES ALL PREVIOUS.

ADVANCE INFORMATION

January 10, 1996

Lieutenant Commander David A. Cole, NOAA
Field Manager, Contract Hydrographic Surveys
Coast & Geodetic Survey, N/CG24x3
National Ocean Service
1315 East West Highway, SSMC3, Station 6856
Silver Spring, MD 20910

Subject: NOAA Contract 50-DGNC-4-00035
Reference: 1) Danger to Navigation Report dated September 20, 1995

Dear Lieutenant Commander Cole:

Science Applications International Corporation (SAIC) reported dangers to navigation on Chart 12366 during the survey of East River, NY, via Reference 1).

After final processing with local observed water levels, soundings at MLLW are as follows:

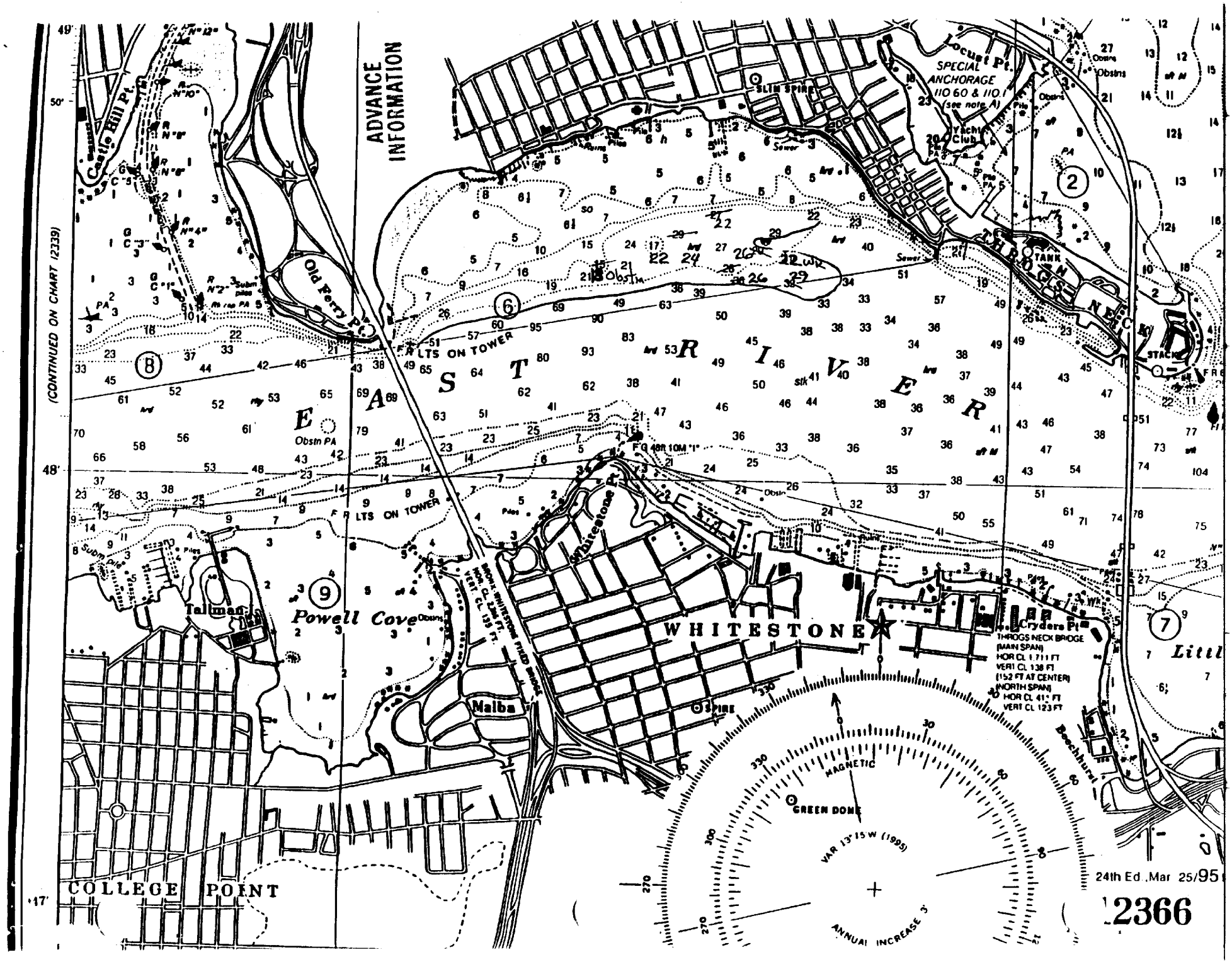
	Meters	Feet	Latitude	Longitude
	8.9	29	40° 48' 28"N	073° 48' 39"W *
	6.9 Wk	22	40° 48' 32"N	073° 48' 40"W *
	9.0	26	40° 48' 28"N	073° 48' 47"W
	7.9	26	40° 48' 32"N	073° 48' 49"W
	7.3	24	40° 48' 31"N	073° 48' 59"W
	6.6	22	40° 48' 30"N	073° 49' 05"W
	6.7	22	40° 48' 32"N	073° 49' 04"W
add	5.6 Obstn	18	40° 48' 27"N	073° 49' 16"W

* The Notice to Mariners issued by NOAA contained two errors. The position listed for the sounding 6.9 m (22 ft) wreck was given as the position for the sounding 8.9 m (29 ft), and the notice did not include the sounding 8.9 m (29 ft). SAIC recommends a correction to the Notice.

Sincerely,
Science Applications International Corporation
Walter S. Simmons
Walter S. Simmons
Program Manager

Enclosure

Admiral's Gate, 221 Third Street, Newport, Rhode Island 02840 Office: (401) 847-4210 FAX: (401) 849-1585
Other SAIC Offices: Albuquerque, Colorado Springs, Dayton, Falls Church, Huntsville, Las Vegas, Los Altos, Los Angeles, McLean, Oak Ridge, Orlando, San Diego, Seattle, Tucson


ADVANCE INFORMATION
(CONTINUED ON CHART 12339)
Castle Hill Pt.
Old Ferry Pt.
Locust Pt.
SPECIAL ANCHORAGE
110 60 & 110 1
(see note A)
SLIM SPIRE
Yacht Club
TANK
THROGS NECK
STACK
FR
FR LTS ON TOWER
FR LTS ON TOWER
FG 48ft 10M "I"
Obstn PA
Obstn
Whitestone Pt.
Powell Cove
Talman
Malba
WHITESTONE
Cryders Pt
THROGS NECK BRIDGE
(MAIN SPAN)
HOR CL 1 711 FT
VERT CL 138 FT
(152 FT AT CENTER)
(NORTH SPAN)
HOR CL 417 FT
VERT CL 123 FT
SPIRE
Beechhurst
Little
COLLEGE POINT
MAGNETIC
GREEN DOME
VAR 13° 15 W (1995)
ANNUAL INCREASE 3'
24th Ed., Mar 25/95
12366

May 21, 1996

Science Applications International Corporation
An Employee-Owned Company

CORRECTION TO JAN 10. MEMO

ADVANCE INFORMATION

Lieutenant Commander David A. Cole, NOAA
Field Manager, Contract Hydrographic Surveys
Office of Coast Survey, N/CG24x3, National Ocean Service
1315 East West Highway, SSMC3, Station 6856
Silver Spring, MD 20910

Subject: NOAA Contract 50-DGNC-4-00035.
Reference: (a) NOAA Letter dated February 26, 1996

DANGER TO NAVIGATION REPORT

Dear Lieutenant Commander Cole:

Science Applications International Corporation (SAIC) has examined the Danger to Navigation Reports of September 20, 1995 and of January 10, 1996 along with the data and smooth sheet for H-10625. During post processing of data, SAIC found that feature number 3 of those reports was actually a depth of 9.0 meters. That depth has been verified and is shown on the smooth sheet. The previous Danger to Navigation Reports should be corrected by changing feature 3 as follows:

Meters	Feet	Latitude	Longitude
9.0	29	40° 48' 28"N	073° 48' 47"W

SAIC regrets the error in the previous report, and requests NOAA take appropriate action to correct any changes to the charts occasioned by them.

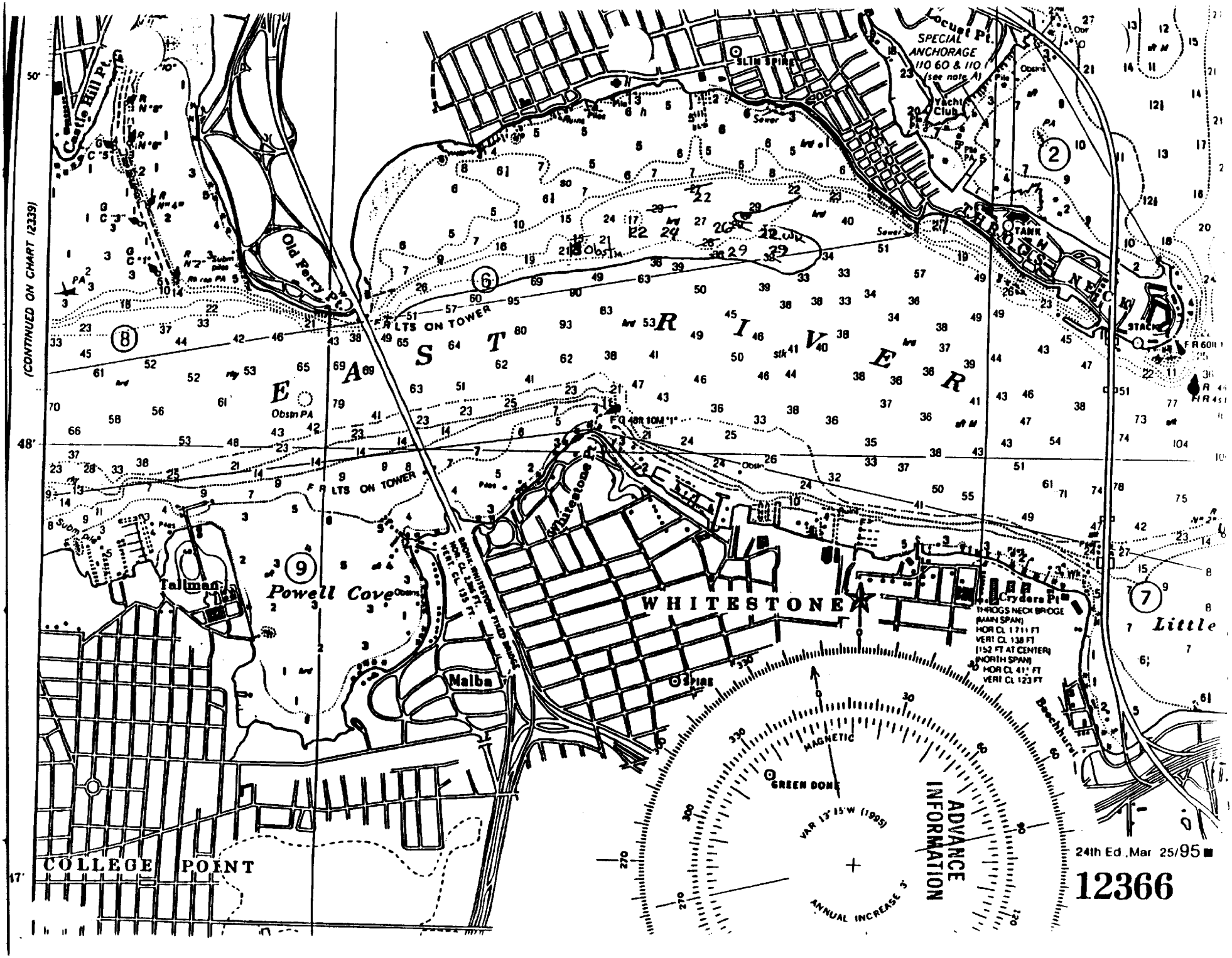
Sincerely,
Science Applications International Corporation

