

**H11642**

NOAA FORM 76-35A

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

**DESCRIPTIVE REPORT**

*Type of Survey* **Hydrographic / SSS & SWMB**

*Registry No.* **H11642**

**LOCALITY**

*State* **WASHINGTON**

*General Locality* **Commencement Bay**

*Sub-locality* **Thea Foss Waterway to  
Hylebos Waterway**

**2007-2009**

CHIEF OF PARTY  
**Kathryn Simmons**  
NOAA/NRT3

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DATE



# Descriptive Report to Accompany H11642

Scale 1:10000

2007-2009

Navigation Response Team 3

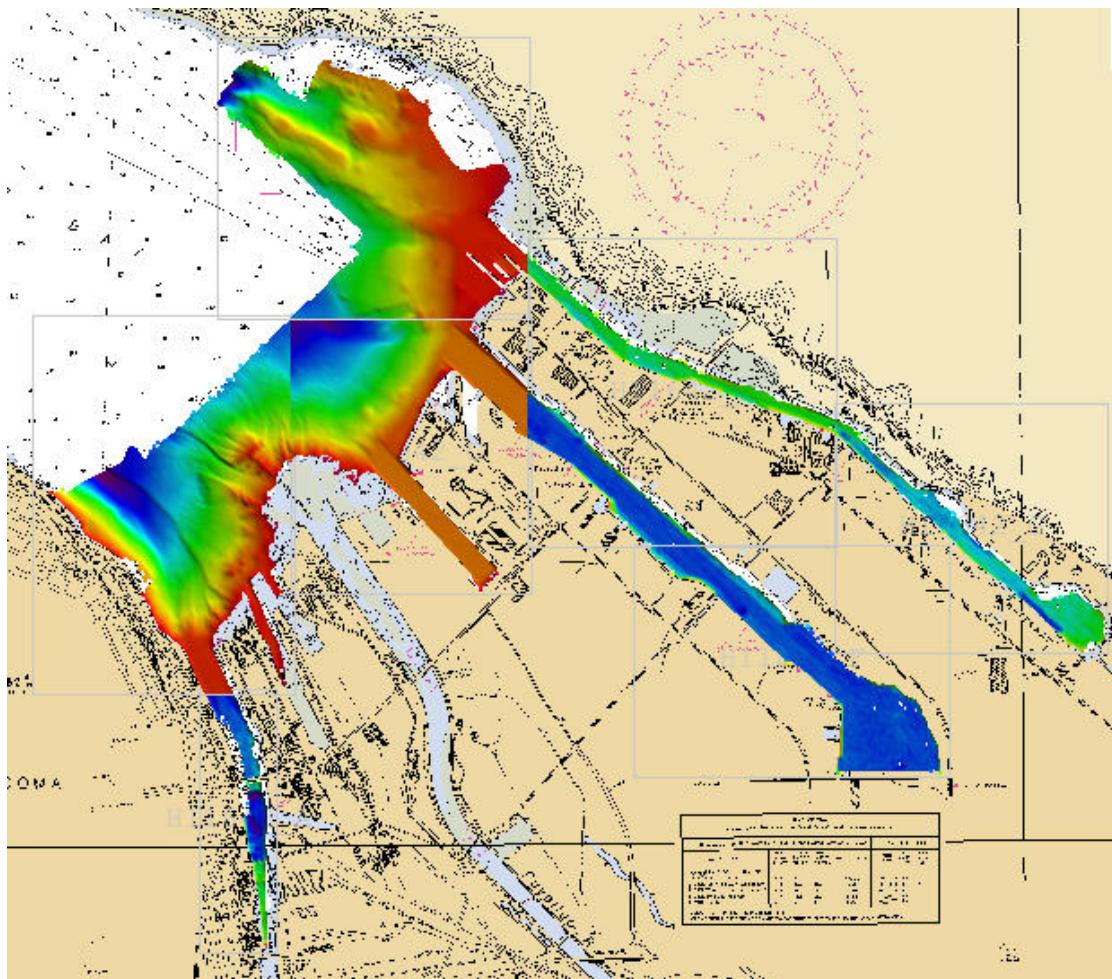
Team Leader: Kathryn Simmons

## A. Area Surveyed

Significant changes to the shoreline in and around Tacoma have occurred in recent years. In 2004 the Marine Chart Division (MCD) identified Tacoma as a port in need of Electronic Nautical Chart (ENC) validation. In addition, Office of Coast Survey's National Survey Plan has identified Commencement Bay as a critical survey area because of major dredging and filling at various locations around the port area. This project was conducted to provide multibeam data in support of updating the National Ocean Service (NOS) nautical charts.

H11642 is one of two surveys in Project OPR-N411-NRT3-07 and includes multibeam hydrography and side scan sonar data.

The total area of hydrography is approximately 1.8 square nautical miles as shown below:



## **B. DATA ACQUISITION AND PROCESSING** *See also the Evaluation Report.*

Data acquisition was conducted from June 19, 2007 (DN 170) through July 18, 2007 (DN 199), and from April 23, 2008 (DN 114) through July 25, 2008 (DN 207). Additional hydrography was collected in portions of the survey area on December 8, 12, and 14 2008 and on April 03 2009.

### **B1. Equipment and Vessels**

NRT3's survey vessel, NOAA Survey Launch S1212, is equipped with an Odom single beam transducer, a Klein side scan sonar system, and a Simrad EM3000 SWMB echosounder, and was used to acquire multibeam and side scan sonar data.

Launch S1212, a 27-foot, SeaArk Commander (SAMA115510000), was acquired in January 2001. In August 2004 the hull was extended to 30 feet to accommodate the weight of the two 150-horsepower Yamaha four-stroke outboards which power the vessel. The launch is eight feet wide, displaces 4.8 tons, has a static draft of 0.4 meters and is equipped with a Dell Pentium IV PC for running the primary acquisition software.

Data acquisition was conducted over several time periods for this survey (June 19 through July 18, 2007, April 23 through July 25, 2008, December 8 through the 14, 2008, and on April 03, 2009). On April 23, 2008 survey launch S1212's original POSMV was sent to Applanix for repair and a temporary replacement was installed (SN 2254). This replacement unit was used for the remainder of the survey. A GAMS calibration and a SWMB patch test were also conducted on April 23 prior to data acquisition.

See Data Acquisition and Processing Report (DAPR). \*

### **B2. Quality Control**

#### Crossline Data

Crosslines acquired for the survey total 6.72 nautical miles, 7.2 percent of mainscheme mileage. Crossline data were compared to mainscheme data using subset editor. No systematic or tidal errors were observed; agreement was seamless. *Concur*

See also Data Acquisition and Processing Report. \*

### **B3. Corrections to Echo Soundings**

See Data Acquisition and Processing Report. \*

### **B4. Data Processing**

A total of seven CARIS field sheets were created for this survey (H11642A through H11642G) to keep base surfaces to an easily manageable size. Single, half-meter surfaces were created for sheets A, E, F and G. Depths on sheets B, C, and D range from very shallow to very deep; therefore, field sheets in these three grids were split into three surfaces: depths between 49 and 150 meters at two-meter resolution, 19 meters to 50 meters at one-meter resolution, and 20 meters and shallower at half-meter resolution. All surfaces were created using the CUBE algorithm with the "deep" cube parameter configuration option.

See also Data Acquisition and Processing Report. \*

*\*Data filed with original field records.*

## C. VERTICAL AND HORIZONTAL CONTROL

### C1. Tides and Water Levels

See Data Acquisition and Processing Report. \*

### C2. Horizontal Datum *See also the Evaluation Report.*

The horizontal control datum for this project is North American Datum of 1983 (NAD83).

### C3. Position Control

See Data Acquisition and Processing Report.\*

## D. RESULTS AND RECOMMENDATIONS *See also the Evaluation Report.*

### D1. Chart Comparison

Survey results were compared with the latest revisions of the largest scale, affected rasters and ENC chart downloaded from NOAA's website at the end of survey.

Chart No.	Edition	Edition Date	Latest Notice to Mariners	Cleared Through Date
18453	25th	September 1, 2007	54	1/10/2009
18474	8th	October 1, 2003	221	1/10/2009

ENC Cell	Edition	Update Application Date	Issue Date
US5WA18M	7	7/31/2007	7/10/2008
US5WA22M	5	10/4/2007	11/10/2008

#### Comparison of Soundings

Survey data were compared with the charts using contour lines and sounding plots generated by CARIS Field Sheet Editor, Pydro and Mapinfo/Vertical Mapper. Major chart discrepancies are described below:

The Thea Foss Waterway south of the 11<sup>th</sup> Street Bridge is deeper than currently charted by as much as 15 feet. The greater depths are a result of a 2006 Superfund remediation project that removed contaminated sediments from this portion of the waterway. *Concur* The one exception is an obstruction with a least depth of 12-feet at latitude 47°14'56.7768"N, longitude 122°25'57.826"W which was submitted as a DTON. *See Appendix 1 for final charting recommendation.*

Highly dynamic river and tide conditions have created major changes in depths at the mouth of the Puyallup River. Most significantly, the charted 18-foot shoal at latitude 47°16'22.967"N, longitude 122°25'58.276"W has shifted approximately 30 meters to the northwest and now has a least depth of 15 feet at latitude 47°16'23.646"N, longitude 122°25'59.373"W. The 24-foot shoal charted at latitude 47°16'19.829"N, *\*Data filed with original field records.*

longitude 122° 25'56.765"W has also shifted and now lies 40 meters to the northeast at latitude 47°16'20.307"N, longitude 122°25'54.963"W with a least depth of 15 feet. These items were also submitted as DTONs. ***See Appendix 1 for final charting recommendations.***

Log storage areas/booming grounds prevented acquisition of complete side scan and/or SWMB coverage in some areas of the survey; e.g., the charted booming grounds just outside the mouth of the Hylebos waterway (the southeastern corner of Commencement Bay), the north end of the upper turning basin at the head of the Hylebos waterway, and the south end of the Hylebos Waterway. ***Concur***

The northern portion of the survey area near the Tye Marina and the charted barge storage area is littered with debris and sunken wrecks, some of which are located under the barges and other structures forming the marina breakwater. Several wrecks were submitted as Dangers to Navigations while others which did not rise to the danger level were designated and discussed in Pydro. Side scan acquisition along the marina breakwater was conducted while the launch was turning; this, combined with small cable-out errors, resulted in substantial differences between the sounding data and correlating side scan contacts. Soundings and side scan contacts have been correlated with bathymetry to the greatest degree possible in this area.

#### Comparison of Non-Sounding Features

New shoreline data provided by Remote Sensing Division (RSD) was verified; the CEF was annotated as requested and returned to RSD on January 21, 2009. Several new features were positioned and processed with CARIS Notebook. Notebook files accompany this survey in hob, S57 and shape file formats.

Major shoreline changes are listed as follows:

The turning basin at the head of Blair Waterway has been enlarged on the east side. ***Concur***

The two drydocks between Piers 25 and 24 at latitude 47°17'2.559"N, longitude 122°24'38.3241"W (at mouth of Hylebos Waterway) have been removed. ***Concur – Delete charted drydocks.***

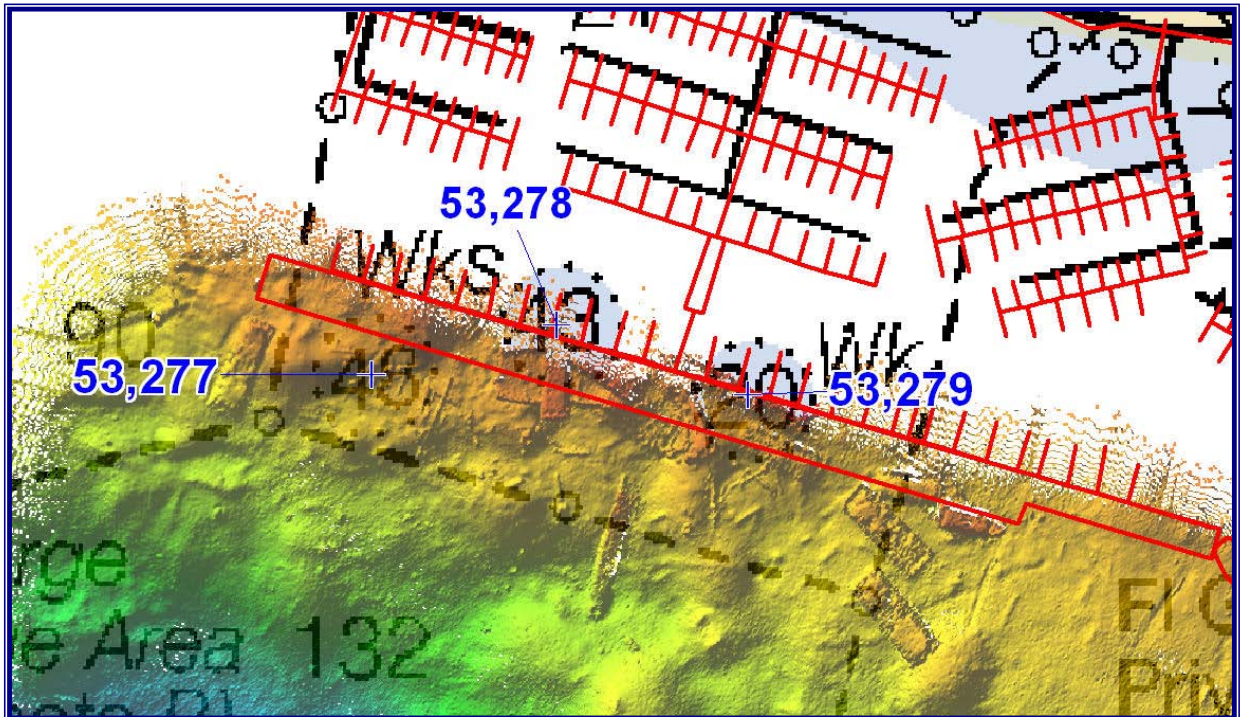
The small waterway east of Pier No. 1 (at mouth of Blair Waterway, latitude 47°16'32.389"N, longitude 122°24'51.2737"W) has been filled in. ***Concur – Revise shoreline.***

The area between Pier No. 1 and Pier No. 5, (just outside the mouth of the Blair Waterway) has been filled in and is now a fish haven. ***Concur - See also section D. of the Evaluation Report .***

#### AWOIS Items

There are 13 AWOIS items within the limits of this survey. AWOIS items 53278, 53279, and, to a lesser extent, item 53277 are located under the uncharted breakwater for the Tye Marina and could be only partially developed with SS and SWMB. See graphic below.





These and all other AWOIS items are discussed in Pydro and included in the Pydro-generated feature report. *See Appendix 2 for final charting recommendations.*

Dangers to Navigation

Twenty primary DTON’s were issued during the course of this survey and submitted to Marine Chart Division. See Appendix I. *Data attached to this report.*

Of special note, in the first week of December 2008, a 175-foot derelict barge broke free of its mooring, split almost in half, and partially sank in the shipping channel of the Hylebos waterway. In response to the incident, NRT3 collected SWMB and side scan data on December 8, 12, and 14 as salvage operations were taking place. According to Tom Szelest, Chief of Navigation Section, USACOE, the barge was completely removed from the waterway on December 18, 2008. Soundings over the submerged barge collected on the above-mentioned days were manually rejected in CARIS Subset Editor. The barge remains evident in all side scan imagery, but should be disregarded as it has been removed.

**D2. Additional Results**

Comparison with Prior Surveys

Prior surveys were not addressed.

Aids to Navigation

New positions were acquired on fixed aids to navigation using the Trimble GeoXT unit. The updated positions and attributes have been submitted directly to MCD.

Bridges, Cables, Pipelines

Charted bridges, cables, and pipelines were visually confirmed.

A charted sewer discharge pipe between the Blair and Sitcum Waterways was located 18 meters west of its charted position. The pipe azimuth is 310 degrees seaward with the offshore end located at latitude 47°16'40.734"N, longitude 122°25'17.315"W.

A second uncharted discharge pipe was located. The offshore end is at latitude 47°16'03.526"N, longitude 122°26'01.223"W. The pipe extends seaward at an azimuth of 306 degrees.

Statistics

Description	Quantities
Total Linear Nautical Miles	105.63
Mainscheme Multibeam	96.12
Side Scan Sonar	24.61
Development	1.21
Crosslines	6.72
Square Nautical Miles Hydrography	1.76
Square Nautical Miles SSS	1.57
Velocity Casts	26
Bottom Samples	0
AWOIS Items	13
Tide Stations Installed	0

Miscellaneous

Due to the entanglement and grounding hazards existing in the Middle Waterway and the St. Paul Waterway, side scan coverage was not acquired in those areas.

Gaps exist in the SWMB coverage on the western edge of Commencement Bay, just outside the mouth of the Thea Foss Waterway alongside a charted pier/mooring facility in the vicinity of latitude 47°15'58.81"N, longitude 122°26'34.14"W. Two large vessels were moored at this location throughout the entire survey, thus hindering acquisition of complete SWMB coverage along the face of the pier.

Soundings over shoreline structures were rejected manually in CARIS subset editor using compiled shoreline provided by RSD as a template.

Single beam data that was acquired in conjunction with side scan data was not processed.

Data collection for this survey was interrupted at the end of July 2007 in order to accomplish offshore data acquisition in Coos Bay, Oregon, for project OPR-M905-NRT3-07 during the optimal summer weather window. NRT3 returned to Tacoma in March 2008 and recommenced the project on March 23.



Submitted for approval,



Kurt Mueller  
Physical Science Technician

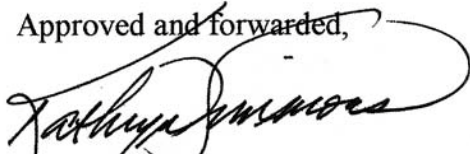
**E. APPROVAL SHEET**

Standard field surveying and processing procedures were followed in producing this survey in accordance with the Navigation Response Branch Operations Manual, the Field Procedures Manual and NOS Hydrographic Surveys Specifications and Deliverables.

The data were reviewed daily during acquisition and processing.

The digital data and supporting records have been reviewed by me, are considered complete and adequate for charting purposes, and are approved. All records are forwarded to Atlantic Hydrographic Branch and should be attached to H11642 for final review and processing.

Approved and forwarded,



Kathryn Simmons  
Team Leader

# H11642 DTON REPORT

**Registry Number:** H11642  
**State:** Washington  
**Locality:** Commencement Bay  
**Sub-locality:** Thea Foss Waterway to Hylebos Waterway  
**Project Number:** OPR-N411-NRT3-08  
**Survey Dates:** 06/19/2007 - 04/23/2008

## Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
18453	25th	10/01/2007	1:15,000 (18453_1)	USCG LNM: 10/17/2006 (12/12/2006) CHS NTM: None (10/27/2006) NGA NTM: 02/26/2000 (12/23/2006)
18474	8th	10/01/2003	1:40,000 (18474_1)	[L]NTM: ?
18445	32nd	08/01/2007	1:80,000 (18445_8) 1:40,000 (18445_7)	[L]NTM: ?
18448	34th	07/01/2006	1:80,000 (18448_1)	[L]NTM: ?
18440	29th	10/01/2007	1:150,000 (18440_1)	[L]NTM: ?
18003	20th	11/01/2006	1:736,560 (18003_1)	[L]NTM: ?
18007	32nd	07/01/2005	1:1,200,000 (18007_1)	[L]NTM: ?
501	12th	11/01/2002	1:3,500,000 (501_1)	[L]NTM: ?
530	32nd	06/01/2007	1:4,860,700 (530_1)	[L]NTM: ?
50	6th	06/01/2003	1:10,000,000 (50_1)	[L]NTM: ?

\* Correction(s) - source: last correction applied (last correction reviewed--"cleared date")

## Features

No.	Name	Feature Type	Survey Depth	Survey Latitude	Survey Longitude	AWOIS Item
1.1	48 Obstrn - 1237/22	Obstruction	14.74 m	47° 16' 38.7" N	122° 24' 38.6" W	---
1.2	3 depth - 1944/118	Shoal	0.88 m	47° 15' 53.7" N	122° 25' 51.0" W	---
1.3	35 depth - 2024/95	Shoal	10.69 m	47° 15' 46.6" N	122° 23' 13.3" W	---
1.4	11 Obstrn - 6888/5	Obstruction	3.34 m	47° 14' 56.8" N	122° 25' 58.0" W	---
1.5	42 Obstrn - 2225/19	Obstruction	12.97 m	47° 15' 44.9" N	122° 26' 23.4" W	---
1.6	15 depth - 3060/19	Shoal	4.61 m	47° 16' 23.6" N	122° 25' 59.4" W	---

1.7	20 Obstn 4467/111	Obstruction	6.32 m	47° 17' 01.6" N	122° 24' 44.1" W	---
1.8	15 depth - 615/104	Shoal	4.59 m	47° 16' 20.3" N	122° 25' 55.0" W	---
1.9	53 Wk - 59/5	Wreck	16.29 m	47° 17' 43.1" N	122° 25' 27.0" W	---
1.10	23 Wks 2049/123	Wreck	6.95 m	47° 17' 38.7" N	122° 25' 09.6" W	---
1.11	57 Wk - 2530/81	Wreck	17.34 m	47° 17' 45.3" N	122° 25' 33.5" W	---
1.12	12 Obstn 293/101	Obstruction	3.66 m	47° 17' 23.5" N	122° 24' 40.6" W	---
1.13	Sewer pipe - 259/32	Pipe	7.97 m	47° 16' 00.2" N	122° 25' 54.6" W	---
1.14	28 depth - 1606/119	Shoal	8.69 m	47° 16' 22.8" N	122° 26' 01.7" W	---
1.15	11 depth - 1294/15	Shoal	3.40 m	47° 16' 19.1" N	122° 25' 52.9" W	---
1.16	28 depth - 191/119	Shoal	8.54 m	47° 16' 24.6" N	122° 25' 58.2" W	---
1.17	Sewer pipe 1808/42	Pipe	17.52 m	47° 16' 03.2" N	122° 26' 00.6" W	---
1.18	43 Wk - 116/126	Wreck	13.10 m	47° 17' 36.5" N	122° 25' 13.8" W	---

**1 - DR\_DToN**

**1.1) 48 Obstn - 1237/22****DANGER TO NAVIGATION****Survey Summary**

**Survey Position:** 47° 16' 38.7" N, 122° 24' 38.6" W  
**Least Depth:** 14.74 m (= 48.37 ft = 8.062 fm = 8 fm 0.37 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 1.612$  m ; **TVU (TPEv)**  $\pm 0.472$  m  
**Timestamp:** 2007-170.19:33:09.893 (06/19/2007)  
**Survey Line:** h11642 / s1212\_simrad / 2007-170 / 068\_1930  
**Profile/Beam:** 1237/22  
**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

**Remarks:**

SS and SWMB coverage was acquired over an obstruction in the Blair Waterway rising 3.4 feet above surrounding depths. The obstruction has a least depth of 48.37 feet and is shoaler than the 51-foot controlling depth of the waterway. This obstruction was reported to the ACOE by NRT-3, however no response was received.

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
h11642/s1212_simrad/2007-170/068_1930	1237/22	0.00	000.0	Primary
h11642/s1212sss_100/2008-190/sonar_data080708194500	0002	8.03	053.4	Secondary (grouped)

**Hydrographer Recommendations**

Chart obstruction as surveyed.

**Cartographically-Rounded Depth (Affected Charts):**

48ft (18453\_1)

8fm (18448\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

8fm 0ft (18445\_7, 18474\_1, 18445\_8)

14.7m (501\_1, 50\_1)

## S-57 Data

**Geo object 1:** Obstruction (OBSTRN)  
**Attributes:** QUASOU - 6:least depth known  
SORDAT - 20090403  
SORIND - US,US,nsurf,H11642  
TECSOU - 3:found by multi-beam  
VALSOU - 14.744 m  
WATLEV - 3:always under water/submerged

## Office Notes

Concur - Add 48 Obstrn and danger curve in present survey location.



### Feature Images

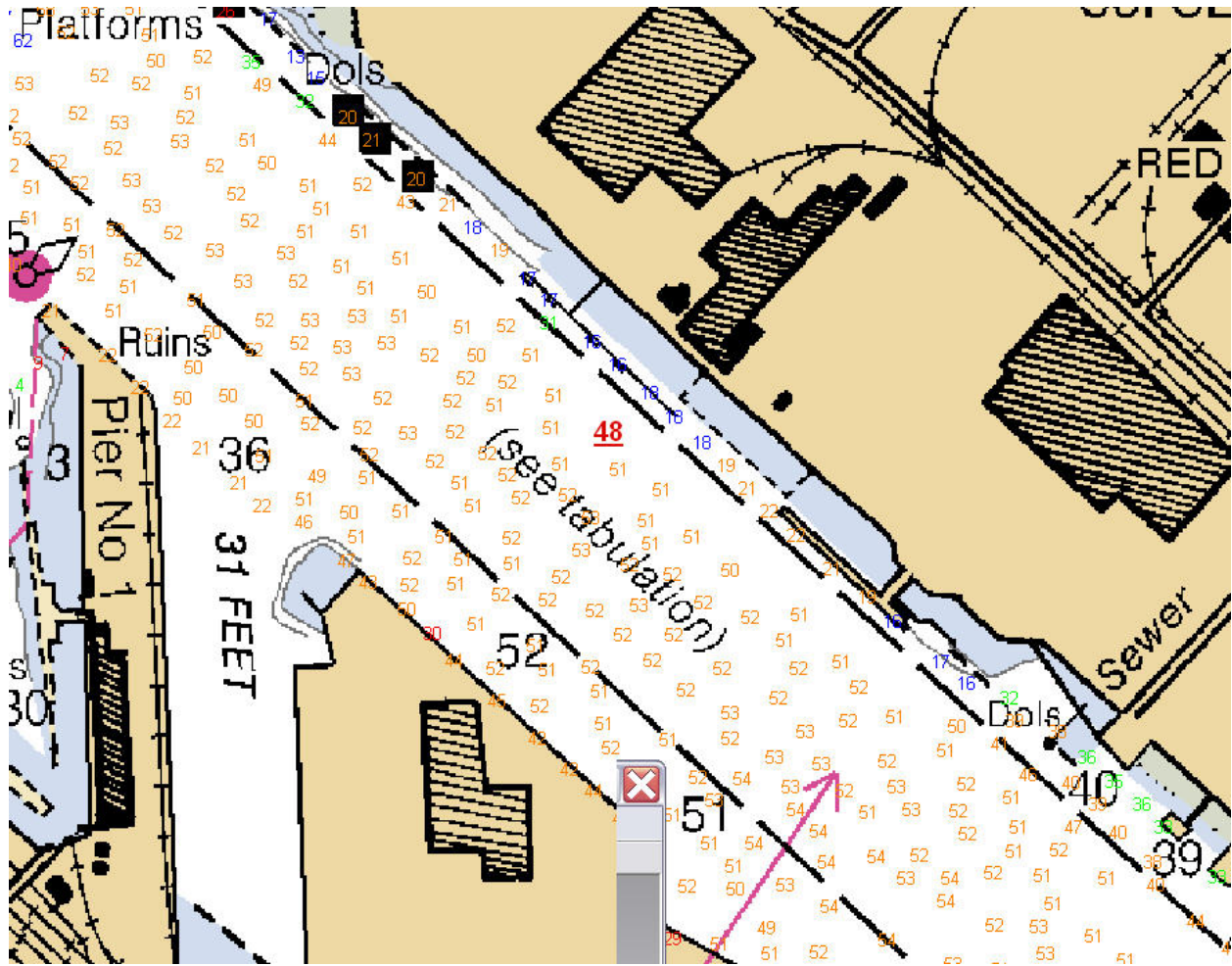


Figure 1.1.1

**1.2) 3 depth - 1944/118****DANGER TO NAVIGATION****Survey Summary**

**Survey Position:** 47° 15' 53.7" N, 122° 25' 51.0" W  
**Least Depth:** 0.88 m (= 2.89 ft = 0.481 fm = 0 fm 2.89 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 1.375$  m ; **TVU (TPEv)**  $\pm 0.185$  m  
**Timestamp:** 2007-171.22:38:01.654 (06/20/2007)  
**Survey Line:** h11642 / s1212\_simrad / 2007-171 / 006\_2235  
**Profile/Beam:** 1944/118  
**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

**Remarks:**

The head of the St. Paul Waterway has silted in. A 3-foot sounding plots over the charted 23-foot depth.

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
h11642/s1212_simrad/2007-171/006_2235	1944/118	0.00	000.0	Primary

**Hydrographer Recommendations**

Chart 3-foot sounding and delete charted 23-foot depth; revise 6, 12 and 18-foot contours to reflect depths as surveyed.

**Cartographically-Rounded Depth (Affected Charts):**

3ft (18453\_1)

0 ½fm (18448\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

0fm 3ft (18445\_7, 18474\_1, 18445\_8)

.9m (501\_1, 50\_1)

**S-57 Data**

**Geo object 1:** Sounding (SOUNDG)

**Attributes:** RECDAT - 20081210

SORDAT - 20070620

SORIND - US, US Survey H11642

TECSOU - 3:found by multi-beam

## Office Notes

Concur - Chart 3 ft depth.

