

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey Hydrographic
Field No. PHP-10-4-93
Registry No. H-10494

LOCALITY

State California
General Locality San Francisco Bay
Sublocality Yerba Buena Island
..... to Hunters Point

19 93

CHIEF OF PARTY

LT Guy T. Noll, NOAA

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DATE MAR 6 1995

10494

H-10494

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.

PHP-10-4-93

State California

General locality San Francisco Bay

Locality Yerba Buena Island to Hunter's Point

Scale 1:10,000 Date of survey August 17 - September 17, 1993

Instructions dated December 29, 1992 Project No. OPR-L344-PHP-93

Vessel NOAA Launch 1101 (EDP 0651) and Launch 1102 (0652)

Chief of party LT Guy T. Noll, NOAA

Surveyed by LT R. Fletcher, ET E. Wernicke, ST R. Adams, ST K. Simmons,
DPT M. Bigelow

Soundings taken by echo sounder, ~~hand lead, etc.~~ Innerspace Model 448

Graphic record scaled by PHP Personnel

Graphic record checked by PHP Personnel

Verification by: I. Almacen, J. Stringham, L. Deodato
~~Processed by:~~ Automated plot by Bruning/Zeta Plotter

Evaluation by: I. Almacen
~~Verification by:~~

Soundings in ~~fathoms fathoms~~ Meters and Decimeters at MKW MLLW

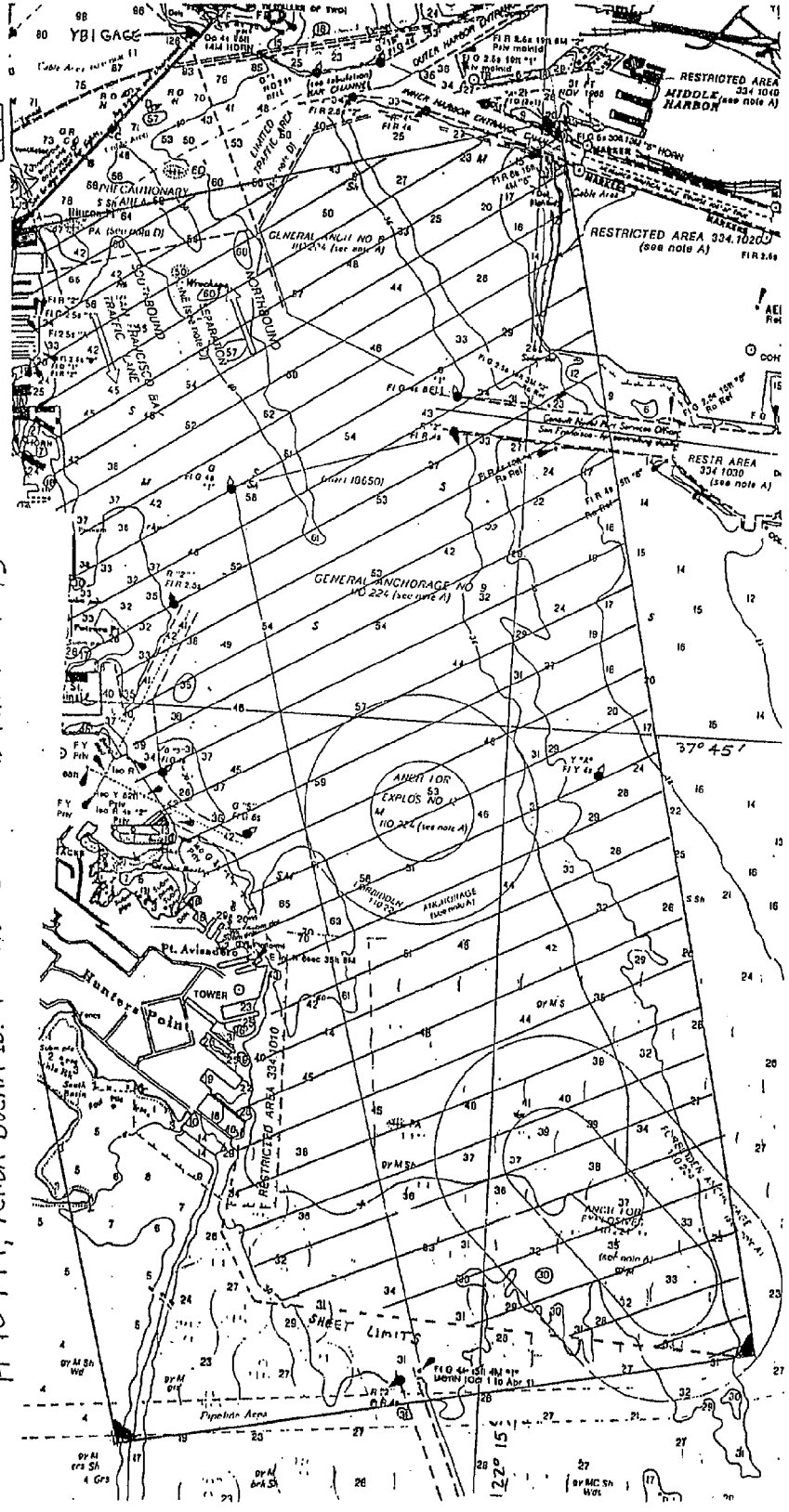
REMARKS: Time in UTC. Revisions and marginal notes in black were generated during office processing. Some separates are filed with the hydrographic data, as a result page numbering may be interrupted or non-sequential.

AWOIS and SURF ✓ PWD 3/95

H-10494

AREA SURVEYED

PACIFIC HYDRO GRAPHIC PARTY, OPR L344
H-10494, YERBA BUENA IS. TO HUNTERS POINT, PHP-10-4-93



Descriptive Report to Accompany Navigable Area Survey H-10494

Field Number PHP-10-4-93
Scale 1:10,000
1993

Pacific Hydrographic Party
Chief of Party: LT Guy T. Noll

A. PROJECT ✓

This survey was conducted in accordance with Hydrographic Project Instructions OPR-L344-PHP, San Francisco Bay, California, dated December 29, 1992.

Hydrographic survey H-10494 was conducted to obtain data to update coverage of the designated traffic lanes in San Francisco Bay. These traffic lanes are frequently transited by deep-draft vessels. This survey was also conducted to obtain data for the maintenance of existing nautical charts. This project responds to the concerns of the Harbor Safety Committee of the San Francisco Bay Region, the San Francisco Bar Pilots, the State of California Department of Fish and Game, Office of Oil Spill Prevention and Response, and the U.S. Coast Guard Marine Safety Office (USCG MSO). This part of San Francisco Bay was last surveyed by the National Ocean Service (NOS) in the late 1970's, with Field Examinations conducted in the early 1980's.

This survey's sheet letter is "D", as specified by the project instructions. Sheet D is the fourth survey for Project OPR-L344.

B. AREA SURVEYED (See EVAL RPT, Sec. 1)

The area surveyed for H-10494 extends from approximately latitude 37°47'15"N, parallel to the south side of the Oakland Bay Bridge. The sheet then extends south to latitude 37°42'00"N, adjacent Hunters Point Naval Shipyard and from longitude 122°18'00"W eastward ^{along the San Francisco waterfront.} ~~to longitude 122°23'00"W~~. The HDAPS plotter sheet number 25 is skewed to 77° and measures 58.5 cm by 115.0 cm. Hydrographic limits for H-10494 are within those required by the Hydrographic Manual (Section 1.2.4, p. 1-6).

Data acquisition was conducted from August 17, 1993, (DN 229) to September 17, 1993, (DN 260).

C. SOUNDING VESSELS ✓

NOAA Launch 1101 (EDP No. 0651), a 29-foot Jensen was used for hydrography, detached positions, diving operations and sound velocity casts.

Launch 1102 (EDP No. 0652) was used for Side scan sonar and related echosounder development on Awois 51988, 51148 and 50780. Some shoreline verification was necessary to confirm the charted features on the west side of the sheet. No bottom drags were required. No changes to the standard vessel sounding configuration were necessary.

