

**ASBESTOS-CONTAINING MATERIALS
REASSESSMENT SURVEY 2015
CCGS HENRY LARSEN
ST. JOHN'S, NEWFOUNDLAND LABRADOR**



Prepared for:
Canadian Coast Guard, Atlantic North Region
Department of Fisheries and Oceans
St John's, Newfoundland Labrador
Canada

Attention: Michael Chaisson

Prepared by:
Pinchin LeBlanc Environmental Limited

February 4, 2015

Pinchin LeBlanc Environmental Project: 02-02-01464

27 AUSTIN STREET, ST JOHN'S, NEWFOUNDLAND LABRADOR, A1B 4C3 TEL: (709) 754-4490 FAX: (709) 754-1359
SAINT JOHN, NB • DARTMOUTH, NS • LABRADOR CITY, NL • CORNER BROOK, NL

ISO 9001:2008 Registered Quality System (Dartmouth, NS)

EXECUTIVE SUMMARY

Canadian Coast Guard (CCG) retained Pinchin LeBlanc Environmental Limited (Pinchin) to perform a reassessment of asbestos-containing "Weather Shield" which is applied over spray- fireproofing aboard the Canadian Coast Guard Ship (CCGS) Henry Larsen. The reassessment was conducted on January 13-16, 2015.

This "Weather Shield" product is classified as a non-friable asbestos product, similar in nature to a higher viscosity latex paint, which is applied over non-asbestos containing fireproofing as an encapsulate. The material is present throughout the vessel on bulkheads, deckheads and the interior of the vessel's hull. Additional non-friable asbestos-containing materials are also present aboard the vessel. The ductwork on the bubbler system located in the forward bubbler compartment on the main deck is covered with a white asbestos containing coating. The coating has been labeled asbestos containing by shipboard personnel. Various types of gasket materials are used on mechanical systems and equipment throughout the vessel. Large quantities of gasket materials are also stored in the steering gear compartment of the vessel and in limited quantities are also stored in in other compartments of the vessel (i.e. general stores, shops and storage lockers). Not all gaskets have been sampled or confirmed asbestos-containing and due to the complexity of vessel operations, the wide variety of gasket materials visually identified on board and the locations of concealed gaskets in operating vessel equipment, the delineation of the location of asbestos containing gasket material is not possible. Shipboard personnel are reminded to manage all gasket materials as asbestos-containing until sampling indicates otherwise.

This report presents an updated record of the condition of the Weather Shield material and recommendations for remedial action and repair where appropriate. Other non-friable asbestos containing materials were not included in this assessment.

<i>This Executive Summary is subject to the same standard limitations as contained in the report and must be read in conjunction with the entire report.</i>
--

TABLE OF CONTENTS

EXECUTIVE SUMMARY	i
1.0 INTRODUCTION	1
2.0 SURVEY AND ASSESSMENT CRITERIA	2
2.1 SURVEY METHODOLOGY	2
3.0 DISCUSSION OF ACM	2
3.1 INTERPRETATION OF RESULTS	4
4.0 CONDITION SURVEY AND RELEVANT REMEDIAL ACTIVITIES	4
5.0 RECOMMENDATIONS	10
5.1 SPECIFIC RECOMMENDATIONS	10
5.2 GENERAL RECOMMENDATIONS	11
6.0 ASSESSMENT LIMITATIONS	12
7.0 CLOSURE	12

LIST OF APPENDICES

- APPENDIX I:** Site Drawings
APPENDIX II: Analytical Results 2013

1.0 INTRODUCTION

Canadian Coast Guard (CCG) retained Pinchin LeBlanc Environmental Limited (Pinchin) to perform a reassessment of asbestos-containing "Weather Shield" which is applied over spray- fireproofing aboard the Canadian Coast Guard Ship (CCGS) Henry Larsen. The reassessment was conducted on January 13-16, 2015.

The asbestos-containing material (ACM) was originally documented during the original ACM assessment of the vessel in March 2002. Samples collected during that assessment indicated that the Weather Shield product, the "encapsulate", contained 1-5% chrysotile asbestos. The discovery of this non-friable product resulted in the development of an asbestos management plan for the vessel, which included an annual reassessment of the condition of the material.

The non- friable¹ asbestos-containing encapsulate (trade name "Weather Shield"), is described as a white (and off-white) coloured material that is comparable to a slightly thicker latex paint overcoat. The material is designed to adhere and cover spray-applied fireproofing. It is believed that the Weather Shield may have been applied during the construction of the vessel to protect the underlying insulation against water damage and/or vibration. The Weather Shield may also have been applied to provide additional strength to the underlying spray-applied fireproofing during normal ship operations.

Additional non-friable asbestos-containing materials are also present aboard the vessel however were not included in this assessment. The ductwork on the bubbler system located in the forward bubbler compartment on the main deck is covered with a white asbestos containing coating. The coating has been labeled asbestos containing by shipboard personnel. Various types of gasket materials are used on mechanical systems and equipment throughout the vessel. Large quantities of gasket materials are also stored in the steering gear compartment of the vessel and in limited quantities are also stored in in other compartments of the vessel (i.e. general stores, shops and storage lockers). Not all gaskets have been sampled or confirmed asbestos and due to the complexity of vessel operations, the wide variety of gasket materials visually identified on board and the locations of concealed gaskets in operating vessel equipment, the delineation of the location of asbestos containing gasket material is not possible. Shipboard personnel are reminded to manage all gasket materials as asbestos-containing until sampling indicates otherwise.

¹ Non-friable ACM include vinyl floor tiles, ceiling tiles, gasket materials, asbestos cement pipe or board (transite), and asbestos textiles. Although a product may be considered non-friable when new, if the product releases fine dust due to deterioration or during removal, the free dust is considered friable. For example, most lay-in or glued-on acoustic ceiling tiles release significant dust during removal of large quantities of these tiles. All provincial regulations regarding asbestos materials distinguish between friable and non-friable materials when assigning appropriate work practices.

2.0 SURVEY AND ASSESSMENT CRITERIA

2.1 Survey Methodology

Mr. Jason Lewis and Mr. Curtis Snelgrove of Pinchin conducted the reassessment on January 13-16, 2015. During the reassessment, Mr. Lewis and Mr. Snelgrove were accompanied by CCGS Representative Dave Vardy.

In order to reassess the condition of the Weather Shield encapsulate throughout the vessel, representative deckhead spaces were assessed on a room-by-room basis (where accessible). Spaces were not entered if access from an adjacent space could provide adequate viewing. The reassessment included all accommodation spaces, the wheelhouse and navigation bridge deck. Mechanical spaces such as the main generator room, tank top level, steering gear compartment and fan rooms were also accessed during the reassessment. The following resources were utilized during this reassessment:

Lewis, Jason. *Asbestos Materials Survey, Canadian Coast Guard Vessel, CCGS Henry Lasren, South Side Coast Guard Base, St. John's, Newfoundland*. Pinchin LeBlanc Environmental Ltd., July 2002. Print.