**1.3) 35 depth - 2024/95****DANGER TO NAVIGATION****Survey Summary**

**Survey Position:** 47° 15' 46.6" N, 122° 23' 13.3" W  
**Least Depth:** 10.69 m (= 35.07 ft = 5.845 fm = 5 fm 5.07 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 1.489$  m ; **TVU (TPEv)**  $\pm 0.284$  m  
**Timestamp:** 2007-171.20:50:29.839 (06/20/2007)  
**Survey Line:** h11642 / s1212\_simrad / 2007-171 / 009\_2046  
**Profile/Beam:** 2024/95  
**Charts Affected:** 18453\_1, 18445\_7, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

**Remarks:**

SWMB coverage over shoal extending into the maintained channel of the Blair Waterway. Although the waterway has been widened from this point to the head of the waterway, a manmade protrusion into the channel remains. This protrusion appears to cause sediment buildup at its offshore limit. A 45-foot sounding was found in the channel where the controlling depth is 51 feet. This 35-foot sounding, fourteen meters shoreward, plots on top of the left outside channel line at the location of the charted dol. Thirteen meters shoreward of the 35-foot sounding is a 22-foot sounding. The dol was disproved with 200% SWMB coverage as well as side scan coverage.

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
h11642/s1212_simrad/2007-171/009_2046	2024/95	0.00	000.0	Primary
h11642/s1212_simrad/2007-170/073_1949	1552/100	13.34	222.1	Secondary (grouped)
h11642/s1212_simrad/2007-171/004_2133	6076/51	14.58	064.7	Secondary (grouped)

**Hydrographer Recommendations**

Delete charted dol. Chart 35-foot sounding at surveyed location.

**Cartographically-Rounded Depth (Affected Charts):**

35ft (18453\_1)

5  $\frac{3}{4}$ fm (18448\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

5fm 5ft (18445\_7, 18445\_8)

10.7m (501\_1, 50\_1)

## S-57 Data

**Geo object 1:** Sounding (SOUNDG)  
**Attributes:** RECDAT - 20081210  
SORDAT - 2007620  
SORIND - US, US Survey H11642  
TECSOU - 3:found by multi-beam

## Office Notes

Concur - Chart 35 ft depth.

**1.4) 11 Obstn - 6888/5****DANGER TO NAVIGATION****Survey Summary**

**Survey Position:** 47° 14' 56.8" N, 122° 25' 58.0" W  
**Least Depth:** 3.34 m (= 10.94 ft = 1.824 fm = 1 fm 4.94 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 1.404$  m ; **TVU (TPEv)**  $\pm 0.302$  m  
**Timestamp:** 2007-171.22:56:29.453 (06/20/2007)  
**Survey Line:** h11642 / s1212\_simrad / 2007-171 / 052\_2245  
**Profile/Beam:** 6888/5  
**Charts Affected:** 18453\_1, 18445\_7, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

**Remarks:**

SS and SWMB coverage was acquired over this ruin in the Thea Foss Waterway. The obstruction has a least depth of 12.19 feet while surrounding depths are approximately 23-25 feet. The obstruction is likely the remains of a bridge abutment; the bridge itself has since been removed.

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
h11642/s1212_simrad/2007-171/052_2245	6888/5	0.00	000.0	Primary
h11642/s1212_simrad/2007-171/051_2301	5074/3	4.40	269.8	Secondary
h11642/s1212sss_100/2008-164/sonar_data080612195000	0003	5.24	287.4	Secondary
h11642/s1212sss_100/2008-164/sonar_data080612195000	0002	46.89	245.4	Secondary

**Hydrographer Recommendations**

Chart obstruction as surveyed.

**Cartographically-Rounded Depth (Affected Charts):**

11ft (18453\_1)

1  $\frac{3}{4}$ fm (18448\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

1fm 5ft (18445\_7, 18445\_8)

3.3m (501\_1, 50\_1)



## S-57 Data

**Geo object 1:** Obstruction (OBSTRN)  
**Attributes:** QUASOU - 6:least depth known  
SORDAT - 20090403  
SORIND - US,US,nsurf,H11642  
TECSOU - 3:found by multi-beam  
VALSOU - 3.336 m  
WATLEV - 3:always under water/submerged

## Office Notes

Concur - Add 11 Obstrn and danger curve in present survey location.

**1.5) 42 Obstn - 2225/19****DANGER TO NAVIGATION****Survey Summary**

**Survey Position:** 47° 15' 44.9" N, 122° 26' 23.4" W  
**Least Depth:** 12.97 m (= 42.54 ft = 7.089 fm = 7 fm 0.54 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 1.646$  m ; **TVU (TPEv)**  $\pm 0.544$  m  
**Timestamp:** 2007-178.22:10:50.592 (06/27/2007)  
**Survey Line:** h11642 / s1212\_simrad / 2007-178 / 083\_2203  
**Profile/Beam:** 2225/19  
**Charts Affected:** 18453\_1, 18445\_7, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

**Remarks:**

An uncharted manmade submerged object was found with SS and SWMB west of the entrance to the Foss Waterway. The object (possibly a sunken barge) is approximately 74 feet long and 35 feet wide and is oriented to the northeast at 040 degrees. Designated sounding of 42.54 feet is at the inshore end.

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
h11642/s1212_simrad/2007-178/083_2203	2225/19	0.00	000.0	Primary
h11642/s1212_simrad/2007-192/007_2152	341/40	19.01	220.6	Secondary

**Hydrographer Recommendations**

in present survey location.

**Cartographically-Rounded Depth (Affected Charts):**

42ft (18453\_1)

7fm (18448\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

7fm 0ft (18445\_7, 18445\_8)

13.0m (501\_1, 50\_1)

**S-57 Data**

**Geo object 1:** Obstruction (OBSTRN)

**Attributes:** QUASOU - 6:least depth known

SORDAT - 20090403

SORIND - US,US,nsurf,H11642

TECSOU - 1,2:found by echo-sounder,found by side scan sonar

VALSOU - 12.965 m

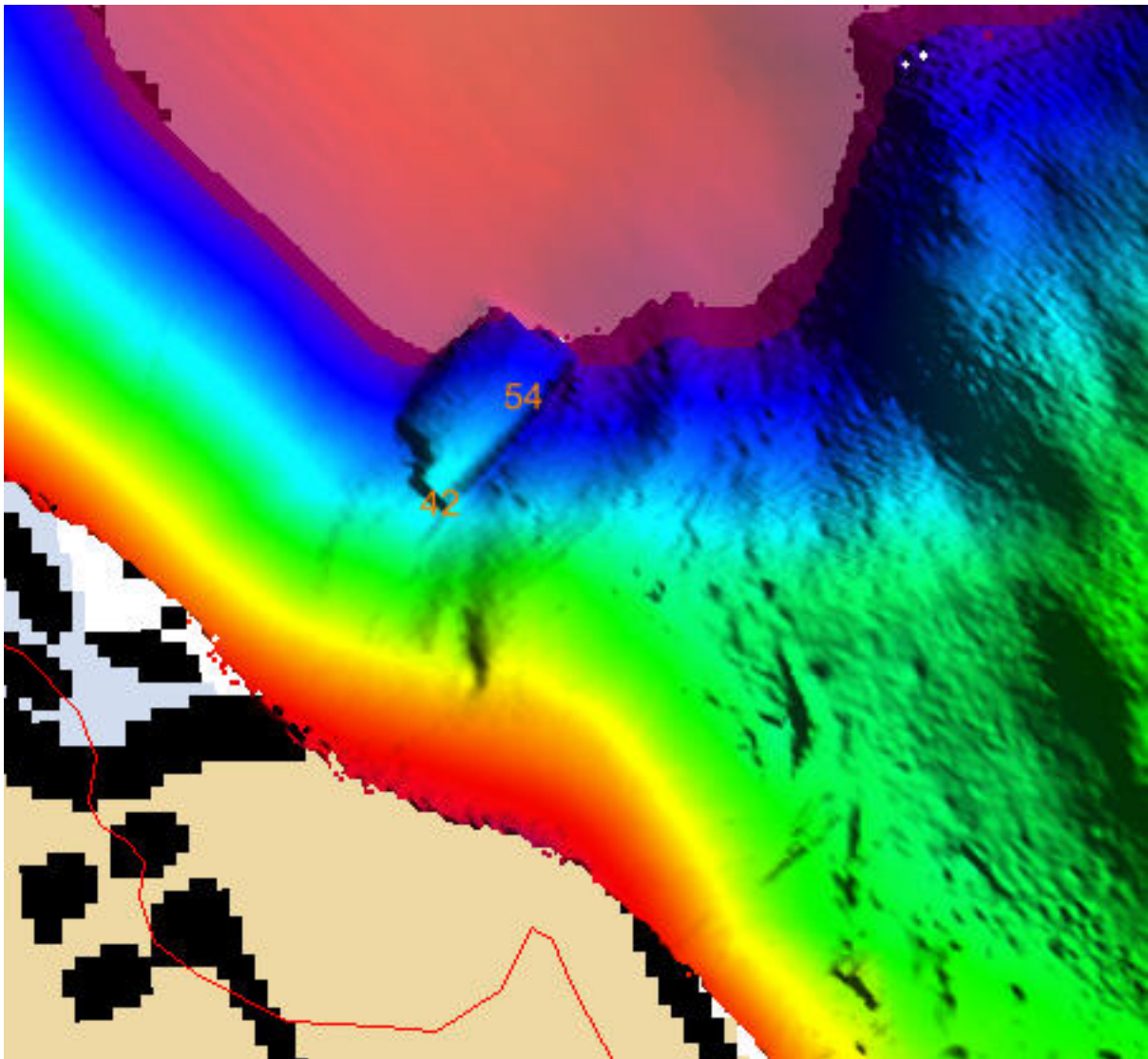
VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

## Office Notes

Concur - Add 42 Obstrn and danger curve in present survey location.

### Feature Images



*Figure 1.5.1*

**1.6) 15 depth - 3060/19****DANGER TO NAVIGATION****Survey Summary**

**Survey Position:** 47° 16' 23.6" N, 122° 25' 59.4" W  
**Least Depth:** 4.61 m (= 15.12 ft = 2.520 fm = 2 fm 3.12 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 1.432$  m ; **TVU (TPEv)**  $\pm 0.291$  m  
**Timestamp:** 2007-178.21:47:44.327 (06/27/2007)  
**Survey Line:** h11642 / s1212\_simrad / 2007-178 / 088\_2136  
**Profile/Beam:** 3060/19  
**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

**Remarks:**

Sedimentation from the Puyallup River has altered the contours in the river delta. This 15-foot sounding represents the least depth of the shoal at the offshore limit.

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
h11642/s1212_simrad/2007-178/088_2136	3060/19	0.00	000.0	Primary

**Hydrographer Recommendations**

Chart 15-foot sounding; delete 18-foot charted sounding.

**Cartographically-Rounded Depth (Affected Charts):**

15ft (18453\_1)

2 ½fm (18448\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

2fm 3ft (18445\_7, 18474\_1, 18445\_8)

4.6m (501\_1, 50\_1)

**S-57 Data**

**Geo object 1:** Sounding (SOUNDG)  
**Attributes:** QUASOU - 6:least depth known  
 RECDAT - 20090202

SORDAT - 20090403

SORIND - US, US, nsurf,H11642

TECSOU - 3:found by multi-beam

## Office Notes

Concur - Chart 15 ft depth.



**1.7) 20 Obstn 4467/111****DANGER TO NAVIGATION****Survey Summary**

**Survey Position:** 47° 17' 01.6" N, 122° 24' 44.1" W  
**Least Depth:** 6.32 m (= 20.74 ft = 3.457 fm = 3 fm 2.74 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 1.465$  m ; **TVU (TPEv)**  $\pm 0.355$  m  
**Timestamp:** 2007-190.19:07:29.522 (07/09/2007)  
**Survey Line:** h11642 / s1212\_simrad / 2007-190 / 076\_1853  
**Profile/Beam:** 4467/111  
**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

**Remarks:**

Submerged object rising 7.6 feet, with least depth 20.7 feet. The obstruction is possibly a submerged piling or dolphin.

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
h11642/s1212_simrad/2007-190/076_1853	4467/111	0.00	000.0	Primary
h11642/s1212sss_100/2008-206/sonar_data080724161800	0001	7.75	292.3	Secondary (grouped)

**Hydrographer Recommendations**

Chart obstruction with least depth.

**Cartographically-Rounded Depth (Affected Charts):**

20ft (18453\_1)

3 ½fm (18448\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

3fm 2ft (18445\_7, 18474\_1, 18445\_8)

6.3m (501\_1, 50\_1)

**S-57 Data**

**Geo object 1:** Obstruction (OBSTRN)

**Attributes:** QUASOU - 6:least depth known

RECDAT - 20081210

SORDAT - 20070709

SORIND - US, US,nsurf,H11642

TECSOU - 2,3:found by side scan sonar,found by multi-beam

VALSOU - 6.323 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

## Office Notes

Concur - Add 20 Obstrn and danger curve in present survey location.

**1.8) 15 depth - 615/104****DANGER TO NAVIGATION****Survey Summary**

**Survey Position:** 47° 16' 20.3" N, 122° 25' 55.0" W  
**Least Depth:** 4.59 m (= 15.06 ft = 2.509 fm = 2 fm 3.06 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 1.430$  m ; **TVU (TPEv)**  $\pm 0.266$  m  
**Timestamp:** 2007-190.20:44:38.011 (07/09/2007)  
**Survey Line:** h11642 / s1212\_simrad / 2007-190 / 117\_2042  
**Profile/Beam:** 615/104  
**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

**Remarks:**

Sedimentation from the Puyallup River has altered the contours in the river delta. This 15-foot sounding lies seaward of the 30-foot contour and adjacent to a charted 24-foot shoal sounding.

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
h11642/s1212_simrad/2007-190/117_2042	615/104	0.00	000.0	Primary

**Hydrographer Recommendations**

Chart 15-foot shoal sounding; delete charted 24-foot shoal.

**Cartographically-Rounded Depth (Affected Charts):**

15ft (18453\_1)

2 ½fm (18448\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

2fm 3ft (18445\_7, 18474\_1, 18445\_8)

4.6m (501\_1, 50\_1)

**S-57 Data**

**Geo object 1:** Sounding (SOUNDG)  
**Attributes:** QUASOU - 1:depth known  
 RECDAT - 20090202

SORDAT - 20070709

SORIND - US, US Survey H11642

TECSOU - 3:found by multi-beam

## Office Notes

Concur - Add 15 ft depth.

**1.9) 53 Wk - 59/5****DANGER TO NAVIGATION****Survey Summary**

**Survey Position:** 47° 17' 43.1" N, 122° 25' 27.0" W  
**Least Depth:** 16.29 m (= 53.45 ft = 8.909 fm = 8 fm 5.45 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 2.126$  m ; **TVU (TPEv)**  $\pm 1.416$  m  
**Timestamp:** 2007-192.19:17:36.270 (07/11/2007)  
**Survey Line:** h11642 / s1212\_simrad / 2007-192 / 034\_1917  
**Profile/Beam:** 59/5  
**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

**Remarks:**

SS and SWMB coverage over wreck with a least depth of 53 feet on north end. The wreck is 185 feet long, 30 feet wide, and is oriented to the north at 010 degrees.

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
h11642/s1212_simrad/2007-192/034_1917	59/5	0.00	000.0	Primary
h11642/s1212sss_100/2008-149/sonar_data080528215000	0001	32.09	345.7	Secondary (grouped)
h11642/s1212_simrad/2007-192/042_1845	2112/91	45.50	011.1	Secondary (grouped)

**Hydrographer Recommendations**

Chart wreck as surveyed.

**Cartographically-Rounded Depth (Affected Charts):**

53ft (18453\_1)

8  $\frac{3}{4}$ fm (18448\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

8fm 5ft (18445\_7, 18474\_1, 18445\_8)

16.3m (501\_1, 50\_1)

## S-57 Data

**Geo object 1:** Wreck (WRECKS)  
**Attributes:** CATWRK - 2:dangerous wreck  
CONVIS - 2:not visual conspicuous  
PICREP - item\_59\_5.jpg  
QUASOU - 6:least depth known  
RECDAT - 20081216  
SORDAT - 20090403  
SORIND - US, US,nsurf,H11642  
TECSOU - 2,3:found by side scan sonar,found by multi-beam  
VALSOU - 16.292 m  
VERDAT - 12:Mean lower low water  
WATLEV - 3:always under water/submerged

## Office Notes

Concur - Add 53 Wk and danger curve in present survey location.

### Feature Images

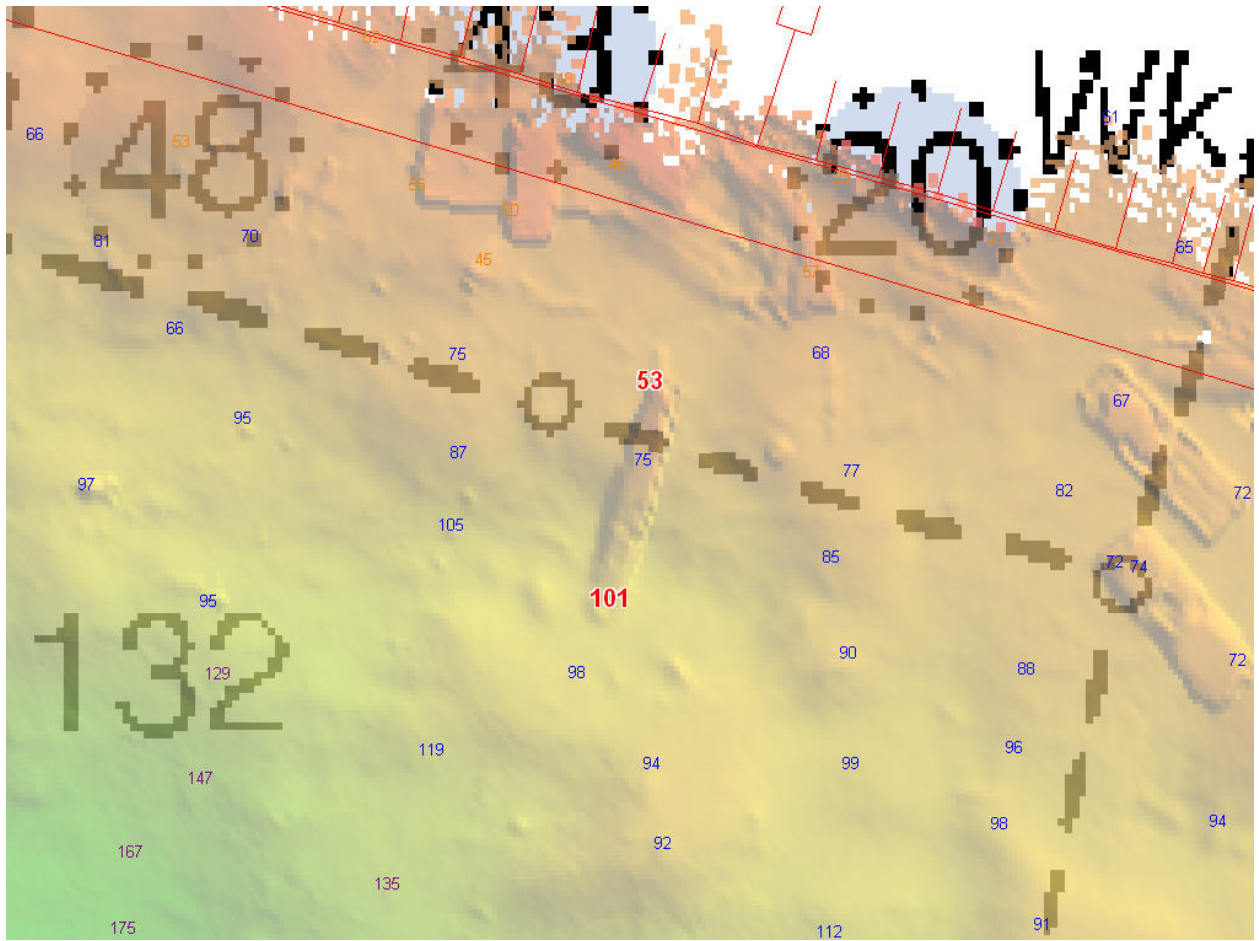


Figure 1.9.1

**1.10) 23 Wks 2049/123****DANGER TO NAVIGATION****Survey Summary**

**Survey Position:** 47° 17' 38.7" N, 122° 25' 09.6" W  
**Least Depth:** 6.95 m (= 22.80 ft = 3.800 fm = 3 fm 4.80 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 1.570$  m ; **TVU (TPEv)**  $\pm 0.684$  m  
**Timestamp:** 2007-192.19:03:13.949 (07/11/2007)  
**Survey Line:** h11642 / s1212\_simrad / 2007-192 / 038\_1856  
**Profile/Beam:** 2049/123  
**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

**Remarks:**

An obstruction with a least depth of 23 feet was found 60 meters southeast of the entrance to the Tye Marina. The obstruction consists of a cluster of submerged wreckage and debris and is near the likely paths of vessel traffic transiting to and from the marina. The least depth currently charted in the area is a 43-foot charted sounding 75 meters to the south and seaward of the obstruction, while a charted 76 exists 90 meters to the northwest.

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
h11642/s1212_simrad/2007-192/038_1856	2049/123	0.00	000.0	Primary

**Hydrographer Recommendations**

Chart obstruction with least depth as surveyed.

**Cartographically-Rounded Depth (Affected Charts):**

23ft (18453\_1)

3  $\frac{3}{4}$ fm (18448\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

3fm 5ft (18445\_7, 18474\_1, 18445\_8)

7.0m (501\_1, 50\_1)

**S-57 Data**

**Geo object 1:** Wreck (WRECKS)



**Attributes:** PICREP - dton\_2049\_123.jpg  
VALSOU - 6.950 m

## Office Notes

Concur w/ clarification. 23 Obstruction determine to be two (2) wrecks. Chart wrecks with a depth of 23 feet in Latitude 47°17'38.696"N, Longitude 122°25'09.631"W. Delete the charted 23 Obsn and danger curve. Add 23 Wks and danger curve.

### Feature Images

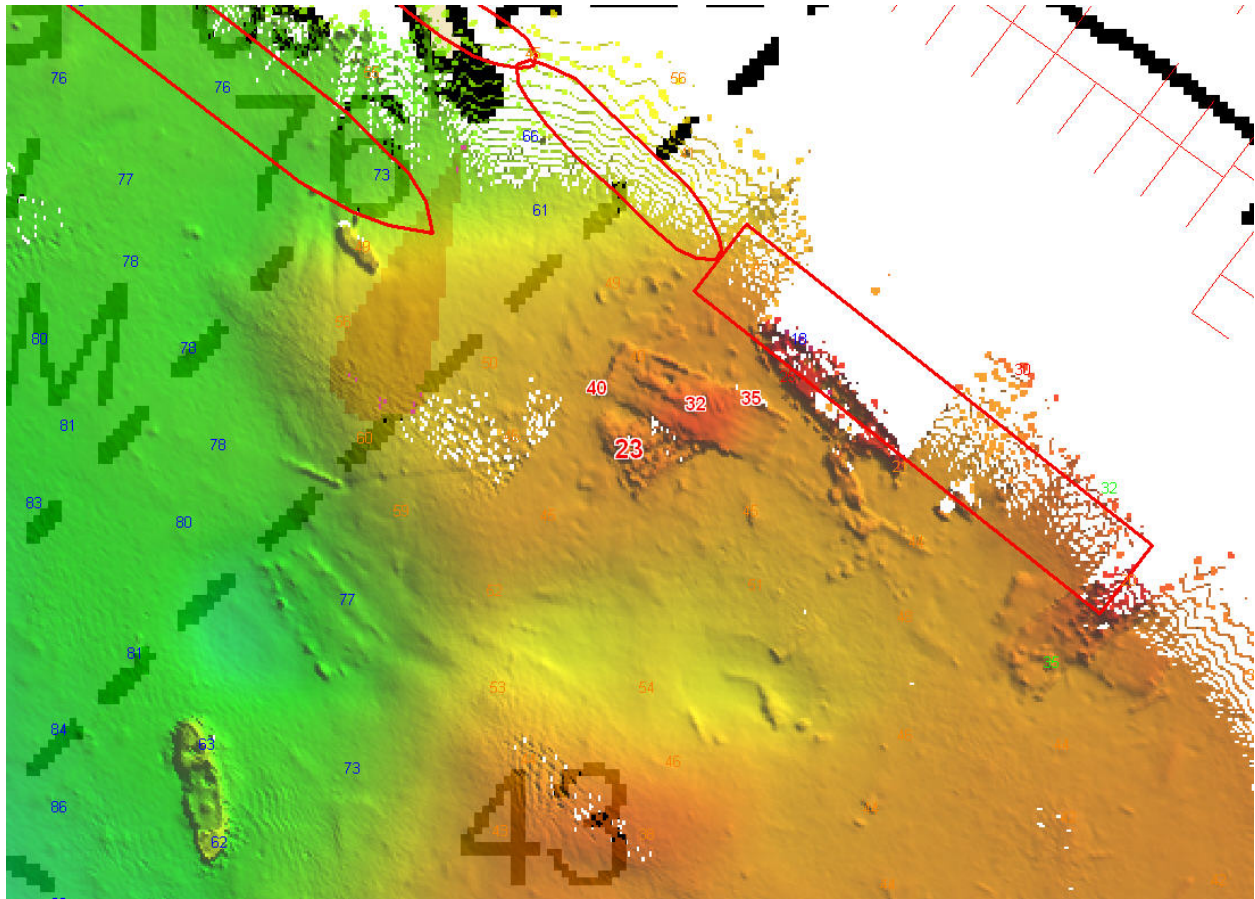


Figure 1.10.1

**1.11) 57 Wk - 2530/81****DANGER TO NAVIGATION****Survey Summary**

**Survey Position:** 47° 17' 45.3" N, 122° 25' 33.5" W  
**Least Depth:** 17.34 m (= 56.89 ft = 9.482 fm = 9 fm 2.89 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 1.640$  m ; **TVU (TPEv)**  $\pm 0.270$  m  
**Timestamp:** 2007-192.18:53:16.045 (07/11/2007)  
**Survey Line:** h11642 / s1212\_simrad / 2007-192 / 042\_1845  
**Profile/Beam:** 2530/81  
**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

**Remarks:**

SS and SWMB coverage over wreck with least depth of 57 feet on north end. The wreck is 130 feet long, 52 feet wide, and oriented to the north at 025 degrees.

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
h11642/s1212_simrad/2007-192/042_1845	2530/81	0.00	000.0	Primary
h11642/s1212sss_100/2008-149/sonar_data080528215000	0008	20.73	327.9	Secondary (grouped)
h11642/s1212_simrad/2007-192/042_1845	2731/22	35.47	037.8	Secondary (grouped)

**Hydrographer Recommendations**

Chart wreck as surveyed.

**Cartographically-Rounded Depth (Affected Charts):**

57ft (18453\_1)

9 ½fm (18448\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

9fm 3ft (18445\_7, 18474\_1, 18445\_8)

17.3m (501\_1, 50\_1)

## S-57 Data

**Geo object 1:** Wreck (WRECKS)  
**Attributes:** CATWRK - 2:dangerous wreck  
CONVIS - 2:not visual conspicuous  
QUASOU - 1:depth known  
RECDAT - 20081216  
SORDAT - 20070711  
SORIND - US, US Survey H11642  
TECSOU - 2,3:found by side scan sonar,found by multi-beam  
VALSOU - 17.340 m  
WATLEV - 3:always under water/submerged

## Office Notes

Concur - Add 57 Wk and danger curve in present survey location.