Walter S. Simmons
Program Manager

cc: Mr. Gary C. Nelson

Admiral's Gate, 221 Third Street, Newport, Rhode Island 02840 Office: (401) 847-4210 FAX: (401) 849-1585

Other SAIC Offices: Albuquerque, Colorado Springs, Dayton, Falls Church, Huntsville, Las Vegas, Los Altos, Los Angeles, McLean, Oak Ridge, Orlando, San Diego, Seattle, Tucson


(CONTINUED ON CHART 12339)
Castle Hill Pt.
Old Ferry Pt.
SLTN SPIRE
Locust Pt.
SPECIAL ANCHORAGE
(see note A)
Yacht Club
THROGS NECK
TANK
STACK
FR LTS ON TOWER
FR LTS ON TOWER
FIR 60ft
FIR 45ft
STRIVER
Obstn PA
FIR 10M "I"
Whitestone
Talman
Powell Cove
Obstn
BROOKLYN-WHITESTONE FIXED BRIDGE
HOR CL 256 FT
VERT CL 135 FT
WHITESTONE
Cryders Pt
THROGS NECK BRIDGE
(MAIN SPAN)
HOR CL 1711 FT
VERT CL 138 FT
(152 FT AT CENTER)
(NORTH SPAN)
HOR CL 417 FT
VERT CL 123 FT
Malba
Spire
Little
Beechhurst
COLLEGE POINT
MAGNETIC
GREEN DOME
VAR 13° 15'W (1995)
ANNUAL INCREASE 3'
ADVANCE INFORMATION
24th Ed., Mar 25/95
12366

APPENDIX B:

LANDMARKS AND NON-FLOATING AIDS TO NAVIGATION LISTS

NOT APPLICABLE

APPENDIX C:

LIST OF HORIZONTAL CONTROL STATIONS

NAME	LATITUDE	LONGITUDE	ANTENNA ELEVATION	SOURCE	DATES & TIMES (UTC) OCCUPIED
MANRESA 1983 (LX7443)	41 04 22.81236N	073 24 38.93245W	52.56m	Published	28 March 1995 - 10 July 1995 01 November 1995 - 13 November 1995
ZIEGLER 1932 (LX3804)	41 02 38.71029N	073 28 40.45528W	16.46m	Published	28 March 1995, 1941 - 29 March 1995, 1623 29 March 1995, 2004 - 31 March 1995, 1312

APPENDIX D:

LIST OF GEOGRAPHIC NAMES

NOAA FORM 76-155 (11-72)

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

SURVEY NUMBER

H-10625

GEOGRAPHIC NAMES

Name on Survey	A ON CHART NO.	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	
Bronx-Whitestone Bridge	12366									1
College Point Reef	12339									2
Deep Reef	12366									3
East River	12366									4
Long Island Sound	12366									5
Middle Ground	12339									6
Stepping Stones	12366									7
Throgs Neck Bridge	12366									8
										9
										10
										11
										12
										13
										14
										15
										16
										17
										18
										19
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										21
										22
										23
										24
										25

Names have not been approved by Chief Geographer.

APPENDIX E:

TIDE NOTES

ADDED BY EVALWATER

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of Ocean and Earth Sciences
Rockville, Maryland 20852

September 17,1996

MEMORANDUM FOR: LTCDR David A. Cole
Hydrographic Surveys Division

FROM: Stephen K. Gill
Chief, Tidal Analysis Branch

Michael C. O'Hargan
Chief, Sea and Estuarine Section

SUBJECT: Final Evaluation of Contract Deliverables,
Project OPR-B389-

The Ocean and Lake Levels Division (OLLD), as requested, has reviewed information received from; the contractor in teleconference between the contractor, yourself, and Michael O'Hargan and Stephen Gill on July 24, 1996; and, the subsequent written submission from the contractor regarding project-wide compliance issues to you dated August 16, 1996.

The additional information received during the teleconference and the written submission completes the requests for detailed information from OLLD. Major errors noted have been corrected, and missing information has been provided. OLLD now has an acceptable understanding of the contractor's procedures related to the water level field collection, data reduction, data processing, and tidal datum determination.

Based on the review of the recent information in the context of the previous evaluation of the contractor's work on tides, OLLD has estimated a worst-case uncertainty in the tide-reducers applied to the soundings for the contract of 1.0 ft. This estimate includes datum recovery of MLLW datum on the bench marks (a bias error), and uncertainties in the raw tide gauge measurements, the staff-to-gauge settings applied to the data, and the tidal zoning correctors. It is our understanding that this maximum estimated error is within the 1.6 foot (0.50 meter) specified in the contract.

OLLD will provide details of the evaluation in a subsequent in-house program evaluation document. OLLD has determined, based on the evaluation, that the tide data collected for this survey are "single purpose data" for use as tide reducer only. Accepted tidal datums, bench mark elevations, and published bench mark sheets will not be updated or produced as result of the contractor data. This limitation does not affect acceptance of the contract deliverables.

cc:

Richard Barazotto
Philip Morris
Jim Hubbard
Mike Gibson

TIDE NOTES

Two water level pressure gauges were installed at each of the 5 locations throughout the survey area. Location and period of operation of gages pertinent to this survey were as follows:

SITE	LOCATION	PERIOD
New Rochelle, NY	40° 53.5'N	20 April 1995 to 13 July 1995
8518490	73° 46.9'W	03 Nov 1995 to 15 Nov 1995
College Point, NY	40° 47.0'N	23 April 1995 to 13 July 1995
8517276	73° 51.4'W	06 Nov 1995 to 16 Nov 1995
Wards Island, NY	40° 47.2'N	23 April 1995 to 12 July 1995
8517401	73° 55.3'W	07 Nov 1995 to 16 Nov 1995
Willets Point, NY	40° 53.5'N	NOAA Station
8516990	73° 46.9'W	

New Rochelle, NY

Sea Data Model TDR-3A (S/N 224) and Coastal Leasing Microtide (S/N 10321) gages were installed on 20 April 1995. The staff was installed on 20 April and leveled on 25 April. The primary gage, TDR #224, failed on 01 May. The backup gage, COASTAL #10321, was connected to the telemetry system as the new primary gage. The backup gage has a complete record of the deployment and no data were lost. TDR #510 was installed as the new secondary gage on 03 May. Both gages were removed 13 July 1995. Coastal Microtide (S/N 10307 and 10320) gages were installed on 3 November 1995 and the staff was leveled. Both gages and staff were removed 17 November 1995.

College Point, NY

Sea Data Model TDR-3A (S/N221 and 338) gages were installed on 23 April 1995. The staff was installed on 22 April and leveled on 26 April. Both gages were removed 13 July 1995. Sea Data Model TDR-3A (S/N518 and 338) gages were installed on 06 November 1995. The staff was leveled on 07 November. Both gages and staff were removed 16 November 1995.

Wards Island, NY

Sea Data Model TDR-3A (S/N508 and 512) gages were installed on 23 April 1995. The staff was installed on 23 April and leveled on 25 April. Both gages were removed 12 July 1995. Sea Data Model TDR-3A (S/N224 and 517) gages were installed on 07 November 1995. The staff was leveled on 07 November. Both gages and staff were removed 16 November 1995.

Tide and Water Level Correction

The reference stations for H-10625 were Willets Point, NY (851-6990) and Bridgeport, CT (846-7150).

Soundings for field sheets were corrected using observed water level data from NOAA Station Willets Point, NY (851-6990). Data were acquired by cellular phone modem using the NOAA REALDATA software.

Smooth sheet soundings were corrected for water level through application of observed data from the New Rochelle, NY (851-8490), College Point, NY (851-7276), Wards Island, NY (851-7401), and the Willets Point, NY (851-6990) stations. A staff MLLW datum was computed at each new station by simultaneous comparison with Willets Point, NY (851-6990) and with Bridgeport, CT (846-7150) using the NOAA Form 248 method prescribed by Marmer (Tidal Datum Planes, Spec. Pub. 135, U.S. Dept. of Commerce). The simultaneous comparison computations are included in the Phase IIA Summary Report - Tides.

The boundaries of tide zones used are listed in the Phase IIA Summary Report - Tides. Gage readings were recorded in relation to staff zero; therefore, the MLLW datum height was subtracted from gage readings before applying the time and ratio correctors.

Zoning correctors applied to the observed gage values were:

		Correctors			
Station	**Zone**	**Time (h min)**	**Ratio**	**Height**	**Staff MLLW Datum**
Willets Point, NOAA	A4	-00 03	*0.98	0.000	0.000
College Point, NY	A5	-00 00	*1.00	0.630	0.630
Willets Point, NOAA	A6	-00 03	*1.00	0.000	0.000
Wards Island, NY	A7	00 00	*1.00	0.837	0.837
Willets Point, NOAA	A8	-00 09	*1.01	0.000	0.000
New Rochelle	A9	00 00	*1.00	0.983	0.983

All data for project water level gages are reported in the Phase IIA Summary Report - Tides.