Hardy, Trent. *Asbestos-Containing Materials Reassessment Survey 2013, CCGS Henry Larsen, St. John's Newfoundland and Labrador*. Pinchin LeBlanc Environmental Ltd., Dec. 2013. Print.

3.0 DISCUSSION OF ACM

Weather Shield was observed on the sprayed insulation that covers most deck heads and bulkheads throughout the vessel. The material was also observed on the vessel's side shell at tank top level in the main generator room.

A summary of the observations is found on the ships drawings located in Appendix I and in the summary tables presented below. The following table is a summary of the sampled results over the previous and current reassessments. Copies of the analytical reports are presented in Appendix II.

Identification of Asbestos-Containing Weather Shield, CCGS Henry Larsen Reference Asbestos Sample Survey Data 2002 – 2004, 2005, and 2013			
Year of Assessment	Sample Identification	Sample Location/Description	Result
2002	Sample 001-A	Sprayed insulation on structural members, main generator room, forward bulkhead	None Detected
2002	Sample 004-A	(A) Sprayed insulation on starboard bulkhead, main generator room (B) Yellow mastic overcoat material	(A) None Detected (B) 1-5% Chrysotile

Identification of Asbestos-Containing Weather Shield, CCGS Henry Larsen Reference Asbestos Sample Survey Data 2002 – 2004, 2005, and 2013			
Year of Assessment	Sample Identification	Sample Location/Description	Result
2002	Sample 013-A	Sprayed insulation, navigation bridge, wheelhouse	None Detected
2002	Sample 019-A	Sprayed insulation main generator room, starboard side, forward, tank top level, in way of main engine fuel at heaters	None Detected
2002	Sample 020-A	Spray coat on ship's hull, side shell, main generator room, starboard side, forward, tank top level	1-5% Chrysotile
2002	Sample 021-A	Sprayed insulation on port side, aft, main generator room tank top level	None Detected
2002	Sample 022-A	Spray coat on ships hull, port side, main generator room at tank top level, port fuel manifold	1-5% Chrysotile
2002	Sample 023-A	(A) Sprayed insulation with (B) off-white overcoat, forward bulkhead, main generator room	(A) None Detected (B) 1-5% Chrysotile
2002	Sample 024-A	Sprayed insulation, main generator room, starboard side, aft	None Detected
2002	Sample 025-A	Sprayed insulation starboard side, aft, auxiliary machinery space, tank top level	<0.1% Chrysotile
2002	Sample 026-A	(A) Sprayed insulation on bulkhead, aft, steering gear room, starboard side, main deck (B) off white, soft sticky, cementitious overcoat	(A) None Detected (B) 1-5% Chrysotile
2002	Sample 027-A	(A) Sprayed insulation with (B) white adhesive, navigation bridge, wheelhouse, starboard side, center window	(A) None Detected (B) 1-5% Chrysotile
2004	Sample 001-A	(A) White adhesive with (B) sprayed insulation, forepeak, paint locker	(A) 1-5% Chrysotile (B) None Detected
2004	Sample 002-A	(A) White adhesive with (B) sprayed insulation, chiller room,	(A) 1-5% Chrysotile (B) None Detected
2005	Sample 001 – A	White adhesive – diving and salvage room # 221	None Detected
2005	Sample 002 – A	White adhesive - engine room hatch boat deck	None Detected
2005	Sample 003 – A	White adhesive - medical officers cabin # 260	None Detected
2013	Sample 02-02-1249-S001	Spray Fireproofing – Monkey's Island Battery Box	None Detected
2013	Sample 02-02-1249-S002	Spray Fireproofing – Monkey's Island Battery Box	None Detected
The Newfoundland and Labrador Department of Government Services recognizes materials with greater than 1% asbestos by weight as an asbestos-containing material.			

3.1 Interpretation of Results

As indicated in the above table, 50% percent of samples taken during the 2002 survey (12 samples total) indicated the positive presence of 1-5% chrysotile asbestos in the Weather Shield product (reference sample 004-A on April 10, 2002 and the analysis of the additional samples 020-A, 022-A, 023-A, 026-A, 027-A on June 5, 2002). Sprayed insulation was observed throughout this vessel as fireproofing or as thermal insulation. The spray, observed on most deckheads and bulkheads throughout the vessel, is a non- asbestos friable material (trade name Cafco) covered by the non-friable asbestos-containing overcoat (termed Weather Shield). The Weather Shield was observed as a thin overcoat layer with a white latex appearance sprayed on all Cafco insulated areas throughout the ship.

Analytical results listed in the above table specify that two (2) additional samples collected during the ACM material condition reassessment conducted in 2004 identified the presence of 1-5% chrysotile asbestos in the Weather Shield product (reference samples 001-A and 002-A collected in March 2004).

Analytical results in the table indicate that three (3) additional samples collected during the ACM material condition reassessment conducted in 2005 did not identify the presence of asbestos (reference samples 001-A, 002-A and 003-A). These samples are assumed representative of a product similar in appearance to Weather Shield, but likely an alternate product (perhaps an area of subsequent repair or patching).

Analytical results in the table indicate that two (2) additional samples collected during the ACM material condition reassessment conducted in 2013 of deteriorated spray fireproofing debris located in the battery box on the monkey's island did not identify the presence of asbestos (reference samples 02-02-1249-S001 and 02-02-1249-S002). These samples are considered to be representative of the deteriorated material in this location. Pinchin did not visually identify the presence of the ACM Weather Shield in this debris.

4.0 CONDITION SURVEY AND RELEVANT REMEDIAL ACTIVITIES

The condition reassessment encompassed all accessible areas aboard the ship, including but not limited to, all mechanical spaces and accommodation areas.

The condition of the Weather Shield observed aboard the vessel following the condition reassessment conducted in January 2015 is presented in the following table and graphically presented on the drawings in Appendix I. Observations are also included in the following table for comparative purposes to evaluate any change in condition of the material since the last reassessment.

For the purposes of this re-assessment the terms good, minor, moderate or excessive have been utilized to describe conditions. The use of the term "good" indicates that no fallout or significant deterioration was noted. Areas of fallout or deterioration in the amount of up to 5 square feet would be described as "minor"; "moderate" would be utilized to describe affected areas up to 20 square feet and "excessive" for deterioration or fallout exceeding 20 square feet.