### Feature Images

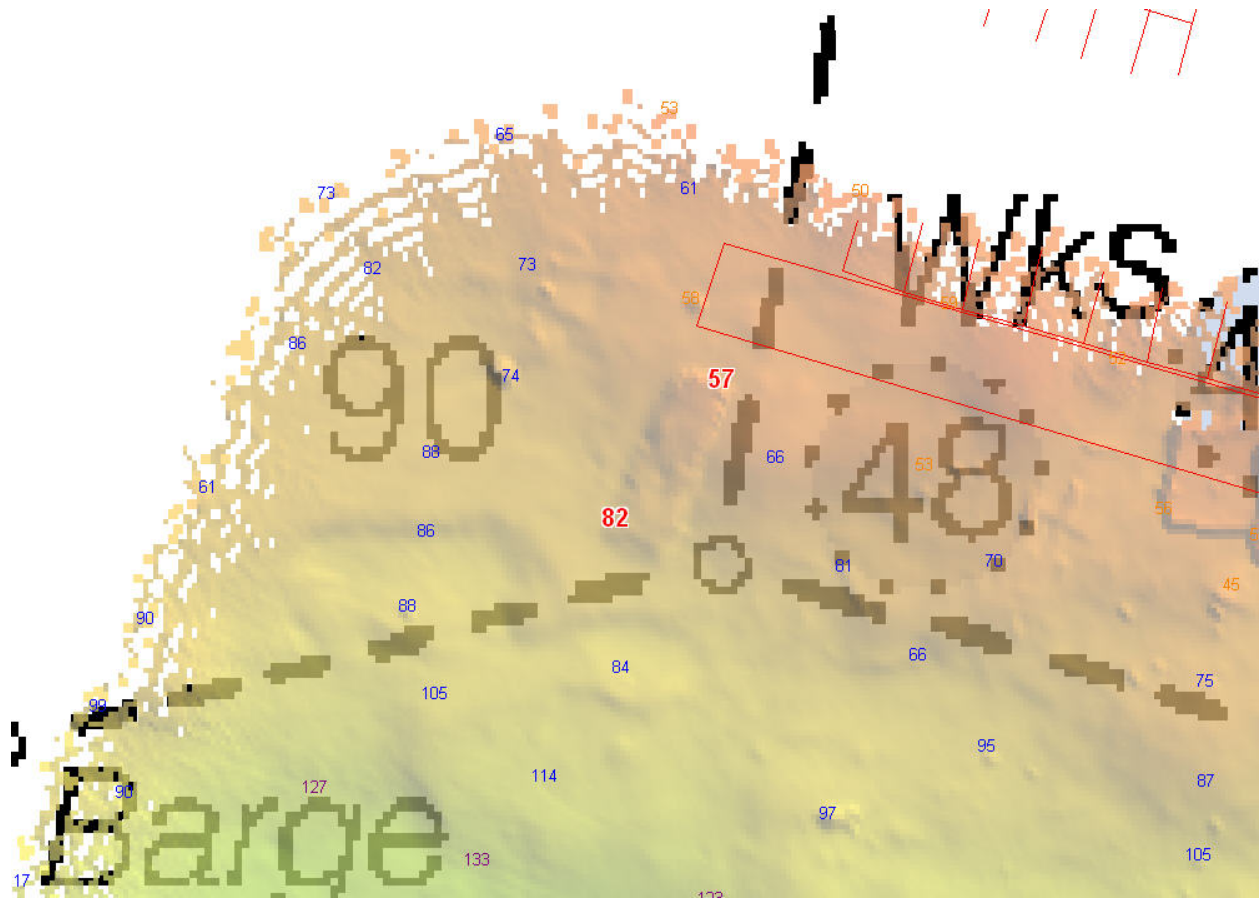


Figure 1.11.1

**1.12) 12 Obstrn 293/101****DANGER TO NAVIGATION****Survey Summary**

**Survey Position:** 47° 17' 23.5" N, 122° 24' 40.6" W  
**Least Depth:** 3.66 m (= 12.00 ft = 2.001 fm = 2 fm 0.00 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 1.423$  m ; **TVU (TPEv)**  $\pm 0.249$  m  
**Timestamp:** 2007-193.23:15:17.879 (07/12/2007)  
**Survey Line:** h11642 / s1212\_simrad / 2007-193 / 054\_2314  
**Profile/Beam:** 293/101  
**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

**Remarks:**

A four-foot obstruction approximately 22 feet long and 12 feet wide was found with SWMB. The obstruction has a least depth of 12 feet and plots over a charted 17-foot depth.

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
h11642/s1212_simrad/2007-193/054_2314	293/101	0.00	000.0	Primary

**Hydrographer Recommendations**

Chart 12-foot obstruction; delete charted 17-foot depth.

**Cartographically-Rounded Depth (Affected Charts):**

12ft (18453\_1)

2fm (18448\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

2fm 0ft (18445\_7, 18474\_1, 18445\_8)

3.7m (501\_1, 50\_1)

**S-57 Data**

**Geo object 1:** Obstruction (OBSTRN)  
**Attributes:** CATOBS - 1:snag / stump  
 RECDAT - 20081216

SORDAT - 20070712  
SORIND - US, US Survey H11642  
TECSOU - 3:found by multi-beam  
VALSOU - 3.659 m  
WATLEV - 3:always under water/submerged

**Geo object 2:** Sounding (SOUNDG)

**Attributes:** SORDAT - 20070712  
SORIND - US, US Survey H11642  
TECSOU - 3:found by multi-beam

## Office Notes

Concur - Add 12 Obstrn and danger curve in present survey location.

### Feature Images

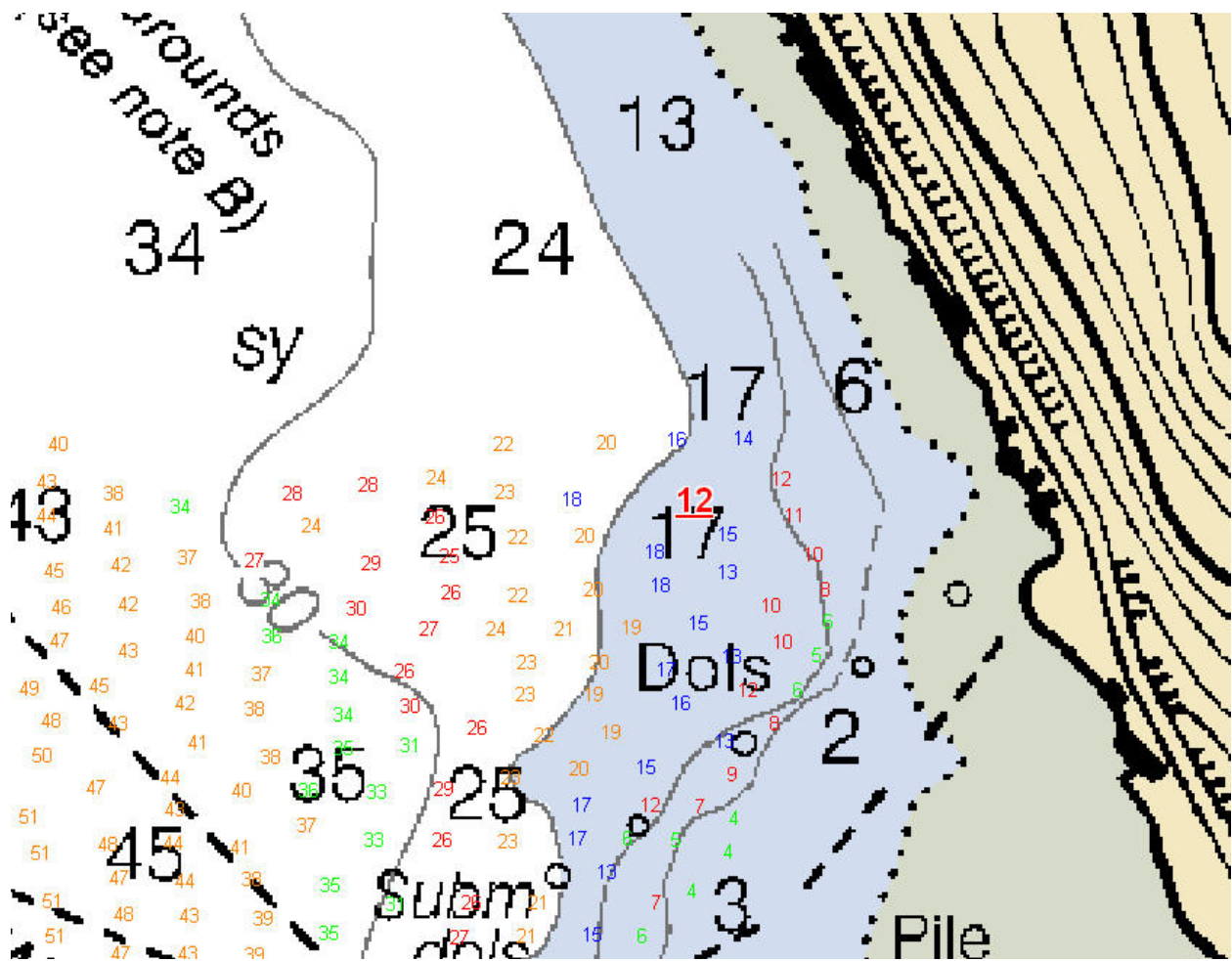


Figure 1.12.1



**1.13) Sewer pipe - 259/32****DANGER TO NAVIGATION****Survey Summary**

**Survey Position:** 47° 16' 00.2" N, 122° 25' 54.6" W  
**Least Depth:** 7.97 m (= 26.15 ft = 4.358 fm = 4 fm 2.15 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 1.443$  m ; **TVU (TPEv)**  $\pm 0.250$  m  
**Timestamp:** 2007-199.19:20:48.731 (07/18/2007)  
**Survey Line:** h11642 / s1212\_simrad / 2007-199 / 007\_1920  
**Profile/Beam:** 259/32  
**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

**Remarks:**

Inshore limit of uncharted submerged pipe as detectable with imagery and SWMB data. Pipeline is oriented 306/126 degrees.

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
h11642/s1212_simrad/2007-199/007_1920	259/32	0.00	000.0	Primary

**Hydrographer Recommendations**

Chart new pipeline as surveyed

**Cartographically-Rounded Depth (Affected Charts):**

26ft (18453\_1)

4 ¼fm (18448\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

4fm 2ft (18445\_7, 18474\_1, 18445\_8)

8.0m (501\_1, 50\_1)

**S-57 Data**

**Geo object 1:** Pipeline, submarine/on land (PIPSOL)

**Attributes:** CATPIP - 2:outfall pipe

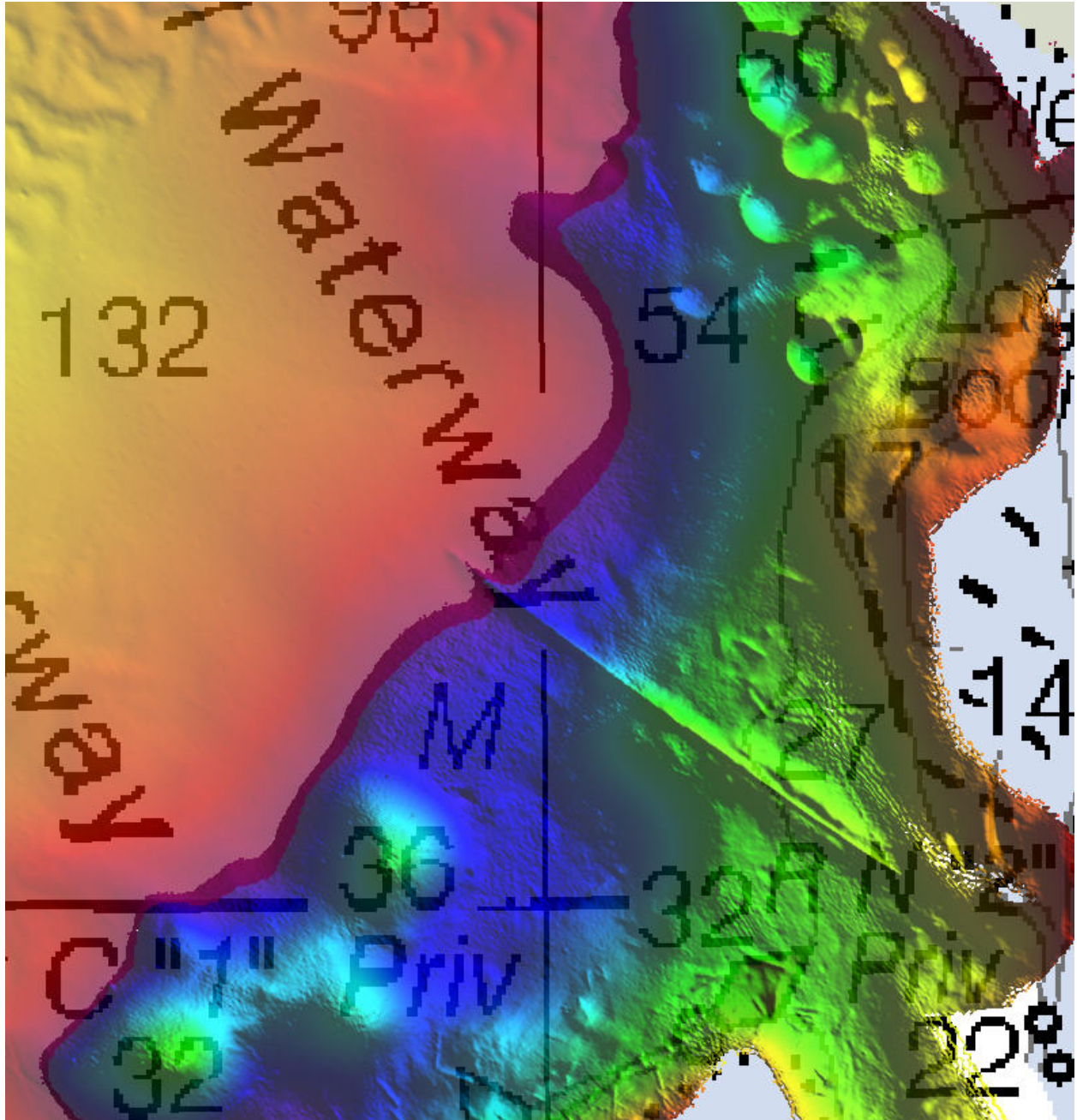
SORDAT - 20080725

SORIND - us,us,survy,11642

## **Office Notes**

Concur with clarification - Pipeline shown on chart 18453, 25th., Ed. Sep./07. No change in charting recommended.

**Feature Images**



*Figure 1.13.1*

**1.14) 28 depth - 1606/119****DANGER TO NAVIGATION****Survey Summary**

**Survey Position:** 47° 16' 22.8" N, 122° 26' 01.7" W  
**Least Depth:** 8.69 m (= 28.52 ft = 4.753 fm = 4 fm 4.52 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 1.567$  m ; **TVU (TPEv)**  $\pm 0.590$  m  
**Timestamp:** 2007-178.20:44:44.190 (06/27/2007)  
**Survey Line:** h11642 / s1212\_simrad / 2007-178 / 110\_2038  
**Profile/Beam:** 1606/119  
**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

**Remarks:**

Sedimentation from the Puyallup River has altered the contours in the river delta. This 28-foot sounding marks the SW offshore limit of the significant shoal area.

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
h11642/s1212_simrad/2007-178/110_2038	1606/119	0.00	000.0	Primary

**Hydrographer Recommendations**

Revise 30-foot contour; chart sounding.

**Cartographically-Rounded Depth (Affected Charts):**

28ft (18453\_1)

4  $\frac{3}{4}$ fm (18448\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

4fm 4ft (18445\_7, 18474\_1, 18445\_8)

8.7m (501\_1, 50\_1)

**S-57 Data**

**Geo object 1:** Sounding (SOUNDG)

**Attributes:** RECDAT - 20090202

SORDAT - 20070626

SORIND - US, US Survey H11642

TECSOU - 3:found by multi-beam

## Office Notes

Concur- Chart 28 ft depth.

**1.15) 11 depth - 1294/15****DANGER TO NAVIGATION****Survey Summary**

**Survey Position:** 47° 16' 19.1" N, 122° 25' 52.9" W  
**Least Depth:** 3.40 m (= 11.15 ft = 1.859 fm = 1 fm 5.15 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 1.421$  m ; **TVU (TPEv)**  $\pm 0.288$  m  
**Timestamp:** 2007-190.20:40:59.155 (07/09/2007)  
**Survey Line:** h11642 / s1212\_simrad / 2007-190 / 115\_2036  
**Profile/Beam:** 1294/15  
**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

**Remarks:**

Sedimentation from the Puyallup River has altered the contours in the river delta. This 11-foot sounding lies on top of the charted 30-foot contour.

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
h11642/s1212_simrad/2007-190/115_2036	1294/15	0.00	000.0	Primary

**Hydrographer Recommendations**

Chart 11-foot shoal.

**Cartographically-Rounded Depth (Affected Charts):**

11ft (18453\_1)

1  $\frac{3}{4}$ fm (18448\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

1fm 5ft (18445\_7, 18474\_1, 18445\_8)

3.4m (501\_1, 50\_1)

**S-57 Data**

**Geo object 1:** Sounding (SOUNDG)

**Attributes:** RECDAT - 20090202

SORDAT - 20070708

SORIND - US, US Survey H11642

TECSOU - 3:found by multi-beam

## Office Notes

Concur - Chart 11 ft depth.

**1.16) 28 depth - 191/119****DANGER TO NAVIGATION****Survey Summary**

**Survey Position:** 47° 16' 24.6" N, 122° 25' 58.2" W  
**Least Depth:** 8.54 m (= 28.03 ft = 4.671 fm = 4 fm 4.03 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 1.594$  m ; **TVU (TPEv)**  $\pm 0.632$  m  
**Timestamp:** 2007-190.20:55:35.994 (07/09/2007)  
**Survey Line:** h11642 / s1212\_simrad / 2007-190 / 127\_2054  
**Profile/Beam:** 191/119  
**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

**Remarks:**

Sedimentation from the Puyallup River has altered the contours in the river delta. This 28-foot sounding marks the NE offshore limit of the significant shoal area and plots over a charted 35-foot sounding.

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
h11642/s1212_simrad/2007-190/127_2054	191/119	0.00	000.0	Primary

**Hydrographer Recommendations**

Delete 35-foot charted depth; chart the 28-foot sounding at the surveyed location.

**Cartographically-Rounded Depth (Affected Charts):**

28ft (18453\_1)

4 ½fm (18448\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

4fm 4ft (18445\_7, 18474\_1, 18445\_8)

8.5m (501\_1, 50\_1)

**S-57 Data**

**Geo object 1:** Sounding (SOUNDG)

**Attributes:** RECDAT - 20090202

SORDAT - 20070708



SORIND - US, US Survey H11642

TECSOU - 3:found by multi-beam

## Office Notes

Concur Chart 28 ft depth.

**1.17) Sewer pipe 1808/42****DANGER TO NAVIGATION****Survey Summary**

**Survey Position:** 47° 16' 03.2" N, 122° 26' 00.6" W  
**Least Depth:** 17.52 m (= 57.48 ft = 9.580 fm = 9 fm 3.48 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 1.713$  m ; **TVU (TPEv)**  $\pm 0.333$  m  
**Timestamp:** 2007-192.21:59:13.201 (07/11/2007)  
**Survey Line:** h11642 / s1212\_simrad / 2007-192 / 007\_2152  
**Profile/Beam:** 1808/42  
**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

**Remarks:**

Offshore end uncharted pipeline which is oriented at 306/126 degrees

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
h11642/s1212_simrad/2007-192/007_2152	1808/42	0.00	000.0	Primary
h11642/s1212_simrad/2007-192/010_2203	305/39	16.39	130.1	Secondary

**Hydrographer Recommendations**

Chart new pipeline as surveyed

**Cartographically-Rounded Depth (Affected Charts):**

57ft (18453\_1)

9 ½fm (18448\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

9fm 3ft (18445\_7, 18474\_1, 18445\_8)

17.5m (501\_1, 50\_1)

**S-57 Data**

**Geo object 1:** Pipeline, submarine/on land (PIPSOL)

**Attributes:** CATPIP - 2:outfall pipe

SORDAT - 20070709

SORIND - us,us,survy,H11642

## **Office Notes**

Concur with clarification - Pipeline shown on chart 18453, 25th., Ed. Sep./07. No change in charting recommended.

**1.18) 43 Wk - 116/126****DANGER TO NAVIGATION****Survey Summary**

**Survey Position:** 47° 17' 36.5" N, 122° 25' 13.8" W  
**Least Depth:** 13.10 m (= 42.99 ft = 7.164 fm = 7 fm 0.99 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 2.050$  m ; **TVU (TPEv)**  $\pm 1.401$  m  
**Timestamp:** 2008-114.18:06:38.802 (04/23/2008)  
**Survey Line:** h11642 / s1212\_simrad / 2008-114 / 012\_1806  
**Profile/Beam:** 116/126  
**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

**Remarks:**

SS and SWMB coverage over uncharted wreck with a least depth of 62 feet on the north end. The wreck is 95 feet long, 24 feet wide, and is oriented to the north at approximately 350 degrees.

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
h11642/s1212_simrad/2008-114/012_1806	116/126	0.00	000.0	Primary
h11642/s1212_simrad/2007-192/034_1917	882/24	6.45	172.9	Secondary
h11642/s1212sss_100/2008-190/sonar_data080708201500	0002	8.01	240.2	Secondary
h11642/s1212_simrad/2007-192/034_1917	907/53	14.00	354.0	Secondary

**Hydrographer Recommendations**

Chart wreck as surveyed.

**Cartographically-Rounded Depth (Affected Charts):**

43ft (18453\_1)

7fm (18448\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

7fm 1ft (18445\_7, 18474\_1, 18445\_8)

13.1m (501\_1, 50\_1)

## S-57 Data

**Geo object 1:** Wreck (WRECKS)

**Attributes:** VALSOU - 13.102 m

## Office Notes

Concur - Add 43 Wk and danger curve in present survey location.

# H11642 AWOIS REPORT

**Registry Number:** H11642  
**State:** Washington  
**Locality:** Commencement Bay  
**Sub-locality:** Thea Foss Waterway to Hylebos Waterway  
**Project Number:** OPR-N411-NRT3-08  
**Survey Dates:** 07/09/2007 - 07/11/2007

## Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
18453	25th	10/01/2007	1:15,000 (18453_1)	USCG LNM: 10/17/2006 (12/12/2006) CHS NTM: None (10/27/2006) NGA NTM: 02/26/2000 (12/23/2006)
18474	8th	10/01/2003	1:40,000 (18474_1)	[L]NTM: ?
18445	32nd	08/01/2007	1:80,000 (18445_8) 1:40,000 (18445_7)	[L]NTM: ?
18448	34th	07/01/2006	1:80,000 (18448_1)	[L]NTM: ?
18440	29th	10/01/2007	1:150,000 (18440_1)	[L]NTM: ?
18003	20th	11/01/2006	1:736,560 (18003_1)	[L]NTM: ?
18007	32nd	07/01/2005	1:1,200,000 (18007_1)	[L]NTM: ?
501	12th	11/01/2002	1:3,500,000 (501_1)	[L]NTM: ?
530	32nd	06/01/2007	1:4,860,700 (530_1)	[L]NTM: ?
50	6th	06/01/2003	1:10,000,000 (50_1)	[L]NTM: ?

\* Correction(s) - source: last correction applied (last correction reviewed--"cleared date")

## Features

No.	Name	Feature Type	Survey Depth	Survey Latitude	Survey Longitude	AWOIS Item
1.1	AWOIS #53275 - Retain	AWOIS	[no data]	[no data]	[no data]	---
1.2	AWOIS #53276 - Retain	AWOIS	[no data]	[no data]	[no data]	---
1.3	AWOIS #53278 - Retain	AWOIS	[no data]	[no data]	[no data]	---
1.4	AWOIS #53279 - Retain	AWOIS	[no data]	[no data]	[no data]	---
1.5	AWOIS #53280 - Revise	AWOIS	[no data]	[no data]	[no data]	---
1.6	AWOIS #53281- Revise	AWOIS	[no data]	[no data]	[no data]	---

1.7	AWOIS #53282 - Retain	AWOIS	[no data]	[no data]	[no data]	---
1.8	AWOIS 353283 - Retain	AWOIS	[no data]	[no data]	[no data]	---
1.9	AWOIS #52576 - Retain	AWOIS	[no data]	[no data]	[no data]	---
1.10	AWOIS #52580 - Retain	AWOIS	[no data]	[no data]	[no data]	---
1.11	AWOIS #52585 - retain	AWOIS	[no data]	[no data]	[no data]	---
1.12	AWOIS #52305 - Obstn - Subm pile - 170/39	Obstruction	4.71 m	47° 16' 57.7" N	122° 24' 41.5" W	52305
1.13	AWOIS #53277 - 2405/113	Wreck	16.18 m	47° 17' 44.8" N	122° 25' 31.6" W	53277

**1 - DR\_AWOIS**



**1.1) AWOIS #53275 - AWOIS #53275 - Retain**

**No Primary Survey Feature for this AWOIS Item**

**Search Position:** 47° 17' 46.8" N, 122° 25' 48.6" W  
**Historical Depth:** [None]  
**Search Radius:** 0  
**Search Technique:** [None]  
**Technique Notes:** [None]

**History Notes:**

F00466/00-- OPR-N411-NRB; LOCATED A WRECK WITH SIDE SCAN SONAR AT POSITION OF 47/17/46.853N - 122/25/48.554W. DIVER LOCATED A PARTIALLY DETERIORATED WOOD FISHING BOAT APPROXIMATELY 50' X 15'. THE VESSEL ORIENTED E-W AND IS RESTING ON ITS SIDE. LEAST DEPTH DETERMINED BY DIVERS LEAST DEPTH GAUGE AT 46 FEET.

**Survey Summary**

**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

**Remarks:**

Item not investigated.

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
Tacoma Awois	AWOIS # 53275	0.00	000.0	Primary

**Hydrographer Recommendations**

No change in charting.

**S-57 Data**

[None]

## Office Notes

Concur - Retain as charted.

**1.2) AWOIS #53276 - AWOIS #53276 - Retain****No Primary Survey Feature for this AWOIS Item**

**Search Position:** 47° 17' 49.4" N, 122° 25' 39.5" W  
**Historical Depth:** [None]  
**Search Radius:** 75  
**Search Technique:** S2,ES,DI,SD  
**Technique Notes:** [None]

**History Notes:**

L 2115/77-- WRECK EXPOSED ABOVE HIGH WATER LEVEL AT 47/17/50N - 122/25/35W (NAD 27). ■  
 \*\*\*\*UNKNOWN SOURCE-- SOMETIME BETWEEN 1980 AND 1984, THE VISIBLE WRECK WAS  
 CHARTED AS A SUBMERGED WRECK. (ENTERED CEH 6/05)

**Survey Summary**

**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1,  
 530\_1, 50\_1

**Remarks:**

L 2115/77-- WRECK EXPOSED ABOVE HIGH WATER LEVEL AT 47/17/50N - 122/25/35W (NAD 27).  
 \*\*\*\*UNKNOWN SOURCE-- SOMETIME BETWEEN 1980 AND 1984, THE VISIBLE WRECK WAS  
 CHARTED AS A SUBMERGED WRECK. (ENTERED CEH 6/05)

Item not investigated

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
Tacoma Awois	AWOIS # 53276	0.00	000.0	Primary

**Hydrographer Recommendations**

Item not in survey limits. No change in charting.

**S-57 Data**

[None]

## Office Notes

Concur - Retain as charted.

### 1.3) AWOIS #53278 - AWOIS #53278 - Retain

#### No Primary Survey Feature for this AWOIS Item

**Search Position:** 47° 17' 45.3" N, 122° 25' 28.2" W  
**Historical Depth:** [None]  
**Search Radius:** 0  
**Search Technique:** [None]  
**Technique Notes:** [None]

#### History Notes:

H11041/2001-- A SUBMERGED WRECK WITH A LEAST DEPTH OF 43 FEET, WAS LOCATED AT 47/17/45.31N - 122/25/28.16W. (ENTERED CEH 6/05)

#### Survey Summary

**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

H11041/2001-- A SUBMERGED WRECK WITH A LEAST DEPTH OF 43 FEET, WAS LOCATED AT 47/17/45.31N - 122/25/28.16W. (ENTERED CEH 6/05) Area was not completely investigated.

#### Feature Correlation

Address	Feature	Range	Azimuth	Status
Tacoma Awois	AWOIS # 53278	0.00	000.0	Primary
h11642/s1212_simrad/2007-192/038_1856	682/12	28.48	321.8	Secondary (grouped)

#### Hydrographer Recommendations

No change in charting.

#### S-57 Data

[None]

## Office Notes

Concur - Retain charted 43 Wk and danger curve.

**1.4) AWOIS #53279 - AWOIS #53279 - Retain**

**No Primary Survey Feature for this AWOIS Item**

**Search Position:** 47° 17' 44.4" N, 122° 25' 24.6" W  
**Historical Depth:** [None]  
**Search Radius:** 0  
**Search Technique:** [None]  
**Technique Notes:** [None]

**History Notes:**

H11041/2001-- A SUBMERGED WRECK WITH A LEAST DEPTH OF 20 FEET, WAS LOCATED AT 47/17/44.4N - 122/25/24.6W. (ENTERED CEH 6/05)

**Survey Summary**

**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

**Remarks:**

Item was not investigated.

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
Tacoma Awois	AWOIS # 53279	0.00	000.0	Primary

**Hydrographer Recommendations**

No change in charting.

**S-57 Data**

**Geo object 1:** Obstruction (OBSTRN)  
**Attributes:** QUASOU - 6:least depth known  
 SORDAT - 20090403  
 SORIND - US,US,nsurf,H11642  
 TECSOU - 3:found by multi-beam  
 WATLEV - 3:always under water/submerged

## Office Notes

Concur - Retain as charted.



