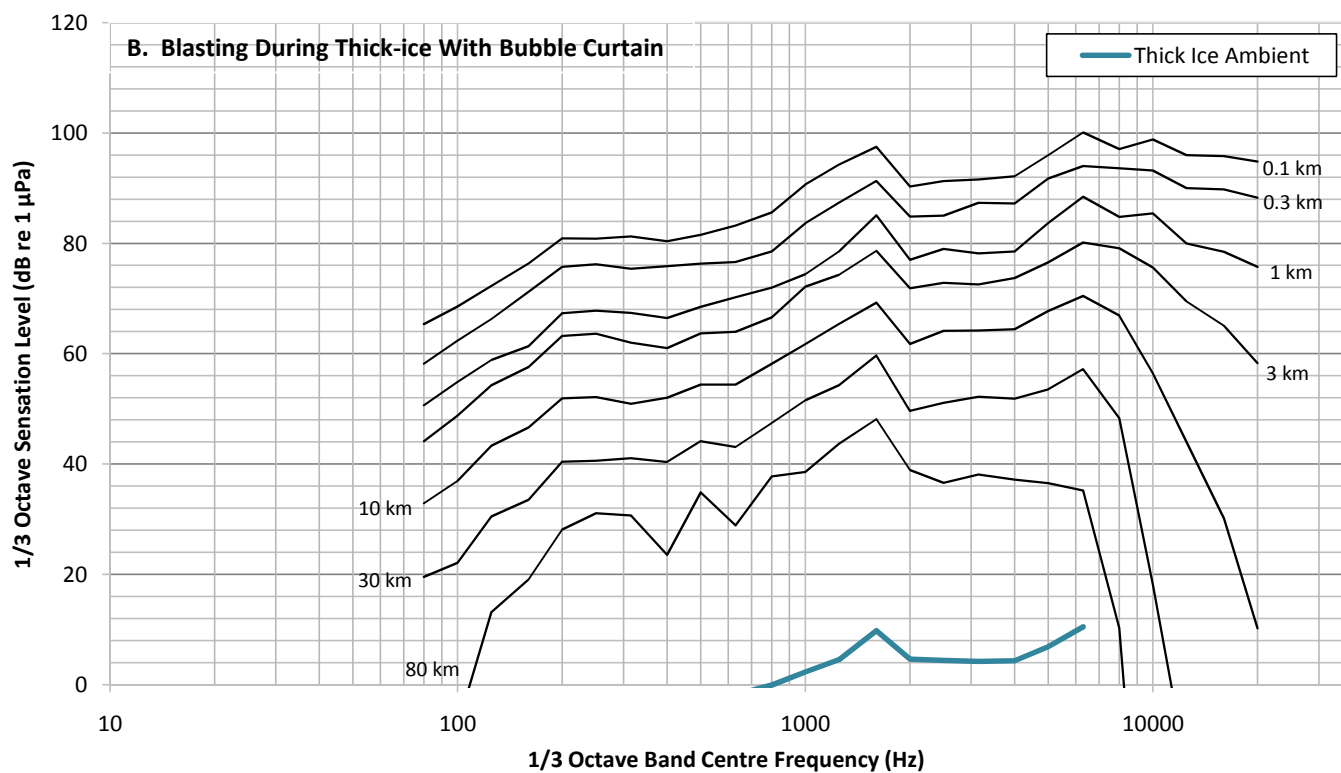
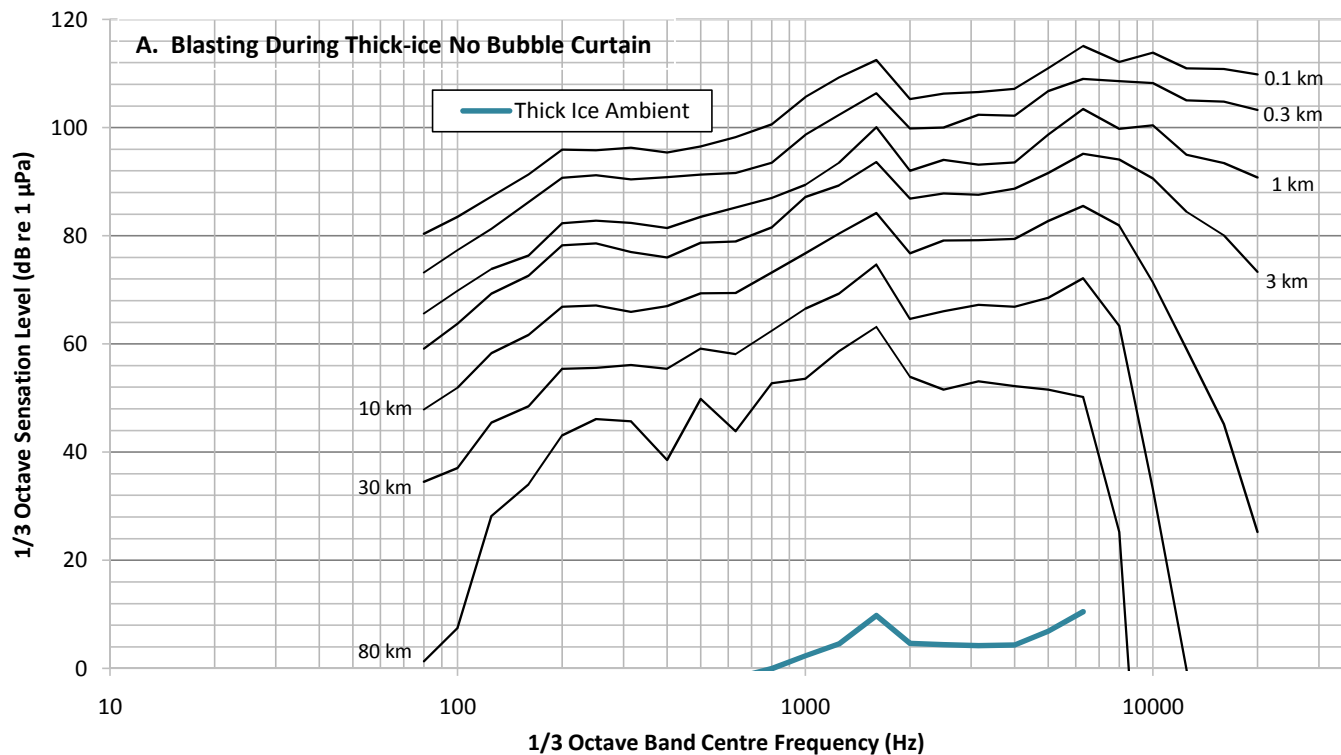