D. AUTOMATED DATA ACQUISITION AND PROCESSING ✓

The standard HDAPS software suite was used throughout this survey. Program names and versions are listed in the appendix.*

The following non-HDAPS computer programs were used:

<u>Program Name</u>	<u>Program Version</u>	<u>Version Date</u>
VELOCITY	2.00	1992
NADCON	1.01	1989
GEOID93	2.00	1993

The PC-DAS SURVEY Program, version 4.03 (GPS implementation), was used for all data acquisition on launch 0651. Version 5.00, (SSS implementation) was used on launch 0652.

E. SONAR EQUIPMENT ✓

Side scan sonar (SSS) operations were conducted using an EG&G model 260 slant-range corrected SSS recorder and an EG&G 272-T dual-channel (single frequency) towfish. The towfish was operated on the 100 kHz frequency and was configured with a 20° beam depression. The following sonar equipment was used throughout the survey:

<u>Type</u>	<u>S/N</u>
Towfish	015598
260 Recorder	015602

The SSS towfish was towed with a 50 meter EG&G lightweight towcable. The towfish was deployed manually from the launch through a block mounted to a swing-arm davit on the starboard quarter. The length of towcable deployed was determined by measured markings on the towfish cable. The SSS towfish was

* Filed with the hydrographic data.

maintained at a height off the bottom of 8 to 20 percent of the range scale. Four range scales were used 25-, 50-, 75- and 100-meters. SSS operations were conducted at a speed of 5 knots (2.5 meters per second) or slower.

Confidence checks were performed daily on buoys, piers, etc. In addition, changes in the bottom texture were noted on the sonargrams.

Sonargrams were occasionally degraded from sea surface return and prop wash. All degraded sonargrams were rejected and rerun, or the acceptable swath width was adjusted. The SSS recorder gain setting was set for the best return for the most prevalent bottom material.

Side scan sonar was conducted by Launch 0652 (1102) on DN 253-258. Side scan sonar was used to develop Awois 51988, 51148 and 50780.

F. SOUNDING EQUIPMENT ✓

During this survey, the following Innerspace Model 448 (IN-448) echosounders, modified with custom EPROMS for HDAPS, were used:

<u>Echosounder</u> <u>Type EDP</u>	<u>Vessel No.</u>	<u>Serial No.</u>	<u>DN Used</u>
IN-448	0651	239	229-251,259,260
IN-448	0652	236	253-258

Soundings were recorded in meters, with an assumed speed-of-sound through water of 1500 m/sec. Depths encountered in the survey area ranged from ~~2.1~~ meters to ~~27.2~~^{27.20} meters based on ~~predicted~~ *actual* tides. The deepest depth was at Pos. 1988 on DN 243, occasionally deeper depths were digitized incorrectly, but were scanned manually from the echogram.

The digitized soundings displayed on-line were compared in real time with the analog trace to ensure reasonable agreement. No on-line calibration adjustments are required for the IN-448. Occasional breaks in the continuity of the fathogram occurred when rapid changes in range scale were required. These breaks are not considered significant by the hydrographer unless greater than 6mm at survey scale, or if they occurred over a shoaling trend (potential missed peak), in which cases the section or line was re-surveyed.

Metric leadlines were made by PHP in accordance with HSG 69. Each leadline is 1/4-inch steering tiller rope. Markings are shrink tubing secured with epoxy glue at one-meter intervals from 0 to 30. This deviation from HSG 69 makes for a more rugged

leadline. Markings were calibrated during fabrication with a steel surveyor's tape while the line was under six pounds of constant tension. The throwing end is a standard six-pound lead shackled to a stainless steel thimble bent to the bitter end. Leadlines were used for depth comparisons with the echosounder. Leadline calibration forms are included in Separate IV (Sounding Equipment Calibration and Corrections)*

G. CORRECTIONS TO SOUNDINGS ✓

Velocity of Sound

Corrections for the speed of sound through the water column were computed from data obtained with an Applied Microsystems Laboratories (AML) Velocity of Sound Profiler (S/N 03004). The VELOCITY Program was used to determine the speed of sound correctors. The following casts were used to determine the velocity correctors.

Cast	Extrapolated DN			HDAPS Tables	Cast Position	
	DN	Depth	Range		Latitude	Longitude
1	232	24.3	229-242	13	37°43'55"N	122°20'49"W
2	246	39.2	243-260	14	37°43'48"N	122°21'20"W

Copies of all velocity cast data and HDAPS Velocity Corrector Tables are included in Separate IV.*

The AML instrument was calibrated by Northwest Regional Calibration Center on March 17, 1993. A copy of this calibration report was included with H-10456. *the survey records.*

Leadline Comparisons

Leadline comparisons were taken periodically to ensure digitization of the echosounder depth matched the fathogram; these are annotated on the fathograms. No systematic drift or error was observed. It should be noted that the Innerspace 488 echosounder is not prone to mis-digitization.

Static Draft

Static draft for vessel number VN 0652 was determined on May 21, 1993 (DN 141). The depth of the transducer face from a reference mark on the hull was determined. Then the depth was measured from this reference mark to the launch's waterline with the launch in the water (fuel tanks half full and two crew aboard). A static draft of 0.4 meters was determined.

A static draft for VN 0651 was determined on January 19, 1993, in two steps. The first step determined the depth of the transducer face from a reference mark on the hull. The second step involved

* Filed with the hydrographic data.

measuring the depth from this reference mark to the launch's waterline with the launch in water (fuel tanks half full and two crew aboard). A static draft of 0.5 meter was determined.

Dynamic Draft ✓

Settlement and squat measurements for VN 0651 were conducted on March 17, 1993 and on May 21, 1993 for VN 0652, in San Francisco Bay at the Tiburon Fisheries Laboratory in Tiburon, CA.

Settlement and squat correctors are applied online based on the vessel's speed over ground (SMG), a practical approximation to the speed through the water upon which these correctors are applied in theory. Settlement and squat correctors are re-applied based on the SMG computed between data records during field processing using the REAPPLY program in HDAPS. Field records are included in Separate IV.*

Tide Correctors ✓

One field-determined tidal zone based on data for reference station Fort Point, CA, was applied to sounding data for sheet D. The correctors were computed from time and height corrections for Yerba Buena Island, adding 32 minutes and 0.3 feet to high tide and 40 minutes and 0.0 feet to low tide. The hydrographer believes that the predicted tide zoning of this survey produces adequate correctors. *Approved Tide Note is attached to this report.*

H. CONTROL STATIONS (*See EVAL RPT, Sec. 2*)

Horizontal Datum

The horizontal control datum for this project is North American Datum of 1983 (NAD 83). ^{*this report*} A copy of the HDAPS Control Station Table is included in ~~Appendix III~~ (List of Horizontal Control Stations). A separate Horizontal Control Report OPR-L344, San Francisco Bay, was submitted with H-10456. Time and resources did not permit the Pacific Hydrographic Party to position San Leandro Marina Channel Directional Light (Coast Guard Light List No. 4829).

* *Filed with the hydrographic data.*

I. HYDROGRAPHIC POSITION CONTROL

Position Control ✓

Differential GPS (DGPS) was used for position control throughout this survey. The DGPS reference station, ALCATRAZ DGPS STATION, 1993, was installed as described in the Horizontal Control Report in accordance with FPM Section 3.4.6. Per FPM Section 3.4.6.3, the reference site was confirmed using the program MONITOR. A copy of the scatter plot and the outlier.sum file are included in Separate III (Horizontal Position Control and Corrections to Position Data)* This station was re-installed without monitor being re-run.

GPS signals were partially blocked near Hunter's Point. In most cases, the interference was sufficiently intermittent that it was possible to continue surveying and to smooth (interpolate) any aberrant positions during processing. In cases where inadequate position control would necessitate smoothing in excess of 4 continual centimeters at the scale of the survey, or where accurate positioning was not recoverable, the data were rejected and the lines, or sections of lines, were re-surveyed. In general, when poor control prevailed, at least two attempts were made to obtain good data.

DGPS Performance Checks ✓

DGPS performance checks were obtained periodically as per FPM Section 3.4.4.1, using a dolphin near Point Chauncey or Sausalito Channel Light "4", a fixed aid to navigation, both of which were positioned to Third Order, Class I, standards (see Horizontal Control Report). All DGPS performance checks were successful; forms are included with the data files.*Confidence in daily DGPS performance was obtained by checking the position of the boat at a fixed position near Yerba Buena Island Tide Gauge.