Fall-Out Conditions of Asbestos-Containing Weather Shield CCGS Henry Larsen, October 2013 & January 2015		
Cabin/Compartment and Deck Location	Condition October 2013	Condition January 2015
Navigation bridge Wheelhouse deck	Minor with patches of moderate	Minor on starboard side, good on port side
Lobby outside Navigation bridge including radar transceiver locker Wheelhouse deck	Mostly minor with isolated area moderate; partial delamination over EL102-P106, however noticeable moderate around structural beams	Mostly minor with isolated area moderate; partial delamination over EL102-P106, however noticeable moderate around structural beams
Ice observers room Wheelhouse deck	Good to minor	Good to minor
Electronics equipment room Wheelhouse deck	Good to minor	Good to minor
Special navigation chart room Wheelhouse deck 404	Minor, some pieces along forward bulkhead	Minor to moderate
AG #2 Generator Wheelhouse	Good	Good
ICS room Wheelhouse deck	Good	Minor
Void utility space under wheelhouse Raised deck	Removed 2008	Removed 2008
Commanding officers cabin 389 Officers deck	Minor with several small pieces of fallout on light, over spray on cable trays and fixtures	Minor with several small pieces of fallout on light, over spray on cable trays and fixtures, fallout over bedroom
Chief officers cabin 381 Officers deck	Minor with debris over foyer area, over spray on cable tray	Minor with debris over foyer area, over spray on cable tray, sporadic chunks of fallout
First officers cabin 378 Officers deck	Minor small debris over washroom.	Moderate
Second officers cabin 385 Officers deck	Good – minor with debris along aft BH	Good – minor with debris along aft BH – large chunk over clock area
Deck office 373 Officers deck	Minor	Minor – no spray
Laundry 365 Officers deck	Debris on light and ductwork	Good
Supernumerary officer cabin 367 Officers deck	Minor - <1ft ² debris	Minor - <1ft ² debris
Alleyway past linen locker 376 Officers Deck	Cable tray has excessive on wiring	Cable tray has excessive on wiring

Fall-Out Conditions of Asbestos-Containing Weather Shield CCGS Henry Larsen, October 2013 & January 2015		
Cabin/Compartment and Deck Location	Condition October 2013	Condition January 2015
Fan room AHU #1 Officers deck	Needs repair over duct	Needs repair over starboard side of duct
Static inverter room Officers deck	Good	Cut-outs around heater should be repaired
Starboard FM 200 Room Officers deck	Good	Caution: overspray on cable tray
Deck locker Officers deck	Repaired - Good	Good
Hallway near commanding officer cabin 389 Officers deck	Good with isolated areas of minor debris	Good with isolated areas of minor debris
Emergency Generator Room	Good	Good
Senior scientist cabin 383 Officers deck	Minor with pieces of fallout scattered throughout	Minor with pieces of fallout scattered throughout
First engineer cabin 339 Boat and flight deck	Good	Good
Helicopter engineer cabin 341 Boat and flight deck	Good	Good
Helicopter pilot cabin 343 Boat and flight deck	Good	Good
Official cabin 352 Boat and flight deck	Good	Good
Official cabin 350 Boat and flight deck	Good	Good
Chief engineer 347 Boat and flight deck	Good	Good
Second engineer 345 Boat and flight deck	Good	Good
Fan room AHU # 2 and # 4 Boat deck	Good	Repair metal lower Bulkhead near feed P507-13
AC chiller room Boat and flight deck	Good	Repair over light aft of chiller
Helicopter hanger Boat and flight deck	Fibreglass	Fibreglass
Paint storage on boat deck	Damage to expanded metal bottom of door	Damage to expanded metal bottom of door and around light
Engine casing at deck elevation Boat and flight deck	Good	Good
Officers lounge Upper deck	Minor to Moderate – with some large pieces	Good

Fall-Out Conditions of Asbestos-Containing Weather Shield CCGS Henry Larsen, October 2013 & January 2015		
Cabin/Compartment and Deck Location	Condition October 2013	Condition January 2015
Senior engineers cabin 274 Upper deck	Minor	Good
Spare cabin 293 Upper deck	Minor on bulkhead	Good
Electronics officer cabin 291 Upper deck	Minor along bulkhead	Good
Designated smoke room 270 Upper deck	Good	Good
Hallway from Cabin 270 past 274 to Cabin 287 Upper Deck	Minor some moderate	Minor some moderate, potential delineation
Logistics officers cabin 287 Upper deck	Minor	Minor
Boatswain's cabin 285 Upper deck	Minor to moderate	Minor
Cadets cabin 283 Upper deck	Minor	Minor
Cadets cabin 281 Upper deck	Minor; moderate over washroom	Moderate
Cadets cabin 279 Upper deck	Minor with large pieces	Minor with large pieces
Cadets cabin 277 Upper deck	Minor on perimeter, rest removed	Minor on perimeter, rest removed
Logistics officers office Upper deck	Moderate	Minor
Ships office Upper deck	Minor where accessed, overspray on ductwork and electrical	Where accessed, there is overspray on ductwork and electrical with fallout located on top of pipe
Alleyway from smoke room to cabin 266 Upper deck	Good	Minor some moderate
Engineers office Upper deck	Debris port side moderate	Good
Engineers change room Upper deck	Minor along Starboard Bulkhead	Minor along Starboard Bulkhead and debris on top of pipe
Alleyway port side of ships office	Excessive to moderate, near electrical officer's cabin Minor – all other	Excessive to moderate, near ships office
Supernumerary's cabin 268 Upper deck	Minor	Moderate
First electrical officer 266 Upper deck	Removed	Removed

Fall-Out Conditions of Asbestos-Containing Weather Shield CCGS Henry Larsen, October 2013 & January 2015		
Cabin/Compartment and Deck Location	Condition October 2013	Condition January 2015
Second electrical officer 264 Upper deck	Minor	Minor
Ice service specialist cabin 262 Upper deck	Removed	Removed
Medical officer cabin 260 Upper deck	Removed	Removed
Dispensary 228 and Ward 229 Upper deck	Moderate to excessive	Minor
Officers pantry 231 Upper deck	Minor	Minor
Officers dining room Upper deck	Moderate some large debris	Minor
Hallway outside cabin 244 Upper deck	Minor to moderate	Minor to moderate
Hallway outside cabin 279 Upper deck	Minor	Moderate
Hallway outside cabin 283 Upper deck	Moderate	Minor to moderate
Hallway outside cabin 287 Upper deck	Minor	Minor to moderate
Fan room #222 Upper deck	Good overall. Perforated metal along deck is damaged throughout	Good overall. Perforated metal along deck is damaged throughout
Salvage/diving #221 Upper deck	Repaired Good	Good
Steering gear compartment and stores Main deck	Good	Good – suspect gasket material storage
Main Deck Cargo	Good	Good
Crew change room and adjacent stairwell Main deck	Good	Good
Refrigerated cargo room Main deck	No access above deck head	No access above deck head
Fruit and vegetable room Main deck	No access above deck head	No access above deck head
Cool dairy room Main deck	No access above deck head	No access above deck head
Cold room Main deck	No access above deck head	No access above deck head
Galley Main deck	Poor access during survey -Drawings indicate no spray present	Poor access during survey -Drawings indicate no spray present