### Feature Images

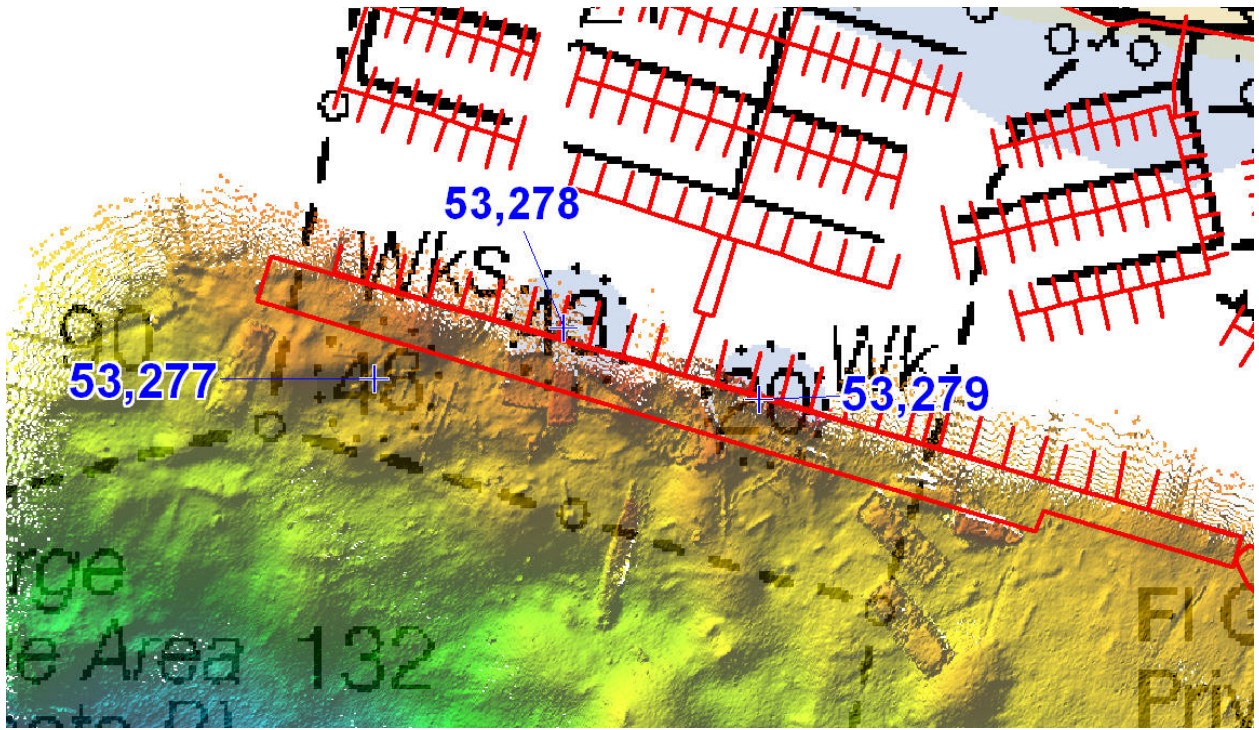


Figure 1.4.1

## 1.5) AWOIS #53280 - AWOIS #53280 - Revise

### No Primary Survey Feature for this AWOIS Item

**Search Position:** 47° 16' 41.1" N, 122° 23' 31.6" W  
**Historical Depth:** [None]  
**Search Radius:** 50  
**Search Technique:** VS, SD  
**Technique Notes:** [None]

#### History Notes:

\*\*\*\*UNKNOWN SOURCE-- A VISIBLE WRECK WAS CHARTED BETWEEN 1976 - 1978 AT THE CHARTED POSITION 47/16/41.1N - 122/23/31.6W. (ENTERED CEH 6/05)

### Survey Summary

**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

A visual search was conducted for this item 6/08. The area is used for log storage. At time of survey logs covered any wreck that may have been visible.

### Feature Correlation

Address	Feature	Range	Azimuth	Status
Tacoma Awois	AWOIS # 53280	0.00	000.0	Primary

### Hydrographer Recommendations

Retain as charted

### S-57 Data

**Geo object 1:** Wreck (WRECKS)  
**Attributes:** CATWRK - 2:dangerous wreck  
 QUASOU - 2:depth unknown  
 SORDAT - 20090403  
 SORIND - US,US,survey,H11642  
 WATLEV - 3:always under water/submerged

## Office Notes

Do not concur - Revise visible wreck to a dangerous sunken wreck in charted position.

## 1.6) AWOIS #53281 - AWOIS #53281- Revise

### No Primary Survey Feature for this AWOIS Item

**Search Position:** 47° 16' 42.0" N, 122° 23' 31.2" W  
**Historical Depth:** [None]  
**Search Radius:** 50  
**Search Technique:** VS, SD  
**Technique Notes:** [None]

#### History Notes:

\*\*\*\*UNKNOWN SOURCE-- A VISIBLE WRECK WAS CHARTED BETWEEN 1976 - 1978 AT THE CHARTED POSITION 47/16/42.0N - 122/23/31.17W. (ENTERED CEH 6/05)

### Survey Summary

**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

A visual search was conducted for this item June 2008. The area is used for log storage. At time of survey logs covered any wreck that may have been visible.

### Feature Correlation

Address	Feature	Range	Azimuth	Status
Tacoma Awois	AWOIS # 53281	0.00	000.0	Primary

### Hydrographer Recommendations

Retain as charted.

### S-57 Data

**Geo object 1:** Wreck (WRECKS)  
**Attributes:** CATWRK - 2:dangerous wreck  
 QUASOU - 2:depth unknown  
 SORDAT - 20090403  
 SORIND - US,US,survey,H11642  
 WATLEV - 3:always under water/submerged

## Office Notes

Do not concur - Revise visible wreck to a dangerous sunken wreck in charted position.

**1.7) AWOIS #53282 - AWOIS #53282 - Retain****No Primary Survey Feature for this AWOIS Item**

**Search Position:** 47° 16' 38.0" N, 122° 23' 22.5" W  
**Historical Depth:** [None]  
**Search Radius:** 50  
**Search Technique:** VS, SD  
**Technique Notes:** [None]

**History Notes:**

\*\*\*UNKNOWN SOURCE-- A VISIBLE WRECK WAS CHARTED BETWEEN 1976 - 1978 AT THE CHARTED POSITION 47/16/38.0N - 122/23/22.55W. (ENTERED CEH 6/05)

**Survey Summary**

**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

**Remarks:**

\*\*\*UNKNOWN SOURCE-- A VISIBLE WRECK WAS CHARTED BETWEEN 1976 - 1978 AT THE CHARTED POSITION 47/16/38.0N - 122/23/22.55W. (ENTERED CEH 6/05)

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
Tacoma Awois	AWOIS # 53282	0.00	000.0	Primary

**Hydrographer Recommendations**

Item outside the survey limits. No change in charting.

**S-57 Data**

[None]

**Office Notes**

Concur - Retain as charted.

**1.8) AWOIS #53283 - AWOIS 353283 - Retain**

**No Primary Survey Feature for this AWOIS Item**

**Search Position:** 47° 16' 27.2" N, 122° 22' 47.5" W  
**Historical Depth:** [None]  
**Search Radius:** 50  
**Search Technique:** VS, SD  
**Technique Notes:** [None]

**History Notes:**

\*\*\*UNKNOWN SOURCE-- A VISIBLE WRECK WAS CHARTED BETWEEN 1976 - 1978 AT THE CHARTED POSITION 47/16/27.25N - 122/23/47.55W. (ENTERED CEH 6/05)

**Survey Summary**

**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

**Remarks:**

\*\*\*UNKNOWN SOURCE-- A VISIBLE WRECK WAS CHARTED BETWEEN 1976 - 1978 AT THE CHARTED POSITION 47/16/27.25N - 122/23/47.55W. (ENTERED CEH 6/05)

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
Tacoma Awois	AWOIS # 53283	0.00	000.0	Primary

**Hydrographer Recommendations**

Item outside the survey limits. No change in charting.

**S-57 Data**

[None]

**Office Notes**

Concur - Retain as charted.

**1.9) AWOIS #52576 - AWOIS #52576 - Retain**

**No Primary Survey Feature for this AWOIS Item**

**Search Position:** 47° 17' 51.8" N, 122° 25' 38.9" W  
**Historical Depth:** [None]  
**Search Radius:** 75  
**Search Technique:** S2,ES.VS.SD,DI  
**Technique Notes:** [None]

**History Notes:**

HISTORY ■ TP00732/73-75; WRECK BARING 8 FT MHW AND WRECKS AWASH SHOWN. WRECKS EXTEND APPROX 60M ABOUT A CENTRAL POINT OF LAT.47 17 52.5, LONG.122 25 34.5 NAD 27. ■ BP135819; NANJI SOURCE CHART REVISION; WRECKS NOT SEEN ON IMAGERY. ■ F00466/00-- (OPR-N411-NRB); WRECKS NOT VISIBLE AT 47/17/51.85 - 122/25/38.94. THE DETERIORATING SHELL OF A WRECK WAS OBSERVED NEAR SHORE. EVALUATOR RECOMMENDS TO DELETE CHARTED WKS NOTE AND SYMBOLOGY AND CHART VISIBLE WRECK AT AWOIS POSITION. (UPDATED CEH 6/05)

**Survey Summary**

**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

**Remarks:**

Item not investigated

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
Tacoma Awois	AWOIS # 52576	0.00	000.0	Primary

**Hydrographer Recommendations**

Item not in survey limits. No change in charting.

**S-57 Data**

[None]



## Office Notes

Concur - Retain as charted.

**1.10) AWOIS #52580 - AWOIS #52580 - Retain**

**No Primary Survey Feature for this AWOIS Item**

**Search Position:** 47° 15' 54.4" N, 122° 26' 02.5" W  
**Historical Depth:** [None]  
**Search Radius:** 30  
**Search Technique:** VS,S2,SD, ES,DI  
**Technique Notes:** SEARCH 20M ABOUT THE TWO NAD 83 POSITIONS FOR DOLS, POS. 47 15 48.15N, 122 25 58.24W AND 47 15 54.43N, 122 26 02.54W. SEARCH 15M OUT FROM AN AXIS DRAWN BETWEEN THE TWO POINTS TO DISPROVE MORAGE REMAINS.

**History Notes:**

HISTORY TP00734/74--BARGE MORAGE SHOWN AS DASHED LINE BETWEEN TWO DOLPHINS IN POS. 47 15 48.8N, 122 25 53.8W AND 47 15 55.08N, 122 25 58.1W (NAD 27) CONVERTS TO NAD 83 POS. 47 15 48.15N, 122 25 58.24W AND 47 15 54.43N, 122 26 02.54W NAD 83. \*\*\*\*1989 EDITION OF CHART 18453, DOLS REVISED TO SUBMERGED, POSSIBLY AS A RESULT OF NANCI SHORELINE REVISION. F00466/00-- OPR-N411-NRB; THE BARGE MOORAGE WAS OBSERVED AS CHARTED, THE SUBMERGED DOLS WERE NOT INVESTIGATED. RETAIN AS CHARTED. (UPDATED CEH 6/05)

**Survey Summary**

**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

**Remarks:**

HISTORY TP00734/74--BARGE MORAGE SHOWN AS DASHED LINE BETWEEN TWO DOLPHINS IN POS. 47 15 48.8N, 122 25 53.8W AND 47 15 55.08N, 122 25 58.1W (NAD 27) CONVERTS TO NAD 83 POS. 47 15 48.15N, 122 25 58.24W AND 47 15 54.43N, 122 26 02.54W NAD 83. \*\*\*\*1989 EDITION OF CHART 18453, DOLS REVISED TO SUBMERGED, POSSIBLY AS A RESULT OF NANCI SHORELINE REVISION. F00466/00-- OPR-N411-NRB; THE BARGE MOORAGE WAS OBSERVED AS CHARTED, THE SUBMERGED DOLS WERE NOT INVESTIGATED. RETAIN AS CHARTED. (UPDATED CEH 6/05)

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
Tacoma Awois	AWOIS # 52580	0.00	000.0	Primary

**Hydrographer Recommendations**

Subm dol verified during office processing. No change in charting is recommended.

### **S-57 Data**

[None]

### **Office Notes**

Concur - Retain as charted.

**1.11) AWOIS #52585 - AWOIS #52585 - retain****No Primary Survey Feature for this AWOIS Item**

**Search Position:** 47° 15' 54.8" N, 122° 26' 02.7" W  
**Historical Depth:** [None]  
**Search Radius:** 30  
**Search Technique:** VS,S2,ES,SD  
**Technique Notes:** [None]

**History Notes:**

HISTORY ■ CL917/89--MOORING BUOY ESTABLISHED BY THE COE. ENTERED 5/00 MCR ■ 47-15-54.78 N 122-26-02.72 W ■ F00466/00--OPR-N411-NRB; MOORING BUOY WAS OBSERVED AS CHARTED. RETAINED AS CHARTED. (UPDATED CEH 6/05)

**Survey Summary**

**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

**Remarks:**

A visual search was conducted June 2007. The mooring buoy was observed as charted.

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
Tacoma Awois	AWOIS # 52585	0.00	000.0	Primary

**Hydrographer Recommendations**

Retain mooring buoy as charted.

**S-57 Data**

[None]

**Office Notes**

Concur - Retain as charted.

**1.12) AWOIS #52305 - Obstn - Subm pile - 170/39****Primary Feature for AWOIS Item #52305**

**Search Position:** 47° 16' 57.5" N, 122° 24' 42.1" W  
**Historical Depth:** [None]  
**Search Radius:** 30  
**Search Technique:** S2, ES, DI, SD  
**Technique Notes:** [None]

**History Notes:**

HISTORY ■ CL313/45--USC NORTHWEST DISTRICT; RECORDED ON THE STANDARD AS BEING THE SOURCE FOR THIS SUBMERGED PILE. THE CHART LETTER NOTED AND SUPPOSEDLY CONTAINED SEVERAL GRAPHIC SOURCES OF DATA AFFECTING THE CHART IN THE VICINITY OF THE SEATTLE-TACOMA SHIPBUILDING COMPANY FACILITY, THE TODD PACIFIC SHIPYARDS FACILITY, THE WAPATO WATERWAY, AND THE HYLEBOS WATERWAY. THESE GRAPHICS WERE NOT MICROFILMED. (ENTERED 6/96 BY MBH) ■ FE427/96--S-N903-PHP-96; INADEQUATE INVESTIGATION. (UPDATED 10/97 BY MBH)

**Survey Summary**

**Survey Position:** 47° 16' 57.7" N, 122° 24' 41.5" W  
**Least Depth:** 4.71 m (= 15.46 ft = 2.577 fm = 2 fm 3.46 ft)  
**TPU ( $\pm 1.96\sigma$ ):** THU (TPEh)  $\pm 1.419$  m ; TVU (TPEv)  $\pm 0.215$  m  
**Timestamp:** 2007-190.19:44:40.747 (07/09/2007)  
**Survey Line:** h11642 / s1212\_simrad / 2007-190 / 059\_1944  
**Profile/Beam:** 170/39  
**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

**Remarks:**

A 5-foot obstruction was found with SWMB. Feature is likely a submerged piling. The position was not accessible for SS coverage. Correlating item #92/81 and item #859/124 are the remains of a drydock/rail system associated with a shipyard facility. These ramps extend along shore to the southwest.

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
h11642/s1212_simrad/2007-190/059_1944	170/39	0.00	000.0	Primary
h11642/s1212_simrad/2007-190/059_1944	92/81	6.31	335.3	Secondary (grouped)
Tacoma Awois	AWOIS # 52305	14.95	066.9	Secondary (grouped)

h11642/s1212_simrad/2007-190/063_1932	859/124	40.69	051.9	Secondary (grouped)
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## Hydrographer Recommendations

Revise position of charted submerged piling. Extend charted remains of rail system seaward.

### Cartographically-Rounded Depth (Affected Charts):

15ft (18453\_1)

2 ½fm (18448\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

2fm 3ft (18445\_7, 18474\_1, 18445\_8)

4.7m (501\_1, 50\_1)

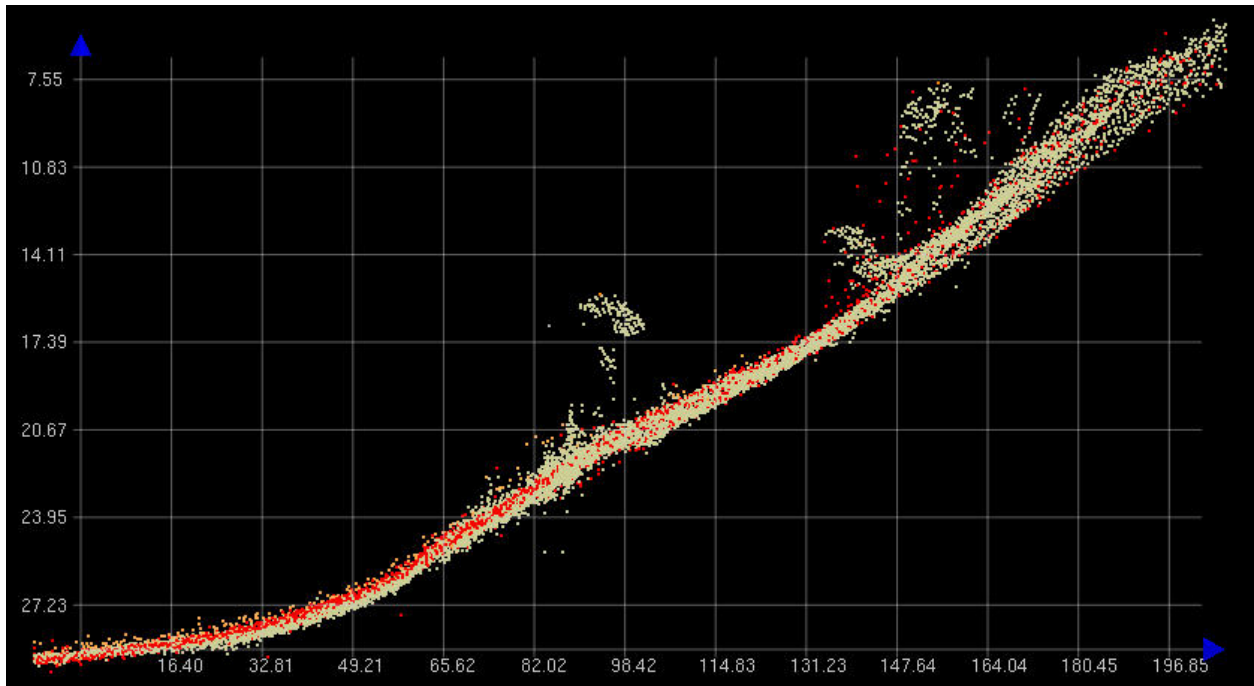
## S-57 Data

**Geo object 1:** Obstruction (OBSTRN)  
**Attributes:** CATOBS - 1:snag / stump  
 QUASOU - 1:depth known  
 TECSOU - 3:found by multi-beam  
 VALSOU - 4.712 m

## Office Notes

Concur w/ clarification. Obstruction determined to be a subm pile during office processing. Revise location of charted (AWOIS #52305) subm pile in Latitude 47°16'57.57"N, Longitude 122°24'42.20"W to present survey Latitude 47°16'57.720"N, Longitude 122°24'41.478". Revise charted Subm Pile symbol location.

### Feature Images



*Figure 1.12.1*



*Figure 1.12.2*



**1.13) AWOIS #53277 - 2405/113****Primary Feature for AWOIS Item #53277**

**Search Position:** 47° 17' 44.7" N, 122° 25' 31.6" W  
**Historical Depth:** [None]  
**Search Radius:** 0  
**Search Technique:** [None]  
**Technique Notes:** [None]

**History Notes:**

H11041/2001-- A SUBMERGED WRECK WITH A LEAST DEPTH OF 48 FEET, WAS LOCATED AT 47/17/44.69N - 122/25/31.63W. (ENTERED CEH 6/05)

**Survey Summary**

**Survey Position:** 47° 17' 44.8" N, 122° 25' 31.6" W  
**Least Depth:** 16.18 m (= 53.07 ft = 8.845 fm = 8 fm 5.07 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPE<sub>h</sub>)**  $\pm 1.748$  m ; **TVU (TPE<sub>v</sub>)**  $\pm 0.723$  m  
**Timestamp:** 2007-192.18:52:49.422 (07/11/2007)  
**Survey Line:** h11642 / s1212\_simrad / 2007-192 / 042\_1845  
**Profile/Beam:** 2405/113  
**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

**Remarks:**

Submerged wreckage with a least depth of 53 feet was found within the AWOIS search radius. The surrounding area is littered with wreckage and other submerged debris. This item is partially covered by a barge which serves as a breakwater for Tyee Marina.

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
h11642/s1212_simrad/2007-192/042_1845	2405/113	0.00	000.0	Primary
Tacoma Awois	AWOIS # 53277	2.08	017.9	Secondary (grouped)
h11642/s1212sss_100/2008-149/sonar_data080528215000	0020	18.68	308.1	Secondary (grouped)

## Hydrographer Recommendations

Wreck is seen on side scan. Chart a wreck.

### S-57 Data

**Geo object 1:** Wreck (WRECKS)  
**Attributes:** CATWRK - 2:dangerous wreck  
CONVIS - 2:not visual conspicuous  
QUASOU - 6:least depth known  
RECDAT - 20081210  
SORDAT - 20090403  
SORIND - US,US, nsurf,H11642  
TECSOU - 3:found by multi-beam  
VALSOU - 16.176 m  
VERDAT - 12:Mean lower low water  
WATLEV - 3:always under water/submerged

### Office Notes

Concur with clarification - Shoaler wreck in vicinity of 53 Wk. Delete 48 Wk and danger curve. Do not chart 53 Wk.

### Feature Images

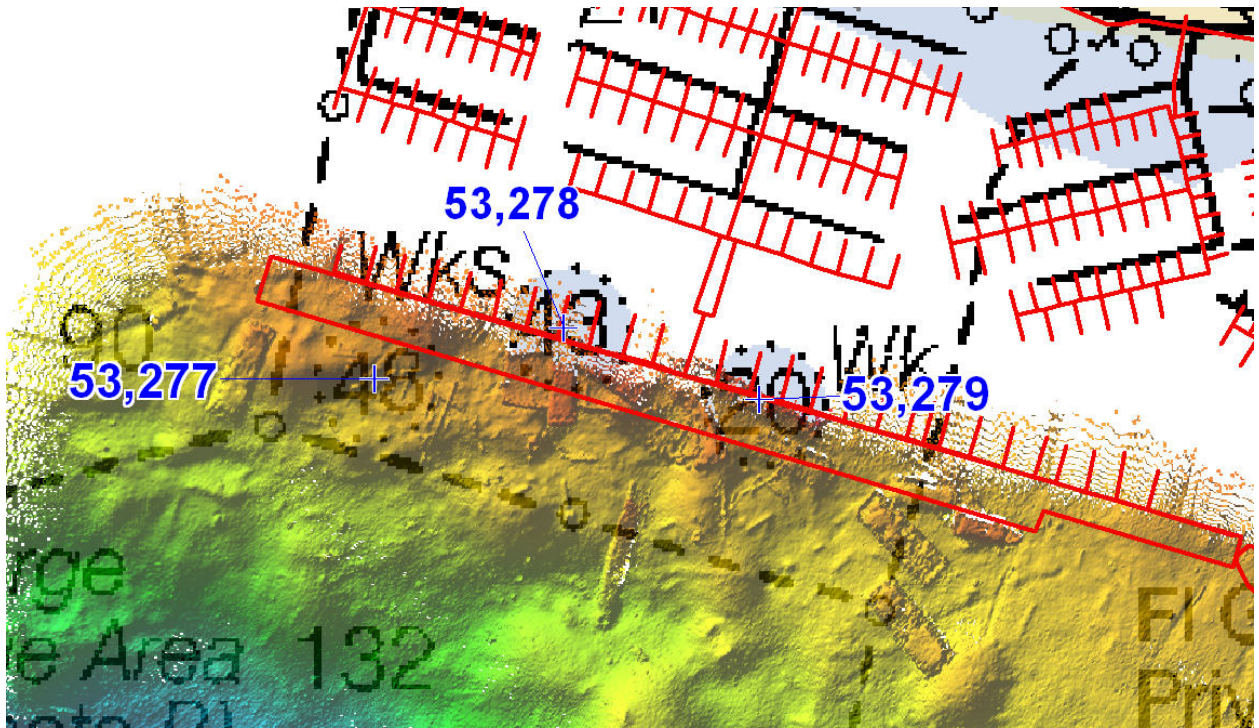


Figure 1.13.1

# H11642 UNCHARTED REPORT

**Registry Number:** H11642  
**State:** Washington  
**Locality:** Commencement Bay  
**Sub-locality:** Thea Foss Waterway to Hylebos Waterway  
**Project Number:** OPR-N411-NRT3-08  
**Survey Dates:** 06/19/2007 - 04/03/2009

## Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
18453	25th	10/01/2007	1:15,000 (18453_1)	USCG LNM: 10/17/2006 (12/12/2006) CHS NTM: None (10/27/2006) NGA NTM: 02/26/2000 (12/23/2006)
18474	8th	10/01/2003	1:40,000 (18474_1)	[L]NTM: ?
18445	32nd	08/01/2007	1:80,000 (18445_8) 1:40,000 (18445_7)	[L]NTM: ?
18448	34th	07/01/2006	1:80,000 (18448_1)	[L]NTM: ?
18440	29th	10/01/2007	1:150,000 (18440_1)	[L]NTM: ?
18003	20th	11/01/2006	1:736,560 (18003_1)	[L]NTM: ?
18007	32nd	07/01/2005	1:1,200,000 (18007_1)	[L]NTM: ?
501	12th	11/01/2002	1:3,500,000 (501_1)	[L]NTM: ?
530	32nd	06/01/2007	1:4,860,700 (530_1)	[L]NTM: ?
50	6th	06/01/2003	1:10,000,000 (50_1)	[L]NTM: ?

\* Correction(s) - source: last correction applied (last correction reviewed--"cleared date")

## Features

No.	Name	Feature Type	Survey Depth	Survey Latitude	Survey Longitude	AWOIS Item
1.1	32 Obstn-Sub dol - 2223/93	Obstruction	9.87 m	47° 15' 55.6" N	122° 26' 03.1" W	---
1.2	19 Obstn - 7487/17	Obstruction	5.89 m	47° 14' 53.1" N	122° 25' 57.2" W	---
1.3	12 Obstn - 5361/123	Obstruction	3.62 m	47° 15' 54.2" N	122° 26' 03.0" W	---
1.4	Obstn - Subm dol - 2366/56	Obstruction	3.15 m	47° 16' 51.3" N	122° 24' 50.9" W	---
1.5	Obstn - Subm pile - 1612/4	Obstruction	2.51 m	47° 16' 53.8" N	122° 24' 47.7" W	---
1.6	Obstn - Subm pile - 1089/27	Obstruction	0.89 m	47° 16' 55.7" N	122° 24' 44.5" W	---

1.7	Obstn - Subm pile - 1307/2	Obstruction	1.18 m	47° 16' 54.8" N	122° 24' 45.8" W	---
1.8	7 depth - 1446/2	Pile	2.18 m	47° 16' 54.2" N	122° 24' 46.5" W	---
1.9	37 Obstn - 1015/95	Obstruction	11.40 m	47° 17' 34.4" N	122° 25' 07.8" W	---
1.10	53 Wk 1140/27 - Delete	Wreck	16.27 m	47° 17' 42.9" N	122° 25' 20.8" W	---
1.11	49 Obstn - 1801/41	Obstruction	14.92 m	47° 17' 40.1" N	122° 25' 12.2" W	---
1.12	2374/16 - insig	Obstruction	9.52 m	47° 17' 37.5" N	122° 25' 05.2" W	---
1.13	52 Wks - 1168/32	Wreck	15.96 m	47° 17' 42.8" N	122° 25' 20.3" W	---
1.14	18 Wk - 2082/3	Wreck	5.60 m	47° 17' 39.5" N	122° 25' 08.1" W	---
1.15	34 Obstn - 2691/122	Obstruction	10.59 m	47° 17' 35.5" N	122° 25' 05.4" W	---
1.16	24 Wk - 2386/3	Wreck	7.48 m	47° 17' 37.7" N	122° 25' 04.6" W	---
1.17	41 Wks - 2331/124	Wreck	12.71 m	47° 17' 44.4" N	122° 25' 30.2" W	---
1.18	20 Obstn - 931/13	Obstruction	6.16 m	47° 15' 48.9" N	122° 25' 57.6" W	---
1.19	20 Obstn - 3311/112	Obstruction	6.30 m	47° 15' 50.4" N	122° 25' 57.1" W	---
1.20	Retain ruins - 755/87	Obstruction	5.32 m	47° 16' 09.8" N	122° 26' 53.7" W	---
1.21	Outfall pipeline - 435/40	Pipe	11.37 m	47° 16' 08.8" N	122° 26' 52.0" W	---
1.22	48 Obstn - 120/125	Obstruction	14.83 m	47° 17' 43.8" N	122° 25' 28.8" W	---

## **1 - DR\_UnCharted**

**1.1) 32 Obstn-Sub dol - 2223/93****Survey Summary**

**Survey Position:** 47° 15' 55.6" N, 122° 26' 03.1" W  
**Least Depth:** 9.87 m (= 32.39 ft = 5.399 fm = 5 fm 2.39 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 1.509$  m ; **TVU (TPEv)**  $\pm 0.284$  m  
**Timestamp:** 2007-170.16:45:58.054 (06/19/2007)  
**Survey Line:** h11642 / s1212\_simrad / 2007-170 / 185\_1641  
**Profile/Beam:** 2223/93  
**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

**Remarks:**

An obstruction which appears to be a submerged dolphin was found with SS and SWMB at the entrance to the Middle Waterway. The object rises 4.2 feet above surrounding depths and has a least depth of 32.39 feet.

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
h11642/s1212_simrad/2007-170/185_1641	2223/93	0.00	000.0	Primary
h11642/s1212sss_100/2008-190/sonar_data080708173000	0001	13.21	037.0	Secondary (grouped)
h11642/s1212sss_100/2008-190/sonar_data080708173000	0005	13.37	041.3	Secondary

**Hydrographer Recommendations**

Chart as obstruction with least depth.

**Cartographically-Rounded Depth (Affected Charts):**

32ft (18453\_1)

5 ¼fm (18448\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

5fm 2ft (18445\_7, 18474\_1, 18445\_8)

9.9m (501\_1, 50\_1)

**S-57 Data**

**Geo object 1:** Obstruction (OBSTRN)  
**Attributes:** CATOBS - 1:snag / stump  
 QUASOU - 1:depth known

RECDAT - 20081216

SORDAT - 20070619

SORIND - US, US Survey H11642

TECSOU - 2,3:found by side scan sonar,found by multi-beam

VALSOU - 9.873 m

WATLEV - 3:always under water/submerged

## Office Notes

Concur - Add 32 Obstn and danger curve in present survey location.