Positioning Equipment ✓

The following GPS equipment was used:

<u>Equipment Location</u>	<u>Type of Receiver/Antenna</u>	<u>Receiver Serial No.</u>	<u>Antenna Serial No.</u>
ALCATRAZ 1993 (DGPS Ref. Sta.)	Trimble 4000SST	2952A00459	2951A00123
Spare (used for geodetic work)	Trimble 4000SST	2952A00461	2951A00008
VN 0651	Ashtech Firmware 1E08D	700417B1139 (DN 096-111,259)	700378A0272

VN 0652

Ashtech
Firmware 1E08D

700417A1141
(DN 253-258)

700378A0402

The printout accompanying the data includes the serial number of electronic equipment used.

J. SHORELINE ✓ (See EVAL RPT, Sec. 2)

Being reviewed by PHS. *There are no photogrammetric data required for this survey. Shoreline from chart 18650 was shown in brown for orientation only.*

K. CROSSLINES ✓

A total of 24.7 nautical miles of crosslines were run, representing 9.2% of the hydrography on H-10494. Crossline soundings are within 0.5 meter of the mainscheme values when using predicted tidal correctors. Launch 0651 (1101) was used for both main scheme and crosslines.

L. JUNCTIONS ✓ (See EVAL RPT, Sec. 5)

This survey joins H-10456 along the north limit of the sheet.

M. COMPARISON WITH PRIOR SURVEYS (See EVAL RPT, Sec. 6)
H-9819 (1979), 1:10,000 and H-9844 (1979-81), 1:10,000

Comparison with prior surveys will be accomplished by PHS as part of "shared processing."

N. ITEM INVESTIGATION REPORTS (See EVAL RPT, Sections 6 & 7)

Item Investigation Reports for the following features are included in Separate VI:

<u>Feature</u>	<u>Item Number</u>	<u>Description/Area</u>
Awois 50780	N1	Submerged Wreck
Awois 51148	N2	Submerged Wreckage
Awois 51988	N3	Submerged Wreck
Shoal	N4	13-meter shoal
Shoal	N5	14.4-meter shoal
Obstruction	N6	1400m North of Alameda Channel (6.9) obstr
Charted Visible Wreck	N7	North of Army Street Terminal
Platforms	N8	3 platforms by Hunters Point
Outfall	N9	At Army Street Terminal

O. COMPARISON WITH THE CHART (See EVAL RPT, Sec. 7)

The applicable shoreline was transferred from a 1:10,000

enlargement of NOAA nautical chart 18650, 44th edition, Oct. 31, 1992 to the sounding plot in brown, and is for orientation purposes only. On DN 244 and DN 246, D.P's were acquired on features near the limits of the sheet to verify charted features. Comparison with the chart was accomplished by the PHP using a sounding plot of H-10494 in feet to facilitate comparison. The following depth comparisons are based on data reduced with predicted tides.

Deep draft vessel transit areas within this survey are defined by traffic schemes as described by the U.S. Coast Guard's Traffic Routing scheme and are labeled on the appropriate charts as Precautionary Areas. The San Francisco Bay traffic scheme has been recently redefined in the Local Notice to Mariners 28/93, dated 06 July 1993 (enclosed in Appendix, I)* Soundings in this precautionary area adequately define the navigable waters within the limits of this survey. * attached to this report.

The main transit area running north to south in the central portion of the bay between general anchorage area No. 9 and anchorage for explosives area No. 12, is on the average 1 meter deeper at the deepest charted depths.

The 30 foot depth curves along the east and west sides of the survey area that run north to south, have migrated shoreward by as much as 150 meters.

The central portion of the charted anchorage for explosives No. 12 is now deeper by ^{0.5, 1.0, 1.5} 1.5 meters.

Pier 94/96 North Channel and South Channel, between Lash Terminal Lighted Buoy 2 and Lash Terminal Lighted Buoy 5, running the entire length of this maintained channel, has apparently been dredged to 13-^{13.5}14 meters. No new maintained depths for this channel are published in the Local Notice to Mariners, between December 1992 to the present. Ron Ard of the Army Corps of Engineers was contacted in this matter at (415) 744-3035. Mr. Ard stated as of his last survey in May of 1993 the controlling depth was 12.5 meters. (41 feet)

The offshore end of Mission Rock Terminal has a charted 57 foot depth at latitude 37°46'23.652"N, longitude 122°22'50.634"W. The survey depth at this position is now 70^{70.5} feet. Most depths off the Mission Rock Terminal pier, developed by hydrographic keel lines, are deeper by 3' meters or more. These depths are from 5 to 50 meters seaward of the pier face. There also is an uncharted deep area running along the west side of the sheet limit, seaward of the shoreline and piers. This deep area is 50 meters wide and runs north to south from the south side of the Oakland Bay Bridge, from pier 30 to pier 38. This deep area then runs past South Beach Harbor Marina and China Basin, to the south end of Mission Rock Terminal.

Potrero Pt. has two charted adjacent 30 foot depth contours protruding into deeper waters. Charted is a small 30 foot cell just off the south end of a long pier on the south side of Central Basin at latitude $37^{\circ}44'57.274''$ N, longitude $122^{\circ}22'32.056''$ W. Also a broader protrusion of the 30 foot depth contour line just north of the Army Street Terminal, the seaward-most limit of which is at latitude $37^{\circ}44'51.151''$ N, longitude $122^{\circ}22'28.847''$ W. Hydrography has shown that these two separate 30-foot contours are now connected on a line drawn between these two positions and all soundings shore-ward of this line are more shoal. The charted more seaward portion of the 30 foot curve is less pronounced now, with only two small single 30 foot contour cells. More development was run on DN 260 to further confirm this change.

Dangers to Navigation ✓

There were no Dangers to Navigation observed within the survey limits of H-10494.

P. ADEQUACY OF SURVEY ✓

This navigable area survey is complete and adequate to supersede prior surveys in their common area, with the following exception:

A "Holiday" or hole in the data was left out of the mainscheme hydrography because of the constant moorage of ships at latitude $37^{\circ}45'23.987''$ N, longitude $122^{\circ}21'27.870''$ W. This moorage spot lies halfway between General Anchorage 9 and 12. Several times during the 17 data collection days the field unit tried to pick up this missing piece of hydrography. This spot was constantly in use by deep draft vessels, however, and it was not possible to run hydrography.

Q. AIDS TO NAVIGATION (See EVAL RPT, Sec. 7d)

A comparison was made between the chart, the Coast Guard Light list and Detached Positions acquired on buoys and sea-level lights within the survey area.

All floating and non-floating aids compare quite well, with the exception of Pier 94 North End Light, Light List No. 4915. The charted position and the Light List position match, but the new field position for Pier 94 North End Light appears to be located at the north end of Pier 94, N-NW about 35 meters. The field position No. 2233, DN 244 is at latitude $37^{\circ}44'43.926''$ N, longitude $122^{\circ}22'22.028''$ W and the published Coast Guard Light List position is at latitude $37^{\circ}44'42''$ N, longitude $122^{\circ}22'24''$ W.

Recommendation: The hydrographer recommends deleting the charted position of Pier 94 North End Light at latitude 37°44'42"N, longitude 122°22'24"W and charting the light at the survey position latitude 37°44'43.926"N, longitude 122°22'22.028"W. *Concur.*

South Beach Harbor Marina, on the NW side of the survey area has two Coast Guard listed lights, South Beach Harbor Breakwater Light "B", Light list number 4577.2 and South Beach Harbor Breakwater Light "A", Light list number 4577.1. NOAA Chart 18649, 56th edition, July 4, 1993 and NOAA Chart 18650, 44th edition, Oct. 31, 1992 shows Lt A in the middle of the breakerwall and Lt B at a bend in the breakerwall south of Lt A. Position 2166 and 2165 was compared to a 1:10,000-scale enlargement of Chart 18650 and it was determined that the chart has these lights reversed. *Concur.*

Recommendations: The hydrographer recommends that the charts be revised to show Lt "A" Pos. 2166, latitude 37°46'44.962"N, longitude 122°23'03.116"W. and Lt "B" Pos. 2165, latitude 37°46'49.932"N, longitude 122°23'03.612"W., both positioned on DN 244 with vessel 0651. *Concur.*

R. STATISTICS ✓

<u>Description</u>	<u>Quantities</u>
Total Positions	175 ³
Total Detached Positions:	46
Total Nautical Miles of Hydrography	312.6
Sq. Nautical Miles of Hydrography	13
Velocity Casts	2
Days of Production	17

S. MISCELLANEOUS ✓

No miscellaneous information was applicable. No anomalous currents were noted during operations.