**APPENDIX 8C
UNDERWATER NOISE MODELLING**

- APPENDIX 8C-1 UNDERWATER NOISE MODELLING FOR STEENSBY INLET, FOXE BASIN AND HUDSON STRAIT (NO CHANGE)**
- APPENDIX 8C-2 UNDERWATER NOISE MODELLING FOR MILNE INLET AND ECLIPSE SOUND (NO CHANGE)**
- APPENDIX 8C-3 COMPOSITE MARINE MAMMAL AUDIOGRAM AND NOISE (CHANGE)**
- APPENDIX 8C-4 ASSESSMENT OF UNDERWATER NOISE FOR THE MARY RIVER IRON MINE – AMENDMENT (NO CHANGE)**
- APPENDIX 8C-5 COMPOSITE MARINE MAMMAL AUDIOGRAM AND NOISE PLOTS FOR VIBRATORY PILE DRIVING (NO CHANGE)**
- APPENDIX 8D SHIP-GENERATED WAVE AND AIRCRAFT NOISE ANALYSES (NO CHANGE)**

APPENDIX 8C-3**COMPOSITE MARINE MAMMAL AUDIOGRAM AND NOISE**

**NOTES:**

1. AMBIENT NOISE DATA FROM GREENE AND HANNA (1997).
2. PREDICTED 1/3 OCTAVE NOISE LEVELS FROM MATTHEWS ET AL. (2010).
3. ANALYSIS APPROACH BASED ON DAVIS AND MALME (1997).
4. AUDIOGRAM DATA FROM TERHUNE (1988, 1989), TERHUNE AND TURNBULL (1995), AND KASTAK AND SCHUSTERMAN (1998).