### Feature Images

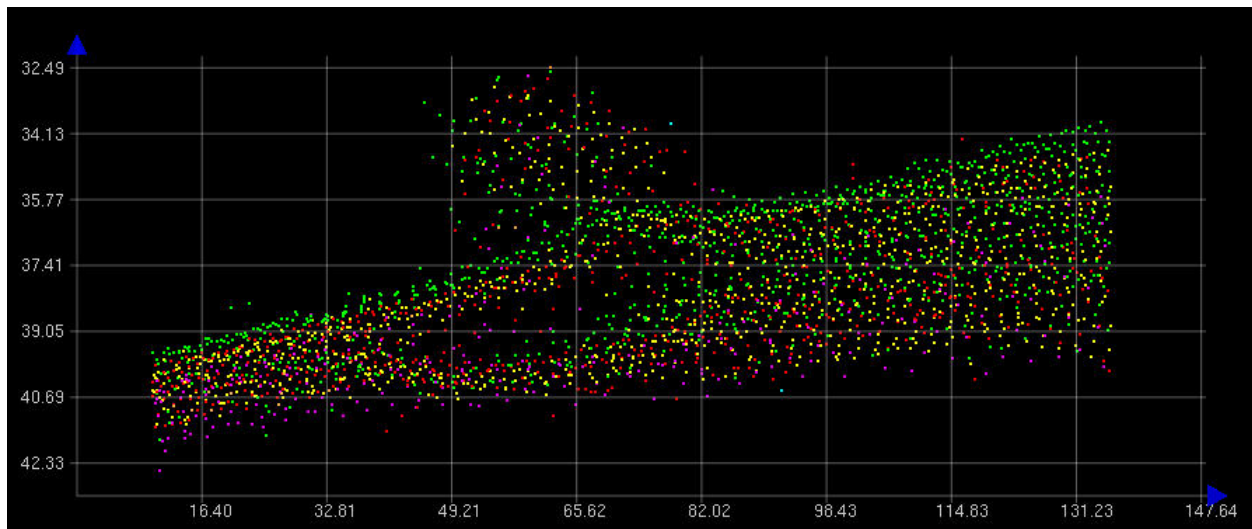


Figure 1.1.1

**1.2) 19 Obstn - 7487/17****Survey Summary**

**Survey Position:** 47° 14' 53.1" N, 122° 25' 57.2" W  
**Least Depth:** 5.89 m (= 19.32 ft = 3.220 fm = 3 fm 1.32 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 1.417$  m ; **TVU (TPEv)**  $\pm 0.276$  m  
**Timestamp:** 2007-171.22:57:19.892 (06/20/2007)  
**Survey Line:** h11642 / s1212\_simrad / 2007-171 / 052\_2245  
**Profile/Beam:** 7487/17  
**Charts Affected:** 18453\_1, 18445\_7, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

**Remarks:**

An obstruction was found in the Foss Waterway with SS and SWMB, least depth 19.3 feet. The object rises 1 meter above surrounding depths and may be a submerged piling or dolphin.

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
h11642/s1212_simrad/2007-171/052_2245	7487/17	0.00	000.0	Primary
h11642/s1212sss_100/2008-164/sonar_data080612192100	0009	3.93	135.7	Secondary (grouped)

**Hydrographer Recommendations**

Chart as obstruction with least depth.

**Cartographically-Rounded Depth (Affected Charts):**

19ft (18453\_1)  
 3 ¼fm (18448\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)  
 3fm 1ft (18445\_7, 18445\_8)  
 5.9m (501\_1, 50\_1)

**S-57 Data**

**Geo object 1:** Obstruction (OBSTRN)  
**Attributes:** CATOBS - 1:snag / stump  
 RECDAT - 20081216  
 SORDAT - 20070620

SORIND - US, US Survey H11642

TECSOU - 2,3:found by side scan sonar,found by multi-beam

VALSOU - 5.888 m

WATLEV - 3:always under water/submerged

### **Office Notes**

Concur - Chart an obstruction with a depth of 19 feet in Latitude 47°14'53.078"N, Longitude 122°25'57.233"W.  
Add 19 Obstn and danger curve.

**1.3) 12 Obstn - 5361/123****Survey Summary**

**Survey Position:** 47° 15' 54.2" N, 122° 26' 03.0" W  
**Least Depth:** 3.62 m (= 11.87 ft = 1.979 fm = 1 fm 5.87 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 1.488$  m ; **TVU (TPEv)**  $\pm 0.523$  m  
**Timestamp:** 2007-178.22:18:11.521 (06/27/2007)  
**Survey Line:** h11642 / s1212\_simrad / 2007-178 / 083\_2203  
**Profile/Beam:** 5361/123  
**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

**Remarks:**

Obstruction found with SS and SWMB, possibly an anchor block associated with barge moorage and/or mooring bouy. Moored barge and stringers crossing the area prevented complete SWMB coverage. This feature does not appear to be a submerged dol, however SWMB/SS coverage over what is likely a submerged dolphin (see item #2223/93) was acquired approximately 47 meters north of this position.

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
h11642/s1212_simrad/2007-178/083_2203	5361/123	0.00	000.0	Primary
h11642/s1212sss_100/2008-190/sonar_data080708173000	0002	13.44	059.4	Secondary (grouped)

**Hydrographer Recommendations**

Chart obstruction with least depth as surveyed.

**Cartographically-Rounded Depth (Affected Charts):**

12ft (18453\_1)

2fm (18448\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

0fm 0ft (18445\_7, 18474\_1, 18445\_8)

3.6m (501\_1, 50\_1)

**S-57 Data**

**Geo object 1:** Obstruction (OBSTRN)  
**Attributes:** QUASOU - 1:depth known

RECDAT - 20081216  
SORDAT - 20070622  
SORIND - US, US Survey H11642  
TECSOU - 3:found by multi-beam  
VALSOU - 3.619 m  
WATLEV - 3:always under water/submerged

### **Office Notes**

Concur - Add 12 Obsn and danger curve in present survey location.

## 1.4) Obstrn - Subm dol - 2366/56

### Survey Summary

**Survey Position:** 47° 16' 51.3" N, 122° 24' 50.9" W  
**Least Depth:** 3.15 m (= 10.34 ft = 1.724 fm = 1 fm 4.34 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 1.399$  m ; **TVU (TPEv)**  $\pm 0.192$  m  
**Timestamp:** 2007-190.19:36:24.110 (07/09/2007)  
**Survey Line:** h11642 / s1212\_simrad / 2007-190 / 063\_1932  
**Profile/Beam:** 2366/56  
**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

A 2-meter obstruction with a least depth of 10.34 feet was found with SWMB northeast of the entrance to the Blair Waterway. The obstruction appears to be a submerged piling or dolphin and plots on top of a dol that is currently charted as above water. A visual search was conducted for both of the dols that are charted on either side of the charted 2-foot shoal. The dols were not seen.

### Feature Correlation

Address	Feature	Range	Azimuth	Status
h11642/s1212_simrad/2007-190/063_1932	2366/56	0.00	000.0	Primary
h11642/s1212sss_100/2008-206/sonar_data080724155000	0001	2.73	217.5	Secondary (grouped)

### Hydrographer Recommendations

Chart dol as submerged.

#### Cartographically-Rounded Depth (Affected Charts):

10ft (18453\_1)

1  $\frac{3}{4}$ fm (18448\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

1fm 4ft (18445\_7, 18474\_1, 18445\_8)

3.2m (501\_1, 50\_1)

### S-57 Data

**Geo object 1:** Obstruction (OBSTRN)

**Attributes:** CATOBS - 1:snag / stump

QUASOU - 1:depth known

RECDAT - 20081216

SORDAT - 20090403

SORIND - US,US,nsurf,H11642

TECSOU - 3:found by multi-beam

VALSOU - 3.152 m

WATLEV - 3:always under water/submerged

## Office Notes

Concur with clarification - Revise charted dolphin in Latitude 47°16'51.25"N, Longitude 122°24'50.83"W to Obstn Subm Dol symbol in Latitude 47°16'51.286"N, Longitude 122°24'50.932"W. Delete Dol. Add Obstn Subm dol.

### Feature Images

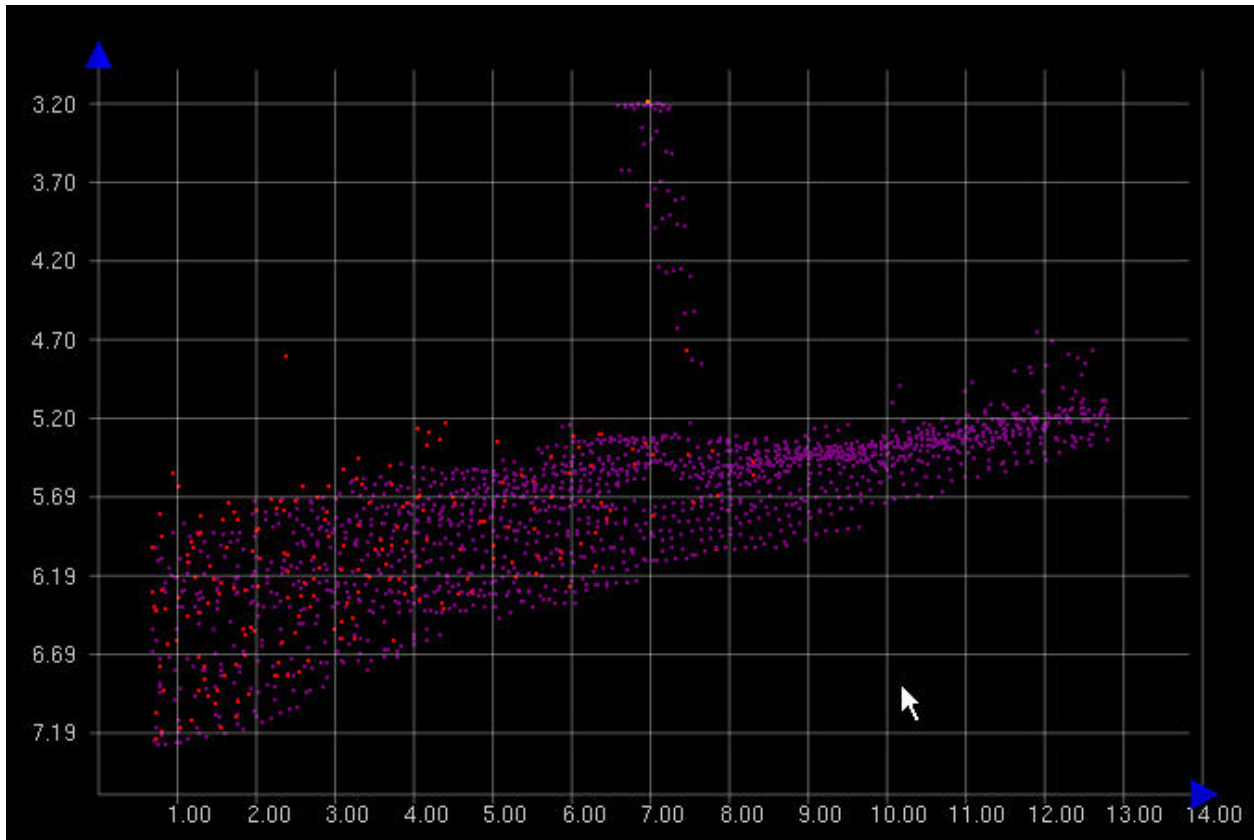


Figure 1.4.1



## 1.5) Obstrn - Subm pile - 1612/4

### Survey Summary

**Survey Position:** 47° 16' 53.8" N, 122° 24' 47.7" W  
**Least Depth:** 2.51 m (= 8.23 ft = 1.372 fm = 1 fm 2.23 ft)  
**TPU ( $\pm 1.96\sigma$ ):** THU (TPEh)  $\pm 1.451$  m ; TVU (TPEv)  $\pm 0.450$  m  
**Timestamp:** 2007-190.19:35:08.266 (07/09/2007)  
**Survey Line:** h11642 / s1212\_simrad / 2007-190 / 063\_1932  
**Profile/Beam:** 1612/4  
**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

Submerged piling, least depth 8.23 feet. The next group of three charted submerged pilings extending along shore to the north of this position appear to be the remains of a rail system associated with a shipyard or log booming operations.

### Feature Correlation

Address	Feature	Range	Azimuth	Status
h11642/s1212_simrad/2007-190/063_1932	1612/4	0.00	000.0	Primary
h11642/s1212sss_100/2008-206/sonar_data080724155900	0001	5.38	203.8	Secondary (grouped)

### Hydrographer Recommendations

Submerged pile is mischarted. Recommend reposition submerged piling, chart depths from current survey.

#### Cartographically-Rounded Depth (Affected Charts):

8ft (18453\_1)

1 ¼fm (18448\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

1fm 2ft (18445\_7, 18474\_1, 18445\_8)

2.5m (501\_1, 50\_1)

### S-57 Data

**Geo object 1:** Obstruction (OBSTRN)  
**Attributes:** CATOBS - 1:snag / stump  
 QUASOU - 1:depth known

SORDAT - 20090403

SORIND - US,US,nsurf,H11642

TECSOU - 3:found by multi-beam

VALSOU - 2.509 m

## Office Notes

Concur with clarification - Add 8 Obstn Subm pile.

## 1.6) Obstn - Subm pile - 1089/27

### Survey Summary

**Survey Position:** 47° 16' 55.7" N, 122° 24' 44.5" W  
**Least Depth:** 0.89 m (= 2.93 ft = 0.488 fm = 0 fm 2.93 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 1.385$  m ; **TVU (TPEv)**  $\pm 0.200$  m  
**Timestamp:** 2007-190.19:34:12.139 (07/09/2007)  
**Survey Line:** h11642 / s1212\_simrad / 2007-190 / 063\_1932  
**Profile/Beam:** 1089/27  
**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

Subm pile verified during office processing.

### Feature Correlation

Address	Feature	Range	Azimuth	Status
h11642/s1212_simrad/2007-190/063_1932	1089/27	0.00	000.0	Primary

### Hydrographer Recommendations

Revise location of charted subm pile.

#### Cartographically-Rounded Depth (Affected Charts):

3ft (18453\_1)

0 ½fm (18448\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

0fm 3ft (18445\_7, 18474\_1, 18445\_8)

.9m (501\_1, 50\_1)

### S-57 Data

**Geo object 1:** Obstruction (OBSTRN)  
**Attributes:** CATOBS - 1:snag / stump  
 QUASOU - 1:depth known  
 TECSOU - 3:found by multi-beam  
 VALSOU - 0.892 m

**Geo object 2:** Pile (PILPNT)  
**Attributes:** CATPLE - 3:post  
CONDTN - 2:ruined  
SORDAT - 20090403  
SORIND - US,US,nsurf,H11642

### Office Notes

Concur with clarification - Revise location of charted Subm pile in Latitude 47°16'55.79"N, Longitude 122°24'44.64"W to Subm pile in Latitude 47°16'55.699"N, Longitude 122°24'44.541"W.

## 1.7) Obstrn - Subm pile - 1307/2

### Survey Summary

**Survey Position:** 47° 16' 54.8" N, 122° 24' 45.8" W  
**Least Depth:** 1.18 m (= 3.88 ft = 0.647 fm = 0 fm 3.88 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 1.434$  m ; **TVU (TPEv)**  $\pm 0.431$  m  
**Timestamp:** 2007-190.19:34:36.269 (07/09/2007)  
**Survey Line:** h11642 / s1212\_simrad / 2007-190 / 063\_1932  
**Profile/Beam:** 1307/2  
**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

Subm pile verified during office processing.

### Feature Correlation

Address	Feature	Range	Azimuth	Status
h11642/s1212_simrad/2007-190/063_1932	1307/2	0.00	000.0	Primary

### Hydrographer Recommendations

Revise location of charted subm pile.

#### Cartographically-Rounded Depth (Affected Charts):

4ft (18453\_1)

0 ½fm (18448\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

0fm 4ft (18445\_7, 18474\_1, 18445\_8)

1.2m (501\_1, 50\_1)

### S-57 Data

**Geo object 1:** Obstruction (OBSTRN)  
**Attributes:** QUASOU - 1:depth known  
 SORDAT - 20090403  
 SORIND - US,US,nsurf,H11642  
 TECSOU - 3:found by multi-beam

VALSOU - 1.183 m

## Office Notes

Concur with clarification - Revise location of charted Subm pile in Latitude 47°16'54.77"N, Longitude 122°24'45.91"W to Subm pile in Latitude 47°16'54.760"N, Longitude 122°24'45.790"W.

**1.8) 7 depth - 1446/2****Survey Summary**

**Survey Position:** 47° 16' 54.2" N, 122° 24' 46.5" W  
**Least Depth:** 2.18 m (= 7.15 ft = 1.191 fm = 1 fm 1.15 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 1.491$  m ; **TVU (TPEv)**  $\pm 0.587$  m  
**Timestamp:** 2007-190.19:34:51.492 (07/09/2007)  
**Survey Line:** h11642 / s1212\_simrad / 2007-190 / 063\_1932  
**Profile/Beam:** 1446/2  
**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

**Remarks:**

Shoal determined during office processing.

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
h11642/s1212_simrad/2007-190/063_1932	1446/2	0.00	000.0	Primary

**Hydrographer Recommendations**

Chart present survey depth

**Cartographically-Rounded Depth (Affected Charts):**

7ft (18453\_1)

1 ¼fm (18448\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

1fm 1ft (18445\_7, 18474\_1, 18445\_8)

2.2m (501\_1, 50\_1)

**S-57 Data**

**Geo object 1:** Pile (PILPNT)  
**Attributes:** CATPLE - 3:post  
 CONDTN - 2:ruined  
 SORDAT - 20090403  
 SORIND - US,US,nsurf,H11642

## Office Notes

Concur - Chart 7 ft depth.



**1.9) 37 Obstn - 1015/95****Survey Summary**

**Survey Position:** 47° 17' 34.4" N, 122° 25' 07.8" W  
**Least Depth:** 11.40 m (= 37.40 ft = 6.234 fm = 6 fm 1.40 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 1.524$  m ; **TVU (TPEv)**  $\pm 0.308$  m  
**Timestamp:** 2007-192.19:25:16.954 (07/11/2007)  
**Survey Line:** h11642 / s1212\_simrad / 2007-192 / 030\_1922  
**Profile/Beam:** 1015/95  
**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

**Remarks:**

[None]

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
h11642/s1212_simrad/2007-192/030_1922	1015/95	0.00	000.0	Primary
h11642/s1212sss_100/2008-190/sonar_data080708202500	0002	11.94	316.8	Secondary
h11642/s1212_simrad/2007-192/029_1928	605/112	15.09	307.8	Secondary
h11642/s1212sss_100/2008-190/sonar_data080708202500	0013	21.18	310.1	Secondary

**Hydrographer Recommendations**

[None]

**Cartographically-Rounded Depth (Affected Charts):**

37ft (18453\_1)

6 ¼fm (18448\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

6fm 1ft (18445\_7, 18474\_1, 18445\_8)

11.4m (501\_1, 50\_1)

**S-57 Data****Geo object 1:** Obstruction (OBSTRN)**Attributes:** CATOBS - 1:snag / stump

QUASOU - 6:least depth known

SORDAT - 20090403

SORIND - US,US,nsurf,H111642

TECSOU - 3:found by multi-beam

VALSOU - 11.400 m

WATLEV - 3:always under water/submerged

## **Office Notes**

Concur with clarification - Several other obstructions in the vicinity. Add 37 Obstns and danger curve.

**1.10) 53 Wk 1140/27 - Delete****Survey Summary**

**Survey Position:** 47° 17' 42.9" N, 122° 25' 20.8" W  
**Least Depth:** 16.27 m (= 53.39 ft = 8.898 fm = 8 fm 5.39 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 1.657$  m ; **TVU (TPEv)**  $\pm 0.459$  m  
**Timestamp:** 2007-192.19:00:13.184 (07/11/2007)  
**Survey Line:** h11642 / s1212\_simrad / 2007-192 / 038\_1856  
**Profile/Beam:** 1140/27  
**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

**Remarks:**

SS and partial SWMB coverage over wreck with a least depth of 52 feet on northwest end. This item could not be completely developed because it is covered by a group of floating barges that serve as a breakwater for the Tyeer Marina. The wreck is 90 feet long, 30 feet wide, and oriented towards the northwest at 295 degrees.

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
h11642/s1212_simrad/2007-192/038_1856	1140/27	0.00	000.0	Primary

**Hydrographer Recommendations**

Chart wreck as surveyed.

**Cartographically-Rounded Depth (Affected Charts):**

53ft (18453\_1)

8  $\frac{3}{4}$ fm (18448\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

8fm 5ft (18445\_7, 18474\_1, 18445\_8)

16.3m (501\_1, 50\_1)

**S-57 Data**

**Geo object 1:** Wreck (WRECKS)  
**Attributes:** CATWRK - 2:dangerous wreck  
 CONVIS - 2:not visual conspicuous  
 RECDAT - 20081210

SORDAT - 20070711

SORIND - US, US Survey H11642

TECSOU - 2,3:found by side scan sonar,found by multi-beam

VALSOU - 16.273 m

WATLEV - 3:always under water/submerged

## **Office Notes**

Do not concur - Shoaler depth on wreck in area. Delete 53 Wk and danger curve.

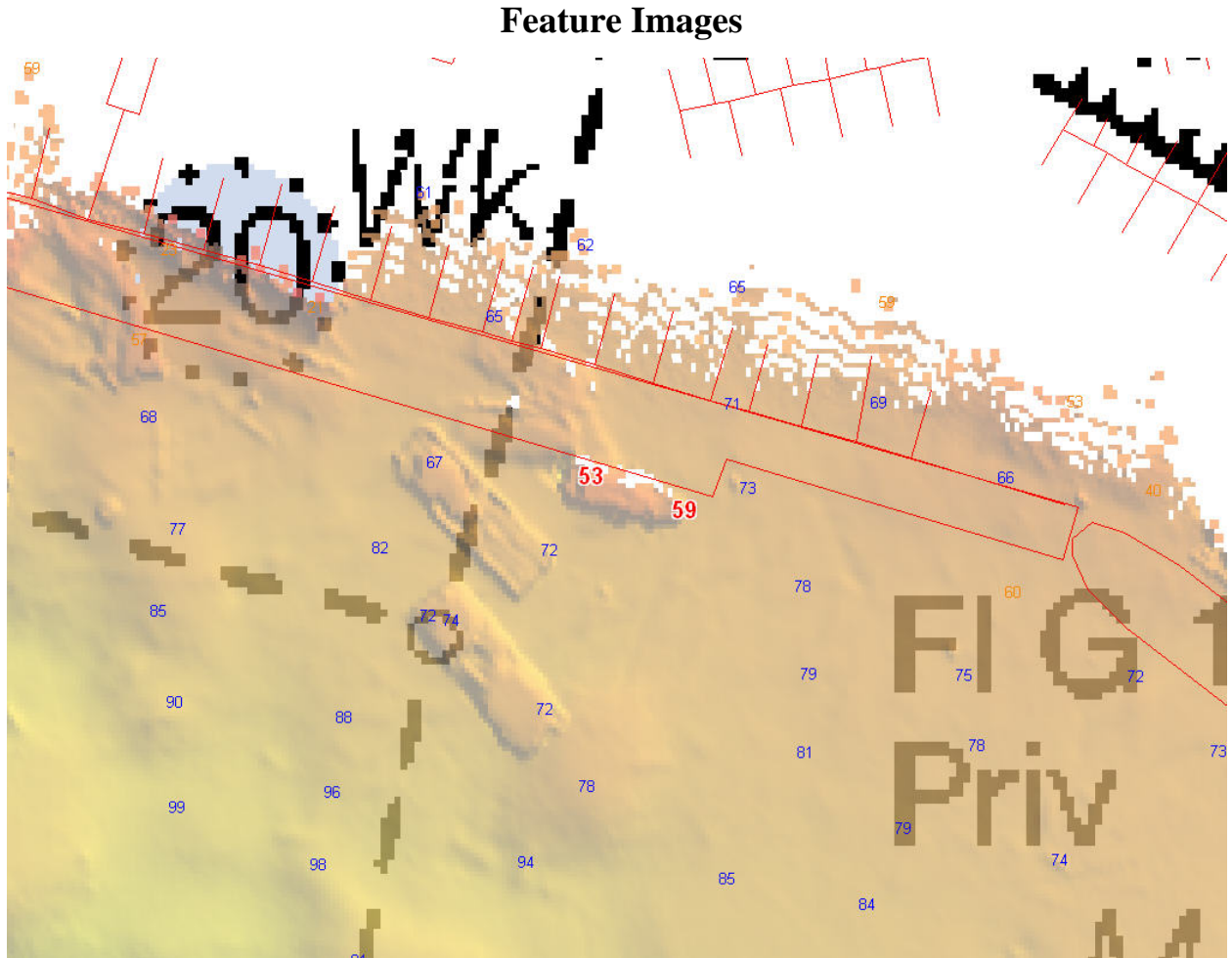


Figure 1.10.1

**1.11) 49 Obstrn - 1801/41****Survey Summary**

**Survey Position:** 47° 17' 40.1" N, 122° 25' 12.2" W  
**Least Depth:** 14.92 m (= 48.95 ft = 8.158 fm = 8 fm 0.95 ft)  
**TPU ( $\pm 1.96\sigma$ ):** THU (TPEh)  $\pm 1.586$  m ; TVU (TPEv)  $\pm 0.290$  m  
**Timestamp:** 2007-192.19:02:25.661 (07/11/2007)  
**Survey Line:** h11642 / s1212\_simrad / 2007-192 / 038\_1856  
**Profile/Beam:** 1801/41  
**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

**Remarks:**

A 7-foot obstruction was found with SWMB, least depth 49 feet. The object lies seaward of a charted 76-foot sounding and is approximately 33 feet long and 14 feet wide.

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
h11642/s1212_simrad/2007-192/038_1856	1801/41	0.00	000.0	Primary

**Hydrographer Recommendations**

Chart obstruction with least depth; delete charted 76-foot sounding.

**Cartographically-Rounded Depth (Affected Charts):**

49ft (18453\_1)

8fm (18448\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

8fm 1ft (18445\_7, 18474\_1, 18445\_8)

14.9m (501\_1, 50\_1)

**S-57 Data**

**Geo object 1:** Obstruction (OBSTRN)  
**Attributes:** QUASOU - 6:least depth known  
 RECDAT - 20081216  
 SORDAT - 20090403  
 SORIND - US,US,nsurf,H11642

TECSOU - 3:found by multi-beam

VALSOU - 14.920 m

WATLEV - 3:always under water/submerged

## Office Notes

Concur - Chart obstruction with a depth of 49 feet in Latitude 47°17'40.061"N, Longitude 122°25'12.245"W. Add 49 Obstn and danger curve.

### Feature Images

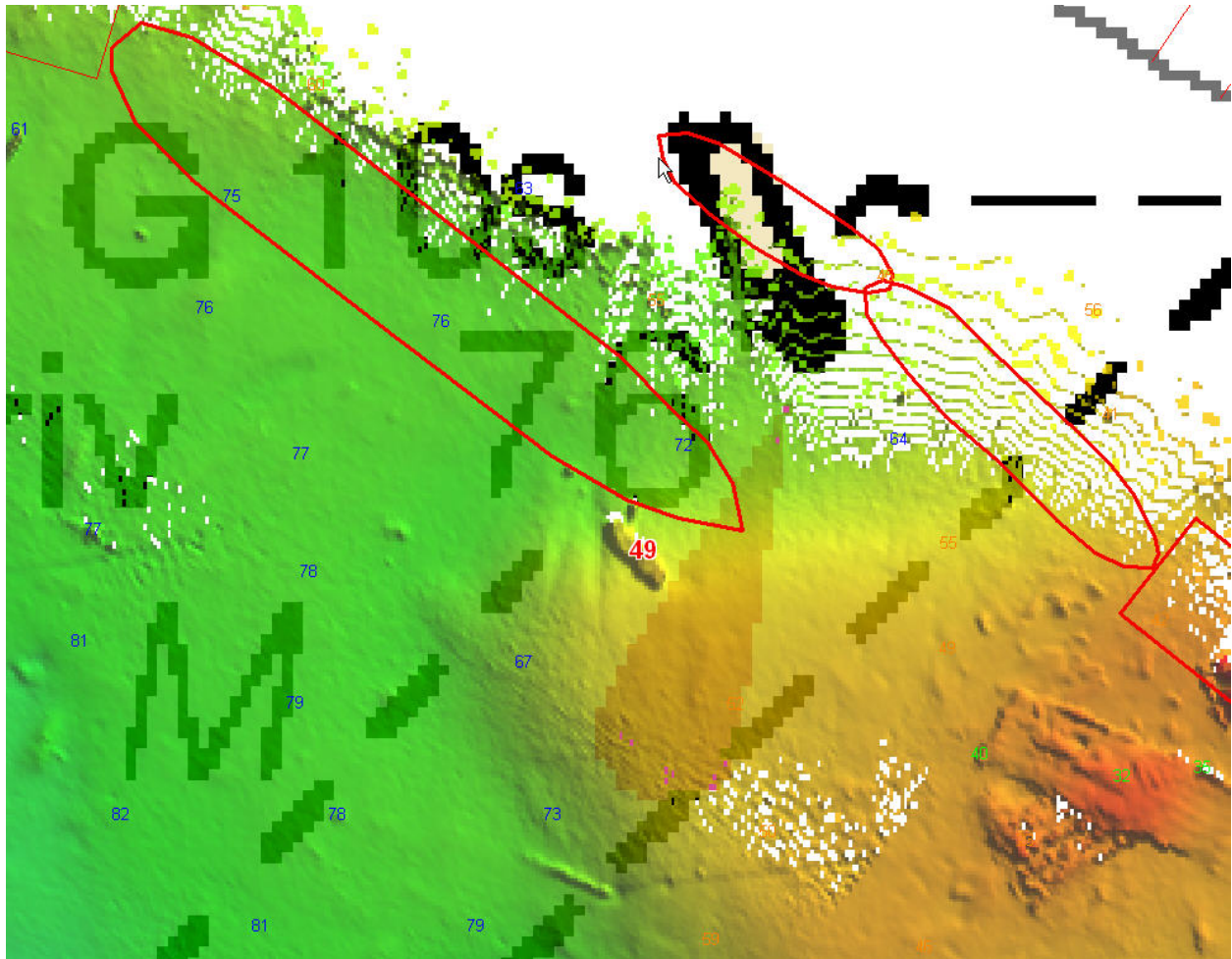


Figure 1.11.1



**1.12) 2374/16 - insig****Survey Summary**

**Survey Position:** 47° 17' 37.5" N, 122° 25' 05.2" W  
**Least Depth:** 9.52 m (= 31.22 ft = 5.203 fm = 5 fm 1.22 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 1.521$  m ; **TVU (TPEv)**  $\pm 0.448$  m  
**Timestamp:** 2007-192.19:04:10.863 (07/11/2007)  
**Survey Line:** h11642 / s1212\_simrad / 2007-192 / 038\_1856  
**Profile/Beam:** 2374/16  
**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

**Remarks:**

Partial SWMB coverage over submerged wreckage with a least depth of 31 feet. Boom logs and a permanently moored floating barge/breakwater along the northern portion of the obstruction prevented complete coverage.