T. RECOMMENDATIONS ✓

None.


U. REFERRAL TO REPORTS ✓

<u>TITLE</u>	<u>DATE</u>
1993 Horizontal Control Report, OPR-L344-PHP	March 1993
1993 Coast Pilot	Sept. 1993

Submitted for approval,

Michael Bigelow
Data Processing Technician

Approved and Forwarded,


Guy T. Noll
Lieutenant, NOAA
Chief of Party

AWOIS INVESTIGATION - N1

AWOIS # 50780

DN:253

CHART # 18649,18650

VN:0652

DESCRIPTION: ~~19 ft. obstruction, unassigned.~~ *20-ft, Submerged wreck*

SOURCE: BP41423--1946, CL46/53--C&GS, H9819/79

GEOGRAPHIC POSITION

POSITION #6087,6091.3,6092.3

	LATITUDE	LONGITUDE
CHARTED:	37°43'56.210"N	122°21'36.610"W
OBSERVED:	37°43'56. ³³⁰ 100 "N	122°21'37. ⁸²⁰ 600 "W

POSITIONED BY: GPS

METHOD OF INVESTIGATION: SSS, Hydrography.

FINDINGS: 200% Sonar coverage was obtained over the charted Awois position at Latitude 37°43'56.210"N and Longitude 122°21'36.610"W. An obstruction was found on the SSS sonagram at the charted position, but the gravel barge was found ^{23.8} meters from the Awois position at Latitude 37°43'56.³³⁰~~100~~"N and Longitude 122°21'37.⁸²⁰~~600~~"W. The gravel barge was square in shape 30 x 15 meters. The approximate least depth of the gravel barge computed from the fathogram at Position 6092+3 was 7.¹¹ meters. *(24 ft.). No dive investigation was done in the field.*

DIVING INVESTIGATION

None.

CHARTING RECOMMENDATIONS: No change to chart is recommended. Leave the wreck charted at Latitude 37°43'56.210"N and Longitude 122°21'36.610"W. *Concur. Retain wreck as charted. (C'rt) WK*

..... COMPILATION USE ONLY

CHART

APPLIED

AWOIS INVESTIGATION - N2

AWOIS # 51148

DN:253

CHART # 18649,18650

VN:0652

DESCRIPTION: Dangerous submerged wreckage. *TA*

SOURCE: H9819/79--41-42ft depths exist in vicinity. CL1221/85--
Dangerous submerged wreckage.

GEOGRAPHIC POSITION

POSITION# 2288

LATITUDE

LONGITUDE

CHARTED: 37°42'59.050"N

122°20'33.990"W

OBSERVED:

POSITIONED BY: Not found.

METHOD OF INVESTIGATION: SSS and hydrography.

FINDINGS: 200% Sonar coverage was obtained to cover the 250 meter search radius. Additional hydrographic development was run on DN 246, Position 2295-2385. No wreckage or obstruction was found.
The depths found in the area are between 12.1m (39) to 14.0m (46')

DIVING INVESTIGATION

None.

CHARTING RECOMMENDATIONS: The hydrographer recommends deleting this Dangerous submerged wreck symbol ^{*AWOIS # 51148*} at latitude 37°42'59.05"N and longitude 122°20'33.990"W. *Concur.*

..... COMPILATION USE ONLY

CHART

APPLIED

AWOIS INVESTIGATION - N3

AWOIS # 51988

DN:258

CHART # 18649,18650

VN:0651

DESCRIPTION: WD cleared wk at 32 ft. Leadline depth 50 feet.

SOURCE: H3967WD/1917

GEOGRAPHIC POSITION

POSITION #6183+1

LATITUDE

LONGITUDE

CHARTED: 37°47'11.740"N

122°22'12.890"W

OBSERVED: 37°47'03.7⁷⁰₆₀"N

122°22'44.6²⁰₁₉"W

POSITIONED BY: GPS

METHOD OF INVESTIGATION: SSS and 5 meter dev. hydrography.

FINDINGS: 200% Sonar coverage was obtained to cover the 150 meter search radius. Nothing was found on SSS at the AWOIS position. Wreckage was found 850 meters west of the AWOIS position. The least depth at position 6183+1 was 15.7² meters. (50 feet)

DIVING INVESTIGATION

None.

CHARTING RECOMMENDATIONS: Delete the wreck. Charted at latitude 37°47'11.74"N, longitude 122°22'12.89"W and chart a ~~non~~-dangerous wreck with a least depth of 15.7² meters at latitude 37°47'03.7⁷⁰₆₀"N and longitude 122°22'44.6²⁰₁₉"W. Concur.

LAWOIS ITEM 52203

..... COMPILATION USE ONLY

CHART

APPLIED

ITEM INVESTIGATION - N4

ITEM # N4 DN:251

CHART # 18649,18650 VN:0652

DESCRIPTION: ^{13.0}~~12.8~~-meter ^{(42 feet) From H9844 (1979-81)} sounding.

SOURCE: ~~H 10494, PHP 1993~~ H9844 (1979-81)

GEOGRAPHIC POSITION

POSITION #2531.6

LATITUDE LONGITUDE

CHARTED:

OBSERVED: 37°47'⁷08.³²⁰~~56.210~~"N 122°22'²36.²⁷⁰~~610~~"W

POSITIONED BY:GPS

METHOD OF INVESTIGATION: Hydrography

FINDINGS: N4, A ^{13.0}~~12.8~~ meters ^(42 feet) sounding was detected on DN 251 by hydrographic methods performing 50,25 and 10 meter splits of Main scheme lines between DOL's 900 and 600. The shoalest depth recorded is a ^{13.0}~~12.8~~ meters depth at position 2531.6 VN 0651 latitude 37°47'08.³²⁰~~56~~"N, longitude 122°22'36.²⁷⁰~~610~~"W. This sounding coincides with a charted rock which appears on chart 18650. This sounding lies on the easternmost side of the south bound traffic lane and deep draft vessels should use extreme caution when in transit over this area. SSS on this feature shows changes in bottom texture indicative of a hard bottom.

DIVING INVESTIGATION

None.

CHARTING RECOMMENDATIONS: Revise the charted depths with depths from this survey H-10494. *Concur. Chart the 13-meter (42 feet) with "Rk" based on the present survey. Remove charted 42 Rk. Retain*

. COMPILATION USE ONLY

CHART

APPLIED

ITEM INVESTIGATION - N5

ITEM # N5

DN:251

CHART # 18649,18650

VN:0652

DESCRIPTION: ⁴1~~3~~.1-meter^(46 feet) sounding

SOURCE: H-10494, PHP 1993

GEOGRAPHIC POSITION

POSITION #2451+8

LATITUDE

LONGITUDE

CHARTED:

OBSERVED: 37°43'24.⁶⁰⁰596"N

122°21'01.^{0 810}004"W

POSITIONED BY:GPS

METHOD OF INVESTIGATION: Hydrography

FINDINGS: N5, A ⁴1~~3~~.1 meter sounding was detected on DN 251 using normal hydrographic methods. 50, 25 and 10 meter mainscheme lines were run between DOL's 8000 and 7700 to define this shoal area. A least depth of 4⁶ feet was recorded at position 24~~51~~+8^c at latitude 037°43'24.⁶⁰⁰596"N, longitude 122°21'01.^{0 810}004"W. This sounding lies along the western edge of anchorage No. 9, 0.5 miles east of Hunters Point Naval Shipyard.
Fix 2461+6 was exceeded and another 14.1 meters was plotted at lat. 37/43/23.96 N; long 122/21/01.55W (Fix 2060+3)

DIVING INVESTIGATION

None.

