Received
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D.N.R. Aquatic Lands

Northern Retriever

For:

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Submitted by:
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BALLARD DIVING & SALVAGE INC

1525 NW Ballard Way Seattle, Washington 98107
VOICE 206-782-6750 **FAX** 206-782-8944 **EMAIL** Divers@ballarddiving.com

BALLARD DIVING & SALVAGE INC

Vessel: Northern Retriever
Job Description: Ship survey
Date: January 6th 2009
Job number: 90911
Diving Supervisor: Michael Szymczak
Inspecting Diver: Chris Calero
Tender: Joe Cadwell

The side shell of the vessel was marked in 10 foot intervals at the waterline with a lumber crayon. At these locations the diver traveled transversely and gathered four data points- port side waterline, midpoint between port side waterline and the keel or (port center), starboard center, and then starboard waterline. At each location the diver took an ultrasonic thickness reading of the hull plating, inspected for damage, and assessed the amount of marine growth on the hull. We started the inspection at the bow of the vessel traveling aft in 10'foot increments. When measuring the vessel we started at the transom working forward the bow is @186'foot and the transom is @ o'.

Location/ Ultrasonic Testing Readings / Marine Growth/ & Notes

186' Feet forward of the transom.
Ultrasonic testing readings.

- Starboard waterline .600
- Starboard center .580
- Port center .560
- Port side waterline .580

Marine growth.

- Hard 50 calcareous fouling in the form of barnacles less then ¼ " in diameter or height.

Notes.

- No visible damage

180' Feet forward of the transom.
Ultrasonic testing readings.

- Starboard waterline .400
- Starboard center .375

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- Port center .340
- Port side waterline .375

Marine growth.

- Hard 50 calcareous fouling in the form of barnacles less then ¼ " in diameter or height
- Sea grass 3"- 4" in height.

Notes

- No visible damage

170' Feet forward of the transom.

Ultrasonic testing readings.

- Starboard waterline .360
- Starboard center .375
- Port center .345
- Port side waterline .375

Marine growth.

- Hard 50 calcareous fouling in the form of barnacles less then ¼ " in diameter or height
- Sea grass 3"- 4" in height.

Notes: video log 09:20

- Dishing 2'wide x 4" deep
- 10 " long fracture in the hull plating @ the keel. The diver noticed his air bubbles passing through the fracture up inside the hull of the vessel.
- More dishing was noticed around the keel traveling aft this location.

160' Feet forward of the transom.

Ultrasonic testing readings.

- Starboard waterline .360
- Starboard center .250
- Port center .360
- Port side waterline .420

Marine growth.

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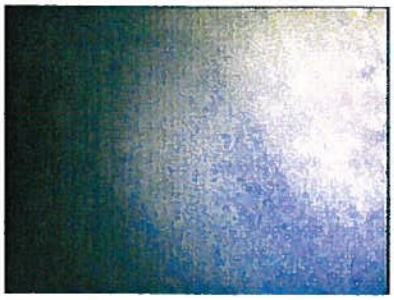
- Hard 50 calcareous fouling in the form of barnacles less then ¼ " in diameter or height

Notes: Video log 13:40 & started the second video file 00:00

- Dishing @ the keel location.
- Fracture in the hull plating 4'-5' foot long x 5"- 6" inches wide traveling transverse across the keel.



150' Feet forward of the transom.

Ultrasonic testing readings.

- Starboard waterline .285
- Starboard center .360
- Port center .360
- Port side waterline .350

Marine growth.

- Hard 50 calcareous fouling in the form of barnacles less then ¼ " in diameter or height.

Notes

- No visible damage

140' Feet forward of the transom.

Ultrasonic testing readings.

- Starboard waterline .320
- Starboard center .380
- Port center .350
- Port side waterline .430

Marine growth.

- Hard 50 calcareous fouling in the form of barnacles less then ¼ " in diameter or height

Notes

- No visible damage

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130' Feet forward of the transom.
Ultrasonic testing readings.

- Starboard waterline .350
- Starboard center .415
- Port center .300
- Port side waterline .380

Marine growth.