Table E-1. Abstract of Times of Hydrography

1995/177 23:00:00.00 to 1995/177 23:11:10.47
1995/177 23:14:24.87 to 1995/177 23:23:45.16
1995/177 23:28:39.32 to 1995/177 23:30:29.91
1995/177 23:32:30.10 to 1995/177 23:40:08.47
1995/177 23:41:28.81 to 1995/177 23:49:26.45
1995/177 23:50:48.21 to 1995/177 23:57:56.52
1995/178 09:20:58.81 to 1995/178 09:25:42.69
1995/178 09:31:46.41 to 1995/178 09:34:07.80
1995/178 09:41:32.99 to 1995/178 09:45:27.69
1995/178 09:53:35.54 to 1995/178 09:55:29.08
1995/178 10:02:55.45 to 1995/178 10:06:45.42
1995/178 10:12:27.51 to 1995/178 10:14:11.27
1995/178 10:21:10.39 to 1995/178 10:24:48.80
1995/178 10:29:57.42 to 1995/178 10:31:35.26
1995/178 10:43:26.48 to 1995/178 10:46:33.49
1995/178 11:01:36.39 to 1995/178 11:21:35.52
1995/178 11:25:40.74 to 1995/178 11:47:02.39
1995/178 11:51:19.46 to 1995/178 12:11:06.91
1995/178 12:15:01.17 to 1995/178 12:38:42.06
1995/178 12:45:00.00 to 1995/178 12:55:27.83
1995/178 12:55:34.05 to 1995/178 13:05:20.92
1995/178 13:13:44.77 to 1995/178 13:34:07.47
1995/178 13:40:09.11 to 1995/178 13:59:09.75
1995/178 14:11:48.32 to 1995/178 14:36:22.52
1995/178 14:45:56.84 to 1995/178 15:06:35.72
1995/178 15:15:17.00 to 1995/178 15:41:18.11
1995/178 15:47:55.06 to 1995/178 16:08:06.40
1995/178 16:20:52.80 to 1995/178 16:42:54.07
1995/178 16:52:26.36 to 1995/178 16:58:53.63
1995/178 17:20:37.35 to 1995/178 17:35:12.97
1995/178 17:40:35.01 to 1995/178 17:48:57.23
1995/178 17:56:03.75 to 1995/178 18:08:49.34
1995/178 18:13:47.00 to 1995/178 18:34:29.79
1995/178 18:39:34.60 to 1995/178 18:59:34.26
1995/178 19:20:40.95 to 1995/178 19:36:35.99
1995/178 19:41:54.01 to 1995/178 19:45:39.86
1995/178 20:47:34.92 to 1995/178 20:55:30.06
1995/178 20:57:24.93 to 1995/178 21:05:35.52
1995/178 21:15:56.33 to 1995/178 21:24:30.88
1995/178 21:27:04.27 to 1995/178 21:35:25.23
1995/178 21:44:10.02 to 1995/178 21:51:28.85
1995/178 22:02:32.86 to 1995/178 22:08:02.12
1995/180 08:59:27.46 to 1995/180 09:21:30.29
1995/180 09:27:22.45 to 1995/180 09:40:24.21
1995/180 09:50:18.11 to 1995/180 10:10:28.37
1995/180 10:15:54.76 to 1995/180 10:26:54.56
1995/180 10:43:32.16 to 1995/180 11:04:25.97
1995/180 11:11:19.76 to 1995/180 11:20:27.05
1995/180 11:35:31.16 to 1995/180 11:54:03.95
1995/180 12:02:50.20 to 1995/180 12:25:39.71
1995/180 12:30:00.09 to 1995/180 12:49:21.02

Table E-1. Abstract of Times of Hydrography (Continued)

1995/180 12:54:34.68 to 1995/180 13:06:24.27
1995/180 13:12:44.29 to 1995/180 13:25:19.21
1995/180 13:34:36.16 to 1995/180 13:55:24.26
1995/180 14:01:55.42 to 1995/180 14:21:16.08
1995/180 14:25:49.61 to 1995/180 14:48:07.60
1995/180 22:03:52.26 to 1995/180 22:09:06.87
1995/180 22:29:59.35 to 1995/180 22:59:20.03
1995/180 23:01:19.35 to 1995/180 23:03:30.96
1995/180 23:04:15.03 to 1995/180 23:09:30.90
1995/180 23:10:14.08 to 1995/180 23:11:42.96
1995/180 23:12:21.17 to 1995/180 23:20:28.58
1995/180 23:27:46.95 to 1995/180 23:50:39.26
1995/180 23:52:27.32 to 1995/180 23:59:56.43
1995/180 23:59:56.51 to 1995/181 00:11:01.88
1995/181 00:17:29.60 to 1995/181 00:34:31.96
1995/181 00:34:37.00 to 1995/181 00:37:28.23
1995/181 00:39:45.10 to 1995/181 00:59:22.47
1995/181 01:06:57.14 to 1995/181 01:26:36.88
1995/181 01:28:46.86 to 1995/181 01:47:32.98
1995/181 08:52:26.42 to 1995/181 08:54:32.99
1995/181 08:59:40.42 to 1995/181 09:01:29.81
1995/181 09:10:39.58 to 1995/181 09:17:47.33
1995/181 09:18:40.66 to 1995/181 09:22:51.96
1995/181 09:26:39.27 to 1995/181 09:28:50.96
1995/181 09:30:05.59 to 1995/181 09:36:00.10
1995/181 09:39:11.11 to 1995/181 09:45:07.25
1995/181 09:46:55.31 to 1995/181 09:49:12.37
1995/181 09:52:47.20 to 1995/181 09:54:29.61
1995/181 09:55:57.81 to 1995/181 09:57:12.22
1995/181 10:02:08.39 to 1995/181 10:03:16.90
1995/181 10:11:14.38 to 1995/181 10:14:08.06
1995/181 10:15:54.04 to 1995/181 10:17:28.07
1995/181 10:21:41.80 to 1995/181 10:23:07.57
1995/181 10:27:46.27 to 1995/181 10:29:07.96
1995/181 11:03:23.26 to 1995/181 11:26:36.74
1995/181 11:28:29.02 to 1995/181 11:47:44.12
1995/181 11:54:44.98 to 1995/181 12:09:34.90
1995/181 12:10:05.00 to 1995/181 12:17:11.96
1995/181 12:23:08.69 to 1995/181 12:42:09.35
1995/181 12:53:20.39 to 1995/181 13:10:55.37
1995/181 13:17:17.96 to 1995/181 13:28:46.86
1995/181 13:32:54.77 to 1995/181 13:42:31.38
1995/181 13:47:49.86 to 1995/181 13:59:26.27
1995/181 14:33:37.72 to 1995/181 14:34:57.79
1995/181 14:36:58.29 to 1995/181 14:44:38.96
1995/181 14:48:51.36 to 1995/181 14:58:16.98
1995/181 15:01:02.21 to 1995/181 15:05:29.80
1995/181 15:09:17.24 to 1995/181 15:10:50.93
1995/181 15:11:55.14 to 1995/181 15:13:33.87
1995/181 15:16:59.10 to 1995/181 15:18:59.97
1995/181 15:25:01.39 to 1995/181 15:30:57.85

Table E-1. Abstract of Times of Hydrography (Continued)

1995/181 15:36:17.73 to 1995/181 15:45:18.98
1995/181 15:50:39.23 to 1995/181 15:57:25.96
1995/181 16:07:10.37 to 1995/181 16:10:02.97
1995/181 16:15:21.41 to 1995/181 16:21:30.90
1995/181 16:24:16.08 to 1995/181 16:31:18.90
1995/181 16:40:26.30 to 1995/181 16:52:48.77
1995/181 16:55:32.23 to 1995/181 17:05:49.98
1995/181 17:09:33.88 to 1995/181 17:12:49.91
1995/181 17:16:46.90 to 1995/181 17:20:14.90
1995/181 17:36:20.90 to 1995/181 17:39:36.93
1995/181 17:44:06.44 to 1995/181 17:47:56.93
1995/181 17:54:39.46 to 1995/181 17:59:36.95
1995/181 18:09:50.20 to 1995/181 18:15:00.93
1995/181 18:21:37.83 to 1995/181 18:27:30.87
1995/181 18:31:01.72 to 1995/181 18:36:55.91
1995/181 20:28:50.04 to 1995/181 20:41:08.95
1995/181 20:44:51.66 to 1995/181 20:56:08.73
1995/181 20:59:19.03 to 1995/181 21:12:58.12
1995/181 21:17:02.16 to 1995/181 21:27:37.77
1995/181 21:29:49.99 to 1995/181 21:40:46.24
1995/181 21:45:03.07 to 1995/181 21:56:08.97
1995/181 22:06:26.71 to 1995/181 22:11:26.59
1995/181 22:23:26.28 to 1995/181 22:25:48.96
1995/181 22:26:27.10 to 1995/181 22:28:26.81
1995/181 22:46:50.38 to 1995/181 23:00:33.66
1995/181 23:13:42.87 to 1995/181 23:26:11.57
1995/181 23:45:00.06 to 1995/181 23:59:57.86
1995/181 23:59:57.90 to 1995/182 00:04:34.06
1995/182 00:07:10.80 to 1995/182 00:23:30.91
1995/182 00:33:56.82 to 1995/182 00:52:26.92
1995/182 00:55:48.25 to 1995/182 01:09:29.89
1995/182 01:15:42.83 to 1995/182 01:29:59.94
1995/182 01:36:30.03 to 1995/182 01:47:01.00
1995/182 01:54:08.42 to 1995/182 02:00:59.96
1995/182 08:47:09.72 to 1995/182 08:48:27.41
1995/182 08:52:17.23 to 1995/182 08:55:02.54
1995/182 08:57:09.63 to 1995/182 08:58:39.46
1995/182 09:04:29.38 to 1995/182 09:05:50.77
1995/182 09:11:53.60 to 1995/182 09:13:11.59
1995/182 09:18:21.63 to 1995/182 09:19:50.62
1995/182 09:21:09.05 to 1995/182 09:22:16.38
1995/182 09:31:36.51 to 1995/182 09:37:01.15
1995/182 09:38:50.99 to 1995/182 09:41:10.60
1995/182 09:45:37.48 to 1995/182 09:49:09.81
1995/182 09:50:00.69 to 1995/182 09:55:42.35
1995/182 10:02:54.20 to 1995/182 10:08:53.92
1995/182 10:14:24.76 to 1995/182 10:15:48.38
1995/182 10:19:58.04 to 1995/182 10:21:32.03
1995/182 10:28:16.63 to 1995/182 10:36:59.80
1995/182 10:50:22.56 to 1995/182 10:56:58.30
1995/182 10:58:28.58 to 1995/182 11:00:51.78

Table E-1. Abstract of Times of Hydrography (Continued)

1995/182 11:29:07.87 to 1995/182 11:36:36.36
1995/182 11:41:14.26 to 1995/182 11:44:09.90
1995/182 12:02:37.04 to 1995/182 12:11:29.11
1995/182 12:18:37.18 to 1995/182 12:30:20.03
1995/182 12:30:22.63 to 1995/182 12:32:05.20
1995/182 12:37:07.60 to 1995/182 12:46:23.43
1995/182 12:51:53.88 to 1995/182 12:54:01.24
1995/182 12:58:54.83 to 1995/182 13:02:12.13
1995/182 13:06:37.79 to 1995/182 13:11:44.78
1995/182 13:17:59.46 to 1995/182 13:20:02.48
1995/182 14:14:43.08 to 1995/182 14:35:54.01
1995/182 14:39:34.62 to 1995/182 14:58:38.84
1995/182 15:03:54.75 to 1995/182 15:25:09.01
1995/182 15:30:19.49 to 1995/182 15:48:28.99
1995/182 15:54:05.40 to 1995/182 16:11:19.01
1995/182 17:07:37.34 to 1995/182 17:15:50.97
1995/182 17:18:10.13 to 1995/182 17:23:11.79
1995/182 17:23:17.04 to 1995/182 17:24:23.77
1995/182 17:24:44.14 to 1995/182 17:25:28.95
1995/182 17:28:13.00 to 1995/182 17:36:39.96
1995/182 17:55:30.07 to 1995/182 18:00:09.80
1995/182 18:01:53.12 to 1995/182 18:02:47.93
1995/182 18:03:15.18 to 1995/182 18:10:35.78
1995/182 18:16:32.10 to 1995/182 18:20:50.80
1995/182 18:25:05.20 to 1995/182 18:30:38.85
1995/182 19:11:53.73 to 1995/182 19:13:29.93
1995/182 19:50:19.96 to 1995/182 19:51:37.95
1995/182 19:51:51.21 to 1995/182 19:53:10.97
1995/182 19:53:26.00 to 1995/182 19:57:44.94
1995/182 19:57:49.00 to 1995/182 19:59:19.98
1995/182 20:06:31.66 to 1995/182 20:11:18.95
1995/182 20:11:37.01 to 1995/182 20:12:33.92
1995/182 20:12:36.02 to 1995/182 20:18:46.00
1995/182 20:24:27.88 to 1995/182 20:32:25.98
1995/182 20:39:39.95 to 1995/182 20:43:34.93
1995/182 20:44:02.11 to 1995/182 20:50:18.97
1995/182 20:56:22.98 to 1995/182 21:03:55.99
1995/182 21:12:00.02 to 1995/182 21:21:57.99
1995/182 21:27:35.35 to 1995/182 21:33:01.90
1995/182 21:33:24.04 to 1995/182 21:34:41.95
1995/182 21:38:22.96 to 1995/182 21:39:09.99
1995/182 21:39:13.03 to 1995/182 21:43:21.00
1995/182 22:08:01.58 to 1995/182 22:13:05.09
1995/182 22:18:15.00 to 1995/182 22:20:46.57
1995/182 22:25:32.68 to 1995/182 22:29:09.94
1995/182 22:37:42.71 to 1995/182 22:40:21.01
1995/182 22:41:27.01 to 1995/182 22:43:56.80
1995/182 22:45:45.03 to 1995/182 22:46:46.96
1995/182 22:46:55.02 to 1995/182 22:48:30.52
1995/183 00:07:04.06 to 1995/183 00:14:01.86
1995/183 00:16:18.65 to 1995/183 00:25:57.90