Fall-Out Conditions of Asbestos-Containing Weather Shield CCGS Henry Larsen, October 2013 & January 2015		
Cabin/Compartment and Deck Location	Condition October 2013	Condition January 2015
Crews mess Main deck	Inboard side – minor Outboard – excessive aft of drink cooler	Inboard side – minor Outboard – excessive forward of drink cooler
Crews lounge 117 Main deck	Minor to moderate (isolated areas) especially along bulk head – Starboard side	Minor
Po's lounge 134 Main deck	Minor – several single chunks	Minor – several single chunks
Chief cook cabin 130 and second cook cabin 131 Main deck	Minor to little moderate on 131 side	Minor to little moderate on 130 side
Steward cabin 132 and 133 Main deck	Minor with 10 square feet of debris aft of washroom 132	Minor with 10 square feet of debris above washroom
Store keeper 157 and spare 158 Main deck	Good	Good
Leading seaman cabins 159 and 160 Main deck	Minor, excessive over washroom	Good
Leading seaman cabins 161 and 162 Main deck	Minor - moderate	Minor on piping
Canteen and canteen store Main deck	Good (No spray)	Good (No spray)
Gymnasium Main deck	Minor	Minor
Hallway from bubbler compartment to canteen Main deck	Minor	Minor to moderate
Bubbler compartment including lower compartment Main deck	Good	Good
Laundry Main deck	Access gained – Moderate to excessive still present	Moderate to excessive still present along bulkhead
Central stores Main deck	Good	Good
E/R technician cabins 193, 192, 191 and 190 Main deck	193 – Excessive 192 – Excessive 191 – Minor 190 – Minor – Moderate, over washroom	193 – Good 192 – Minor 191 – Minor 190 – Minor – Moderate, over washroom
Oiler cabins 167 and 168 Main deck	Minor with some moderate over the washroom.	Good
Seamen 165 and 166 Main deck	Minor	Good
Small carpenters work shop Main deck	Good	Good

Fall-Out Conditions of Asbestos-Containing Weather Shield CCGS Henry Larsen, October 2013 & January 2015		
Cabin/Compartment and Deck Location	Condition October 2013	Condition January 2015
Seamen 163 and 164 Main deck	Minor with excessive over Br 163	Good
Engine casing Main deck	No spray	No spray
Cargo hold Main deck	Good	Good
Beer/bonded stores Main deck	Good - no spray	Good - no spray
Propulsion Motor Room, Port and Starboard Sides, Aft corners near shafts. Tank Top	Good	Good – #1 void tank hatchway edges damaged, need repair
Motor Room Flat Escape Hatch	Good	Good
Auxiliary Room	Good	Good
Fore Peak	Repairs completed with duct tape are not adequate – consider expanded metal or other alternative.	Good -adequate repairs completed
Main Generator Room, Structural Steel at Deckhead elevation, forward of Main Generator #2 and starboard corner forward of Generator #1 over purifiers Tank Top	Good	Some exposed spray forward of #2 generator, but intact
202 – Clothing Storage	Good	Good
Upper propulsion room		Good
Engineers workshop		Good
Electrician workshop		Good – some repair required around door and aft wall
MCR		Good

5.0 RECOMMENDATIONS

5.1 Specific Recommendations

The following specific recommendations are based on the ACM reassessment of the Weather Shield conducted throughout the CCGS Henry Larsen on January 13-16, 2015:

1. Following Type II (moderate risk) asbestos abatement procedures clean areas identified in moderate and excessive condition as outlined by this reassessment. Please refer to the fallout condition table and updated condition drawings for specific locations referenced in this report.
2. Repair areas of perforated sheathing (expanded metal) on bulkheads and deck heads identified in excessive (poor) condition. Repairs to the metal may require the utilization of Type I (low risk) asbestos abatement procedures where metal may have damaged the underlying spray and Weather Shield.

5.2 General Recommendations

General recommendations as developed from the asbestos reassessment and the CCGS Henry Larsen Asbestos Management Program still apply:

1. Maintain a copy of the asbestos survey report and accompanying field drawings on board the vessel for record of the location and condition of the asbestos-containing Weather Shield.
2. Advise workers that may disturb the ACM of the presence of asbestos (including outside contractors) of the procedures required to enter each space.
3. Should suspect materials be uncovered, they should be analyzed for their asbestos content. If sampling is not practical at sea, treat the material as an ACM until sample analysis can be conducted.
4. Access to deck head spaces for inspection purposes should be conducted following Type I (low risk) asbestos entry procedures.
5. Access to deck head spaces to facilitate a cable pull or pipe repair creating only a minor disturbance in areas where the Weather Shield is in good condition, use Type I (low risk) asbestos abatement procedures.
6. Access into any deck head space where the condition of spray weather shield fallout is moderate to excessive in large quantities, with any disturbance, use Type II (moderate risk) abatement procedures.
7. The removal of large quantities of weather shield should be conducted under Type II (moderate risk) asbestos abatement procedures.
8. Removal of the perforated aluminium sheathing from sprayed surfaces should be conducted following Type I (low risk) asbestos abatement procedures.
9. All asbestos-related work should follow industry standards and good practice, applicable federal regulations and guidelines governing asbestos materials, and the Newfoundland and Labrador Asbestos Regulation 111/98.

6.0 ASSESSMENT LIMITATIONS

Due to the nature of ship construction and the non-destructive nature of the reassessment, some limitations exist as to the possible thoroughness of the survey. Some of these limitations would include poor access through narrow panels, occupied spaces, and fixed deck head structures. The field observations, measurements, and analysis are considered sufficient in detail and scope to form a reasonable basis for a general asbestos hazard assessment of this ship. Pinchin warrants that findings and conclusions have been conveyed in accordance with generally accepted asbestos hazard evaluation methods.

There is a distinct possibility that conditions may exist which could not be reasonably identified within the scope of the assessment or which were not apparent during the site visit. Pinchin believes that the information collected during the survey period concerning the ship is reliable however, we cannot warrant or guarantee that the information provided is absolutely complete or accurate beyond the current asbestos consulting industry standards or accurate once the vessel returns the normal operating conditions at sea and in ice.