- Hard 50 calcareous fouling in the form of barnacles less then ¼ " in diameter or height
- Small oysters visible.

Notes

- No visible damage

120' Feet forward of the transom.
Ultrasonic testing readings.

- Starboard waterline .410
- Starboard center .410
- Port center .410
- Port side waterline .415

Marine growth.

- Hard 50 calcareous fouling in the form of barnacles less then ¼ " in diameter or height

Notes

- No visible damage

110' Feet forward of the transom.
Ultrasonic testing readings.

- Starboard waterline .430
- Starboard center .390
- Port center .420
- Port side waterline .405

Marine growth.

- Hard 50 calcareous fouling in the form of barnacles less then ¼ " in diameter or height

Notes

- No visible damage

100' Feet forward of the transom.

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Ultrasonic testing readings.

- Starboard waterline .440
- Starboard center .380
- Port center .410
- Port side waterline .350

Marine growth.

- Hard 50 calcareous fouling in the form of barnacles less then ¼ " in diameter or height

Notes

- No visible damage

90' Feet forward of the transom.

Ultrasonic testing readings.

- Starboard waterline .460
- Starboard center .380
- Port center .330
- Port side waterline .340

Marine growth.

- Hard 50 calcareous fouling in the form of barnacles less then ¼ " in diameter or height

Notes

- No visible damage

80' Feet forward of the transom.

Ultrasonic testing readings.

- Starboard waterline .325
- Starboard center .355
- Port center .380
- Port side waterline .470

Marine growth.

- Hard 50 calcareous fouling in the form of barnacles less then ¼ " in diameter or height

Notes: Video log 28:15

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- The leading edge of the bilge keel is visible.
- The leading edge of the starboard bilge keel is torn away from the hull and bent aft 1' foot.

70' Feet forward of the transom.
Ultrasonic testing readings.
- Starboard waterline .365
- Starboard center .380
- Port center .400
- Port side waterline .445

Marine growth.
- Hard 50 calcareous fouling in the form of barnacles less then ¼ " in diameter or height

Notes
- No visible damage

60' Feet forward of the transom.
Ultrasonic testing readings.
- Starboard waterline .415
- Starboard center .410
- Port center .390
- Port side waterline .420

Marine growth.
- Hard 50 calcareous fouling in the form of barnacles less then ¼ " in diameter or height

Notes
- Bilge keel ends 4' foot aft of the 60'foot mark.

50' Feet forward of the transom.
Ultrasonic testing readings.
- Starboard waterline .370
- Starboard center .380

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- Port center .360
- Port side waterline .465

Marine growth.

- Hard 50 calcareous fouling in the form of barnacles less then ¼ " in diameter or height

Notes

- Video log 40:05

- The keel is torn up and peeled forward. The effected area is 3'-4' foot long x 8" wide.
- Noticeable dishing in the area as well.

40' Feet forward of the transom.

Ultrasonic testing readings.

- Starboard waterline .365
- Starboard center .380
- Port center .380
- Port side waterline .355

Marine growth.

- Hard 50 calcareous fouling in the form of barnacles less then ¼ " in diameter or height

Notes

- No visible damage

30' Feet forward of the transom.

Ultrasonic testing readings.

- Starboard waterline .355
- Starboard center .345
- Port center .330
- Port side waterline .360

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Marine growth.

- Hard 50 calcareous fouling in the form of barnacles less then ¼ " in diameter or height

Notes

- No visible damage

20' Feet forward of the transom.

Ultrasonic testing readings.

- Starboard waterline .345
- Starboard center .375
- Port center .335
- Port side waterline .355

Marine growth.

- Hard 50 calcareous fouling in the form of barnacles less then ¼ " in diameter or height
- Sea grass 3"- 4" inches long.

Notes

- No visible damage

10' Feet forward of the transom.

Ultrasonic testing readings.

- Starboard waterline .320
- Starboard center .255
- Port center .335
- Port side waterline .315

Marine growth.

- Hard 50 calcareous fouling in the form of barnacles less then ¼ " in diameter or height

Notes

- No visible damage

<u>Propeller and Running Gear Inspection</u>

Propeller

- The propeller has 4 blades all intact.
- All blades are equally spaced within the kort nozzle.