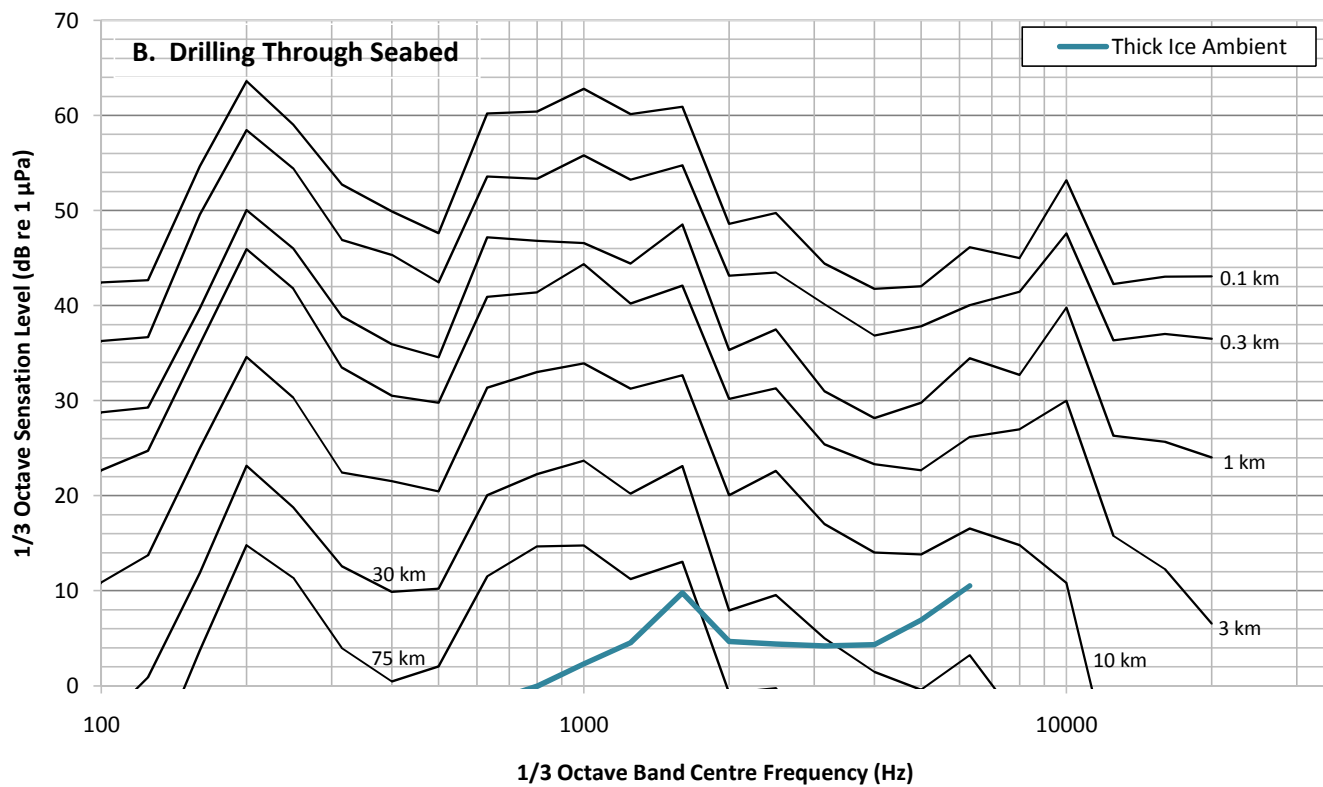
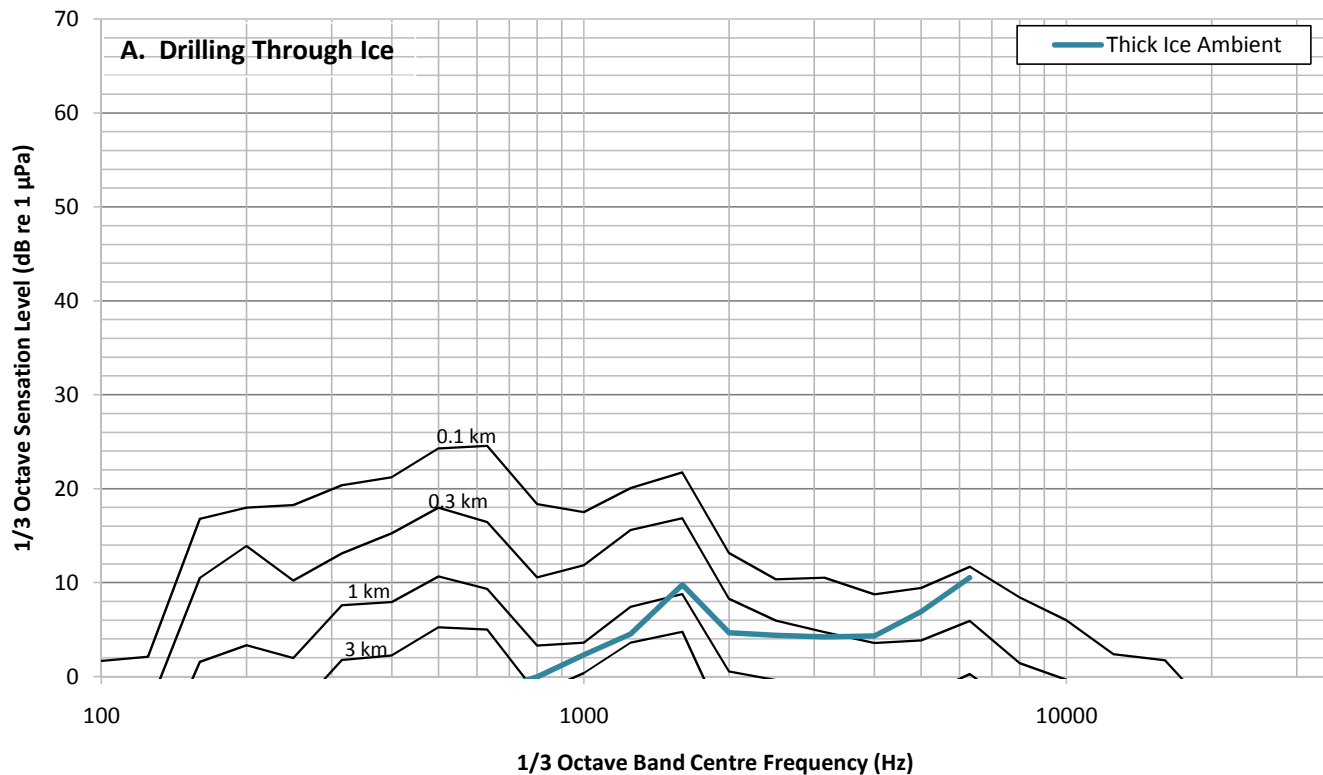
BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