No warranty is either expressed or implied, or intended by this agreement or by furnishing oral or written reports or findings. The liability of Pinchin or its staff is limited to the lesser of the fees paid or actual damages incurred by the Client. Pinchin will not be responsible for any consequential or indirect damages. Pinchin will only be liable for damages resulting from negligence of Pinchin. All claims by the Client shall be deemed relinquished if not made within one year after last date of services provided.

Information provided by Pinchin is intended for the Client's use only. Pinchin will not provide results or information to any party other than the Client, unless the Client, in writing, requests information to be provided to a third party, or unless disclosure by Pinchin is required by law. Any use by a third party, of reports or documents authorized by Pinchin, or any reliance by a third party on or decisions made based on the findings described in said documents, is the sole responsibility of such third parties. Pinchin accepts no responsibility for damages suffered by any third party as a result of decisions made or actions conducted. No other warranties are implied or expressed.

7.0 CLOSURE

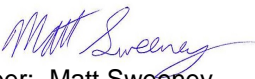
We trust that the aforementioned report addresses your requirements. Should you require clarification or information regarding this report, please contact the undersigned. Following your review of this submission, we shall be available to address any questions you may have relating to the findings and/or recommendations.

Should you have any questions or require additional information, please contact either of the undersigned at our office (709-754-4490).

Sincerely,

PINCHIN LEBLANC ENVIRONMENTAL LIMITED

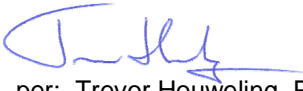
Prepared by:


per: Matt Sweeney
Environmental Technologist
Hazardous Materials Group
thardy@pinchinleblanc.com

Reviewed by:


per: Jason Lewis
Director of Operations for NL
Hazardous Materials Group
jlewis@pinchinleblanc.com

Reviewed by:


per: Trevor Houweling, P.Eng.
Vice President
Hazardous Materials Group
thouweling@pinchinleblanc.com

APPENDIX I
SURVEY DRAWINGS



LEGEND:

	EXCESSIVE
	MODERATE
	MINOR
	GOOD
	REMOVED
	NO ACCESS

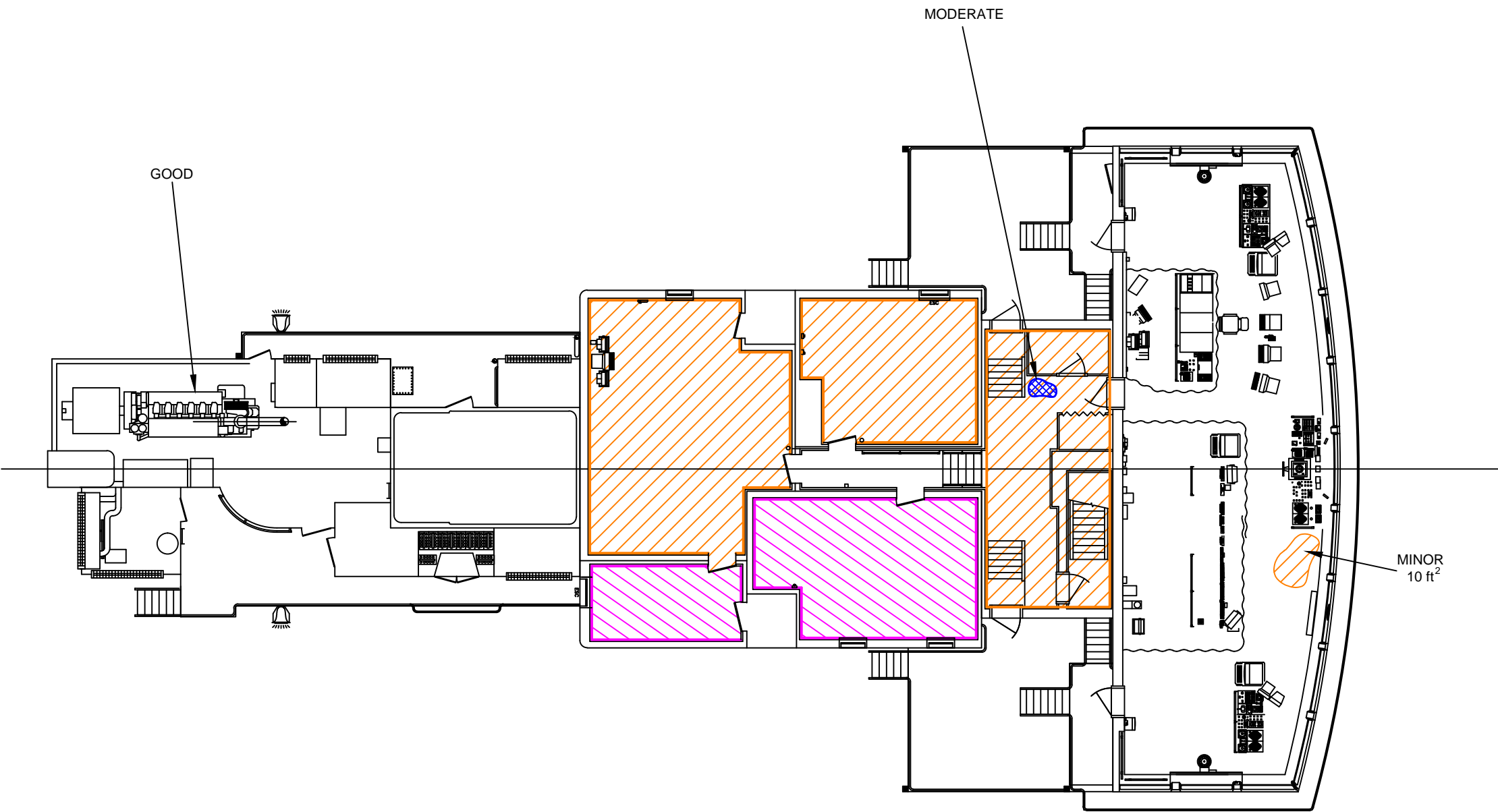
CLIENT:
CANADIAN COAST GUARD

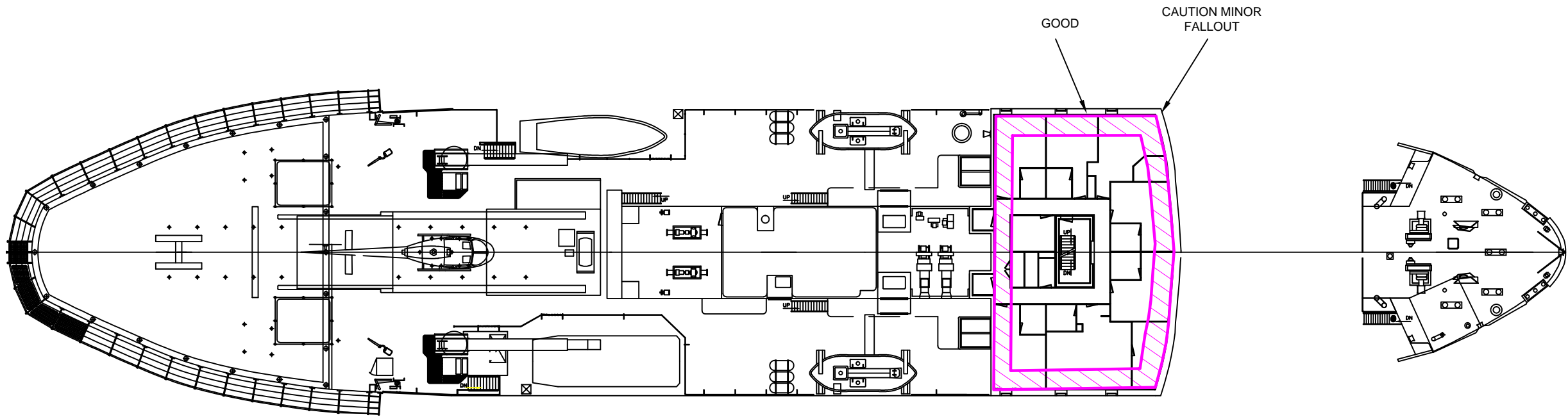
PROJECT:
ASBESTOS MATERIALS REASSESSMENT
- CCGS HENRY LARSEN

DRAWING NAME:
ASBESTOS CONDITIONS
WHEELHOUSE DECK

REFERENCE:
PINCHIN LEBLANC SITE SURVEY

DATE: JANUARY 2015	PROJECT # : 02 - 02 - 01464
SCALE: N.T.S.	FIGURE# : 1
DRAWN BY: A. ANISIKLI	
CHECKED BY: C. SNELGROVE	





LEGEND:	
	EXCESSIVE
	MODERATE
	MINOR
	GOOD
	REMOVED
	NO ACCESS

CLIENT:	
CANADIAN COAST GUARD	
PROJECT:	
ASBESTOS MATERIALS REASSESSMENT - CCGS HENRY LARSEN	
DRAWING NAME:	
ASBESTOS CONDITIONS FLIGHT AND BOAT DECK	
REFERENCE:	
PINCHIN LEBLANC SITE SURVEY	
DATE:	PROJECT # :
JANUARY 2015	02 - 02 - 01464
SCALE:	FIGURE# : 2
N.T.S.	
DRAWN BY:	
A. ANISCIKLI	
CHECKED BY:	
C. SNELGROVE	



LEGEND:

	EXCESSIVE
	MODERATE
	MINOR
	GOOD
	REMOVED
	NO ACCESS

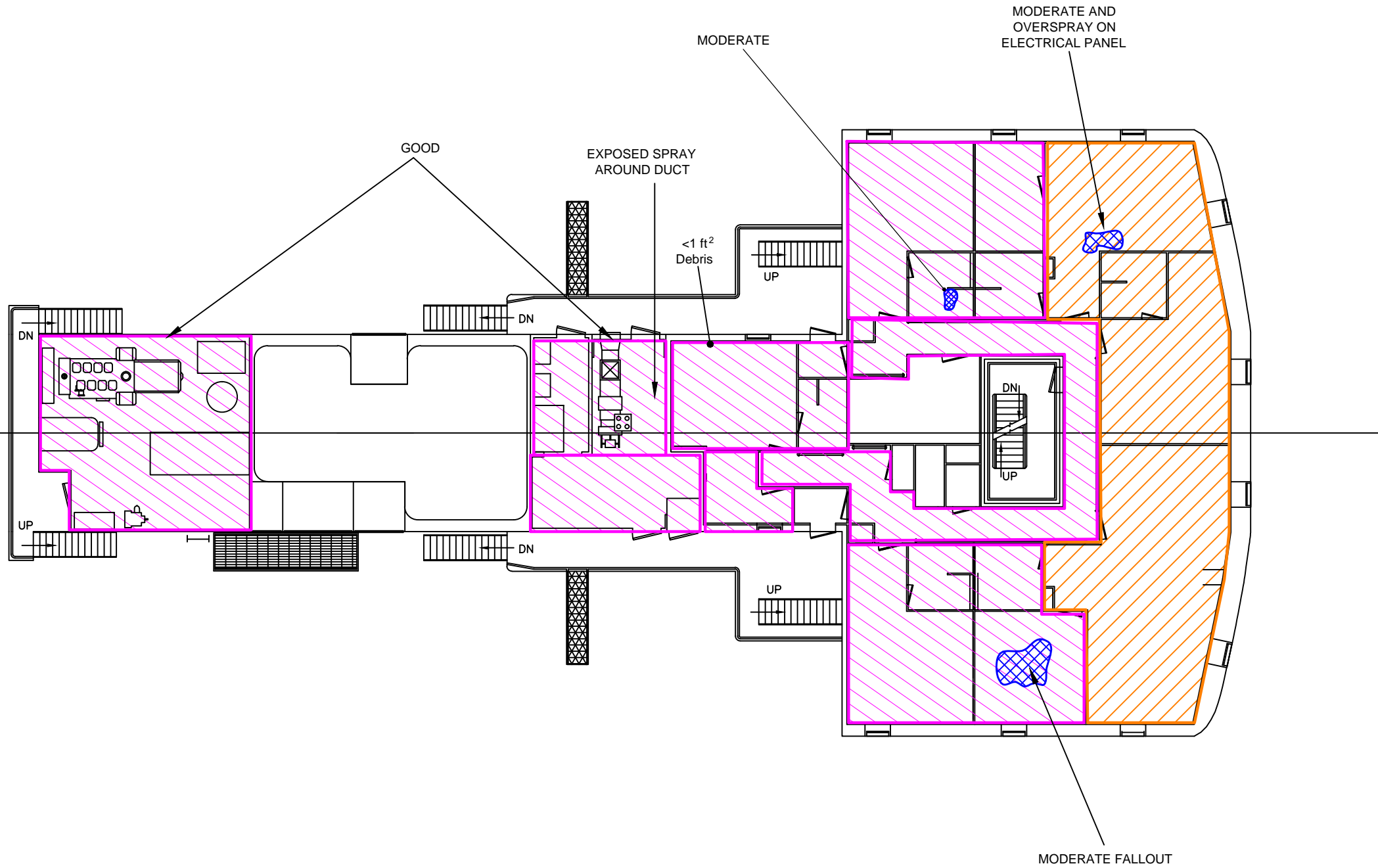
CLIENT:
CANADIAN COAST GUARD

PROJECT:
ASBESTOS MATERIALS REASSESSMENT
- CCGS HENRY LARSEN

DRAWING NAME:
ASBESTOS CONDITIONS
OFFICERS DECK

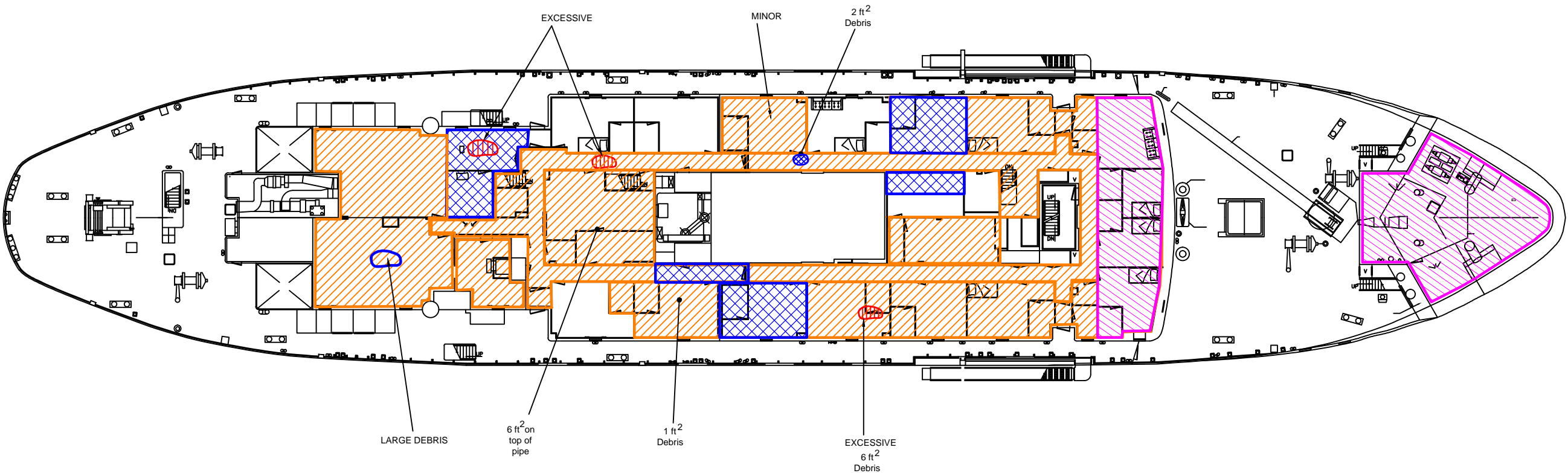
REFERENCE:
PINCHIN LEBLANC SITE SURVEY

DATE: JANUARY 2015	PROJECT # : 02 - 02 - 01464
SCALE: N.T.S.	FIGURE# : 3
DRAWN BY: A. ANISCIKLI	
CHECKED BY: C. SNELGROVE	





LEGEND:	
	EXCESSIVE
	MODERATE
	MINOR
	GOOD
	REMOVED
	NO ACCESS
CLIENT:	
CANADIAN COAST GUARD	
PROJECT:	
ASBESTOS MATERIALS REASSESSMENT - CCGS HENRY LARSEN	
DRAWING NAME:	
ASBESTOS CONDITIONS UPPER DECK	
REFERENCE:	
PINCHIN LEBLANC SITE SURVEY	
DATE:	PROJECT # :
JANUARY 2015	02 - 02 - 01464
SCALE:	FIGURE# :
N.T.S.	
DRAWN BY:	
A. ANISCIKLI	4
CHECKED BY:	
C. SNELGROVE	





LEGEND:

	EXCESSIVE
	MODERATE
	MINOR
	GOOD
	REMOVED
	NO ACCESS

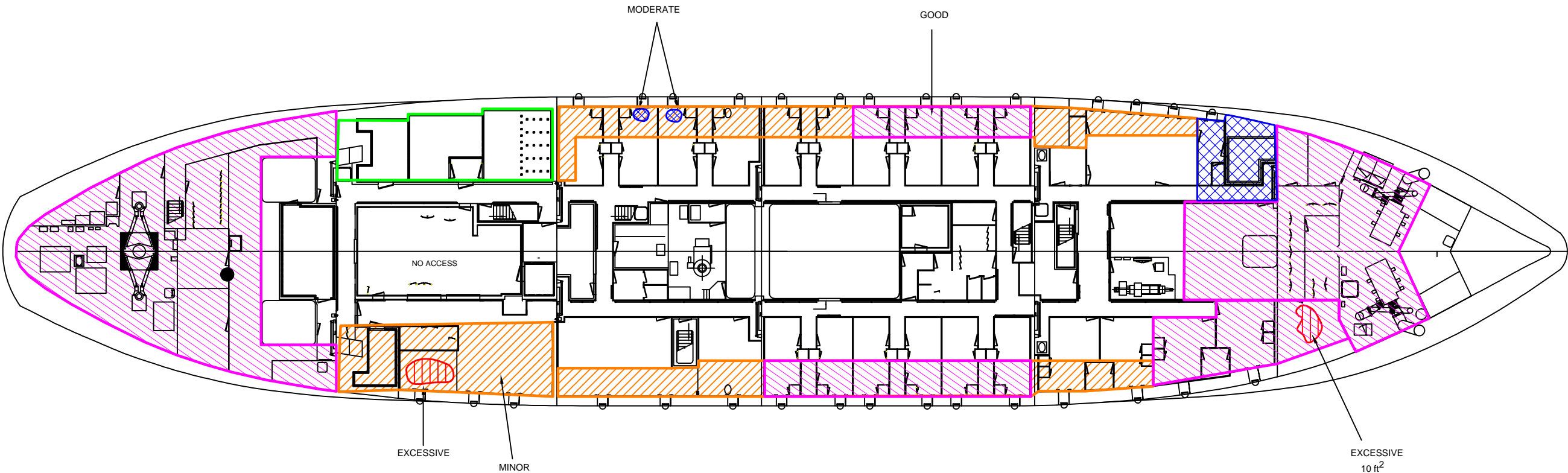
CLIENT:
CANADIAN COAST GUARD

PROJECT:
ASBESTOS MATERIALS REASSESSMENT
- CCGS HENRY LARSEN

DRAWING NAME:
ASBESTOS CONDITIONS
MAIN DECK

REFERENCE:
PINCHIN LEBLANC SITE SURVEY

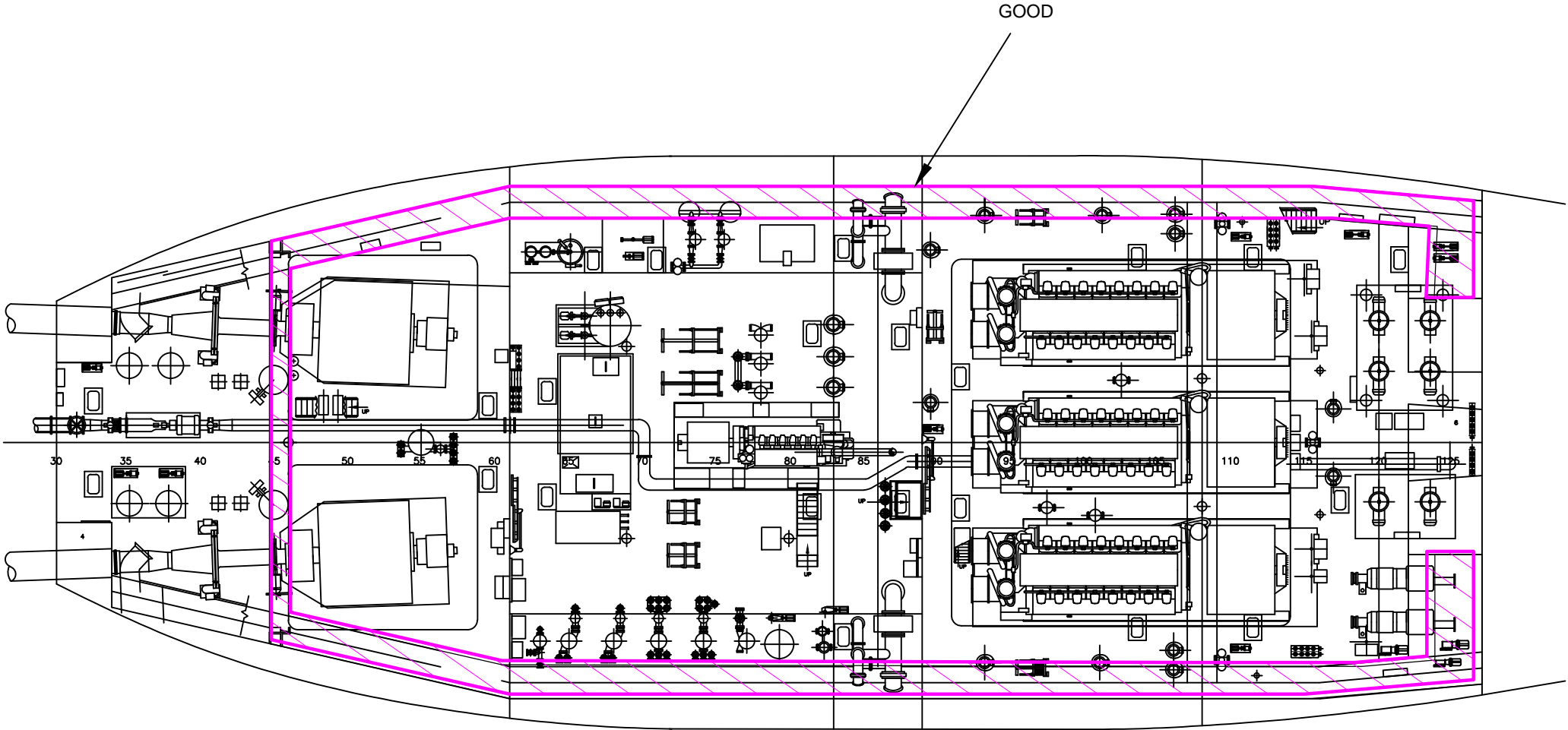
DATE: JANUARY 2015	PROJECT # : 02 - 02 - 01464
SCALE: N.T.S.	FIGURE# : 5
DRAWN BY: A. ANISCIKLI	
CHECKED BY: C. SNELGROVE	





LEGEND:

	EXCESSIVE
	MODERATE
	MINOR
	GOOD
	REMOVED
	NO ACCESS



CLIENT: CANADIAN COAST GUARD	
PROJECT: ASBESTOS MATERIALS REASSESSMENT - CCGS HENRY LARSEN	
DRAWING NAME: ASBESTOS CONDITIONS LOWER DECK	
REFERENCE: PINCHIN LEBLANC SITE SURVEY	
DATE: JANUARY 2015	PROJECT # : 02 - 02 - 01464
SCALE: N.T.S.	FIGURE# : 6
DRAWN BY: A. ANISCIKLI	
CHECKED BY: C. SNELGROVE	

APPENDIX II
ANALYTICAL RESULTS



**ANALYSIS OF BULK SAMPLES FOR ASBESTOS CONTENT
BY POLARIZED LIGHT MICROSCOPY AND DISPERSION STAINING**

PROJECT NAME: CCGS Henry Larsen
PROJECT NO.: 02-02-01249
LAB REFERENCE NO.: NLB 1662 - 2013
DATE: November 7, 2013

Two (2) bulk samples were submitted for determination of their asbestos content by Polarized Light Microscopy and Dispersion Staining.

Sample preparation and analytical procedures are in compliance with the Code for the Determination of Asbestos from Bulk Insulation Samples, dated the 23rd of August, 1985 and issued by the Occupational Health and Safety Division of the Ontario Ministry of Labour, and U.S. EPA Method 600/R-93/116 dated July, 1993. Asbestos fibres are identified by a combination of morphology, colour, refractive index, extinction, sign of elongation, birefringence and dispersion staining colours. A visual estimate is made of the volume percentage of asbestos present. The lower limit of reliable quantitation is estimated to be 0.1%. A reported concentration of <0.1% indicates the presence of confirmed asbestos in trace quantities limited to only a few fibres or fibre bundles in an entire sample. Multiple phases within a sample are analyzed separately. A total of two (2) analyses were performed.

All bulk samples submitted to this laboratory for asbestos analysis are retained for a minimum of three months. Samples may be retrieved, upon request, for re-examination at any time during that period.

This test relates only to the items tested. The results are presented in the attached table.



27 Austin Street
St. John's, NL
A1B 4C3

BULK SAMPLE ANALYSIS

PROJECT NAME: CCGS Henry Larsen
Project # 02-02-01249

PREPARED FOR: Jason Lewis

LAB REFERENCE No: NLB 1662

DATE: November 7, 2013

PAGE: 1 of 1

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)		COMMENTS
		ASBESTOS	OTHER	
02-02-1249-S001 Spray Fireproofing, Monkey's Island Battery Box, CCGS Henry Larsen	Homogenous, beige/off white, fibrous material	None Detected	Mineral wool >75% Non-fibrous material 10-25%	
02-02-1249-S002 Spray Fireproofing, Monkey's Island Battery Box, CCGS Henry Larsen	Homogenous, beige/off white, fibrous material	None Detected	Mineral wool >75% Non-fibrous material 10-25%	

ANALYST: Angela Stagg