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Kort Nozzle
Video Log: 01:00

- The leading edge of the kort nozzle at the bottom is turned up and peeled aft 1'foot.
- Looking aft at the nozzle the effected area is from the 4 o'clock position to the 8 o'clock position.

Rudder

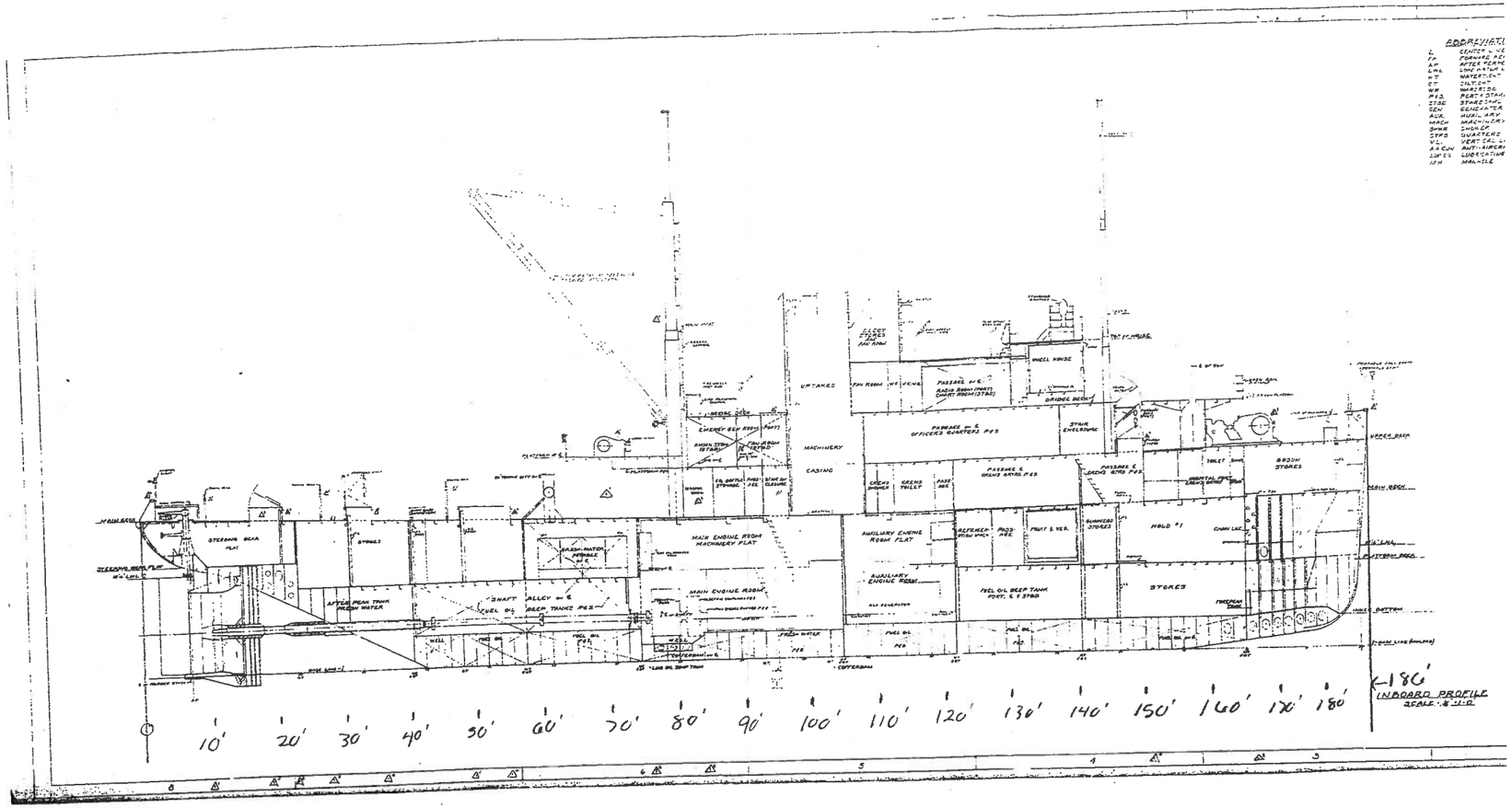
- The rudder is in the centered position and secured. This was accomplished by securing the turning gear with multiple wraps of chain in the lazarette.
- At the bottom of the rudder on the starboard side the steel is fractured and torn aft approximately 1'foot.
- At the bottom of the rudder on the port side the steel is fractured and torn open approximately 3".