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
h11642/s1212_simrad/2007-192/038_1856	2374/16	0.00	000.0	Primary

**Hydrographer Recommendations**

Chart obstruction with least depth as surveyed.

**Cartographically-Rounded Depth (Affected Charts):**

31ft (18453\_1)

5 ¼fm (18448\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

5fm 1ft (18445\_7, 18474\_1, 18445\_8)

9.5m (501\_1, 50\_1)

**S-57 Data**

**Geo object 1:** Obstruction (OBSTRN)  
**Attributes:** RECDAT - 20090209  
 SORDAT - 20070711  
 SORIND - US, US Survey H11642  
 TECSOU - 3:found by multi-beam

VALSOU - 9.515 m

WATLEV - 3:always under water/submerged

### **Office Notes**

Concur w/ clarification. This sounding is not the LD. LD redesignated as 8.767m (Line 038\_1856, 2385, 11).

### Feature Images

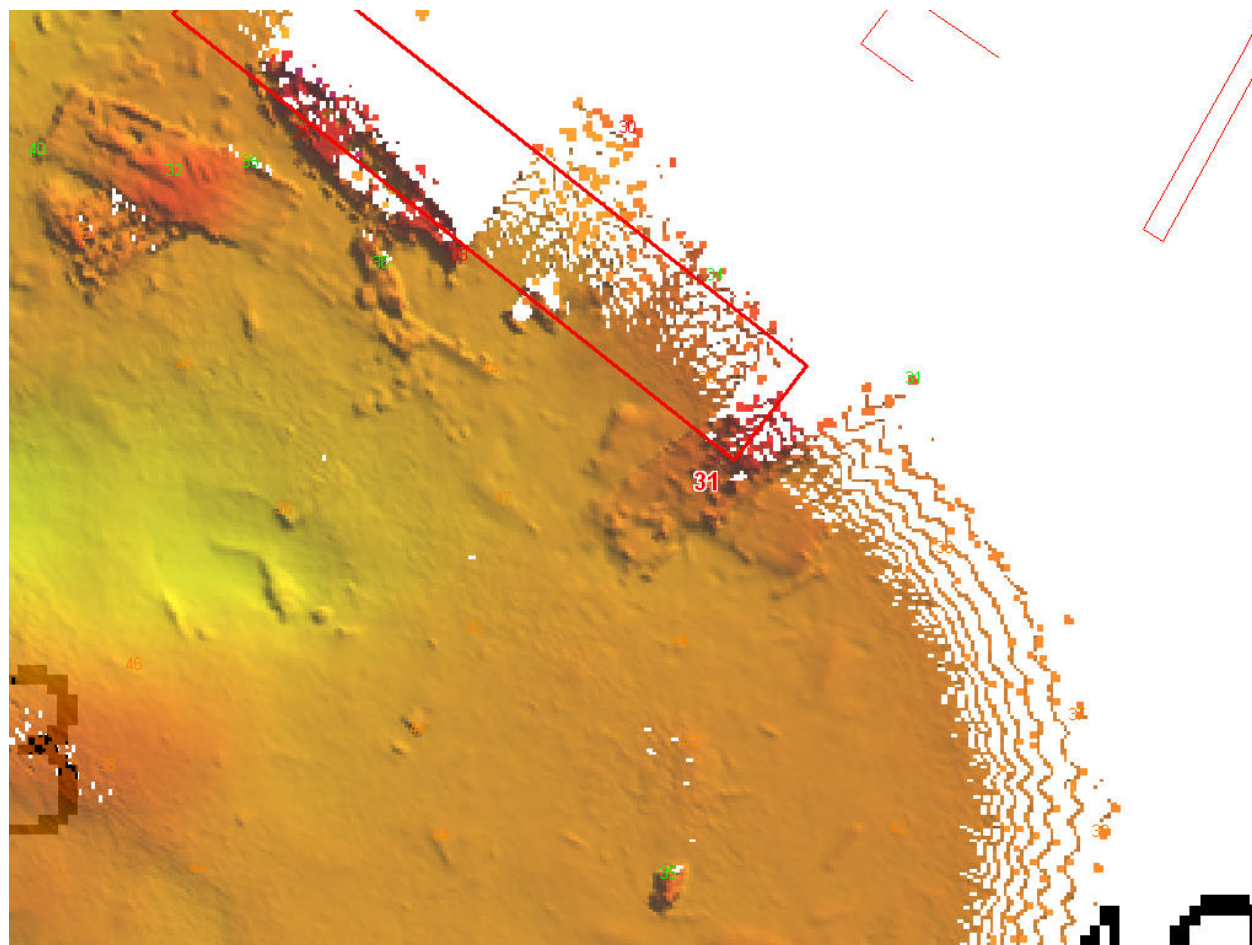


Figure 1.12.1

**1.13) 52 Wks - 1168/32****Survey Summary**

**Survey Position:** 47° 17' 42.8" N, 122° 25' 20.3" W  
**Least Depth:** 15.96 m (= 52.37 ft = 8.728 fm = 8 fm 4.37 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 1.632$  m ; **TVU (TPEv)**  $\pm 0.389$  m  
**Timestamp:** 2007-192.19:00:19.116 (07/11/2007)  
**Survey Line:** h11642 / s1212\_simrad / 2007-192 / 038\_1856  
**Profile/Beam:** 1168/32  
**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

**Remarks:**

SS and partial SWMB coverage over wreck with a least depth of 52 feet on northwest end. This item could not be completely developed because it is covered by a group of floating barges that serve as a breakwater for the Tyee Marina. The wreck is 90 feet long, 30 feet wide, and oriented towards the northwest at 295 degrees.

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
h11642/s1212_simrad/2007-192/038_1856	1168/32	0.00	000.0	Primary
h11642/s1212sss_100/2008-149/sonar_data080528215000	0019	16.72	304.1	Secondary

**Hydrographer Recommendations**

Chart wreck as surveyed.

**Cartographically-Rounded Depth (Affected Charts):**

52ft (18453\_1)

8  $\frac{3}{4}$ fm (18448\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

8fm 4ft (18445\_7, 18474\_1, 18445\_8)

16.0m (501\_1, 50\_1)

**S-57 Data**

[None]

## Office Notes

Concur - Chart a wreck with a depth of 52 feet in Latitude 47°17'42.776"N, Longitude 122°25'20.295"W. Other wrecks in area. Add 52 Wks and danger curve.

**1.14) 18 Wk - 2082/3****Survey Summary**

**Survey Position:** 47° 17' 39.5" N, 122° 25' 08.1" W  
**Least Depth:** 5.60 m (= 18.37 ft = 3.062 fm = 3 fm 0.37 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 1.584$  m ; **TVU (TPEv)**  $\pm 0.756$  m  
**Timestamp:** 2007-192.19:03:20.266 (07/11/2007)  
**Survey Line:** h11642 / s1212\_simrad / 2007-192 / 038\_1856  
**Profile/Beam:** 2082/3  
**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

**Remarks:**

Wreck determined during office processing.

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
h11642/s1212_simrad/2007-192/038_1856	2082/3	0.00	000.0	Primary

**Hydrographer Recommendations**

Chart an obstruction with least depth as surveyed.

**Cartographically-Rounded Depth (Affected Charts):**

18ft (18453\_1)

3fm (18448\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

3fm 0ft (18445\_7, 18474\_1, 18445\_8)

5.6m (501\_1, 50\_1)

**S-57 Data**

**Geo object 1:** Wreck (WRECKS)  
**Attributes:** CATWRK - 2:dangerous wreck  
 QUASOU - 6:least depth known  
 SORDAT - 20090403  
 SORIND - US,US,nsurf,H11642

TECSOU - 3:found by multi-beam

VALSOU - 5.599 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

### **Office Notes**

Concur - Chart a wreck with a depth of 18 feet in Latitude 47°17'37.749"N, Longitude 122°25'04.602"W. Add 18 Wk and danger curve.

**1.15) 34 Obstrn - 2691/122****Survey Summary**

**Survey Position:** 47° 17' 35.5" N, 122° 25' 05.4" W  
**Least Depth:** 10.59 m (= 34.74 ft = 5.790 fm = 5 fm 4.74 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 1.695$  m ; **TVU (TPEv)**  $\pm 0.847$  m  
**Timestamp:** 2007-192.19:04:52.407 (07/11/2007)  
**Survey Line:** h11642 / s1212\_simrad / 2007-192 / 038\_1856  
**Profile/Beam:** 2691/122  
**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

**Remarks:**

An 2.7 meter obstruction was found with SS and SWMB, least depth of 35 feet. The object is located within a charted booming ground and lies seaward of a charted 43-foot sounding.

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
h11642/s1212_simrad/2007-192/038_1856	2691/122	0.00	000.0	Primary
h11642/s1212sss_100/2008-149/sonar_data080528213200	0004	0.69	036.1	Secondary
h11642/s1212_simrad/2007-192/028_1931	350/112	2.25	160.4	Secondary

**Hydrographer Recommendations**

Chart obstruction with least depth as surveyed.

**Cartographically-Rounded Depth (Affected Charts):**

34ft (18453\_1)

5  $\frac{3}{4}$ fm (18448\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

5fm 4ft (18445\_7, 18474\_1, 18445\_8)

10.6m (501\_1, 50\_1)

**S-57 Data**

**Geo object 1:** Obstruction (OBSTRN)  
**Attributes:** QUASOU - 6:least depth known  
 SORDAT - 20090403



SORIND - US,US,nsurf,H11642

TECSOU - 3:found by multi-beam

VALSOU - 10.588 m

WATLEV - 3:always under water/submerged

## Office Notes

Concur - Chart obstruction with a depth of 34 feet in Latitude 47°17'35.497"N, Longitude 122°25'05.449"W. Add 34 Obstn and danger curve.

**1.16) 24 Wk - 2386/3****Survey Summary**

**Survey Position:** 47° 17' 37.7" N, 122° 25' 04.6" W  
**Least Depth:** 7.48 m (= 24.53 ft = 4.089 fm = 4 fm 0.53 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 1.706$  m ; **TVU (TPEv)**  $\pm 0.960$  m  
**Timestamp:** 2007-192.19:04:12.894 (07/11/2007)  
**Survey Line:** h11642 / s1212\_simrad / 2007-192 / 038\_1856  
**Profile/Beam:** 2386/3  
**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

**Remarks:**

Partial SWMB coverage over submerged wreckage with a least depth of 31 feet. Boom logs and a permanently moored floating barge/breakwater along the northern portion of the obstruction prevented complete coverage.

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
h11642/s1212_simrad/2007-192/038_1856	2386/3	0.00	000.0	Primary

**Hydrographer Recommendations**

Chart wreck with least depth as surveyed.

**Cartographically-Rounded Depth (Affected Charts):**

24ft (18453\_1)

4fm (18448\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

4fm 0ft (18445\_7, 18474\_1, 18445\_8)

7.5m (501\_1, 50\_1)

**S-57 Data**

**Geo object 1:** Wreck (WRECKS)  
**Attributes:** CATWRK - 2:dangerous wreck  
 QUASOU - 6:least depth known  
 SORDAT - 20090403  
 SORIND - US,US,nsurf,H11642

TECSOU - 3:found by multi-beam

VALSOU - 7.478 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

### **Office Notes**

Concur - Chart a wreck with a depth of 24 feet in Latitude 47°17'37.749"N, Longitude 122°25'04.602"W. Add 24 Wk and danger curve.

**1.17) 41 Wks - 2331/124****Survey Summary**

**Survey Position:** 47° 17' 44.4" N, 122° 25' 30.2" W  
**Least Depth:** 12.71 m (= 41.71 ft = 6.952 fm = 6 fm 5.71 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 1.955$  m ; **TVU (TPEv)**  $\pm 1.259$  m  
**Timestamp:** 2007-192.18:52:33.501 (07/11/2007)  
**Survey Line:** h11642 / s1212\_simrad / 2007-192 / 042\_1845  
**Profile/Beam:** 2331/124  
**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

**Remarks:**

Submerged wreckage with a least depth of 41 feet was found within the AWOIS search radius.

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
h11642/s1212_simrad/2007-192/042_1845	2331/124	0.00	000.0	Primary

**Hydrographer Recommendations**

Wreck is seen on side scan. Chart a wreck.

**Cartographically-Rounded Depth (Affected Charts):**

41ft (18453\_1)

7fm (18448\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

6fm 5ft (18445\_7, 18474\_1, 18445\_8)

12.7m (501\_1, 50\_1)

**S-57 Data**

**Geo object 1:** Wreck (WRECKS)  
**Attributes:** CATWRK - 2:dangerous wreck  
 QUASOU - 6:least depth known  
 SORDAT - 20090403  
 SORIND - US,US,nsurf,H11642

TECSOU - 2,3:found by side scan sonar,found by multi-beam

VALSOU - 12.713 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

### **Office Notes**

Concur - Additional wreck in the vicinity of this wreck. Add 41 Wks and danger curve in present survey location.

**1.18) 20 Obstrn - 931/13****Survey Summary**

**Survey Position:** 47° 15' 48.9" N, 122° 25' 57.6" W  
**Least Depth:** 6.16 m (= 20.22 ft = 3.371 fm = 3 fm 2.22 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 1.482$  m ; **TVU (TPEv)**  $\pm 0.412$  m  
**Timestamp:** 2008-206.16:57:19.941 (07/24/2008)  
**Survey Line:** h11642 / s1212\_simrad / 2008-206 / 001\_1655  
**Profile/Beam:** 931/13  
**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

**Remarks:**

A 4.5-foot submerged obstruction was found in the Middle Waterway with SWMB, least depth 20.2 feet. The object is most likely a submerged dolphin.

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
h11642/s1212_simrad/2008-206/001_1655	931/13	0.00	000.0	Primary

**Hydrographer Recommendations**

Chart obstruction with least depth as surveyed.

**Cartographically-Rounded Depth (Affected Charts):**

20ft (18453\_1)

3 ¼fm (18448\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

3fm 2ft (18445\_7, 18474\_1, 18445\_8)

6.2m (501\_1, 50\_1)

**S-57 Data**

**Geo object 1:** Obstruction (OBSTRN)  
**Attributes:** RECDAT - 20081216  
 SORDAT - 20090403  
 SORIND - US,US,nsurf,H11642  
 TECSOU - 3:found by multi-beam

VALSOU - 6.164 m

WATLEV - 3:always under water/submerged

### **Office Notes**

Concur - Chart an obstruction with a depth of 20 feet in Latitude 47°15'48.929"N, Longitude 122°25'57.609"W.  
Add 20 Obstn and danger curve.

### Feature Images

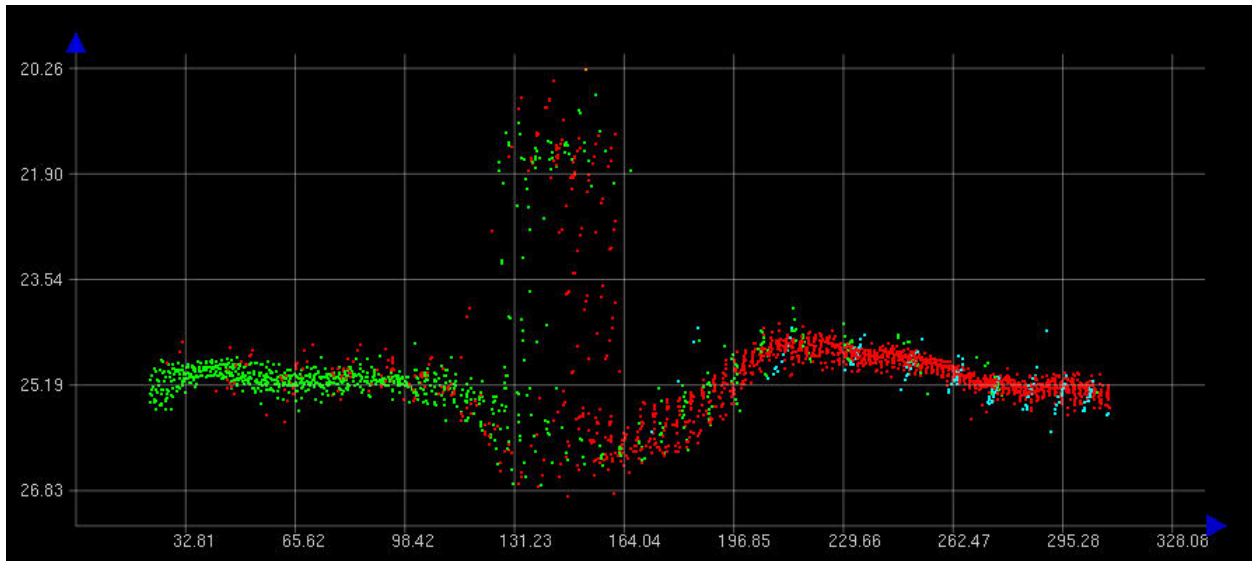


Figure 1.18.1



**1.19) 20 Obstrn - 3311/112****Survey Summary**

**Survey Position:** 47° 15' 50.4" N, 122° 25' 57.1" W  
**Least Depth:** 6.30 m (= 20.67 ft = 3.445 fm = 3 fm 2.67 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 1.474$  m ; **TVU (TPEv)**  $\pm 0.377$  m  
**Timestamp:** 2008-206.17:09:20.251 (07/24/2008)  
**Survey Line:** h11642 / s1212\_simrad / 2008-206 / 004\_1704  
**Profile/Beam:** 3311/112  
**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

**Remarks:**

A 3.5-foot obstruction was found in the Middle Waterway with SWMB, least depth 20.7 feet.

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
h11642/s1212_simrad/2008-206/004_1704	3311/112	0.00	000.0	Primary

**Hydrographer Recommendations**

Chart obstruction with least depth as surveyed.

**Cartographically-Rounded Depth (Affected Charts):**

20ft (18453\_1)

3 ½fm (18448\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

3fm 2ft (18445\_7, 18474\_1, 18445\_8)

6.3m (501\_1, 50\_1)

**S-57 Data**

**Geo object 1:** Obstruction (OBSTRN)  
**Attributes:** QUASOU - 6:least depth known  
 RECDAT - 20081216  
 SORDAT - 20090403  
 SORIND - US, US,nsurf,H11642

TECSOU - 3:found by multi-beam

VALSOU - 6.300 m

WATLEV - 3:always under water/submerged

## **Office Notes**

Concur - Chart an obstruction with a depth of 20 feet in Latitude 47°15'50.441"N, longitude 122°25'57.109"W. Add 20 Obstn and danger curve.

## 1.20) Retain ruins - 755/87

### Survey Summary

**Survey Position:** 47° 16' 09.8" N, 122° 26' 53.7" W  
**Least Depth:** 5.32 m (= 17.44 ft = 2.907 fm = 2 fm 5.44 ft)  
**TPU ( $\pm 1.96\sigma$ ):** THU (TPEh)  $\pm 1.420$  m ; TVU (TPEv)  $\pm 0.211$  m  
**Timestamp:** 2009-093.20:23:04.046 (04/03/2009)  
**Survey Line:** h11642 / s1212\_simrad / 2009-093 / 050\_2020  
**Profile/Beam:** 755/87  
**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

Mischarted ruin found with SWMB, least depth of 17.44 feet on south end. The ruin is 22 feet long and oriented north to south with an azimuth of 166 degrees. Correlating designated sounding (item 732/70) marks the northern extent of the ruin. Due to a large cable-out error while collecting SS data along this portion of shoreline, the correlating imagery item for this feature (Contact 0014) lies 35 meters to the southeast of the primary designated sounding.

### Feature Correlation

Address	Feature	Range	Azimuth	Status
h11642/s1212_simrad/2009-093/050_2020	755/87	0.00	000.0	Primary
h11642/s1212_simrad/2009-093/050_2020	732/70	7.02	155.1	Secondary (grouped)
h11642/s1212sss_100/2008-164/sonar_data080612192100	0014	33.44	296.4	Secondary (grouped)

### Hydrographer Recommendations

Chart as submerged ruin with least depths as surveyed.

### S-57 Data

**Geo object 1:** Obstruction (OBSTRN)  
**Attributes:** QUASOU - 1:depth known  
 RECDAT - 20090407  
 SORDAT - 20090403  
 SORIND - US, US Survey H11642  
 TECSOU - 3:found by multi-beam

VALSOU - 5.317 m

WATLEV - 3:always under water/submerged

### **Office Notes**

Concur with clarification - Obstruction falls with a charted ruins. Do not chart obstruction. Retain ruins.

## 1.21) Outfall pipeline - 435/40

### Survey Summary

**Survey Position:** 47° 16' 08.8" N, 122° 26' 52.0" W  
**Least Depth:** 11.37 m (= 37.31 ft = 6.219 fm = 6 fm 1.31 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 1.526$  m ; **TVU (TPEv)**  $\pm 0.265$  m  
**Timestamp:** 2009-093.20:27:47.750 (04/03/2009)  
**Survey Line:** h11642 / s1212\_simrad / 2009-093 / 051\_2026  
**Profile/Beam:** 435/40  
**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

Uncharted feature found with SS and SWMB, appears to be an outfall pipe. The feature extends seaward west to east at an azimuth of 068 degrees, and is approximately 75 feet long. This designated sounding of 37.31 feet marks the shoalest depth of the offshore end of the feature. The correlating designated sounding of 18.73 feet (item 927/122) marks the shoalest depth of the inshore end. Due to a large cable-out error while collecting SS data along this portion of shoreline, the correlating imagery item for this feature (Contact 0012) lies 42 meters to the east of the primary designated sounding.

### Feature Correlation

Address	Feature	Range	Azimuth	Status
h11642/s1212_simrad/2009-093/051_2026	435/40	0.00	000.0	Primary
h11642/s1212_simrad/2009-093/050_2020	927/122	20.84	069.3	Secondary (grouped)
h11642/s1212sss_100/2008-164/sonar_data080612192100	0012	42.90	285.0	Secondary (grouped)

### Hydrographer Recommendations

Chart feature as surveyed with least depths.

#### Cartographically-Rounded Depth (Affected Charts):

37ft (18453\_1)

6 ¼fm (18448\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

6fm 1ft (18445\_7, 18474\_1, 18445\_8)

11.4m (501\_1, 50\_1)

## S-57 Data

**Geo object 1:** Pipeline, submarine/on land (PIPSOL)

**Attributes:** RECDAT - 20090407

SORDAT - 20090403

SORIND - US, US Survey H11642

## Office Notes

Concur - Add pipeline

**1.22) 48 Obstrn - 120/125****Survey Summary**

**Survey Position:** 47° 17' 43.8" N, 122° 25' 28.8" W  
**Least Depth:** 14.83 m (= 48.67 ft = 8.111 fm = 8 fm 0.67 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 2.054$  m ; **TVU (TPEv)**  $\pm 1.373$  m  
**Timestamp:** 2009-093.23:06:42.168 (04/03/2009)  
**Survey Line:** h11642 / s1212\_simrad / 2009-093 / 019\_2306  
**Profile/Beam:** 120/125  
**Charts Affected:** 18453\_1, 18445\_7, 18474\_1, 18445\_8, 18448\_1, 18440\_1, 18003\_1, 18007\_1, 501\_1, 530\_1, 50\_1

**Remarks:**

Least depth on submerged obstruction.

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
h11642/s1212_simrad/2009-093/019_2306	120/125	0.00	000.0	Primary
h11642/s1212_simrad/2007-192/038_1856	635/47	16.47	209.1	Secondary
h11642/s1212sss_100/2008-149/sonar_data080528215000	0021	17.55	091.4	Secondary (grouped)

**Hydrographer Recommendations**

Chart obstruction with least depth as surveyed.

**Cartographically-Rounded Depth (Affected Charts):**

48ft (18453\_1)

8fm (18448\_1, 18440\_1, 18003\_1, 18007\_1, 530\_1)

8fm 0ft (18445\_7, 18474\_1, 18445\_8)

14.8m (501\_1, 50\_1)

**S-57 Data**

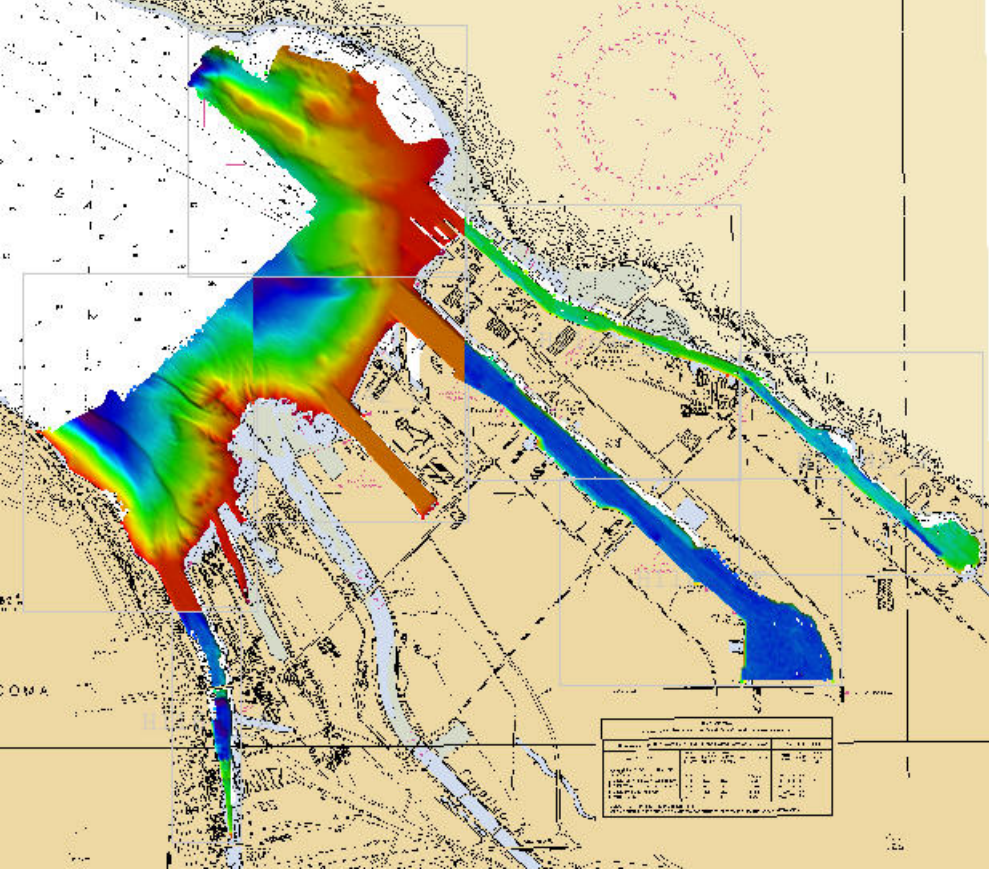
**Geo object 1:** Obstruction (OBSTRN)  
**Attributes:** QUASOU - 6:least depth known  
 RECDAT - 20090414

SORDAT - 20090403  
SORIND - US, US Survey H11642  
TECSOU - 3:found by multi-beam  
VALSOU - 14.834 m  
WATLEV - 3:always under water/submerged

### **Office Notes**

Concur - Chart an obstruction with a depth of 48 feet in Latitude 47°17'43.822"N, Longitude 122°25'28.755"W.  
Add 48 Obstn and danger curve.