CHARTING RECOMMENDATIONS: Revise the charted depths to the survey depths from this survey H-10494. *Concur.*

. COMPILATION USE ONLY

CHART

APPLIED

ITEM INVESTIGATION - N6

ITEM # N6 DN:258

CHART # 18649,18650 VN:0651

DESCRIPTION: Obstruction north of Alameda Channel 1400 meters, just east of the project area.

SOURCE: H-10494, PHP 1993

GEOGRAPHIC POSITION

POSITION #2535+3

LATITUDE LONGITUDE

CHARTED:
OBSERVED: 37°47'19.6⁷⁰~~64~~"N 122°20'16.8⁴⁰~~38~~"W

POSITIONED BY:GPS

METHOD OF INVESTIGATION: SSS,echosounder and diver investigation.

FINDINGS: A spike was found just between regular mainscheme sounding line on DN 230. It was then searched for with SSS on DN 258, and a feature was located. A dive investigation was conducted on DN 259. Diver investigation observed a cylindrical metal object 35 feet long and 8 feet wide with struts sticking out from it. The steel wreckage lies in a large indentation on the bottom, lying in a E-W orientation. A two foot chop precluded getting a leadline least depth. The diver depth gage least depth was 29 feet (7^{8.8} meters). The least depth was 7^{6.9}~~7.0~~ meters, ^(22 feet) at Position 2535+3, DN 259 at latitude 37°47'19.6⁷⁰~~64~~"N, longitude 122°20'17.8⁴⁰~~38~~"W. This is not considered to be a hazard to navigation because of the surrounding depths are equal to or less ^{deeper} than the least depth of the wreckage.

DIVING INVESTIGATION:Diver investigation was conducted on DN 259.

CHARTING RECOMMENDATIONS: Chart the submerged non-dangerous wreckage at the surveyed position position 2535+3 at latitude 37°47'19.6⁷⁰~~64~~"N, longitude 122°20'17.8⁴⁰~~38~~"W with a least depth of 7.8 meters. ^(22 feet) Do not concur. Chart this feature as " 22 Obstr (Steel wreckage) " ^{16.840} cylinder
..... COMPILATION USE ONLY

..... COMPILATION USE ONLY

CHART

APPLIED

ITEM INVESTIGATION - N7

ITEM # N7 *Awois ITEM 52204* DN:260

CHART # 18649,18650 VN:0651

DESCRIPTION: Charted visible wreck

SOURCE: LNM ^{16/dated} 17 April 1989

GEOGRAPHIC POSITION

POSITION #6127+3

	LATITUDE	LONGITUDE
CHARTED:	^{14.000} 37°45' 13.274 "N	⁵⁰⁰ 122°22'42.493"W
OBSERVED:	^{14.000} 37°45' 13.274 "N	⁵⁰⁰ 122°22'42.493"W

POSITIONED BY:GPS

METHOD OF INVESTIGATION: Visual and hydrography.

FINDINGS: A visible wreck reported is charted along the 18 foot curve of Chart 18650 just outside the project limits and just north of the Army Street Terminal on the west side of the chart. This wreck is charted just south of geographically labeled ⁵⁰⁰ Potrero PT at latitude 37°45' ~~13.274~~ "N, longitude 122°22'42.493"W. This wreck was investigated by visual search at low water, hydrographic lines and drift search was conducted and nothing was found. The water was too shallow for SSS and visibility was too poor for diver investigation. Nick Larocco of the San Francisco Port Commission was contacted at (415) 274- 0523. He stated he had been employed with the Port for 25 years and knows the area in question well. He said his office nor any salvage company had ever removed this wreck. Petty officer Hopkins was contacted at the Long Beach LNM offices at (310) 980 4300 ext. 509. Their offices had no record of salvage on this wreck.

Recommendation: Delete ^{14.000} the charted visible wreck ⁵⁰⁰ from the chart at latitude 37°45' ~~13.274~~ "N, longitude 122°22'42.493"W. *Do not concur. chart as "sunken wreck" at the same charted position.*

..... COMPILATION USE ONLY

CHART

APPLIED

ITEM INVESTIGATION - N8

ITEM # N8 DN:244
CHART # 18649,18650 VN:0651

DESCRIPTION: Platforms

SOURCE: Charted are 2 Platforms

GEOGRAPHIC POSITION

POSITION #2275

	LATITUDE	LONGITUDE
CHARTED:	37°43'48.952"N	122°21'31.779"W
OBSERVED:	37°43'48.952"N	122°21'31.779"W

POSITIONED BY:GPS

METHOD OF INVESTIGATION: Visual

FINDINGS: Chart 18650 depicts two square platforms on the west side of the chart, along the shoreline. These platforms are approximately 200 meters N-NW of Point Avisadero and adjacent the charted geographic name Hunters PT. Field verification on DN 244 has found that (3) platforms exist. The platforms are aligned in a north south orientation. The northernmost is at Position 2274, latitude 37°43'49.913"N, longitude 122°21'33.110"W. the middle platform at Position 2275, latitude 37°43'48.952"N, longitude 122°21'31.779"W. and the southernmost at Position 2276, latitude 37°43'48.001"N, longitude 122°21'30.510"W.

Recommendation: Chart the platforms to show (3) platforms at the surveyed positions. *Concur.*

DIVING INVESTIGATION

..... COMPILATION USE ONLY

CHART

APPLIED

ITEM INVESTIGATION - N9

ITEM # N9 DN:260

CHART # 18649,18650 VN:0651

DESCRIPTION: Charted submerged sewer outfall.

SOURCE: Charted sewer.

GEOGRAPHIC POSITION

POSITION #2614+⁰~~5~~

LATITUDE LONGITUDE

CHARTED: 37°4^{45'00.}~~4~~'^{29.700}"N 122°2^{2, 24}~~0~~'^{17.100}"W

OBSERVED: 37°4^{45 00.710}~~4~~'^{59.478}"N 122°22'^{26.340}~~28.068~~"W

POSITIONED BY:GPS

METHOD OF INVESTIGATION:Visual and echosounder.

FINDINGS: An outfall is charted on 18650 extending east from the Army Street Terminal at latitude 37°4^{45, 00.710}~~4~~'^{59.478}"N, longitude 122°22'^{26.340}~~28.068~~"W. Hydrographic investigation of this item was conducted on DN 260, position 2600-2620. Position 2620, a D.P. shows the sewer outfall sign on the pier end. Position 2614+⁰~~5~~ a ^{2.3 (40 feet)} 13.4 m. depth shows the offshore limit of the outfall. When compared to an enlargement of the chart the offshore end of the charted and field position matches quite well.

DIVING INVESTIGATION

None.

CHARTING RECOMMENDATIONS: No change to the chart. *Concur. Retain as charted.*

. COMPILATION USE ONLY

CHART

APPLIED

CONTROL STATIONS as of 6 Aug 1993

No	Type	Latitude	Longitude	H	Cart	Freq	Vel	Code	MM/DD/YY	Station Name
001	G	037:48:19.064	122:27:18.198	4	139	0.0	0.0	0.0	02/17/93	PRESIDIO JPL 13 7252
002	G	037:50:06.223	122:28:21.045	4	139	0.0	0.0	0.0	02/17/93	RANGE RESET
100	G	037:49:34.480	122:25:19.687	36	250	0.0	0.0	0.0	03/01/92	ALCATRAZ DGPS STATION
200		037:51:21.232	122:28:07.244	0	200	0.0	0.0	0.0	03/23/93	SAUSALITO CHANNEL LIGHT 2
102	G	037:51:41.184	122:28:43.534	-26	139	0.0	0.0	0.0	03/23/93	SAUSALITO CHANNEL LIGHT 4
103	G	037:53:28.906	122:26:49.453	-14	139	0.0	0.0	0.0	03/23/93	TIBU DGPS STATION BLDG 54
104	G	037:53:36.193	122:26:52.957	-27	139	0.0	0.0	0.0	03/23/93	PILE AT PT. CHAUNCEY
201	T	037:48:24.000	122:27:54.000	0	244	0.0	0.0	0.0	05/13/93	941-4290
202	T	037:46:18.000	122:17:54.000	0	244	0.0	0.0	0.0	05/13/93	941-4750
203	T	037:48:36.000	122:21:36.000	0	244	0.0	0.0	0.0	05/13/93	941-4782
204	T	037:53:30.000	122:26:48.000	0	244	0.0	0.0	0.0	05/13/93	941-4837
205	T	037:57:21.277	122:25:37.056	0	244	0.0	0.0	0.0	05/13/93	941-4881