Table E-1. Abstract of Times of Hydrography (Continued)

1995/183 00:27:37.66 to 1995/183 00:31:18.44
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1995/183 23:08:30.72 to 1995/183 23:11:46.61
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1995/187 02:07:16.83 to 1995/187 02:08:36.01
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1995/312 13:21:50.97 to 1995/312 13:30:37.77
1995/312 13:35:33.65 to 1995/312 13:38:33.25
1995/312 13:44:51.48 to 1995/312 13:49:45.73
1995/312 13:53:30.21 to 1995/312 13:59:22.82
1995/312 14:03:29.22 to 1995/312 14:10:08.04
1995/312 14:13:14.90 to 1995/312 14:16:32.87
1995/312 14:26:29.14 to 1995/312 14:28:03.13
1995/312 14:40:14.19 to 1995/312 14:42:59.57
1995/312 14:45:37.10 to 1995/312 14:47:16.42

Table E-1. Abstract of Times of Hydrography (Continued)

1995/312 15:01:44.05 to 1995/312 15:04:32.69
1995/312 15:16:23.02 to 1995/312 15:20:29.27
1995/312 15:31:01.98 to 1995/312 15:32:19.67
1995/312 15:33:39.29 to 1995/312 15:35:35.19
1995/312 15:38:08.87 to 1995/312 15:40:11.30
1995/312 15:44:29.25 to 1995/312 15:49:00.00
1995/312 15:52:24.19 to 1995/312 15:57:12.09
1995/312 16:05:34.63 to 1995/312 16:10:50.32
1995/312 16:27:37.19 to 1995/312 16:40:20.69
1995/312 16:45:09.17 to 1995/312 16:50:30.07
1995/312 16:56:14.54 to 1995/312 16:59:57.98
1995/312 17:04:10.31 to 1995/312 17:09:31.52
1995/312 17:12:30.67 to 1995/312 17:18:49.35
1995/312 17:23:37.23 to 1995/312 17:30:43.90
1995/312 17:34:31.04 to 1995/312 17:37:04.57
1995/312 17:48:43.35 to 1995/312 17:53:27.22
1995/312 17:56:24.60 to 1995/312 18:00:30.56
1995/312 18:17:28.35 to 1995/312 18:19:05.06
1995/312 18:23:47.60 to 1995/312 18:25:12.64
1995/312 18:46:45.62 to 1995/312 18:52:12.78
1995/312 19:27:41.83 to 1995/312 19:33:07.78
1995/312 19:39:04.39 to 1995/312 19:42:15.84
1995/312 20:08:51.35 to 1995/312 20:12:57.01
1995/312 20:44:36.40 to 1995/312 20:46:34.44
1995/312 21:16:03.25 to 1995/312 21:17:37.88
1995/312 21:24:06.03 to 1995/312 21:25:15.03
1995/312 21:29:50.97 to 1995/312 21:30:48.34
1995/312 21:40:25.85 to 1995/312 21:43:43.69
1995/312 21:55:52.99 to 1995/312 21:56:55.78
1995/312 22:08:31.75 to 1995/312 22:11:59.97
1995/313 01:44:35.41 to 1995/313 01:45:39.17
1995/313 01:50:54.40 to 1995/313 01:51:35.91
1995/313 01:54:51.12 to 1995/313 01:57:21.99
1995/313 02:03:39.92 to 1995/313 02:04:31.54
1995/313 02:12:08.63 to 1995/313 02:13:44.39
1995/313 02:19:14.34 to 1995/313 02:21:26.83
1995/313 02:27:37.31 to 1995/313 02:28:15.52
1995/313 02:36:17.98 to 1995/313 02:36:55.13
1995/313 02:41:35.19 to 1995/313 02:42:30.66
1995/313 02:47:10.45 to 1995/313 02:47:53.97
1995/313 02:53:11.74 to 1995/313 02:53:50.03
1995/313 02:56:42.29 to 1995/313 02:57:30.20
1995/313 03:05:20.15 to 1995/313 03:05:56.67
1995/313 03:13:36.96 to 1995/313 03:15:08.28
1995/313 03:20:18.67 to 1995/313 03:21:31.62
1995/313 03:35:11.94 to 1995/313 03:36:35.56
1995/313 03:42:38.17 to 1995/313 03:43:18.16
1995/313 03:47:48.26 to 1995/313 03:48:20.04
1995/313 03:52:52.29 to 1995/313 03:53:36.06
1995/313 03:57:59.93 to 1995/313 03:58:59.39
1995/313 04:11:24.24 to 1995/313 04:12:23.26

Table E-1. Abstract of Times of Hydrography (Continued)

1995/313 04:16:08.12 to 1995/313 04:17:12.19
1995/313 04:21:44.97 to 1995/313 04:22:35.76
1995/313 04:29:05.17 to 1995/313 04:30:34.71
1995/313 04:36:18.58 to 1995/313 04:37:15.24
1995/313 04:40:22.39 to 1995/313 04:41:22.01
1995/313 04:44:24.72 to 1995/313 04:45:30.56
1995/313 04:57:52.88 to 1995/313 04:58:36.50
1995/313 05:03:56.67 to 1995/313 05:04:51.85
1995/313 05:13:37.61 to 1995/313 05:14:15.02
1995/313 05:21:12.60 to 1995/313 05:21:58.25
1995/313 05:26:42.01 to 1995/313 05:27:18.05
1995/313 05:30:00.87 to 1995/313 05:34:02.24
1995/313 05:41:59.08 to 1995/313 05:43:10.28
1995/313 06:47:15.05 to 1995/313 06:48:36.59
1995/313 06:52:58.70 to 1995/313 06:53:17.44
1995/313 06:59:08.12 to 1995/313 06:59:37.52
1995/313 07:04:15.33 to 1995/313 07:04:51.77
1995/313 07:12:35.10 to 1995/313 07:13:27.90
1995/313 07:18:22.15 to 1995/313 07:19:27.40
1995/313 07:34:29.70 to 1995/313 07:38:30.88
1995/313 07:44:00.82 to 1995/313 07:45:33.17
1995/313 07:54:31.59 to 1995/313 07:55:10.83
1995/313 08:00:49.02 to 1995/313 08:02:26.84
1995/313 08:10:19.57 to 1995/313 08:12:02.26
1995/313 08:23:16.81 to 1995/313 08:24:18.21
1995/313 08:32:09.97 to 1995/313 08:33:26.35
1995/313 08:39:59.32 to 1995/313 08:41:17.07
1995/313 08:51:22.86 to 1995/313 08:52:15.10
1995/313 08:56:46.96 to 1995/313 08:57:32.60
1995/313 09:03:16.17 to 1995/313 09:04:36.53
1995/313 09:10:46.47 to 1995/313 09:14:54.98
1995/313 09:33:15.18 to 1995/313 09:34:25.19
1995/313 09:47:02.07 to 1995/313 09:49:51.30
1995/313 10:07:13.72 to 1995/313 10:10:18.65
1995/313 10:20:10.48 to 1995/313 10:21:34.99
1995/313 10:28:37.10 to 1995/313 10:30:20.08
1995/313 10:53:20.26 to 1995/313 10:55:23.28
1995/313 11:08:00.41 to 1995/313 11:10:22.98
1995/313 11:12:48.35 to 1995/313 11:19:41.68
1995/313 11:24:31.93 to 1995/313 11:28:00.46
1995/313 11:38:05.76 to 1995/313 11:40:40.48
1995/313 12:04:51.72 to 1995/313 12:05:50.45
1995/313 12:14:04.22 to 1995/313 12:15:41.46
1995/313 12:36:48.44 to 1995/313 12:38:21.24
1995/313 12:56:13.32 to 1995/313 12:57:19.16
1995/313 13:13:29.24 to 1995/313 13:14:11.71
1995/313 13:25:22.01 to 1995/313 13:26:45.33
1995/313 13:29:40.34 to 1995/313 13:31:15.80
1995/313 13:35:18.36 to 1995/313 13:36:58.56
1995/313 13:54:25.13 to 1995/313 13:56:07.41
1995/313 14:01:18.39 to 1995/313 14:02:38.75

Table E-1. Abstract of Times of Hydrography (Continued)

1995/313 14:08:48.98 to 1995/313 14:10:10.23
1995/313 14:18:26.67 to 1995/313 14:19:26.28
1995/313 14:23:32.69 to 1995/313 14:24:15.13
1995/313 14:28:15.01 to 1995/313 14:28:58.34
1995/313 14:34:34.51 to 1995/313 14:35:30.99
1995/313 14:40:03.81 to 1995/313 14:40:46.13
1995/313 14:46:00.42 to 1995/313 14:46:53.52
1995/313 14:51:30.73 to 1995/313 14:52:51.98
1995/313 14:59:46.62 to 1995/313 15:00:19.96
1995/313 15:02:20.81 to 1995/313 15:03:02.22
1995/313 15:07:40.15 to 1995/313 15:08:23.68
1995/313 15:18:09.72 to 1995/313 15:19:34.82
1995/313 15:24:02.55 to 1995/313 15:25:11.35
1995/313 15:29:48.57 to 1995/313 15:30:41.37
1995/313 15:38:05.37 to 1995/313 15:40:19.85
1995/313 15:55:47.33 to 1995/313 15:56:53.46
1995/316 03:44:09.60 to 1995/316 03:44:36.10
1995/316 16:48:42.15 to 1995/316 16:51:11.06
1995/316 17:04:30.90 to 1995/316 17:06:01.27
1995/316 17:10:18.99 to 1995/316 17:12:43.64
1995/316 17:19:19.31 to 1995/316 17:24:32.72
1995/316 17:57:41.71 to 1995/316 17:58:56.00
1995/316 18:07:09.81 to 1995/316 18:08:27.29
1995/316 18:18:55.99 to 1995/316 18:19:45.91
1995/316 18:25:56.72 to 1995/316 18:26:46.64

APPENDIX F:

SUPPLEMENTAL CORRESPONDENCE

NOT APPLICABLE

NOAA FORM 77-27(H)
(9-83)

U.S. DEPARTMENT OF COMMERCE

HYDROGRAPHIC SURVEY STATISTICS

REGISTRY NUMBER
H-10625

RECORDS ACCOMPANYING SURVEY: To be completed when survey is processed.