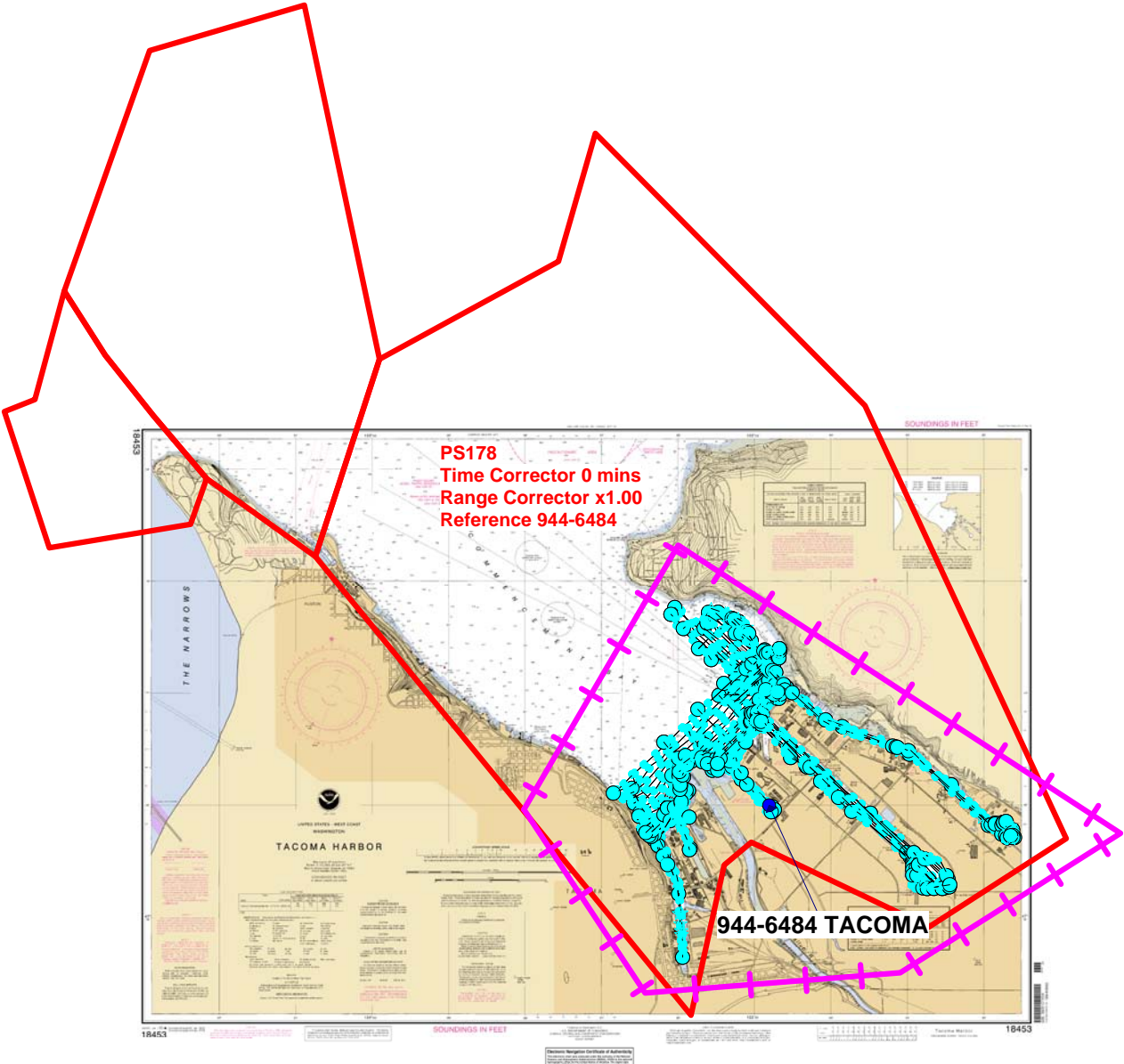




**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
National Ocean Service  
Silver Spring, Maryland 20910



**Final Tidal Zoning for  
OPR-N411-NRT3-2008, H11642\_Rev.  
Tacoma, WA**



**U.S. Coast Pilot 7, 39<sup>th</sup> Ed., 2007**  
**Chapter 13, Page 558 – Paragraph 415 through Page 563 - Paragraph 466**  
**Reviewed through LNM 05/07, CG13**

**Chart 18453**

(415)

**Dash Point**, the E entrance of Commencement Bay, and the village of **Dash Point** are 1 mile NE of Browns Point. There is a restaurant at the foot of the long pier which extends out from the N side of the point to a depth of 20 feet.

(416)

**Point Defiance**, the W entrance of Commencement Bay, terminates in a very prominent dirt bluff, 160 feet high. A light and fog signal are just W of the point. ~~The terminal for the Point Defiance/Tahlequah ferry is located approximately 1.8 nautical miles SSE of the Point. A small boat launch ramp is just south of the terminal adjacent to a small craft boat basin formed by a manmade peninsula. and Point Defiance Park is wooded along its northeastern shore for 3.8 miles~~ ~~mile~~ from the end of the point.

(417)

**Commencement Bay** entrance lies 18 miles S of Alki Point and 56 miles S of Point Wilson. The bay is about 2.5 miles in length, easy of access, and free of dangers. Log storage grounds are off the NE shore of the bay.

(418)

**Tacoma**, the second city in size and importance on the sound, occupies the S and SW shores of Commencement Bay, and its residential area has grown N into Seattle's S suburbs, and to Steilacoom on the SW.

(419)

The **Port of Tacoma** is a rapidly expanding major port, second only to Seattle in maritime importance on Puget Sound. Its exports include lumber and other wood products, grain, refined metals, machinery, general and containerized cargo; imports include alumina, and refined steel, automobiles, electronic equipment, rubber, and meat. Much of the Alaska trade originates here.

**Prominent features**

(420)

On entering Commencement Bay, either from the N via East Passage or Colvos Passage or from the S via The Narrows and Dalco Passage, Dash Point, Browns Point, and Point Defiance are prominent. **Browns Point Light** (47°18'22"N., 122°26'35"W.), 38 feet above the water, is shown from a 31-foot white tower on Browns Point; a fog signal is at the light. Once inside the bay numerous stacks, tanks and towers are visible.

(421)

A **132°05' - 312°05' measured nautical mile** is along the SW shore of the bay about midway between Ruston and Tacoma.

(422)

~~A fishing reef, marked by private buoys, is along the SW shore of the bay about midway between Ruston and Tacoma. A fish haven, covered 21 feet, is just N of the public pier at the N end of Tacoma.~~

~~A line of seven mooring buoys extends for .65 miles along the SW shore of the bay.~~

(423)

From the **SE** corner of Commencement Bay, the city waterfront extends NW to ~~within 1.5 miles of Point Defiance~~ ~~the southeast corner of Point Defiance Park~~. Along here are numerous industrial plants with wharves to accommodate vessels drawing 30 feet or more.

(424)

**Thea Foss Waterway** is the westernmost of the channels at the head of the bay; a light is on the E side of the entrance. A Federal project provides for depths of 29 feet in Thea Foss Waterway to the South 11th Street Bridge, thence 22 feet for 0.2 mile, thence 19 feet to the head of the project. Maintenance work is done when required on this waterway. Two deep-draft oil handling wharves and many oil storage tanks are on the E side.

(425)

There are two bridges over the waterway. The South 11th Street vertical lift bridge, 0.5 mile from the entrance to the waterway, has a clearance of 64 feet down and 139 feet up. A fixed highway bridge near the head of the waterway has a clearance of 28 feet (36 feet at the center).

(426)

**Middle Waterway**, NE of Thea Foss Waterway, and **St. Paul Waterway**, NE of Middle Waterway, are not Federal projects. The inner parts of both waterways have shoaled and are not navigable. For about the outer 400 yards of each waterway, there are depths of 25 to 34 feet, but there is no deep-draft traffic. St. Paul Waterway is used for log storage by the large papermill which occupies the land on the NE side.

(427)

**Puyallup Waterway**, NE of St. Paul Waterway, discharges the water of **Puyallup River**. The waterway has shoaled to such an extent that it cannot be used commercially. A lighted buoy marks a shoal area extending about 500 yards NW of the entrance. A fixed bridge, with a clearance of 29 feet, crosses the waterway about 0.7 mile above the mouth. An overhead cable, just SE of the bridge, has a clearance of 46 feet.

(428)

**Sitcum Waterway**, NE of Milwaukee Waterway, is maintained at more than the project depth of 40 feet. The Port of Tacoma's

Pier 7 is on the E side. A private light is just off the NW end of Pier 7; it marks the NE side of the entrance to Sitcum Waterway.  
(429)

The next two channels to the NE of Sitcum Waterway, **Blair Waterway** and **Hylebos Waterway**, are maintained as Federal projects. A lighted buoy is off a shoal on the N side of the entrance and a private light is on the S side at the NW end of Pier 25; these aids mark the entrance to Hylebos Waterway. The entrance to Blair Waterway is marked by a directional light on the NE side and a private lighted buoy on the SW side. Project depths in Hylebos Waterway are 30 feet in the waterway and basins. Project depths in Blair Waterway are 30 feet in the Southern Section and 35 feet in the rest of the waterway and basins. (See Notice to Mariners and latest editions of charts for controlling depths.)

(430)

The 11th Street bascule bridge over Hylebos Waterway has a clearance of 21 feet. (See **117.1 through 117.59 and 117.1061**, chapter 2, for drawbridge regulations.) The bridgetender monitors VHF-FM channel 16 and works on channel 13. Call signs: KZN-574, Hylebos Bridge. A power cable at the bridge has a clearance of 173 feet.

(431)

**Security zones** are in the Sitcum Waterway and Blair Waterway areas. (See **165.1 through 165.8, 165.30 and 165.1321**, chapter 2, for limits and regulations.)

### Anchorage

(432)

A **general anchorage** is off the N shore of Commencement Bay. (See **110.1 and 110.230**, chapter 2, for limits and regulations.) The depths elsewhere in the bay, as a rule, are too great for convenient anchorage.

(433)

City regulations permit anchorage in any part of the bay outside the harbor lines so as not to interfere with vessels arriving or departing from their docks.

### Tides and currents

(434)

The mean range of tide at Tacoma is 8.1 feet, and the diurnal range of tide is 11.8 feet. A range of about 19 feet may occur at the time of maximum tides. The tidal currents in the harbor have little velocity, except in Hylebos Waterway where the NOAA Ship **McARTHUR** reported estimated currents of up to 2 knots in 1994.

### Pilotage, Tacoma

(435)

Pilotage is compulsory for all vessels except those under enrollment or engaged exclusively in the coasting trade on the W coast of the continental United States (including Alaska) and/or British Columbia. Pilotage for Puget Sound is provided by the Puget Sound Pilots. (See Pilotage, Strait of Juan de Fuca and Puget Sound, indexed as such, chapter 12 for details.)

### Towage

(436)

Tugs up to 3,000 hp are available at Tacoma, and larger tugs may be obtained from Seattle. Arrangements should be made in advance through ships' agents.

### Quarantine, customs, immigration, and agricultural quarantine

(437)

(See chapter 3, Vessel Arrival Inspections, and Appendix A for addresses.)

(438)

**Quarantine** is enforced in accordance with regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.)

(439)

Tacoma is a **customs port of entry**.

### Harbor regulation

(440)

Harbor regulations are administered by the **harbormaster**, whose headquarters are at the fire station at 901 South Fawcett Street. The general offices of the Port of Tacoma are in the Tacoma Building at the corner of 11th and A Streets; the Port of Tacoma terminal offices are at Pier 2.

### Speed

(441)

A city ordinance prohibits speeds in excess of 5 knots on any of the waterways and within 200 yards of any shore or pier in the harbor.

### Wharves

(442)

The Port of Tacoma has more than 30 deep-draft piers and wharves located on Hylebos, Blair, Sitcum, and Thea Foss Waterways and along the S shore of Commencement Bay. The port-owned properties consist of the Port Industrial Yard, the 160-acre area between Blair and Hylebos Waterways NW of 11th Street, and its deep-draft piers; the 3,600-acre Port Industrial Development District, which includes the entire waterfronts of Blair and Hylebos Waterways above 11th Street; and the Marine Terminal facilities between Blair and Sitcum Waterways below 11th Street. The terminal facilities include some 23 deepwater berths ranging in depth from 35 to 65 feet. In addition to the port-owned properties, the harbor has numerous privately owned piers and wharves and many barge facilities.

(443)

Only the major deep-draft facilities are described. For a complete description of the port facilities refer to Port Series No. 35, published and sold by the U.S. Army Corps of Engineers. (See Appendix A for address.) The alongside depths are reported. (For information on the latest depths contact the Port of Tacoma general office or the individual operators.) All the facilities described have direct highway connections, and most have plant trackage with railroad connections. Water and electrical shore power connections are available at about 80 percent of the wharves. General cargo is usually handled by ships' tackle. Special handling equipment, if available, is mentioned in the description of the particular facility. The Port of Tacoma operates its own belt line railroad with switching connections to two major railroads and has a 200-ton mobile crane and a 300-ton floating crane.

#### **Port of Tacoma facilities:**

##### **Facilities on Blair Waterway:**

(444)

**Terminal 4** (47°16'22"N., 122°24'18"W.): W side of Blair Waterway just below East 11th Street, 1,900-foot berthing space, 50 feet alongside; deck height, 18 feet; 75 acres open storage; six 50 to 66-ton straight-line cranes; rail service with 10-car capacity; receipt and shipment of general and containerized cargo; operated by the Port of Tacoma.

(445)

**Blair Waterway Log Terminal:** W side of Blair Waterway, 1.8 miles above the entrance to the waterway; 1,200-foot berthing space, 50 feet alongside; deck height, 22 feet; 10 acres open log storage and sorting area; lift equipment required, receipt and shipment of fabricated structure; operated by Port of Tacoma.

(446)

**Pierce County Terminal:** S end of the upper turning basin on Blair Waterway; 1,400-foot berthing space, 50 feet alongside; deck height, 22 feet; one 60-ton traveling gantry crane; 100,000 square feet covered storage, 147 acres paved, open storage area; receipt and shipment of general cargo; receipt of automobiles, lumber, military equipment, and heavy lift items; rail spurs on pier, adjacent the warehouse and in auto storage areas; operated by Port of Tacoma.

(447)

**Weyerhaeuser Wood Chip Terminal** (47°15'42"N., 122°23'01"W.): 805 feet of berthing space with dolphins; 50 feet alongside; deck height, 20 feet; belt-conveyor with loading rate of 1,000 tons per hour; 25 acres of open storage for 100,000 tons with rail access, 32-car capacity storage/siding; shipment of wood chips; operated by Weyerhaeuser Co.

(448)

**Georgia-Pacific Gypsum Terminal** (47°16'02"N., 122°23'29"W.): 220-foot face; 580 feet of berthing space with dolphins; 50 feet alongside; deck height, 18 feet; belt conveyor with unloading rate of 2,000 tons per hour; covered storage for 40,000 tons of gypsum rock; receipt of gypsum rock by self-unloading vessels; operated by Georgia-Pacific Gypsum.

(449)

**Totem Ocean Trailer Express (TOTE) Terminal** (47°16'29"N., 122°24'14"W.): 620-foot face; two dolphin piers, 620-foot face and 1,000 foot-face; 50 feet alongside; 33 acres open storage; receipt and shipment of roll-on/roll-off cargo; operated by Totem Ocean Trailer Express (TOTE).

##### **Facilities on Sitcum Waterway:**

(450)

**Terminal 7** (47°16'06"N., 122°24'48"W.): 2,700-foot berthing space; 39 feet alongside two inner berths, A and B, 45 feet alongside Berth C and 50 feet alongside outer berth, Berth D; deck heights, 18 feet; 198,400 square feet covered storage; three 40-ton traveling gantry cranes, one bulk-loading crane, rate 750 tons per hour, container cranes to 60 tons, alumina loadout facility which transports alumina ore to one of two storage domes, capacities of 50,000 and 100,000 tons, serves Berth C; receipt of alumina, receipt and shipment of general, roll-on/roll-off, and containerized cargo; operated by Port of Tacoma, Kaiser Aluminum & Chemical Corp.

Facilities on SW side of Commencement Bay:

(451)

**Continental Grain Wharf** (47°15'59"N., 122°26'35"W.): 910 feet of berthing space with dolphins; 65 feet alongside; deck height, 19½ feet; 3-million-bushel grain elevator; loading rate, 80,000 bushels per hour; shipment of grain; operated by Continental Grain Co.

#### **Private facilities:**

##### **Facilities on Hylebos Waterway:**

(452)

**Occidental Chemical Corp., Docks 1 and 2** (47°16'49"N., 122°24'08"W.): 940-foot usable berthing space with dolphins, 32 feet alongside; deck heights, 19 feet; pipelines extend from wharves to storage tanks; at wharf 1, a hopper for receiving bulk salt serves a conveyor system extending to storage area of 70,000-ton capacity, unloading rate 900 tons per hour; storage tanks for 37,000 barrels of fuel oil and 4 million gallons of caustic soda; receipt of fuel oil for plant consumption and bulk salt; shipment of industrial chemical and caustic soda; receipt and shipment of liquid caustic soda, chlorine, and brine solutions; owned and operated by Occidental Chemical Corp.

(453)

**PRI Northwest Wharf:** W side 500 yards NW of 11th Street Bridge; 500 feet of berthing space with dolphins, including adjacent U.S. Naval Reserve Wharf; 30 to 31 feet alongside; deck heights, 12 to 18 feet; storage tanks with a 80,000-barrel capacity; receipt and shipment of petroleum products; owned and operated by PRI Northwest Inc.

(454)

**Sound Refining Dock** (47°16'33"N., 122°23'03"W.): 770 feet of berthing space with dolphins; 30 feet alongside; deck height, 19

feet; storage tanks with a 600,000-barrel capacity; receipt and shipment of petroleum products; owned and operated by Sound Refining Inc.

(455)

**Pennwalt Corp. Wharf** (47°16'09"N., 122°22'24"W.): 740 feet of berthing space with dolphins, 30 feet alongside, deck height, 18 feet; conveyors extend from wharf to a 60,000-ton open storage area, storage tanks for 2.2 million gallons of caustic soda and 27,000 barrels of fuel oil; receipt of salt, bulk chemicals, and fuel oil for plant consumption, and shipment of caustic soda and liquid chemicals; owned and operated by Pennwalt Corp.

(456)

**General Metals Wharf** (47°16'05"N., 122°22'09"W.): 1,155-foot berthing space with dolphins, 15 to 30 feet alongside, two 40-ton and one 50-ton gantry crane; shipment of scrap metal; owned and operated by General Metals of Tacoma Inc. Note: the company prefers vessels to moor starboardside-to.

(457)

**Weyerhaeuser Co., Tacoma Export Yard Dock:** SW side of upper turning basin on Hylebos Waterway; 1,100-foot berthing space with dolphins, 39 feet alongside deck height, 19 feet; 18 acres open log storage and sorting yard; lift trucks to 60 tons; shipment of logs; owned and operated by Weyerhaeuser Co.

**Facilities on Blair Waterway:**

(458)

**U.S. Oil and Refining Co. Dock 1** (47°16'01"N., 122°23'47"W.): 645-foot berthing space with dolphins, 27 to 40 feet alongside, deck height, 18 feet; storage tanks with a 2.1-million-barrel capacity; receipt and shipment of petroleum products; owned and operated by U.S. Oil and Refining Co.

(459)

**Tacoma Lime Wharf** (47°16'09"N., 122°23'40"W.): 16-foot face; 420 feet of berthing space with dolphins; 32 feet alongside; deck height, 20 feet; belt conveyor with unloading rate of 300 tons per hour; storage silos for 1,900 tons; open storage for 15,000 tons; receipt of limestone; owned and operated by Tacoma Lime, a division of Continental Lime.

(460)

**Buckeye Pipeline Co. Dock** (47°15'30"N., 122°22'52"W.): 200 feet of berthing space with dolphins; 35 feet alongside; deck height, 16 feet; storage tanks with a 90,000-barrel capacity; receipt of jet fuel; owned and operated by Buckeye Pipeline Co.

(461)

**Superior Oil Terminals Co. Wharf** (47°15'39"N., 122°26'05"W.): 570-foot berthing space with dolphins, 26 feet alongside, deck height, 20 feet; storage tanks with a 350,000-barrel capacity; receipt and shipment of petroleum products, and fueling of small craft; owned and operated by Superior Oil Terminals Co.

(462)

**Tacoma Marine Terminal Dock** (47°15'30"N., 122°25'57"W.): 300 feet of berthing space with dolphins; 30 feet alongside; deck height, 26 feet; storage tanks with a 140,000-barrel capacity; receipt of petroleum products; owned and operated by Union Oil Co. of California.

**Supplies**

(463)

Most marine supplies and services are available at Tacoma. Bunker fuel, diesel oil, and lubricants are available. Gasoline and diesel fuel are available at the oil docks on Thea Foss Waterway. Large vessels are bunkered at their berths by barge. Water is available at most of the berths.

**Repairs**

(464)

There are no facilities for major repairs to large oceangoing vessels in Tacoma; the nearest such facilities are in Seattle, Wash. The largest floating drydock in Tacoma is at a boatbuilding company on the SW side at the entrance to Hylebos Waterway. It will handle vessels to 8,000 tons or 516 feet. The firm has a complete machine shop. The largest marine railway in Tacoma is at a repair yard on the NE side of the upper turning basin in Hylebos Waterway; the railway here is certified for 1,000 tons.

**Small-craft facilities**

(465)

A public pier, owned by the city of Tacoma, is 0.6 mile SE of the S marker of the measured mile course on the SW side of Commencement Bay; small craft moor here temporarily. There are numerous other small-craft facilities on Hylebos, Blair, and Thea Foss Waterways, and on the NE and SW shores of Commencement Bay. (See the small-craft facilities tabulation on chart 18445 for services and supplies available.)

**Communications**

(466)

Tacoma is served by two major railroads, Seattle-Tacoma Airport, and Tacoma Narrows Industrial Airport.

**Shoreline Verification Report  
 OPR-N411-NRT3-07  
 Tacoma, Washington  
 Scale: 1:10000**

**A. AREA SURVEYED**

OPR-N411-NRT3-07 included shoreline verification for the latest revisions of the affected raster and ENC charts:

Chart No.	Scale	Date	Edition	Downloaded
18453	1:15,000	October 2003	25th	January 21, 2009
18474	1:40,000	September 2007	8th	January 21, 2009

ENC Cell	Edition	Update Application Date	Issue Date
US5WA18M	7	7/31/2007	7/10/2008
US5WA22M	5	10/4/2007	11/10/2008

**Data Acquisition**

Equipment used for shoreline acquisition is listed in the table below:

Equipment Type	Manufacturer	Model	Serial Number	Firmware and/or Software Version	Version Install Date
GPS Handheld Receiver/Datalogger	Trimble	GeoXT 50950-20	4428E01847	Terra Sync 2.41 GPS Firmware 1.05	2/27/07 4/15/04
Beacon-on-Belt DGPS Receiver/Antenna	Trimble	38508-00	440111069		

GPS data were collected on shoreline features throughout the project area. Some features were new; others were inaccurately depicted on the chart. Feature data were categorized at the time of acquisition by Object Class in accordance with S-57 standards in the form of points, lines or areas, consistent with the allowable geometry type for each Object Class. S-57 Attributes were defined in the field whenever possible.

Positions on discrete point features were acquired by placing the antenna over the feature and recording GPS positions for a period of time, typically one minute. The collection period was



extended to five minutes on major lights and ten minutes on ranges. The position data files for fixed aids to navigation have been transmitted to Marine Chart Division.

For line and area features, GPS data positions were acquired by collecting position data along the outside edge of a feature at a vertex or intersection, then pausing data collection until the next vertex or intersection is reached, at which point a new position would be collected and added to the feature. These steps would be repeated until the feature was completely defined. The GPS Pathfinder Office software extrapolates between the points acquired to create a continuous line or complete area and to clearly delineate the feature.

Point data were post-processed in GPS Pathfinder Office version 3.00 using dgps correction data from the nearest Continually Operating Reference Station (CORS). All position data were evaluated by examining horizontal precision and standard deviation calculated with GPS Pathfinder Office software as well as by comparing the data with the chart, aerial photographs and/or photographs acquired on the site. Where multipathing was known to occur (i.e., under bridges or near other overhead obstructions), points were examined with more rigorous attention. Positions significantly inconsistent with the above sources were deleted and reacquired.

The Pathfinder data collected in the field were exported from GPS Pathfinder Office into shape files which were then imported into NOTEBOOK.

### **Data Files**

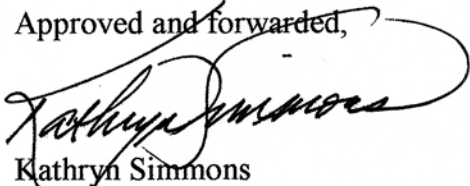
Two standalone hob files were created in NOTEBOOK: OPR\_N411\_NRT3-07.hob and OPR-N411\_ATONs.hob. The ATON files were submitted to MCD on March 23, 2009, as text and excel files. Those files along with the ATON Notebook files accompany this report. (See Project Files.) On completion of post-processing, each of the above files was exported to S-57 files as well as to shape files. Notes to the cartographer were recorded in the Marker Layer of the respective hob file.

Photographs referenced in the PICREP field or in the Marker files are located in the Notebook/Images Used folder.

Marker notes concerning submerged or non-existent charted features are included with the Notebook data; however, remarks and recommendations are based on the data obtained with side scan and SWMB hydrography.

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

Approved and forwarded,

A handwritten signature in black ink, appearing to read 'Kathryn Simmons', written in a cursive style. The signature is positioned above the printed name and title.

Kathryn Simmons  
Team Leader

**ATLANTIC HYDROGRAPHIC BRANCH  
EVALUATION REPORT to Accompany  
Surveys H11642 (2007-2009)**

This Evaluation Report has been written to supplement and/or clarify the original Descriptive Report. Sections in this report refer to the corresponding sections of the Descriptive Report.

**B. DATA ACQUISITION AND PROCESSING**

**B.1 DATA PROCESSING**

The following software was used to process and review data at the Atlantic Hydrographic Branch (AHB):

CARIS HIPS/SIPS version 6.1 SP2 HF 1-4  
 CARIS BASE Manager 2.1 SP1 HF 1-8  
 CARIS HOM ENC 3.3  
 PYDRO, version 9.10\_r2802\_c  
 CARIS S-57 Composer 2.0

**B.2 QUALITY CONTROL**

**H-Cells**

The AHB source depth grid was generated from the field 0.5M, 1M, and 2M MBES source grids. This process was used to create a 4m resolution combined surface from which survey scale soundings were extracted. Survey scale soundings were chosen using a scale of 1:10,000 and a depth-radius file with the following values:

<i>Depth Range</i>	<i>mm@scale</i>
<i>0 to 20</i>	<i>0.5</i>
<i>20.001 to 300</i>	<i>1.0"</i>

Soundings were selected for charting by hand using the latest raster charts 18453. Soundings were then checked for conflicts, corrected to remove conflicts, and edited to allow for proper sounding compilation placement with respect to existing charted depths outside the survey area. The BASE surface was referenced when selecting the chart scale soundings, to ensure that the selected soundings portrayed the bathymetry within the common area.

Depth curves were drawn from the Base surface. In order to create depth contours the X meter resolution SS interpolated tin was shifted, by a factor of negative 0.75 feet (in accordance with NOAA sounding rounding rules), and

the contours were then derived from the interpolated and non-interpolated nodes. Therefore, using this method the contour are in harmony with the SS and CS soundings while maintaining the chart equivalent contour values as whole integers. The depth contours are being forwarded to MCD for reference only. The contours were utilized during chart scale sounding selection and quality assurance efforts at AHB. The depth contours are incorporated into the SS H-Cell product as per 2009 H-Cell Specifications.

The compilation products and Stand Alone HOB Files (SAHOB) are detailed in the Compilation Process Log of this document. All individual SAHOB files were assembled in BASE Editor during H-Cell compilation.

The completed H-Cell was exported as a Base Cell File (ENC.000) in S-57 format with all values in metric units. The metric equivalent ENC.000 file was then converted to NOAA chart units (ENC\_CS.000) with all values measured in feet following NOAA sounding rounding rules.

The H11458 CARIS H-Cell final deliverables include the following products:

H11642_CS.000	1:15,000 Scale	H11642 Selected Soundings (Chart Scale)
H11642_SS.000	1:10,000 Scale	H11642 Selected Soundings (Survey Scale)

**JUNCTIONS**

H11458 (2008-2009) to the north

The present survey junctions along its northern edge with contemporary survey H11458. Present survey soundings are in agreement with survey H11458 (2008-2009).

**C. VERTICAL AND HORIZONTAL CONTROL**

Final vertical correction processing was completed by the field unit with no additional corrections required by Atlantic Hydrographic Branch personnel. The field unit applied verified water levels in conjunction with the preliminary tidal zoning which was accepted and approved by N/OPSI CO-OPS as the final zoning for H11642. Sounding datum is Mean Lower Low Water (MLLW). Vertical datum is Mean High Water (MHW).

Horizontal control used for this survey during data acquisition is based upon the North American Datum of 1983 (NAD83), UTM projection zone 10. Office ENC processing of this survey required translating the datum to meet S-57 ENC requirements. The horizontal geodetic datum was translated to Latitude and Longitude (LLDG) World Geodetic System-84 (WGS-84) during CARIS Base Manager processing.