00 # = PUBLISHED / COMPUTED GPS STATIONS (RECOVERABLE)
 10 # = COMPUTED GPS STATIONS (NON-RECOVERABLE)
 20 # = INTERESTING D.P.'s

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
 NATIONAL OCEAN SERVICE
 COAST AND GEODETIC SURVEY

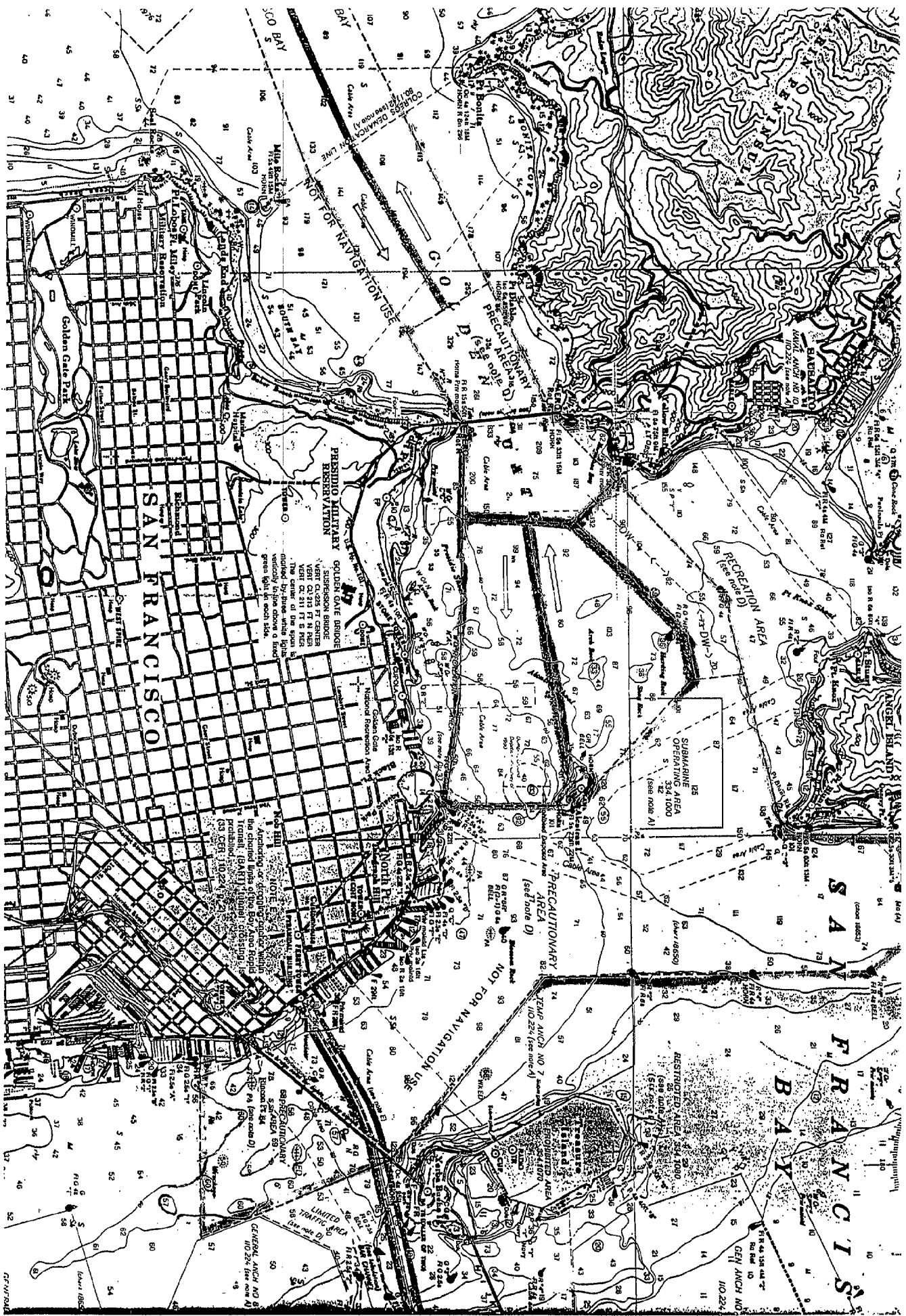
PACIFIC HYDROGRAPHIC PARTY
 TIBURON FISHERIES LAB.
 3150 PARADISE DRIVE
 TIBURON, CA 94920-1211
 (415) 435-9509
 FAX (415) 435-9511

TELEFAX COVER SHEET

DATE: 13 AUG 1993
 ORIGINATOR: LT NOLL
 ADDRESSEE: LT HAINES
 TELEPHONE: _____
 FAX #: _____

NUMBER OF PAGES : 2 (INCLUDING THIS PAGE)

REMARKS:
 NEW VTS SCHEME - NOTE
 NO CHANNEL DELIMITED ~~WEST~~ EAST OF
 ALCATRAZ; PRECAUTIONARY AREA ONLY.
 THIS IS NEW (AS OF JULY 1993) AND
 SUPPORTS ~~THE~~ PRESENT USE OF VTS BY
 LARGE VESSELS.



NOT FOR NAVIGATION USE

The U.S. Coast Guard is revising the Traffic Routing Scheme in San Francisco Bay. The revised routing scheme is defined in the Chart Corrections section (Sect. IV) of Local Notice to Mariners 28/93, dated 06 July 1993. The revised scheme is depicted on the enclosed chartlet. This chartlet shall not be used for navigation. These changes will be published on all new editions of applicable charts.

APPROVAL SHEET

HYDROGRAPHIC SURVEY

OPR-L344

1993

PHP-10-4-93

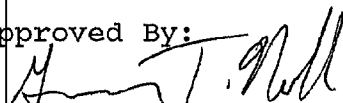
H-10494

The data for this survey were acquired and checked under my daily supervision. Position and sounding accuracy meet the requirements specified in the Hydrographic Manual, the Hydrographic Survey Guidelines, and the Field Procedures Manual for Hydrographic Surveying. The survey is complete and adequate for the intended purpose of delineating bottom topography, determining depths, and identifying potential dangers to navigation. No final field sheets were prepared for this survey. The survey data and accompanying records are complete and adequate for the preparation of the smooth sheet.

Following initial field processing, data were forwarded to Pacific Hydrographic Section, N/CG245, in two batches for verification. The first data submittal included mainscheme and crossline data, the second included splits, crosslines, developments on item investigations, and detached positions. No unverifiable data have been reported to this date.

The field sheets and supporting data have been reviewed by me, are considered complete and adequate for charting purposes, and are approved.

Approved By:



Guy T. Noll
Lieutenant, NOAA
Chief of Party



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of Ocean and Earth Sciences
Silver Spring, Maryland 20910

TIDE NOTE FOR HYDROGRAPHIC SURVEY

ORIGINAL

DATE: October 27, 1993

MARINE CENTER: Pacific

HYDROGRAPHIC PROJECT: OPR-L344-PHP

HYDROGRAPHIC SHEET: H-10494

LOCALITY: California, San Francisco Bay, Yerba Buena Island to
Hunters Point

TIME PERIOD: August 17 - September 17, 1993

TIDE STATION USED: 941-4782 Yerba Buena Island, S.F. Bay, Ca.
Lat. $37^{\circ} 48.6'N$ Lon. $122^{\circ} 21.6'W$

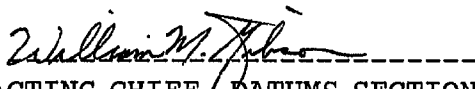
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 8.97 ft.

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 5.6 ft.

REMARKS: RECOMMENDED ZONING

1. North of $37^{\circ} 47.0'N$, times and heights are direct on Yerba Buena Island, Ca. (941-4782).
2. South of $37^{\circ} 47.0'N$, apply a +10 minute time correction and a X1.09 range ratio for all heights to Yerba Buena Island, Ca. (941-4782).

Note: Times are tabulated in Pacific Standard Time.