RECORD DESCRIPTION	AMOUNT	RECORD DESCRIPTION	AMOUNT
SMOOTH SHEET	1	SMOOTH OVERLAYS: ~~POS ARC EXCESS~~ CORR	1
DESCRIPTIVE REPORT	1	FIELD SHEETS AND OTHER OVERLAYS	NA

DESCRIPTION	DEPTH/POS RECORDS	HORIZ. CONT. RECORDS	SONAR-GRAMS	PRINTOUTS	ABSTRACTS/ SOURCE DOCUMENTS	
ACCORDION FILES						
ENVELOPES						
VOLUMES						
CAHIERS						
BOXES	1		2			

SHORELINE DATA

SHORELINE MAPS (List):	NA
PHOTOBATHYMETRIC MAPS (List):	NA
NOTES TO THE HYDROGRAPHER (List):	NA
SPECIAL REPORTS (List):	NA
NAUTICAL CHARTS (List):	Chart 12339 41st Ed.,Chart 12342 21st Ed.,Chart 12366 25th Ed.

OFFICE PROCESSING ACTIVITIES

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

PROCESSING ACTIVITY	AMOUNTS VERIFICATION	AMOUNTS EVALUATION	AMOUNTS TOTALS
POSITIONS ON SHEET			
POSITIONS REVISED			
SOUNDINGS REVISED			
CONTROL STATIONS REVISED			

	TIME-HOURS VERIFICATION	TIME-HOURS EVALUATION	TIME-HOURS TOTALS
PRE-PROCESSING EXAMINATION			
VERIFICATION OF CONTROL			
VERIFICATION OF POSITIONS			
VERIFICATION OF SOUNDINGS			
VERIFICATION OF JUNCTIONS			
APPLICATION OF PHOTOBATHYMETRY			
SHORELINE APPLICATION VERIFICATION			
COMPILATION OF SMOOTH SHEET			
COMPARISON WITH PRIOR SURVEYS AND CHARTS		40	40
EVALUATION OF SIDE SCAN SONAR RECORDS		80	80
EVALUATION OF WIRE DRAGS AND SWEEPS			
EVALUATION REPORT		24	24
GEOGRAPHIC NAMES			
OTHER*			
*USE OTHER SIDE OF FORM FOR REMARKS — TOTALS		144	144

	Beginning Date	Ending Date
Pre-processing Examination by: J. Ferguson	6/10/96	6/14/96
Verification of Field Data by: J. Ferguson	Time (Hours): 120	Ending Date: 10/30/96
Verification Check by: B. Olmstead	Time (Hours): 12	Ending Date: 4/10/97
Evaluation and Analysis by: J. Ferguson	Time (Hours): 24	Ending Date: 4/4/97
Inspection by: B. Olmstead	Time (Hours): 16	Ending Date: 7/1/97

EVALUATION REPORT
H-10625
Sheet A

A. PROJECT

The hydrographer's report contains a complete discussion of the project information.

B. AREA SURVEYED

The hydrographer's report lists the geographic coordinates outlining the survey area and lists the dates of data acquisition. The survey covers areas of the East River and western Long Island Sound, New York. Depths range from 10 feet (3.1 meters) to 111 feet (34 meters). Bottom characteristics varied from mud, sand, gravel, to rocky.

C. SURVEY VESSELS

Survey vessel information is found in the hydrographer's report.

D. AUTOMATED DATA ACQUISITION AND PROCESSING

Due to contractor proprietary data formats, final data processing and verification was accomplished using contractor supplied software and a contractor supplied HP workstation. The software, used for processing is discussed in the hydrographer's report. The final smooth sheet is an AutoCAD (version 12) drawing file submitted by the contractor. Data is plotted using a UTM projection and are depicted on a single sheet. A revision overlay was created at PHB during office processing. The overlay includes corrected contour lines and minor cartographic changes.

At the time of the survey certification the format for transmission of digital data had not been formally approved. In the interim, digital data for this survey exists in SAIC's Generic Sensor Format (GSF) for multibeam survey data. In addition, the sounding plot is filed both in the AutoCAD drawing format, i.e., .dwg (extension); and in the more universally recognized graphics transfer format, i.e., .dxf (extension). Copies of these files will be retained at PHB until data transfer protocols are developed and approved.

E. SONAR EQUIPMENT

Side scan sonar was used on survey H-10625. The side scan sonar equipment, the method of operation, and disposition of significant sonar contacts are adequately discussed in the hydrographer's report.

F. SOUNDING EQUIPMENT

Sounding equipment is discussed in the hydrographer's report.

G. CORRECTIONS TO SOUNDINGS

The sounding data have been reduced to Mean Lower Low Water (MLLW). Smooth sheet soundings were corrected through application of observed data from the New Rochelle, NY (851-8490), College Point, NY (851-7276), Wards Island, NY (851-7401), and the Willets Point, NY (851-6990) stations. The reducers include corrections for an actual tide, dynamic draft, and sound velocity. Soundings were corrected for heave, roll, pitch, and heading during data acquisition.

Several velocity casts did not meet the depth requirement. When sounding depths exceeded the cast depth, the RESON used the bottom of the table to extend correctors below the table. The hydrographer's report describes (Pg 35) how an error analysis was conducted comparing the vertical extrapolation to an extrapolation using the trend of the bottom of the velocity profile. The error analysis determined that errors are minimal.

H. CONTROL STATIONS

Sections H and I of the hydrographer's report contain adequate discussions of horizontal control and hydrographic positioning. The positions of horizontal control stations used during hydrographic operations are published and field values based on NAD83. The geographic positions of all survey data are based on NAD83.

A DGPS reference station was established at first order station MANRESA 1983 (LX7443). The station was properly recovered and the DGPS reference station was properly verified. Results are included in the Phase II-A summary report.

Data based on NAD27 may be referenced to this survey by applying the following corrections:

Latitude:	0.359 seconds	(11.07 meters)
Longitude:	-1.530 seconds	(-35.82 meters)

I. HYDROGRAPHIC POSITION CONTROL

Differential GPS (DGPS) was used to control this survey. A maximum allowable horizontal dilution of precision (HDOP) limit of 2.5 was used for this survey. The hydrographer's report adequately describes the methods used to insure all positions were within specifications.

J. SHORELINE

Shoreline verification was not required.

K. CROSSLINES

Crosslines are adequately discussed in the hydrographer's report.

L. JUNCTIONS

Survey H-10625 junctions with the following surveys.

Survey	Year	Scale	Area
H-10346	1990	1:10,000	NE corner
H-10618	1995	1:10,000	Northern junction
H-10541	1994	1:10,000	Eastern half

The junction with H-10618 is complete. Soundings are in good agreement within the common area. The junction with H-10346 was not formally completed since the survey was previously processed and forwarded for charting. The hydrographer's report describes a 0.3 to 0.4 meter shoaling since the 1990 survey. An "Adjoins" note has been added to the smooth sheet overlay. A dashed line has been placed on H-10346 to indicate the area which has been superseded.

The common area in the junction between H-10346 and the present survey is listed below:

Latitude (N)	Longitude (W)
40/50.5	073/45.3
40/50.9	073/45.3
40/50.9	073/45.1

The hydrographer's report makes no discussion of the junction with survey H-10541. Soundings are in good agreement within the common area. An "Adjoins" note has been added to the smooth sheet overlay. Survey H-10625 shall supersede survey H-10541 within the common area. A dashed line has been placed on H-10541 to indicate the area which has been superseded.

There is a large common area in the junction between H-10541 and the present survey. The common area is listed below:

Latitude (N)	Longitude (W)
40/48.3	073/49.85
40/48.65	073/48.8
40/48.15	073/47.4
40/49.4	073/47.25
40/49.95	073/47.05
40/50.1	073/47.1
40/50.7	073/45.95
40/50.9	073/45.9
40/50.9	073/45.1
40/50.5	073/45.3

40/49.65	073/46.25
40/49.5	073/46.5
40/48.3	073/46.4
40/47.8	073/47.25
40/47.8	073/47.9
40/48.15	073/49.15
40/48.1	073/49.7

M. COMPARISON WITH PRIOR SURVEYS

Survey H-10625 was compared to the following prior surveys.

Survey	Year	Scale
H-5333	1933	1:10,000
H-5546	1934	1:10,000
H-5547	1934	1:10,000

The hydrographer's report adequately describes the comparison analysis of the surveys.

Survey H-10625 is adequate to supersede the prior surveys within the common area.

N. ITEM INVESTIGATIONS

Nineteen AWOIS items were investigated within the survey area. Discussion and disposition of the items have been adequately addressed in the hydrographer's report.

Portions of AWOIS circles that lay outside of the survey limits (as defined by the contract) were not surveyed. However, these areas were usually outside the areas of general navigation. Specific examples follow:

4274, wreck not found. North and south portions of circle not completed, however, circle was surveyed to limit of safe navigation. Consider item disproved.

6354, numerous significant rocks found. SE quadrant of circle not surveyed, however this is mostly inshore of Stepping Stones light. Consider item verified.

8787, 15 ft sounding not found. North half of circle not surveyed. Found 18 ft obstruction. Chart obstruction, consider item unresolved.

O. COMPARISON WITH CHART

Survey H-10625 was compared with the following charts:

Chart	Edition	Date	Scale	Datum
12339	39th	February 11, 1995	1:10,000	NAD83
12366	24th	March 25, 1995	1:20,000	NAD83

a. Hydrography

Charted data originates with the above mentioned prior surveys and miscellaneous sources. The prior surveys have been adequately discussed in section M and require no further discussion.

Survey H-10625 is adequate to supersede charted hydrography in the common area.

b. Dangers to Navigation

A Danger to Navigation Report (dated September 28, 1995) was submitted for shoaling and a wreck detected on the north side of the East River between the Bronx-Whitestone and Throgs Neck bridges. The danger report listed the wreck at position 40/48/28 N, 073/48/39 W. The correct location of the wreck is at position 40/48/31.7 N, 073/48/40.6 W. The least depth reported of 22 feet (6.8 meters) is unchanged.

The hydrographer's report describes a wreck at 40/48.038 N, 073/48.861 W (feature 364) with a height of 13 ft (4.1 m) off the bottom. The position and height are estimated from the side scan records. The wreck was outside of multibeam coverage and is not shown on the submitted smooth sheet. Closest selected sounding was 29 feet, which provides a side scan estimated least depth of 16 feet. Chart a 16 foot sounding type WK at estimated side scan position.

P. ADEQUACY OF SURVEY

Hydrography on H-10625 is adequate to:

a. delineate the bottom configuration, determine least depths, and draw the standard depth curves.

b. Reveal there are no significant discrepancies or anomalies requiring further investigation.

c. Show the survey was properly controlled and soundings are correctly plotted.

The hydrographic records and reports received for processing are adequate and conform to the contract specifications.

Q. AIDS TO NAVIGATION

There are 10 floating aids within the survey limits. They are properly positioned and plotted and serve their intended purpose.

R. STATISTICS

Statistics are itemized in the hydrographer's report.

S. MISCELLANEOUS

Miscellaneous information is discussed in the hydrographer's report. No additional miscellaneous items were noted during office processing.