**RINGED SEAL 1/3 OCTAVE BAND SENSATION LEVELS
DURING THE THICK-ICE PERIOD (MAY) AT STEENSBY
PORT FOR A. BLASTING WITH NO BUBBLE CURTAIN, AND
B. BLASTING WITH BUBBLE CURTAIN**

P/A NO.
NB102-181/25REF. NO.
13**FIGURE 8C-3.1**REV
A

A	23NOV10	ISSUED WITH REPORT	REE	VDM	REE
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

**NOTES:**

1. AMBIENT NOISE DATA FROM GREENE AND HANNA (1997).
2. PREDICTED 1/3 OCTAVE NOISE LEVELS FROM MATTHEWS ET AL. (2010).
3. ANALYSIS APPROACH BASED ON DAVIS AND MALME (1997).
4. AUDIOGRAM DATA FROM TERHUNE (1988, 1989), TERHUNE AND TURNBULL (1995), AND KASTAK AND SCHUSTERMAN (1998).

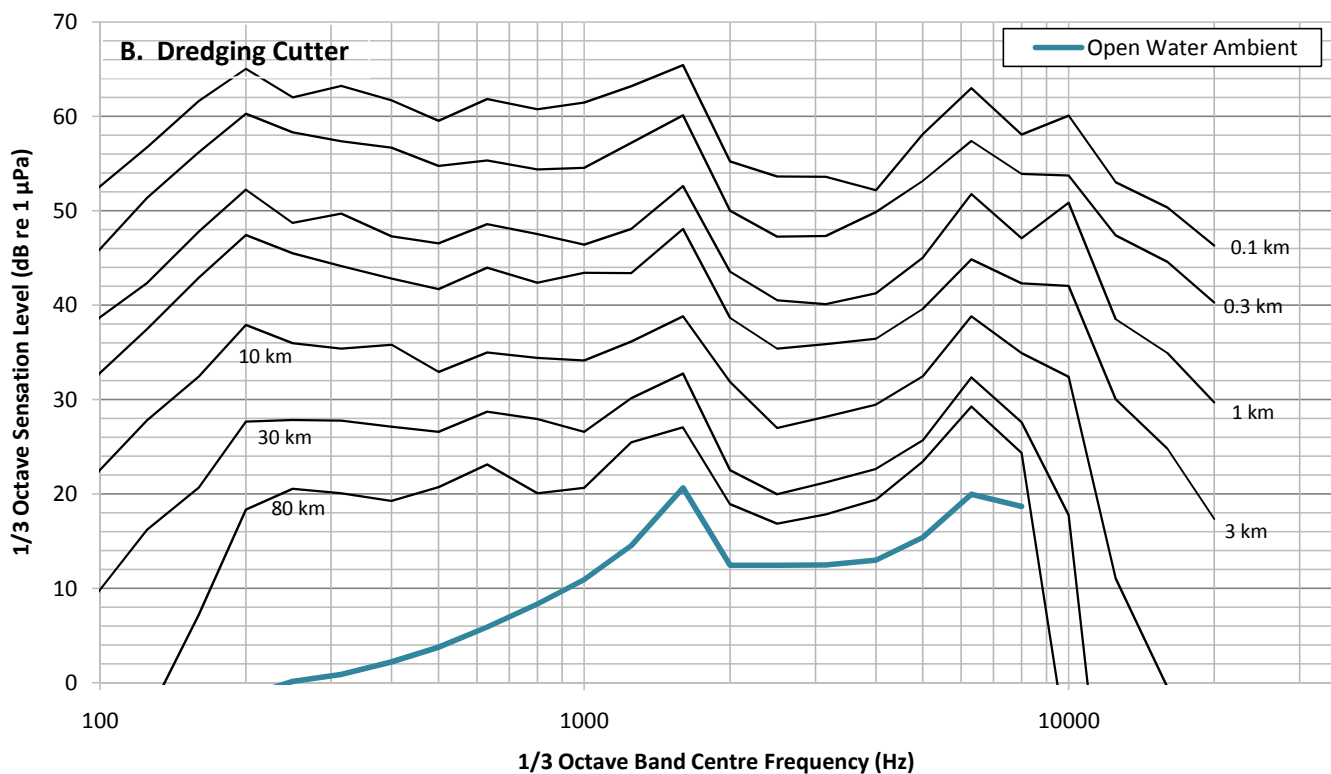
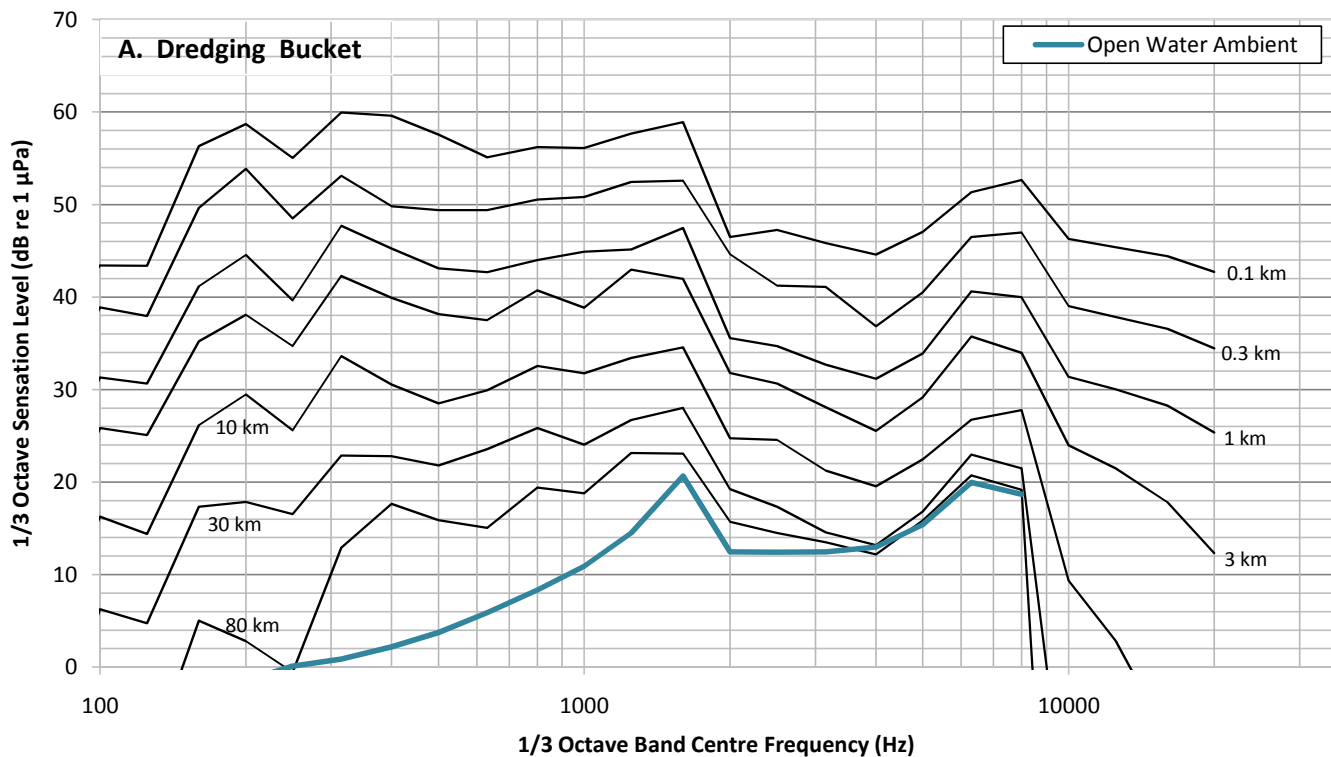
BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