ACTING CHIEF DATUMS SECTION



GEOGRAPHIC NAMES

Name on Survey	A ON CHART NO. 18650 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										
	A	B	C	D	E	F	G	H	K		
ARMY STREET TERMINAL (cultural)	X										1
AVISADERO, POINT	X										2
CALIFORNIA (title)	X										3
CENTRAL BASIN	X										4
HUNTERS POINT	X										5
INDIA BASIN	X										6
ISLAIS CREEK CHANNEL	X										7
MISSION ROCK TERMINAL (cultural)	X										8
POTRERO POINT	X										9
SAN FRANCISCO	X										10
SAN FRANCISCO BAY	X										11
											12
											13
											14
											15
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											22
											23
											24
											25

Approved:

Charles E. Harrington

Chief Geographer - N/C6275

MAY 27 1994

NOAA FORM 77-27(H) (9-83)		U.S. DEPARTMENT OF COMMERCE		REGISTRY NUMBER		
HYDROGRAPHIC SURVEY STATISTICS				H-10494		
RECORDS ACCOMPANYING SURVEY: To be completed when survey is processed.						
RECORD DESCRIPTION		AMOUNT	RECORD DESCRIPTION		AMOUNT	
SMOOTH SHEET		1	SMOOTH OVERLAYS: POS., ARC, EXCESS			
DESCRIPTIVE REPORT		1	FIELD SHEETS AND OTHER OVERLAYS			
DESCRIP-TION	DEPTH/POS RECORDS	HORIZ. CONT. RECORDS	SONAR-GRAMS	PRINTOUTS	ABSTRACTS/SOURCE DOCUMENTS	
ACCORDION FILES	1					
ENVELOPES						
VOLUMES						
CAHIERS						
BOXES						
SHORELINE DATA						
SHORELINE MAPS (List):						
PHOTOBATHYMETRIC MAPS (List):						
NOTES TO THE HYDROGRAPHER (List):						
SPECIAL REPORTS (List):						
NAUTICAL CHARTS (List):						
OFFICE PROCESSING ACTIVITIES <i>The following statistics will be submitted with the cartographer's report on the survey</i>						
PROCESSING ACTIVITY			AMOUNTS			
			VERIFICATION	EVALUATION	TOTALS	
POSITIONS ON SHEET					1753	
POSITIONS REVISED						
SOUNDINGS REVISED						
CONTROL STATIONS REVISED						
			TIME-HOURS			
			VERIFICATION	EVALUATION	TOTALS	
PRE-PROCESSING EXAMINATION						
VERIFICATION OF CONTROL						
VERIFICATION OF POSITIONS			59.5		59.5	
VERIFICATION OF SOUNDINGS			76.0		76.0	
VERIFICATION OF JUNCTIONS						
APPLICATION OF PHOTOBATHYMETRY						
SHORELINE APPLICATION/VERIFICATION						
COMPILATION OF SMOOTH SHEET			39.5		39.5	
COMPARISON WITH PRIOR SURVEYS AND CHARTS				17.0	17.0	
EVALUATION OF SIDE SCAN SONAR RECORDS						
EVALUATION OF WIRE DRAGS AND SWEEPS						
EVALUATION REPORT				24.0	24.0	
GEOGRAPHIC NAMES						
OTHER*						
*USE OTHER SIDE OF FORM FOR REMARKS			TOTALS	175.0	41.0	216.0
Pre-processing Examination by LT D. Neander, LT D. Haines			Beginning Date 8/17/93	Ending Date 10/12/93		
Verification of Field Data by I. Almacen, J. Stringham, L. Deodato			Time (Hours) 175.0	Ending Date 9/23/94		
Verification Check by			Time (Hours)	Ending Date		
Evaluation and Analysis by I. Almacen			Time (Hours) 41.0	Ending Date 10/5/94		
Inspection by R. DAVIES			Time (Hours)	Ending Date 1/24/95		

EVALUATION REPORT H-10494

1. INTRODUCTION

Survey H-10494 is a navigable area survey accomplished by the Pacific Hydrographic Party under the following Project Instructions.

OPR-L344-PHP, dated December 29, 1992

This survey was conducted in San Francisco Bay, California, to update coverage of the designated traffic lanes within the bay area which are frequently transited by deep-draft vessels. It was also undertaken in response to the request of the Harbor Safety Committee of the San Francisco Bay Region, the San Francisco Bar Pilots, the State of California Department of Fish and Game, Office of Oil Spill Prevention and Response and the U.S. Coast Guard. This survey extends from the vicinity of San Francisco-Oakland Bay bridge at latitude 37/47/30N to latitude 37/42/00N and stretches from longitude 122/18/30W towards the area along the San Francisco waterfront. The bottom generally consists of sand and mud mixed with broken shells. Depths range from 1.5 to 32.0 meters.

Predicted tides for Fort Point, California, gage 941-4290, were used for the reduction of soundings during field processing. Approved hourly heights zoned from this same gage and Yerba Buena Island, California, gage 941-4782, were used during office processing.

The field sheet parameters have been revised to center the hydrography on the smooth sheet and to change the projection to polyconic. NAD 83 is used as the horizontal datum for plotting and position computation. The offset table and sound velocity correctors are adequate. An accompanying computer printout contains the parameters and the correctors.

A digital file has been generated for this survey as required by the specifications contained in Hydrographic Survey Guideline No. 52, Standard Digital Data Exchange Format, April 15, 1986. Certain descriptive information, however, may not be in the digital record due to the restrictions of the presently available cartographic codes. The user should refer to the smooth sheet for a complete depiction of the survey data.

2. CONTROL AND SHORELINE

Sections H and I of the hydrographer's report and the 1993 Horizontal Control Reports for OPR-L344-PHP, contain adequate discussions of horizontal control and hydrographic positioning.

Differential GPS (DGPS) was used to control this survey. GPS station Alcatraz DGPS, 1993 was established to Third-Order accuracy and served as DGPS reference station. Sausalito Channel Light 4, 1978 and Pt. Chauncey (Pile), 1993, were used as calibration points during this survey.

Positions of horizontal control stations used during this survey are based on NAD 83. The smooth sheet is annotated with NAD 27 adjustment ticks based on values determined with the NGS program, NADCON. Geographic positions based on NAD 27 may be

plotted on the smooth sheet utilizing the NAD 83 projection by applying the following corrections.

Latitude: -0.252 seconds (-7.778 meters)
Longitude: 3.893 seconds (95.298 meters)

The year of establishment of control stations shown on the smooth sheet originates with the previously referenced horizontal control reports.

With the exception of one position where the maximum allowable horizontal dilution of precision (HDOP) limits of 3.75 has been exceeded, the data obtained during this survey is generally considered good. The DGPS performance checks conducted in the field were adequate.

There are no shoreline maps required for this survey. The shoreline depicted in brown on the smooth sheet originates from chart 18650 (44th Edition) and is shown for orientation purposes only.

3. HYDROGRAPHY

Except for the specific items mentioned elsewhere in this report, hydrography 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; and
- c. show the survey was properly controlled and soundings are correctly plotted.

Side Scan Sonar was used during item investigations to supplement the echo-sounding information obtained during the survey.

4. CONDITION OF SURVEY

The hydrographic records and reports received for processing are adequate and conform to the requirements of the Hydrographic Manual, 4th Edition, revised through Change No. 3, the Hydrographic Survey Guidelines, and the Field Procedures Manual, March 1993 Edition.

5. JUNCTIONS

Survey H-10494 junctions with the following surveys.

<u>Survey</u>	<u>Year</u>	<u>Scale</u>	<u>Area</u>
H-10456	1993	1:10,000	North

Junction with survey H-10456 is complete and the comparison is considered good. However, some soundings were transferred from survey H-10456 to delineate depth curves within the adjoining area.

6. COMPARISON WITH PRIOR SURVEYS

H-9819(1979), 1:10,000
H-9844(1979-81), 1:10,000

Surveys H-9819 and H-9844, provides the basic coverage of the entire area of this survey. Comparison with these surveys undertaken from 1979 to 1981 is considered good. The present soundings are generally within 0.3 meter (1 foot) compared with the prior surveys except in some areas particularly along the waterfront where changes in depths were noted as a result of periodic dredging undertaken by the Corps of Engineers and the shifting of sediments caused by the strong current.