T. RECOMMENDATIONS

The wreck at 40/48.038 N, 073/48.861 W (feature 364), should be added to the AWOIS database for resolution by the next field unit that returns to the area. Position was determined by side scan records, no echosounder least depth obtained, recommend a 100 meter search radius.

The wreck at 40/47.957 N, 073/52.293 W (feature 359), should be added to the AWOIS database for resolution by the next field unit that returns to the area. Position and depth was determined by outer beams which may not meet IHO specifications. Recommend a 50 meter search radius.

Recommendations are discussed in the hydrographer's report. This is a good hydrographic survey, no additional work is required, except as noted above.

U. REFERRAL TO REPORTS

Referral to reports is discussed in the hydrographer's report.

Lieutenant Commander Jeffrey A. Ferguson
Multibeam Processing Officer

A Features Correlated with Multibeam Source Data

DEPTHS ARE IN METERS

Feat. #	Latitude	Longitude	Feature Least Depth	Feature Type	1 or 2 x IHO	Multibeam File Name	Ping Number	Beam Number	MB Depth
3	40 50.89587N	073 45.84224W	15.88	ROCK	1	mba95178.d02	13676	36*	15.8*
4	40 50.80544N	073 45.92285W	9.43	ROCK	1	mba95178.d02	6179	22	9.43
5	40 50.76930N	073 45.92710W	10.39	ROCK	1	mba95178.d02	6368	38	10.39
9	40 50.73497N	073 45.85085W	17.78	ROCK	1	mba95178.d02	23335	25	17.78
12	40 50.68136N	073 45.89024W	14.7	ROCK	1	mba95313.d03	86859	36	14.7
24	40 50.22716N	073 46.73560W	15.52	WRECK	1	mba95312.d02	10832	38	15.52
25	40 50.12064N	073 46.98876W	9.6	ROCK	1	mba95178.d03	3406	36*	9.6*
28	40 49.98385N	073 46.93508W	9.32	WRECK	1	mba95178.d02	77333	55	9.32
29	40 50.02464N	073 46.90656W	10.71	OBSTR	1	mba95178.d02	57271	71*	10.7*
30	40 50.10367N	073 46.71299W	14.62	ROCK	1	mba95313.d03	58874	46	14.62
31	40 50.12354N	073 46.70337W	20.32	WRECK	1	mba95313.d03	62584	70*	20.3*
32	40 50.18018N	073 46.63829W	11.08	ROCK	1	mba95182.d02	9150	35	11.08
33	40 50.17281N	073 46.60497W	10.74	ROCK	1	mba95178.d02	58689	60	10.74
41	40 50.19976N	073 46.65071W	8.35	ROCK	1	mba95181.d02	47431	33	8.35
43	40 50.08153N	073 46.66427W	12.89	ROCK	1	mba95313.d03	58616	52	12.89
47	40 50.84126N	073 45.12715W	9.05	ROCK	1	mba95313.d01	6598	51	9.05
48	40 50.35785N	073 46.56953W	6.77	OBSTR	1	mba95178.d03	18815	36	6.77
50	40 50.41867N	073 46.44813W	6.82	ROCK	1	mba95313.d03	77827	3	6.82
51	40 50.43600N	073 46.40156W	5.53	ROCK	1	mba95316.d01	1789	52	5.53
52	40 50.52065N	073 46.22706W	6.46	WRECK	1	mba95313.d03	79858	1	6.46
55	40 50.46904N	073 45.64868W	21.61	WRECK	1	mba95178.d04	15154	25	21.61
57	40 50.00570N	073 45.99034W	9.72	ROCK	1	mba95313.d01	21648	51	9.72
58	40 50.28084N	073 45.79170W	20.05	OBSTR	1	mba95313.d01	18987	53	20.05
59	40 50.47070N	073 45.39956W	13.1	WRECK	1	mba95313.d03	93602	51	13.1
60	40 49.42620N	073 46.58454W	7.43	ROCK	1	mba95184.d01	58894	21	7.43
62	40 49.44576N	073 46.54858W	3.66	ROCK	1	mba95181.d05	10727	7	3.66
63	40 49.42018N	073 46.53057W	3.23	ROCK	1	mba95184.d03	35815	35	3.23
64	40 49.43471N	073 46.52465W	3.16	ROCK	1	mba95181.d05	15227	13	3.16
66	40 49.46031N	073 46.54268W	4.08	ROCK	1	mba95184.d03	35420	34	4.08
67	40 49.46953N	073 46.59655W	7.37	ROCK	1	mba95182.d01	17632	28	7.37
68	40 49.47302N	073 46.57090W	5.55	ROCK	1	mba95181.d01	27608	39	5.55
69	40 49.48106N	073 46.56503W	4.47	ROCK	1	mba95181.d01	27555	20	4.47
70	40 49.48952N	073 46.54638W	5.16	ROCK	1	mba95184.d01	23006	50	5.16
71	40 49.48733N	073 46.59123W	6.8	ROCK	1	mba95182.d01	17784	39	6.8
76	40 49.53547N	073 46.54483W	6.06	ROCK	1	mba95181.d01	27204	26	6.06
78	40 49.49405N	073 46.61387W	7.57	ROCK	1	mba95181.d05	25695	24	7.57
80	40 49.50024N	073 46.58530W	6.63	ROCK	1	mba95181.d05	25902	1	6.63
81	40 49.50576N	073 46.65209W	9.92	ROCK	1	mba95181.d05	36685	9	9.92
84	40 49.52656N	073 46.52362W	5.59	ROCK	1	mba95181.d05	26501	34	5.59
85	40 49.50082N	073 46.53975W	5.19	ROCK	1	mba95181.d05	15912	33	5.19
86	40 48.09364N	073 46.87077W	16.64	WRECK	1	mba95181.d03	55411	40	16.64
87	40 48.14339N	073 46.87481W	26.75	WRECK	1	mba95180.d04	23441	31	26.75
88	40 50.50034N	073 45.34208W	9.4	ROCK	1	mba95313.d01	12225	26	9.4
90	40 49.93284N	073 46.15113W	14.01	WRECK	1	mba95313.d01	30108	1	14.01
91	40 49.61980N	073 46.70192W	13.67	OBSTR	1	mba95313.d03	49078	6	13.67
96	40 49.63846N	073 46.62478W	9.94	ROCK	1	mba95182.d03	23362	38	9.94
97	40 50.28040N	073 45.59671W	13.5	OBSTR	1	mba95177.d08	35746	45	13.5
98	40 49.65263N	073 46.63586W	10.16	ROCK	1	mba95313.d03	49404	8	10.16
99	40 49.94450N	073 46.02635W	8.82	ROCK	1	mba95313.d01	26597	36	8.82
101	40 49.93552N	073 45.94405W	7.7	ROCK	1	mba95313.d01	38319	32	7.7
103	40 49.70398N	073 46.43354W	12.42	ROCK	1	mba95313.d01	43391	30	12.42
104	40 49.65913N	073 46.27856W	6.72	ROCK	1	mba95181.d05	29022	28	6.72
106	40 49.63877N	073 46.34864W	5.61	ROCK	1	mba95181.d05	41655	25	5.61
108	40 48.49841N	073 47.17567W	10.31	WRECK	1	mba95313.d03	47396	58	10.31

A Features Correlated with Multibeam Source Data

Feat. #	Latitude	Longitude	Feature Least Depth	Feature Type	1 or 2 x IHO	Multibeam File Name	Ping Number	Beam Number	MB Depth
109	40 48.32924N	073 47.27402W	10.64	ROCK	1	mba95181.d02	100612	49	10.64
110	40 48.36206N	073 47.26206W	11.15	ROCK	1	mba95181.d02	100759	33	11.15
111	40 48.36059N	073 47.22652W	12.84	ROCK	1	mba95181.d02	94599	36	12.84
112	40 48.35762N	073 47.04731W	13.85	ROCK	1	mba95189.d04	40337	7	13.85
116	40 48.60039N	073 46.95254W	13.76	ROCK	1	mba95180.d04	17392	21	13.76
117	40 48.51577N	073 47.02807W	13.53	ROCK	1	mba95180.d02	30917	40	13.53
118	40 48.49680N	073 46.91816W	13.82	ROCK	1	mba95180.d04	39969	21	13.82
119	40 49.00630N	073 46.95011W	15.14	OBSTR	1	mba95313.d01	56120	7	15.14
120	40 49.02528N	073 46.90635W	13.8	ROCK	1	mba95313.d01	63009	16	13.8
121	40 48.24055N	073 46.81115W	21.57	OBSTR	1	mba95181.d01	17193	57	21.57
122	40 48.67007N	073 46.74282W	12.11	OBSTR	1	mba95181.d12	84340	24	12.11
123	40 48.33279N	073 46.69070W	12.3	OBSTR	1	mba95313.d01	71212	19	12.3
124	40 49.29873N	073 47.15890W	13.36	WRECK	1	mba95181.d02	107025	14	13.36
126	40 48.07451N	073 47.41667W	29.89	WRECK	1	mba95182.d04	31766	33	29.89
128	40 48.22374N	073 47.26883W	13.81	ROCK	1	mba95181.d03	11235	20	13.81
129	40 48.27527N	073 46.46482W	6.64	ROCK	1	mba95184.d03	114296	40	6.64
131	40 49.60017N	073 46.37998W	4.58	ROCK	1	mba95181.d05	27979	33	4.58
132	40 50.05376N	073 47.00423W	9.84	WRECK	1	mba95184.d03	55731	65*	9.8*
133	40 48.10353N	073 47.70918W	13.03	WRECK	1	mba95313.d01	93346	12	13.03
134	40 48.21492N	073 47.92337W	14.09	ROCK	1	mba95182.d04	6333	40	14.09
135	40 48.28275N	073 48.20377W	10.46	ROCK	1	mba95312.d02	86178	27	10.46
137	40 48.32568N	073 48.70102W	11.75	OBSTR	1	mba95313.d03	28840	33	11.75
138	40 47.60781N	073 51.58555W	9.74	OBSTR	1	mba95182.d08	85064	40	9.74
139	40 48.51619N	073 48.67552W	8.01	OBSTR	1	mba95187.d09	79626	25	8.01
140	40 48.52867N	073 48.67745W	6.88	WRECK	1	mba95184.d05	39160	28	6.88
141	40 48.58337N	073 48.74049W	8.83	OBSTR	1	mba95185.d01	36830	35	8.83
142	40 48.45420N	073 49.27068W	5.63	OBSTR	1	mba95187.d09	30555	20	5.63
144	40 48.23810N	073 48.90953W	13.56	ROCK	1	mba95184.d09	6651	60	13.56
145	40 48.27939N	073 49.03612W	17.76	ROCK	1	mba95184.d09	6048	43	17.76
146	40 48.28893N	073 49.06872W	19.67	ROCK	1	mba95184.d09	5897	13	19.67
147	40 48.24379N	073 48.98982W	14.7	ROCK	1	mba95184.d09	20068	18	14.7
148	40 47.99822N	073 48.44720W	8.94	OBSTR	1	mba95185.d01	2675	56	8.94
149	40 47.92162N	073 48.25375W	11.72	OBSTR	1	mba95313.d01	101269	19	11.72
150	40 48.03809N	073 48.80215W	6.71	WRECK	1	mba95185.d01	19350	26	6.71
152	40 48.11004N	073 49.12377W	6.67	OBSTR	1	mba95313.d01	110580	32	6.67
153	40 48.32302N	073 49.81492W	5.52	WRECK	2	mba95187.d09	24690	104*	5.5*
154	40 48.14800N	073 50.89988W	16.98	WRECK	1	mba95185.d02	75609	36	16.98
155	40 48.07938N	073 50.95656W	20.94	WRECK	1	mba95185.d04	10108	34	20.94
156	40 48.23830N	073 50.57896W	7.66	WRECK	1	mba95316.d02	12418	21	7.66
157	40 48.23767N	073 49.98147W	13.16	ROCK	1	mba95185.d03	65709	30	13.16
158	40 48.22987N	073 49.96098W	13.74	ROCK	1	mba95316.d02	17456	53	13.74
159	40 48.19134N	073 49.99651W	23.17	ROCK	1	mba95185.d03	29598	54	23.17
160	40 48.16330N	073 49.94864W	18.89	WRECK	1	mba95185.d03	74961	28	18.89
161	40 48.11606N	073 49.92740W	22.46	ROCK	1	mba95185.d04	21824	60	22.46
162	40 48.10464N	073 49.92120W	22.78	ROCK	1	mba95185.d04	21810	25	22.78
163	40 48.05500N	073 51.38799W	8.63	ROCK	1	mba95187.d01	66882	29	8.63
164	40 48.00837N	073 51.64626W	8.56	ROCK	1	mba95185.d03	10608	27	8.56
165	40 47.99019N	073 51.44457W	9.83	WRECK	1	mba95188.d04	6590	28	9.83
166	40 48.25941N	073 49.72927W	19.79	ROCK	1	mba95312.d03	21463	38	19.79
167	40 48.25706N	073 49.33598W	26.59	WRECK	1	mba95185.d03	72257	28	26.59
168	40 48.20614N	073 49.64275W	23.14	ROCK	1	mba95185.d04	51680	52	23.14
169	40 47.95310N	073 51.62874W	11.03	ROCK	1	mba95188.d04	7268	4	11.03
173	40 47.93885N	073 51.55420W	10.88	ROCK	1	mba95312.d03	53492	3	10.88
174	40 47.96078N	073 51.58450W	11.38	ROCK	1	mba95188.d04	7112	6	11.38