**RINGED SEAL 1/3 OCTAVE BAND SENSATION LEVELS DURING
THE THICK-ICE PERIOD (MAY) AT STEENSBY PORT FOR A.
DRILLING THROUGH ICE, AND B. DRILLING THROUGH SEABED**

P/A NO.
NB102-181/25REF. NO.
13**FIGURE 8C-3.2**REV
A

A	23NOV10	ISSUED WITH REPORT	REE	VDM	REE
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

**NOTES:**

1. AMBIENT NOISE DATA FROM BURGESS AND GREENE (1998).
2. PREDICTED 1/3 OCTAVE NOISE LEVELS FROM MATTHEWS ET AL. (2010).
3. ANALYSIS APPROACH BASED ON DAVIS AND MALME (1997).
4. AUDIOGRAM DATA FROM TERHUNE (1988, 1989), TERHUNE AND TURNBULL (1995), AND KASTAK AND SCHUSTERMAN (1998).

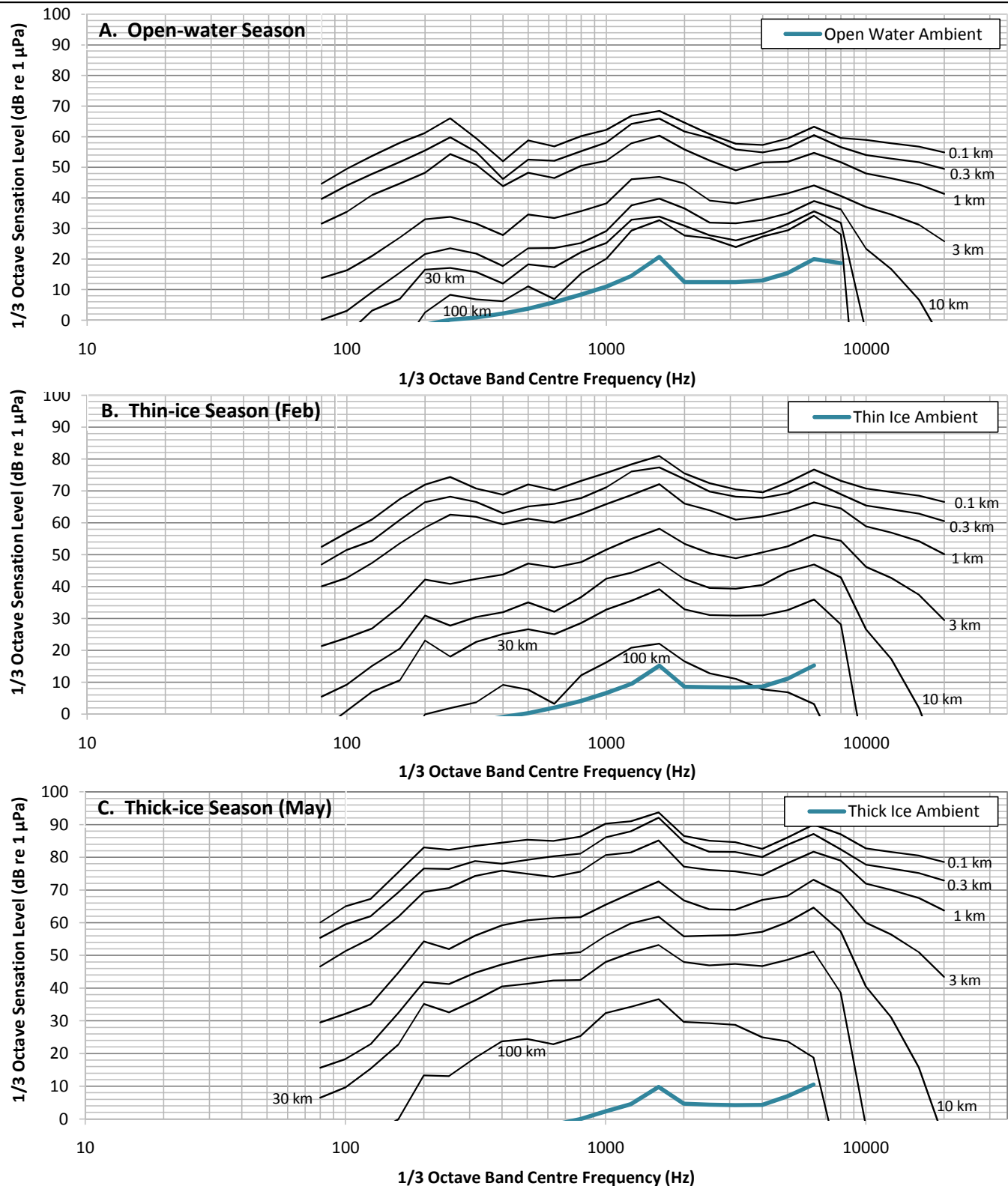
BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

**RINGED SEAL 1/3 OCTAVE BAND SENSATION LEVELS
DURING THE OPEN-WATER PERIOD (AUG) AT STEENSBY
PORT FOR A. DREDGING BUCKET, AND B. DREDGING
CUTTER**

P/A NO.
NB102-181/25REF. NO.
13**FIGURE 8C-3.3**REV
A

A	23NOV10	ISSUED WITH REPORT	REE	VDM	REE
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

**NOTES:**

1. AMBIENT NOISE DATA FROM GREENE AND HANNA (1997), AND BURGESS AND GREENE (1998).
2. PREDICTED 1/3 OCTAVE NOISE LEVELS FROM MATTHEWS ET AL. (2010).
3. ANALYSIS APPROACH BASED ON DAVIS AND MALME (1997).
4. AUDIOGRAM DATA FROM TERHUNE (1988, 1989), TERHUNE AND TURNBULL (1995), AND KASTAK AND SCHUSTERMAN (1998).