The charted 20-foot submerged wreck (AWOIS 50780) at latitude 37/43/56.2N, longitude 122/21/36.6W, originating from survey H-9819 was investigated and confirmed to be a sunken gravel barge. No dive investigation was accomplished during this survey. However, a shoal depth of 7.4 meters (24 feet) was located in the area at latitude 37/43/56.33N, longitude 122/21/37.82W, an indication of the existence of the wreck. This feature was carried forward on the smooth sheet as charted.

With the transfer of the feature mentioned above, Survey H-10494 is adequate to supersede the prior surveys for the area of common coverage.

7. COMPARISON WITH CHART

Chart 18650, 44th edition, dated Oct. 31, 1992; scale 1:20,000

a. Hydrography

The charted hydrography on the 44th and 45th edition of chart 18650 originates mostly with prior surveys mentioned in the preceding section of this report and the rest from miscellaneous sources.

The following significant changes were noted during this survey.

(1) The area along the charted northbound traffic lane has appreciably deepened by approximately one meter (3 feet) and the presently charted 60-foot depth curve has expanded and moved further south up to latitude 37/45/00N.

(2) The area covered by the charted 60-foot depth curve off Point Avisadero has expanded and moved further north up to latitude 37/44/45N.

(3) Indications of shoaling were noted west of the 30-foot depth curve around the entrance to China Basin, approach to Pier 54 and the area off Potrero Point.

Aside from the AWOIS investigations mentioned in section 7(b), six (6) more separate items (N4 to N9) were investigated during this survey. Discussion and disposition of each of these items is included in the hydrographer's report. Item (N7) was retained as a sunken wreck at its charted position and Item (N9) was retained as a submerged sewer outfall.

With the exception of the feature mentioned above and in the preceding section, survey H-10494 is adequate to supersede charted hydrography within the common area.

b. AWOIS

There are three (3) AWOIS items (50780,51148 & 51988) investigated during this survey. These AWOIS items originates with prior surveys. Discussion and disposition of each of these items is included in the hydrographer's report.

c. Controlling Depths

The area of the channels leading to Army Street Terminal, Pier 94 and Pier 96 were fully covered by this survey. The depths found on this survey are consistent with or deeper than its presently charted depths. A least depth of 11.4 meters (37 ft.) was found at latitude 37/44/58N, longitude 122/22/25W. This depth should be the controlling depth for these privately maintained channels. As this survey was conducted in 1993, it is recommended that the chart compiler consider the latest source of information for the application on the next edition of the chart.

A comparison of controlling depths was not made for the channel leading into the Alameda Naval Air Station boat basin. A comparison of the channel was not possible because depths information are not published on the chart and the charted boat basin is a designated "Restricted Area". Mariners are advised to consult the Alameda Naval Port Services Office for information concerning the controlling depths in the area.

d. Aids to Navigation

There are nineteen (19) aids to navigation located during this survey. The detached positions taken on each of the following aids using DGPS positioning system confirms its presently charted locations. They were found in good condition and adequately serve their intended purpose.

<u>Name of aid</u>	<u>Lt.List #</u>	<u>Latitude(N)</u>	<u>Longitude(W)</u>
(South Beach Harbor)			
North Ent.Light 2	4576	37/46/54.43	122/23/05.45
North Ent. Light 1	4577	37/46/55.32	122/23/04.24
Breakwater Light A	4577.1	37/46/44.97	122/23/03.12
Breakwater Light B	4777.2	37/46/49.94	122/23/03.62
South Ent. Light 1	4578	37/46/42.24	122/23/07.18
South Ent. Light 2	4579	37/46/41.32	122/23/06.75
(Alameda Naval Air Station Channel)			
Ent. Lt.(Bell) Buoy 1	4745	37/46/37.90	122/20/27.07
Ent. Lighted Buoy 2	4750	37/46/27.39	122/20/28.75
Light 3	4755	37/46/36.34	122/19/51.72
Light 4	4760	37/46/24.09	122/19/48.58
S.F.Bay S. Ch. lighted Buoy 1	4820	37/46/07.13	122/21/47.83
Anchorage 9 Lighted Buoy A	4825	37/44/45.91	122/19/25.46
(Hunters Point)			
Lash Terminal Approach Lighted Buoy 3	4910	37/44/39.18	122/22/09.16

Lash Terminal Approach Lighted Buoy 2	4912	37/45/29.17	122/22/05.12
Pier 94 N. End Light	4915	37/44/43.94	122/22/22.03
Lash Terminal Lighted Buoy 5	4929	37/44/21.67	122/21/35.49
Lighter Basin Ent. Lt. 2	4930	37/44/24.43	122/22/03.64
Lighter Basin Ent. Lt. 1	4935	37/44/21.09	122/22/04.43
Army Street Terminal(not listed)		37/44/55.39	122/22/32.79

A privately maintained mooring buoy was located during this survey at latitude 37/43/03.00N, longitude 122/19/49.11W, and recommended for charting.

See section Q of the hydrographer's report for further information concerning aids to navigation located during this survey.

A redefined Traffic Routing Scheme in San Francisco Bay was issued by the Coast Guard, effective July 1993. The revised routing scheme was published in the Local Notice to Mariners on July 6, 1993. This changes will be reflected on all future editions of applicable charts. A cover letter and copy of the chartlet depicting the new traffic routing scheme are included in this report.

e. Geographic Names

Names appearing on the smooth sheet and in the survey title have been approved by the Chief Geographer.

f. Dangers to Navigation

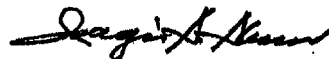
No reports of dangers to navigation were generated during the field or office processing.

8. COMPLIANCE WITH INSTRUCTIONS

Survey H-10494 adequately complies with the Project Instructions.

9. ADDITIONAL FIELD WORK

This is a good hydrographic survey. Additional field work may be required to adequately determine the least depth on AWOIS Item 50780 and determine the status of item N7. discussed in the hydrographer's report. Also, because of the periodic dredging operations around the bay particularly along the charted channels, contact must be maintained with the Corps of Engineers and the Coast Guard to regularly update the chart of the area.




Isagani A. Almacen
Cartographer

APPROVAL SHEET
H-10494

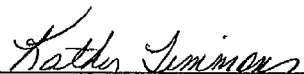
Initial Approvals:

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 digital data have been completed and all revisions and processing have been entered in the magnetic tape record for this survey. Final control, position, and sounding printouts have been made and are included with the survey records. The survey records and digital data comply with NOS requirements except where noted in the Evaluation Report.



Dennis J. Hill
Chief, Hydrographic Processing Unit
Pacific Hydrographic Section
Date: 1/24/95


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.



Commander Kathryn Timmons, NOAA
Chief, Pacific Hydrographic Section
Date: 1/26/95

Final Approval

Approved:



for J. Austin Yeager
Rear Admiral, NOAA
Director, Coast and Geodetic Survey
Date: 2/8/95

MARINE CHART BRANCH
RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-10494

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
18022	9/18/93	Mr. Isagani Almacen	Full Part Before After Marine Center Approval Signed Via Drawing No. Examined, no corrections and soundings applied.
530	9/18/93	Bruce A. Olmstead	Full Part Before After Marine Center Approval Signed Via Drawing No. Examined, no corrections and soundings applied.
18007	9/18/93	Bruce A. Olmstead	Full Part Before After Marine Center Approval Signed Via Drawing No. Examined, no corrections and soundings applied.
18020	9/18/93	Bruce A. Olmstead	Full Part Before After Marine Center Approval Signed Via Drawing No. Examined, no corrections and soundings applied.
18680	1/26/95	Bruce A. Olmstead	Full Part Before After Marine Center Approval Signed Via Drawing No. Examined, no corrections and soundings applied.
18650	7/24/95	A. Chappell	Full Part Before After Marine Center Approval Signed Via Drawing No. Ex'd, no corrections + soundings applied thru H-drawing
18651	7/29/95	A. Chappell	Full Part Before After Marine Center Approval Signed Via Drawing No. 46 Curves, soundings applied thru 18650 H-drawing
18649	1/26/96	A. Chappell	Full Part Before After Marine Center Approval Signed Via Drawing No. Ex'd - NC - soundings applied thru 18650 H-drawing SCARS.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
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