A Features Correlated with Multibeam Source Data

Feat. #	Latitude	Longitude	Feature Least Depth	Feature Type	1 or 2 x IHO	Multibeam File Name	Ping Number	Beam Number	MB Depth
177	40 47.86686N	073 51.54342W	10.05	ROCK	1	mba95185.d04	29576	59	10.05
178	40 47.93424N	073 51.96613W	10.55	ROCK	1	mba95185.d03	55999	60	10.55
179	40 48.16604N	073 50.38316W	12.07	ROCK	1	mba95313.d02	7054	21	12.07
180	40 48.11998N	073 50.37117W	13.57	OBSTR	1	mba95313.d03	20287	32	13.57
181	40 48.03015N	073 50.20066W	17.79	ROCK	1	mba95312.d04	8026	51	17.79
182	40 47.95248N	073 50.75106W	9.26	ROCK	1	mba95189.d04	75852	24	9.26
184	40 47.94470N	073 50.94677W	10.73	ROCK	1	mba95187.d02	3832	38	10.73
185	40 47.94117N	073 50.97244W	11.01	ROCK	1	mba95187.d02	3930	35	11.01
186	40 47.93245N	073 51.01882W	10.89	ROCK	1	mba95313.d02	16493	47	10.89
190	40 47.77629N	073 52.00370W	10.54	OBSTR	1	mba95185.d04	73158	54	10.54
191	40 48.00676N	073 50.77501W	17.53	OBSTR	1	mba95185.d04	61185	56	17.53
192	40 47.96183N	073 50.98490W	16.63	ROCK	1	mba95185.d04	26725	36	16.63
193	40 47.94052N	073 51.07060W	19.64	ROCK	1	mba95185.d04	27132	11	19.64
196	40 48.04462N	073 49.92082W	17.22	OBSTR	2	mba95185.d04	93311	31*	17.2*
197	40 47.80923N	073 51.34742W	15.27	ROCK	1	mba95185.d05	3349	6	15.27
198	40 47.83631N	073 51.29930W	15.34	ROCK	1	mba95185.d05	5745	45	15.34
199	40 47.78789N	073 52.08460W	11.28	OBSTR	1	mba95316.d02	9123	4	11.28
201	40 47.71096N	073 52.39954W	6.99	ROCK	1	mba95312.d03	85055	41	6.99
202	40 47.69250N	073 52.44750W	7.2	ROCK	1	mba95313.d02	21254	35	7.2
204	40 47.87279N	073 51.10451W	11.03	ROCK	1	mba95185.d06	24610	40	11.03
205	40 47.89341N	073 52.82177W	11.91	ROCK	1	mba95313.d02	54940	60	11.91
206	40 47.86758N	073 52.88694W	6.65	ROCK	1	mba95186.d02	5220	38	6.65
207	40 47.89880N	073 52.92838W	10.87	ROCK	1	mba95183.d03	15607	56	10.87
208	40 47.93916N	073 53.02299W	11.16	ROCK	1	mba95186.d02	21466	52	11.16
209	40 47.94433N	073 52.99661W	10.6	ROCK	1	mba95185.d06	45470	38	10.6
210	40 47.94164N	073 53.05567W	10.86	ROCK	1	mba95183.d03	16173	24	10.86
213	40 48.22782N	073 53.64624W	20.37	ROCK	1	mba95186.d02	16120	22	20.37
214	40 48.25558N	073 53.72190W	21.4	ROCK	1	mba95183.d01	12153	41	21.4
216	40 48.08684N	073 53.25740W	18.89	ROCK	1	mba95185.d06	51965	60	18.89
218	40 48.08432N	073 53.22685W	16.51	ROCK	1	mba95185.d06	52133	30	16.51
219	40 48.08119N	073 53.18142W	17.73	ROCK	1	mba95186.d01	57408	7	17.73
220	40 48.05142N	073 53.17476W	15.72	ROCK	1	mba95185.d06	52549	37	15.72
221	40 48.02076N	073 53.19090W	10.91	ROCK	1	mba95185.d06	46134	33	10.91
222	40 48.04260N	073 53.21261W	11.21	ROCK	1	mba95313.d02	70766	3	11.21
224	40 48.01678N	073 53.05799W	11.99	ROCK	1	mba95313.d02	67663	31	11.99
227	40 47.99796N	073 53.07111W	11.72	ROCK	1	mba95186.d02	33090	58	11.72
228	40 47.99909N	073 53.01630W	12.03	ROCK	1	mba95185.d06	53547	57	12.03
229	40 47.98628N	073 52.97884W	11.51	ROCK	1	mba95185.d06	53777	59	11.51
230	40 47.99452N	073 52.93603W	12.14	ROCK	1	mba95186.d01	56437	38	12.14
231	40 47.94931N	073 52.89978W	11.07	ROCK	1	mba95185.d06	54286	27	11.07
232	40 47.99331N	073 52.81084W	17.12	ROCK	1	mba95185.d06	68876	52	17.12
233	40 47.95541N	073 52.41462W	10.47	ROCK	1	mba95313.d02	91566	44	10.47
234	40 47.97228N	073 52.42786W	8.55	ROCK	1	mba95313.d02	95572	52	8.55
235	40 47.94162N	073 52.38427W	11.12	ROCK	1	mba95185.d06	93323	27	11.12
236	40 47.93317N	073 52.40503W	12.41	ROCK	1	mba95185.d06	70605	58	12.41
237	40 47.98508N	073 52.63103W	10.74	ROCK	1	mba95185.d06	94177	30	10.74
238	40 47.96602N	073 52.78286W	16.07	ROCK	1	mba95185.d06	74831	57	16.07
239	40 47.97915N	073 52.74352W	16.66	ROCK	1	mba95312.d03	73289	38	16.66
240	40 47.96257N	073 52.70610W	19.11	ROCK	1	mba95185.d06	98994	4	19.11
242	40 48.06248N	073 52.97472W	10.66	ROCK	1	mba95313.d02	85891	58	10.66
243	40 48.05225N	073 52.98057W	13.08	ROCK	1	mba95185.d06	66290	60	13.08
244	40 48.03334N	073 53.03778W	18.55	ROCK	1	mba95186.d01	56851	30	18.55
246	40 48.03997N	073 52.82004W	10.58	ROCK	1	mba95313.d02	86501	33	10.58
247	40 47.99810N	073 52.91534W	12.35	ROCK	1	mba95183.d03	46776	21	12.35