**D. RESULTS AND RECOMMENDATIONS**

<u>Chart Comparison</u>	<u>18453 (25<sup>th</sup>. Edition, Sep. /07</u> Corrected through NM, Sep. 15/07 Corrected through LNM, Sep. 18/07 Scale 1:15,000
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<u>ENC Comparison</u>	<u>US5WA22M</u> Tacoma harbor Edition 13 Update Application Date 2009-09-17 Issue Date 2009-09-17 References: Charts 18453
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Hydrography

The charted Hydrography originates with prior surveys and requires no further consideration. The hydrographer makes adequate chart comparisons in section D., Appendix 1 and 2. of the Descriptive Report. The following should be noted:

An uncharted wreck with a depth of 18 feet in Latitude 47°17'39.469"N, Longitude 122°25'08.094"W was located by present survey multibeam. It is recommended that an 18Wk be charted in present survey location.

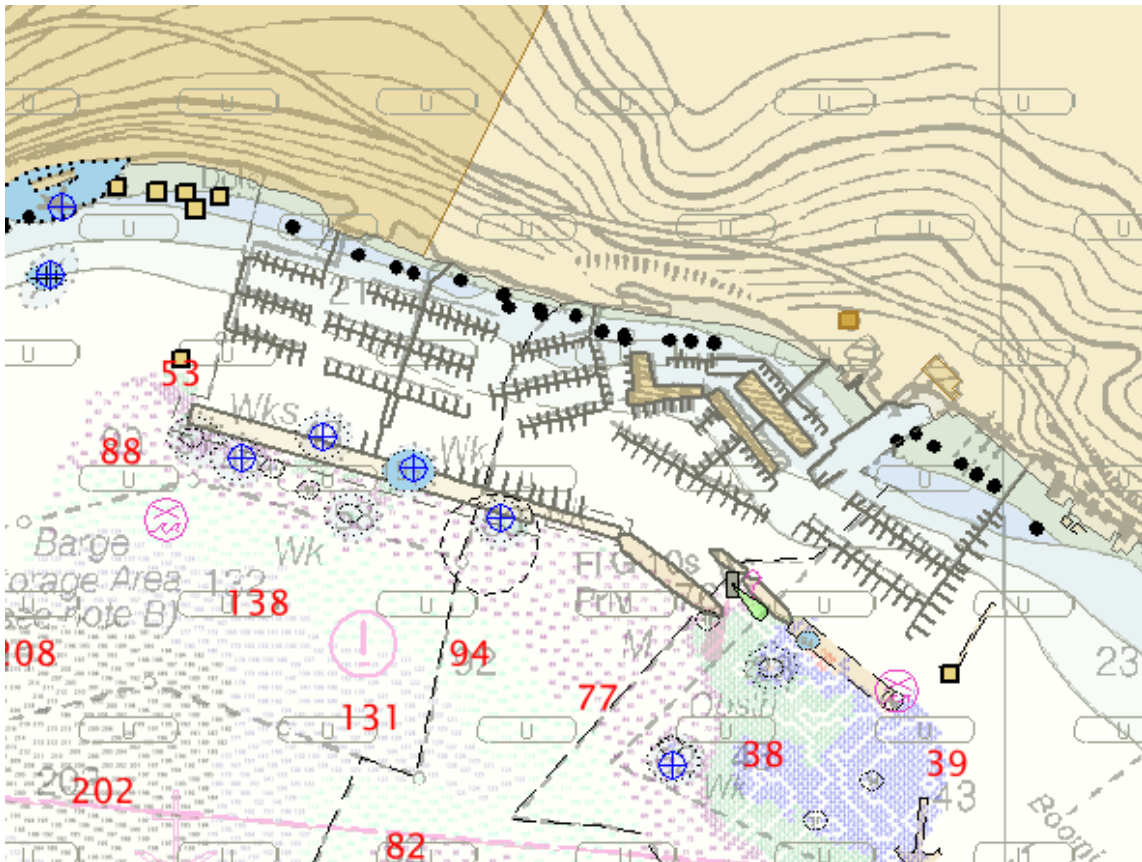
A charted Subm pile in the vicinity of Latitude 47°16'52.12"N, Longitude 122°24'49.57"W was disproved during present survey operations. It is recommended that the Subm pile be deleted.

A charted dolphin (Dol) in the vicinity of Latitude 47°16'52.36"N, Longitude 122°24'50.10"W was disproved during present survey operations. It is recommended that the dolphin (Dol) be deleted.

A charted Dolphin (Dol) in the vicinity of Latitude 47°16'53.28"N, Longitude 122°24'49.09"W was located in Latitude 47°16'53.10"N, Longitude 122°24'49.29"W during

present survey operations. It is recommended that the Dolphin (Dol) be charted in present survey location.

A major shoreline change was determined during present survey operations in the vicinity of Latitude 47°17'44"N, Longitude 122°25'22"W. A huge breakwater and pier system has been created. The changes were submitted by the field unit in a report labeled OPR-N411-NRT3 Shoreline Report to MCD. The corrections are shown on the edited ENC US5WA22E 15JUN2009 for chart 18453.



Charted Ruins in the vicinity of Latitude 47°16'31.77"N, Longitude 122°25'00.20"W was not seen during present survey visual investigation. It is recommended that the Ruins be revised to Subm ruins.

Charted Ruins in the vicinity of Latitude 47°16'34.81"N, Longitude 122°24'57.58"W was not seen during present survey visual investigation. It is recommended that the Ruins be revised to Subm ruins.

A charted Dolphin (Dol) in the vicinity of Latitude 47°16'38.43"N, Longitude 122°24'58.28"W was not seen during present survey visual investigation. It is recommended that the Dolphin (Dol) be revised to Subm dol.

Two charted piles in the vicinity of Latitude 47°16'17.88"N, Longitude 122°22'36.83"W were disproved during present survey operations. New piers have been built in the area. It is recommended that the piles be deleted.

Three (3) charted dolphins (Dol) in the vicinity of Latitude 47°16'38.5"N, Longitude 122°23'46.3"W were not visually seen or during present survey operations. It is recommended that the dolphin (Dol) be revised to Obstn Subm dols in charted locations.

A charted pile in the vicinity of Latitude 47°16'32.28"N, Longitude 122°23'06.04"W was disproved during present survey operations. It is recommended that the pile be deleted.

A charted obstruction in the vicinity of in Latitude 47°16'39.96"N, Longitude 122°23'36.46"W was neither verified nor disproved by present survey. It is recommended that the Obstn be retained as charted.

A charted pile in the vicinity of Latitude 47°16'34.90"N, Longitude 122°23'27.52"W was neither verified nor disproved during present survey operations. The piles were not seen during present survey operations or on side scan. It is recommended that the pile be revised to Obstn Subm pile.

A charted dolphin (Dol) in the vicinity of Latitude 47°15'48.11"N, Longitude 122°25'58.18"W was not seen during present survey operations. It is recommended that the dolphin (Dol) be revised to Obstn Subm dol.

An uncharted obstruction with a depth of 31 feet in Latitude 47°15'53.77"N, Longitude 122°22'00.75"W was located by present survey multibeam. The 31 Obstn is in the controlled channel of The Hylebos Waterway and deeper than the controlling depth of 30.7 feet. It is recommended that the obstruction not be charted.

An uncharted obstruction with a depth of 12 feet in Latitude 47°15'41.43"N, Longitude 122°21'43.58"W was located by present survey multibeam. It is recommended that a 12 Obstn and danger curve be charted in present survey location.

A charted Obstn Subm dol in the vicinity of Latitude 47°17'18.61"N, Longitude 122°24'41.84"W was located in Latitude 47°17'18.44"N, Longitude 122°24'42.04"W during present survey operations. It is recommended that the Obstn Subm dol be charted in present survey location.

A charted dolphin (Dol) in the vicinity of Latitude 47°16'03.07"N, Longitude 122°23'55.27"W was located during present survey operations and determined to be submerged. It is recommended that the dolphin (Dol) be revised to Obstn Subm dol in charted location.

A charted Dolphin (Dol) in the vicinity of Latitude 47°15'57.41"N, Longitude 122°23'46.68"W was disproved during present survey operations. It is recommended that the Dolphin (Dol) be deleted.

Charted Obstn Subm dols in the vicinity of Latitude 47°17'13.67"N, Longitude 122°24'45.60"W were disproved during present survey operations. It is recommended that the Obstn Subm dol be deleted.

A row of charted piles (10) in the vicinity of Latitude 47°16'34.2"N, Longitude 122°23'13.0"W were disproved during present survey operations. It is recommended that the row of charted piles (10) be deleted.

Nine (9) charted Dolphins (Dol) and a pier in the vicinity of Latitude 47°15'41.4"N, Longitude 122°23'04.6"W were disproved during present survey operations. It is recommended that the Dolphins (Dol) and pier be deleted.

Three (3) charted dolphins (Dol) and a pier in the vicinity of Latitude 47°15'29.7"N, Longitude 122°22'56.5"W was disproved during present survey operations. It is recommended that the dolphins (Dol) and pier be deleted.



The following items were disproved by present survey:

<u>Feature</u>	<u>Latitude (N)</u>	<u>Longitude (W)</u>
pile	47°16'42.42"	122°23'45.64"
pile	47°16'26.39"	122°22'57.06"
pile	47°16'27.09"	122°23'00.49"
pile	47°16'27.12"	122°22'58.38"
pile	47°16'02.62"	122°22'17.90"
pile	47°15'51.92"	122°21'59.78"
pile	47°15'51.48"	122°22'00.23"
pile	47°15'54.44"	122°22'03.71"
pile	47°15'53.77"	122°22'02.60"
pile	47°15'55.11"	122°22'04.91"
pile	47°15'53.04"	122°22'01.47"
dolphin	47°15'44.27"	122°21'47.75"
pile	47°15'44.02"	122°21'33.78"
pile	47°15'52.48"	122°21'42.37"
pile	47°16'30.99"	122°23'00.28"
pile	47°15'15.71"	122°22'34.43"
pile	47°15'40.17"	122°21'38.46"
pile	47°15'42.68"	122°21'34.24"
pile	47°15'42.24"	122°21'34.64"

Delete the above discussed charted features.

Two (2) charted piles in the vicinity of Latitude 47°15'53.1"N, Longitude 122°23'21.2"W were disproved during present survey operations. It is recommended that the piles be deleted.

Two rows of charted piles (13) in the vicinity of Latitude 47°15'59.1"N, Longitude 122°22'12.0"W were disproved during present survey operations. It is recommended that the rows of charted piles (13) be deleted.

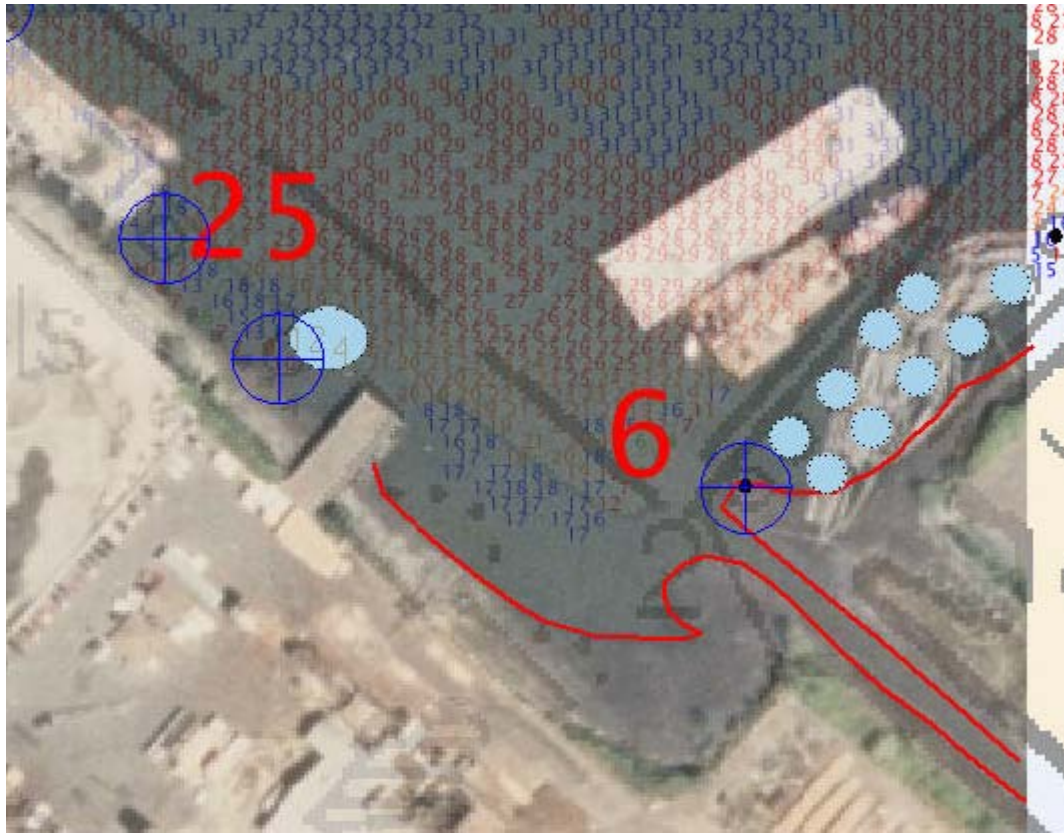
Two rows of charted piles (13) in the vicinity of Latitude 47°15'59.1"N, Longitude 122°22'12.0"W were disproved during present survey operations. It is recommended that the rows of charted piles (13) be deleted

Two (2) charted AWOIS #53280 &53281 (visible wrecks) in the vicinity of Latitude 47°16'42.0"N, Longitude 122°23'32.5"W were not seen during survey operations. The below Ortho photo #97567773 shows a log storage area where

the visible wrecks are charted. It is recommended that the two charted AWOIS #53280 & 53281 (visible wrecks) be revised to dangerous sunken wrecks. See also Appendix 2 of this report.



Nine (9) charted Piles in the vicinity of Latitude 47°15'40.8"N, Longitude 122°21'37.0"W were not seen during survey operations. The below Orthophoto #97567773 shows a log storage area where the Piles are charted. It is recommended that the charted Piles be revised to Obstns Subm piles as shown in below photo.



Charted **Shoreline** in the vicinity of Latitude 47°15'39.58"N, Longitude 122°21'38.71"W seen on U.S. Geological Survey Orthoimagery #97567773, for Zone 10 Washington State Quarter Quadrangle TACOMA, 20070312, has changed. The shoreline change has been digitized to the H-Cell from the Orthophoto. It is recommended that the **Shoreline** be revised from H-Cell H11642 as shown from above photo.

In Blair Waterway several conflicts exist between the controlling depths and the present survey. Depths were charted in the channel to support the present survey. The local ACOE and Port Authority constituents have been made aware of the shoal sounding in this waterway by Pacific Northwest Nav Manager, Gary Nelson, per conversation on February 24, 2010.



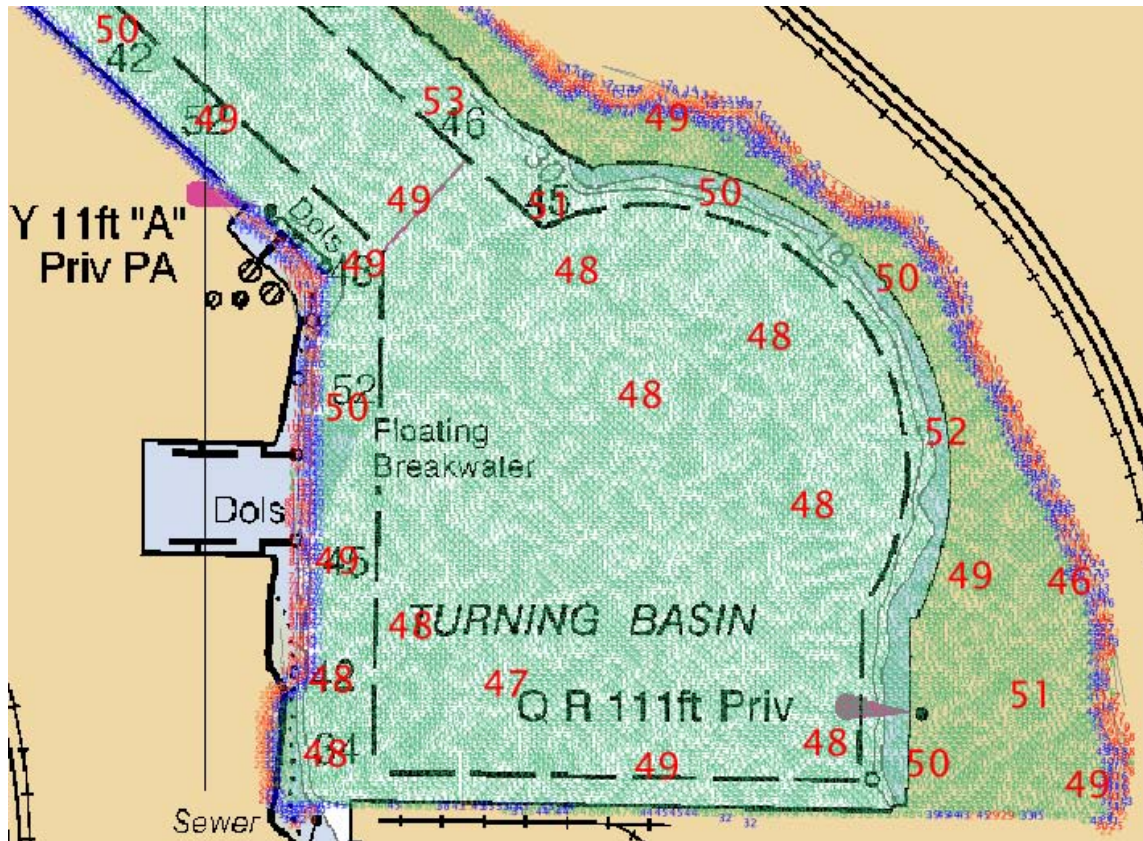
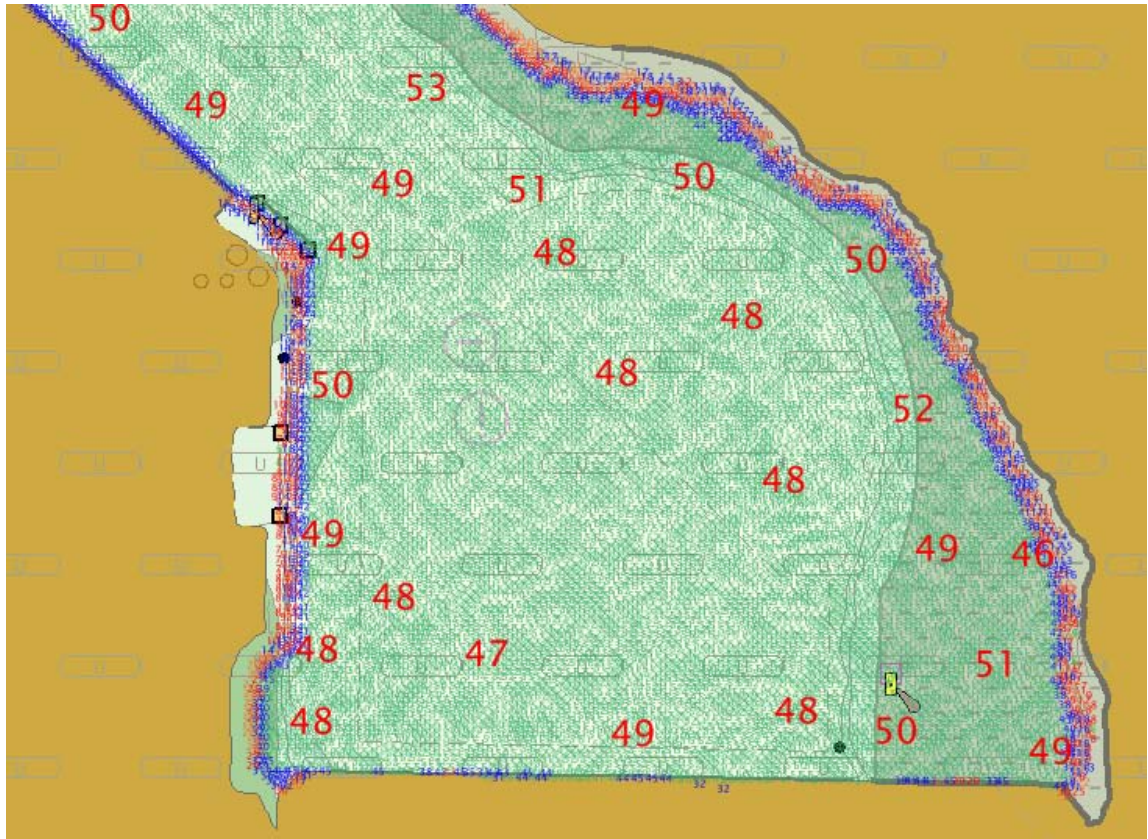


Chart 18453, 25<sup>th</sup>, Ed., Sep/07.

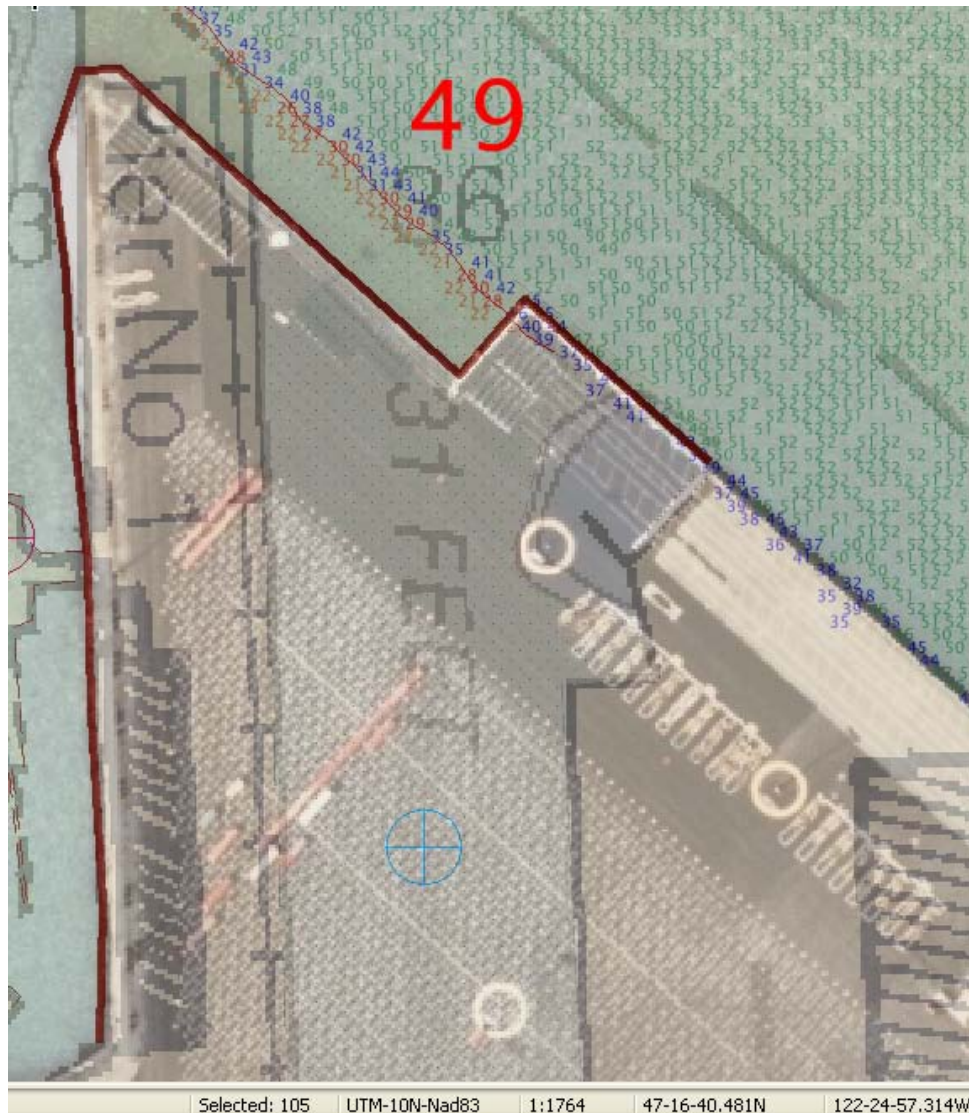
Charted Shoreline in the vicinity of Latitude 47°15'24"N, Longitude 122°22'28"W has changed. The shoreline change has not been digitized because the edited ENC US5WA22E 15JUN2009 for chart 18453 has the corrections applied. No change in charting is recommended.



ENC US5WA22E 15JUN2009

Charted **Shoreline** in the vicinity of Latitude 47°16'40"N, Longitude 122°24'57"W seen on U.S. Geological Survey Orthoimagery #61127731, for Zone 10 Washington State Quarter Quadrangle TACOMA, 20070312, has changed. The shoreline change has been digitized to the H-Cell from the Orthophoto. It is recommended that the **Shoreline** be revised from present survey H-Cell.





### Adequacy of Survey

The present survey is adequate to supersede the charted bathymetry within the common area. Any features not specifically addressed either in the H-Cell File or the Blue Notes should be retained as charted. Refer to the Descriptive Report for further survey requirements recommended by the hydrographer.

**Miscellaneous**

Chart compilation was done by Atlantic Hydrographic Branch personnel, in Norfolk, Virginia. Compilation data will be forwarded to Marine Chart Division, Silver Spring, Maryland. See Section D.1. of this report for a list of the Raster Charts and Electronic Navigation Chart (ENC) used for compiling the present survey.

# H11642 COMPILATION LOG

General Survey Information	
REGISTRY No.	<i>H11642</i>
PROJECT No.	<i>OPR-N411-NRT3-07</i>
FIELD UNIT	<i>NOAA-NRT3</i>
DATE OF SURVEY	<i>JUNE 19, 2007 TO APRIL 3, 2009</i>
LARGEST SCALE CHART	<i>18453, edition #25, 20070901, 1:15000</i>
SOUNDING UNITS	<i>feet</i>
COMPILER	<i>Norris A. Wike</i>
Source Grids	File Name
	<i>H11642_A_50CM_FINAL.hns</i>
	<i>H11642_B_50CM_FINAL.hns</i>
	<i>H11642_B_1M_FINAL.hns</i>
	<i>H11642_B_2M_FINAL.hns</i>
	<i>H11642_C_50CM_FINAL.hns</i>
	<i>H11642_C_1M_FINAL.hns</i>
	<i>H11642_C_2M_FINAL.hns</i>
	<i>H11642_D_50CM_FINAL.hns</i>
	<i>H11642_D_1M_FINAL.hns</i>
	<i>H11642_D_2M_FINAL.hns</i>
	<i>H11642_E_50CM_FINAL.hns</i>
	<i>H11642_F_50CM_FINAL.hns</i>
	<i>H11642_G_50CM_FINAL.hns</i>
Surfaces	File Name
<i>Combined</i>	<i>H11642_Combined_4M.hns</i>
Final HOBs	File Name
<i>Survey Scale Soundings</i>	<i>H11642_SS_Soundings.hob</i>
<i>Chart Scale Soundings</i>	<i>H11642_CS_Soundings.hob</i>
<i>Contour Layer</i>	<i>H11642_Contours.hob</i>
<i>Feature Layer</i>	<i>H11642_Features.hob</i>
<i>Meta-Objects Layer</i>	<i>H11642_MetaObjects.hob</i>
<i>Blue Notes</i>	<i>H11642_BlueNotes.hob</i>
<i>ENC Retain Soundings</i>	<i>H11642_ENC_Retain.hob</i>
Meta-Objects Attribution	
Acronym	Value
<b>M_COVR</b>	
CATCOV	<i>1</i>
SORDAT	<i>20090403</i>
SORIND	<i>US,US,survy,H11642</i>
<b>M_QUAL</b>	
CATZOC	<i>U</i>
INFORM	<i>H11642, OPR-N411-NRT3-07,NOAA Survey Launch S1212</i>
POSACC	<i>10</i>
SORDAT	<i>20090403</i>
SORIND	<i>US,US,survy,H11642</i>
SUREND	<i>20090403</i>
SURSTA	<i>20070619</i>



<b>DEPARE</b>	
DRVALV 1	<i>-3.00</i>
DRVALV2	<i>350.00</i>
SORDAT	<i>20090403</i>
SORIND	<i>US,US,nsurf,H11642</i>

**APPROVAL SHEET**  
**H11642**

The completed survey has been inspected with regard to survey coverage, delineation of depth curves, representation of critical depths, cartographic symbolization, and verification or disproof of charted data. All revisions and additions made to the H-Cell files during survey processing have been entered in the digital data for this survey. The survey records and digital data comply with National Ocean Service and Office of Coast Survey requirements except where noted in the Descriptive Report and the Evaluation Report.

All final products have undergone a comprehensive review as per the Atlantic Hydrographic Branch Processing Manual and are verified to be accurate and complete except where noted.

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**Norris A. Wike**  
Cartographer  
Atlantic Hydrographic Branch

I have reviewed the H-Cell files, accompanying data, and reports. This survey and accompanying Marine Chart Division deliverables meet National Ocean Service requirements and standards for products in support of nautical charting except where noted.

Approved: \_\_\_\_\_  
**Richard T. Brennan**  
Commander, NOAA  
Chief, Atlantic Hydrographic Branch