Recommendations

- Ballard Diving & Salvage recommends before transportation of the vessel that all hull penetrations be plugged and that all fractures be repaired with steel temporary patches. For more information regarding methodologies please feel free to call anytime.

  For questions regarding this survey please call:

  Jesse Hutton
  (360) 518-3641
  jesse@nwuwconst.com



INBOARD PROFILE
SCALE: 1/16"

Northern Retriever

Field Notes

Submitted by:
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NORTHWEST UNDERWATER CONSTRUCTION LLC

Client Name Dept of Natural Resources

Job Name Northern Retriever

Job # 91001 Page ____ of ____

Date ____ Scale: 1 square = ____

Drawing by ____

Northern Retriever Bow 186 from transom

Bow,	STBD	StBD center	Port center	PorT	NOTES
186' -	.60	.580	.560	.580	Hard 50 Less Than 1/4" 100%
180' -	.40 HD50	.375	.340 Sea Grass/musc	.375 HD50	
170' -	.360	.375 *09:20	.345 HD 50	.375	Dishing + crack in Hull 09:20 video Log
160' -	.360	.25 * 13:40	.360	.420	Dishing & 4' Long crack Transverse Keel
150' -	.285	.360	.360	.350	
140' -	.320	.380	.350	.430	
130' -	.350 Hard 50 w/ oysters	.415	.300	.380	
120' -	.410	.410	.410 HD 50	.415	
110' -	.430	.390	.420	.405	
100' -	.440	.380	.410	.350	
90' -	.460	.380	.330 * Bilge Keel	.340	Bilge Keel good condition
80' -	.325	.355 28:15 X Bilge Keel	.380	.470	*Bilge keel torn see notes
70' -	.365	.380 *Bilge Keel Deflected up	.400	.445	
60' -	.415	.410	.390	.420	Bilge Keel ends 4' aft 60' mark

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Job # 91001 Page ____ of ____

Date ____ Scale: 1 square = ____

Drawing by ____

Location -	STBD	STBD center	Port center	PorT	Notes
50' -	.370 HD 50	.380 HD 50	.360 * 40:05 Depth 16'	.465	* Keel Damage
40' -	.365	.380	.380	.355	
30' -	.355	.345	.330	.360	
20' -	.345	.375	.335 HD 50 Sea Grass 3"-4"	.355	
10' -	.320	.255	.335	.315	

NORTHWEST UNDERWATER CONSTRUCTION LLC

Client Name _____

Job Name _____

Job # _____ Page _____ of _____

Date _____ Scale: 1 square = _____

Drawing by _____

* 170' - 09:20 Damage Location on the Keel
- Dishing 2' wide x 4" deep
- 10" long Fracture in Hull plating @ the Keel
The divers air bubbles were travelling through the Fracture up into the ~~Hull~~ vessels Hull
- more Dishy Noted travelling aft of this Location.

* 160' - 13:40 Dishing & Fracture on the Keel
- 5'-6" wide fracture 4'-5' long transverse Keel
00:00 second file

NOTE - Weld seams could be inspected Due to The hard 50 marine growth covering 100% of the Hull plating.

* 80' - 28:15 - Torn Bilge Keel L/E 1' Long
Bent aft 1' STBD side

* 50' - 40:05 - Keel torn up & FWD (peelled FWD)
- Dishing
- widest point 8"
- 3'-4' Long peel

Kort Noz - Nozzle 1:00 - L/E Cort Nozz - @ the Bottom Port & STBD
Torn up & peeled aft 1'
- 4 o'clock to 7-8:00 Looking AFT

Wheel - 4 Blades all intact

Rudder - is in the centerline position
- Bottom STBD side torn, open 1'
- " Port " " 3'
- Inside of the rudder is exposed

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