A Features Correlated with Multibeam Source Data

Feat. #	Latitude	Longitude	Feature Least Depth	Feature Type	1 or 2 x IHO	Multibeam File Name	Ping Number	Beam Number	MB Depth
248	40 47.98963N	073 52.87777W	12.79	ROCK	1	mba95186.d01	37021	3	12.79
250	40 47.95176N	073 52.81796W	12.26	ROCK	1	mba95313.d02	63800	43	12.26
251	40 47.91549N	073 52.42384W	13.94	ROCK	1	mba95185.d06	73541	5	13.94
252	40 47.92520N	073 52.36604W	12.37	ROCK	1	mba95185.d06	70820	30	12.37
253	40 47.88594N	073 52.38664W	14.78	ROCK	1	mba95185.d06	103031	32	14.78
254	40 47.87614N	073 52.32135W	14.59	ROCK	1	mba95185.d06	102815	25	14.59
255	40 47.90824N	073 52.62167W	16.93	WRECK	1	mba95185.d06	107330	39	16.93
256	40 47.86397N	073 52.40619W	12.59	ROCK	1	mba95313.d02	39991	25	12.59
257	40 47.84860N	073 52.38158W	10.57	ROCK	1	mba95313.d02	40274	56	10.57
258	40 47.82830N	073 52.40324W	10.86	ROCK	1	mba95185.d06	108770	31	10.86
259	40 48.08301N	073 53.08817W	16.5	ROCK	1	mba95183.d03	24105	7	16.5
260	40 48.07411N	073 53.11748W	18.1	ROCK	1	mba95183.d03	46075	60	18.1
262	40 48.13429N	073 53.19187W	10.03	ROCK	1	mba95186.d01	9766	40	10.03
263	40 48.13360N	073 53.23384W	11.08	ROCK	1	mba95183.d03	23573	30	11.08
264	40 48.23502N	073 53.43988W	10.06	ROCK	1	mba95313.d02	72988	40	10.06
265	40 48.21937N	073 53.43798W	10.44	ROCK	1	mba95313.d02	82316	7	10.44
266	40 48.20637N	073 53.43819W	11.09	ROCK	1	mba95186.d01	39293	58	11.09
268	40 48.29004N	073 53.65162W	10.73	ROCK	1	mba95186.d01	40467	28	10.73
269	40 48.27070N	073 53.66686W	16.07	ROCK	1	mba95186.d01	59582	55	16.07
270	40 48.28659N	073 53.68510W	15.8	ROCK	1	mba95187.d02	67456	32	15.8
272	40 48.00358N	073 53.36902W	~~10.65~~	ROCK	1	mba95186.d01	16154	40	10.65 13.9.
274	40 48.04871N	073 53.34195W	13.97	ROCK	1	mba95186.d02	2742	37*	~~14.0~~
275	40 47.92580N	073 53.15125W	7.39	ROCK	1	mba95186.d01	18033	18	7.39
276	40 47.96733N	073 53.14131W	10.65	ROCK	1	mba95186.d02	3909	7	10.65
277	40 47.91965N	073 53.02120W	12.52	ROCK	1	mba95186.d02	4560	48	12.52
278	40 47.92029N	073 53.08379W	16.32	ROCK	1	mba95186.d01	46582	24	16.32
279	40 47.88443N	073 53.06233W	6.89	ROCK	1	mba95313.d02	56971	40	6.89
280	40 47.86233N	073 53.01646W	8.69	ROCK	1	mba95313.d02	57425	24	8.69
281	40 47.82802N	073 52.87410W	7.58	ROCK	1	mba95183.d03	6256	18	7.58
282	40 48.18909N	073 53.38159W	17.46	ROCK	1	mba95186.d01	39024	36	17.46
284	40 47.97220N	073 53.19673W	10.8	ROCK	1	mba95186.d01	45970	21	10.8
285	40 47.98738N	073 53.20358W	11.25	ROCK	1	mba95186.d02	3572	21	11.25
286	40 48.01449N	073 53.10355W	13.6	ROCK	1	mba95186.d02	33215	34	13.6
287	40 47.98632N	073 53.08979W	13.03	ROCK	1	mba95186.d02	40029	40	13.03
288	40 48.05404N	073 53.27785W	16.36	ROCK	1	mba95185.d06	46419	15	16.36
289	40 47.66151N	073 52.20695W	6.68	ROCK	1	mba95313.d02	19188	59	6.68
290	40 47.96218N	073 52.94510W	10.73	ROCK	1	mba95313.d02	59984	57	10.73
291	40 47.96203N	073 52.98635W	10.74	ROCK	1	mba95186.d02	32775	26	10.74
292	40 48.23611N	073 54.06078W	22.71	ROCK	1	mba95186.d02	79904	44	22.71
293	40 48.19081N	073 54.18826W	19.11	WRECK	1	mba95313.d02	98513	20	19.11
294	40 48.17296N	073 54.23767W	19.1	WRECK	1	mba95313.d02	98782	72*	19.1*
295	40 48.18365N	073 54.11501W	22.12	WRECK	1	mba95186.d02	79598	49	22.12
296	40 48.14329N	073 54.13344W	20.02	ROCK	1	mba95313.d02	102938	40	20.02
297	40 48.17807N	073 54.03900W	12.65	ROCK	1	mba95186.d03	21038	35	12.65
299	40 48.19643N	073 53.98254W	16.8	ROCK	1	mba95186.d03	47854	23	16.8
300	40 47.94634N	073 54.33585W	17.45	ROCK	1	mba95186.d03	5614	27	17.45
301	40 47.91539N	073 54.32427W	17.41	WRECK	1	mba95186.d03	19429	27	17.41
302	40 47.89039N	073 54.42496W	19.93	ROCK	1	mba95186.d02	77902	58	19.93
303	40 47.82897N	073 54.50207W	14.35	ROCK	1	mba95186.d02	77526	27	14.35
304	40 47.21823N	073 55.13714W	11.84	ROCK	1	mba95187.d03	65018	22	11.84
305	40 47.24972N	073 55.03565W	20.01	ROCK	1	mba95187.d04	16374	49	20.01
306	40 47.75406N	073 54.57870W	15.19	ROCK	1	mba95186.d02	77103	34	15.19
307	40 48.08952N	073 54.16139W	10.96	ROCK	1	mba95313.d02	103327	26	10.96
308	40 47.66767N	073 54.58865W	16.32	ROCK	1	mba95186.d03	17960	10	16.32

A Features Correlated with Multibeam Source Data

Feat. #	Latitude	Longitude	Feature Least Depth	Feature Type	1 or 2 x IHO	Multibeam File Name	Ping Number	Beam Number	MB Depth
309	40 47.63815N	073 54.61333W	14.84	ROCK	1	mba95187.d05	2006	8	14.84
310	40 47.50970N	073 54.74484W	10.79	ROCK	1	mba95187.d04	14595	43	10.79
311	40 47.52499N	073 54.76235W	10.81	ROCK	1	mba95187.d06	8932	51	10.81
312	40 47.46124N	073 54.81959W	10.94	ROCK	1	mba95186.d03	16792	23	10.94
314	40 47.47347N	073 54.79946W	10.9	ROCK	1	mba95186.d03	16877	8	10.9
315	40 47.47426N	073 54.76816W	10.64	ROCK	1	mba95186.d03	27652	52	10.64
316	40 47.11515N	073 55.26610W	17.22	ROCK	1	mba95186.d02	73210	4	17.22
317	40 47.04451N	073 55.22670W	18.97	ROCK	1	mba95186.d03	36008	47	18.97
318	40 47.05302N	073 55.15689W	9.86	ROCK	1	mba95187.d04	46630	6	9.86
319	40 47.34407N	073 54.89545W	12.06	ROCK	1	mba95187.d04	25215	29	12.06
320	40 47.38795N	073 54.90257W	10.81	ROCK	1	mba95187.d04	9433	29	10.81
321	40 47.54809N	073 54.69017W	10.91	ROCK	1	mba95186.d03	27015	60	10.91
323	40 47.53707N	073 54.66970W	11.03	ROCK	1	mba95187.d04	23622	3	11.03
324	40 47.43442N	073 54.78660W	10.93	ROCK	1	mba95187.d04	24425	48	10.93
325	40 47.42057N	073 54.80887W	11.15	ROCK	1	mba95187.d04	24562	33	11.15
326	40 47.45432N	073 54.77199W	11.33	ROCK	1	mba95187.d04	24289	37	11.33
327	40 47.38522N	073 54.84428W	10.69	ROCK	1	mba95187.d04	24855	59	10.69
328	40 47.14116N	073 55.10213W	18.19	ROCK	1	mba95187.d04	26605	6	18.19
329	40 48.07353N	073 54.07059W	6.86	ROCK	1	mba95188.d04	43681	26	6.86
330	40 47.92834N	073 54.20527W	8.65	ROCK	1	mba95313.d02	105428*	92*	8.6*
331	40 47.89310N	073 54.25132W	10.26	ROCK	1	mba95188.d04	34946	30	10.26
332	40 47.83349N	073 54.29290W	11.03	ROCK	1	mba95313.d02	106216	45	11.03
333	40 47.69472N	073 54.41897W	15.13	WRECK	1	mba95313.d02	107415	25	15.13
334	40 47.71289N	073 54.39942W	17.19	OBSTR	1	mba95313.d02	107236	26	17.19
335	40 47.43794N	073 54.69541W	14.95	OBSTR	1	mba95313.d02	114654	33*	14.9*
336	40 47.45851N	073 54.70940W	18.3	WRECK	1	mba95187.d84	53175	32	18.3
337	40 47.03766N	073 55.18131W	10.86	ROCK	1	mba95187.d04	47045	31	10.86
338	40 47.28093N	073 54.90430W	20.5	ROCK	1	mba95187.d04	44081	26	20.5
339	40 48.34003N	073 47.32576W	8.59	ROCK	1	mba95188.d02	49761	37	8.59
340	40 48.00120N	073 54.13794W	12.72	WRECK	1	mba95188.d04	35523	50	12.72
341	40 48.27772N	073 53.94704W	17.05	ROCK	1	mba95187.d03	5024	56	17.05
343	40 48.28387N	073 49.79504W	12.56	ROCK	1	mba95316.d02	22021	30	12.56
344	40 48.27720N	073 49.87772W	4.13	ROCK	1	mba95316.d02	22948	15*	4.1*
346	40 48.17033N	073 49.78989W	21.31	ROCK	1	mba95185.d04	51155	39	21.31
347	40 48.19954N	073 49.73888W	19.39	ROCK	1	mba95185.d04	51346	22	19.39
351	40 48.18389N	073 47.59176W	9.27	OBSTR	1	mba95184.d05	7843	23	9.27
352	40 49.98478N	073 46.76640W	10.7	ROCK	1	mba95313.d03	51982	11	10.7
353	40 48.09396N	073 48.24350W	10.62	OBSTR	1	mba95184.d56	8112	37	10.62
354	40 47.93004N	073 47.24498W	31.32	WRECK	1	mba95181.d02	97014	35*	31.3*
355	40 47.87157N	073 47.54694W	20.94	OBSTR	1	mba95184.d56	5095	51	20.94
356	40 48.09875N	073 50.03370W	24.9	OBSTR	1	mba95185.d04	22345	16	24.9
358	40 48.21178N	073 50.46917W	13.73	OBSTR	1	mba95185.d02	62456	20	13.73
359	40 47.95694N	073 52.29296W	8.97	WRECK	2	mba95185.d06	63581	105*	9.0*
361	40 48.00967N	073 52.88100W	19.04	ROCK	1	mba95183.d01	7324	32	19.04
362	40 48.19300N	073 49.14433W	10.98	ROCK	1	mba95185.d01	10690	29	10.98
363	40 48.15247N	073 47.62938W	13.62	ROCK	1	mba95182.d04	53999	18	13.62
364	40 48.03814N	073 48.86146W	0	WRECK	2	no mb here			
365	40 48.25455N	073 49.81540W	14.94	ROCK	1	mba95312.d03	21881	92*	14.9*

* after beam number and MB depth indicates value determined using gsfedit

Shaded rows indicate features not plotted on smooth sheet and discussed in Descriptive Report

APPROVAL SHEET
H-10625

Initial Approvals:

The completed survey has been inspected with regard to survey coverage, delineation of the depth curves, development of critical depths, cartographic symbolization, comparison with prior surveys and verification or disproval of charted data. The survey records and digital data comply with NOS requirements except where noted in the Evaluation Report.

Bruce A. Olmstead Date: 7/1/97
Bruce A. Olmstead
Senior Cartographer, Cartographic Section
Pacific Hydrographic Branch

I have reviewed the smooth sheet, accompanying data, and reports. This survey and accompanying digital data meet or exceed NOS requirements and standards for products in support of nautical charting except where noted in the Evaluation Report.

Kathy A. Timmons Date: 7/8/97
Kathy A. Timmons
Commander, NOAA
Chief, Pacific Hydrographic Branch

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Final Approval:

Approved:

Andrew A. Armstrong III Date: Oct. 21, 1997
Andrew A. Armstrong III
Captain, NOAA
Chief, Hydrographic Surveys Division

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. H-10625

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.

CHART	DATE	CARTOGRAPHER	REMARKS
12366	5/20/97	[signature]	Full ~~Part Before~~ After Marine Center Approval Signed Via Full application of soundings
			Drawing No. and curves except for area pulled thru from Chart 12339
			centered at Lat. 40/46/10 N, Long. 73/50/30 W.
12339	5/10/97	[signature]	Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No. Full application of soundings and curves from smooth sheet
12342	5/5/97	[signature]	Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No. Full application of soundings and curves from smooth sheet.
			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
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			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 (C)
			Drawing No. RE: BP163115-17

PRODUCTS

12339
12342
12366
12364 E + F INS II
12327
12363 NX

SUPERSEDES C&GS FORM 8352 WHICH MAY BE USED