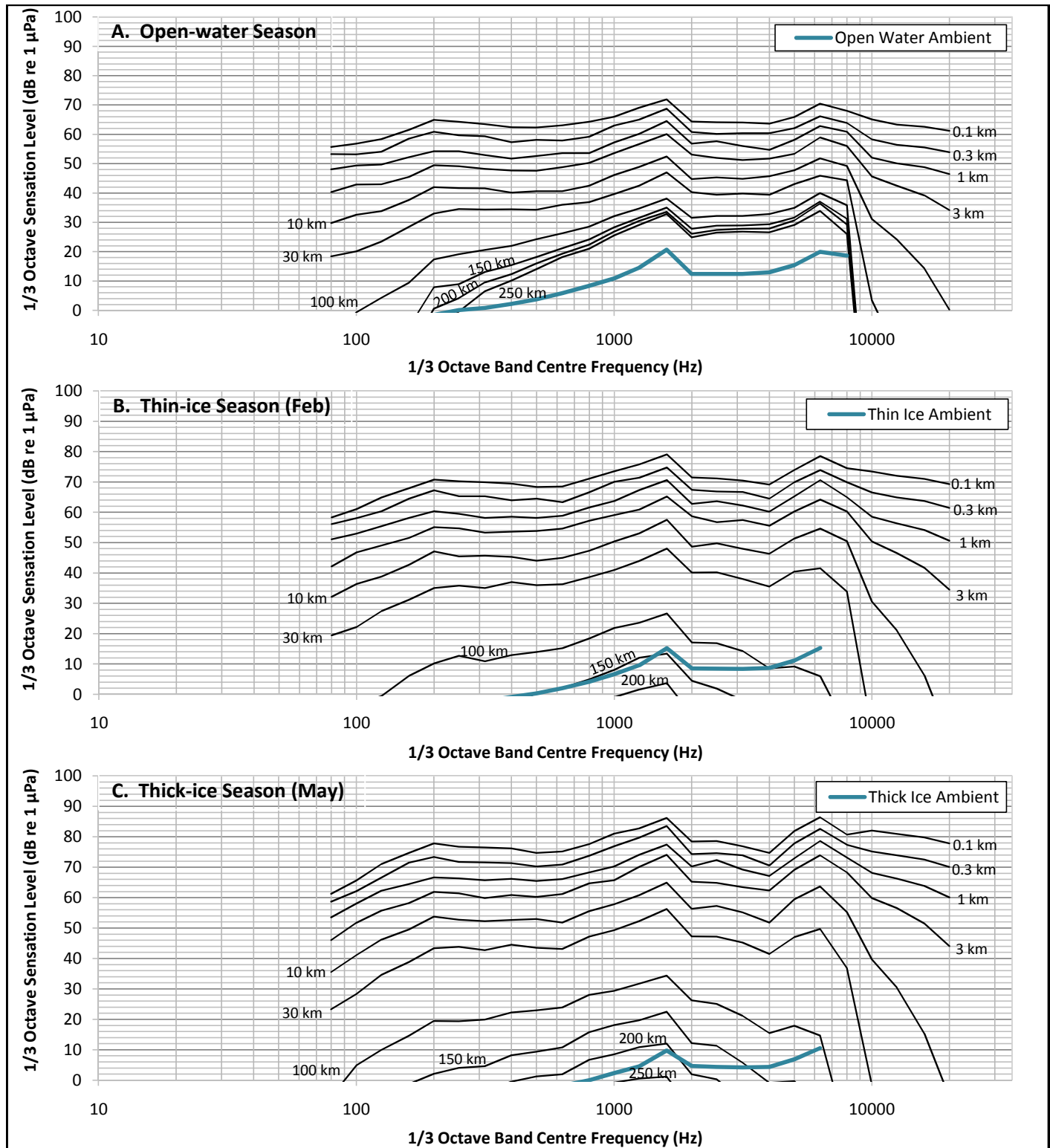
BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

**RINGED SEAL 1/3 OCTAVE BAND SENSATION LEVELS
FOR TUG OPERATIONS AT STEENSBY PORT DURING A.
OPEN-WATER (AUG), B. THIN-ICE (FEB), AND C. THICK-ICE
(MAY) PERIODS**

P/A NO.
NB102-181/25REF. NO.
13**FIGURE 8C-3.4**REV
A

A	23NOV10	ISSUED WITH REPORT	REE	VDM	REE
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

**NOTES:**

1. AMBIENT NOISE DATA FROM GREENE AND HANNA (1997), AND BURGESS AND GREENE (1998).
2. PREDICTED 1/3 OCTAVE NOISE LEVELS FROM MATTHEWS ET AL. (2010).
3. ANALYSIS APPROACH BASED ON DAVIS AND MALME (1997).
4. AUDIOGRAM DATA FROM TERHUNE (1988, 1989), TERHUNE AND TURNBULL (1995), AND KASTAK AND SCHUSTERMAN (1998).

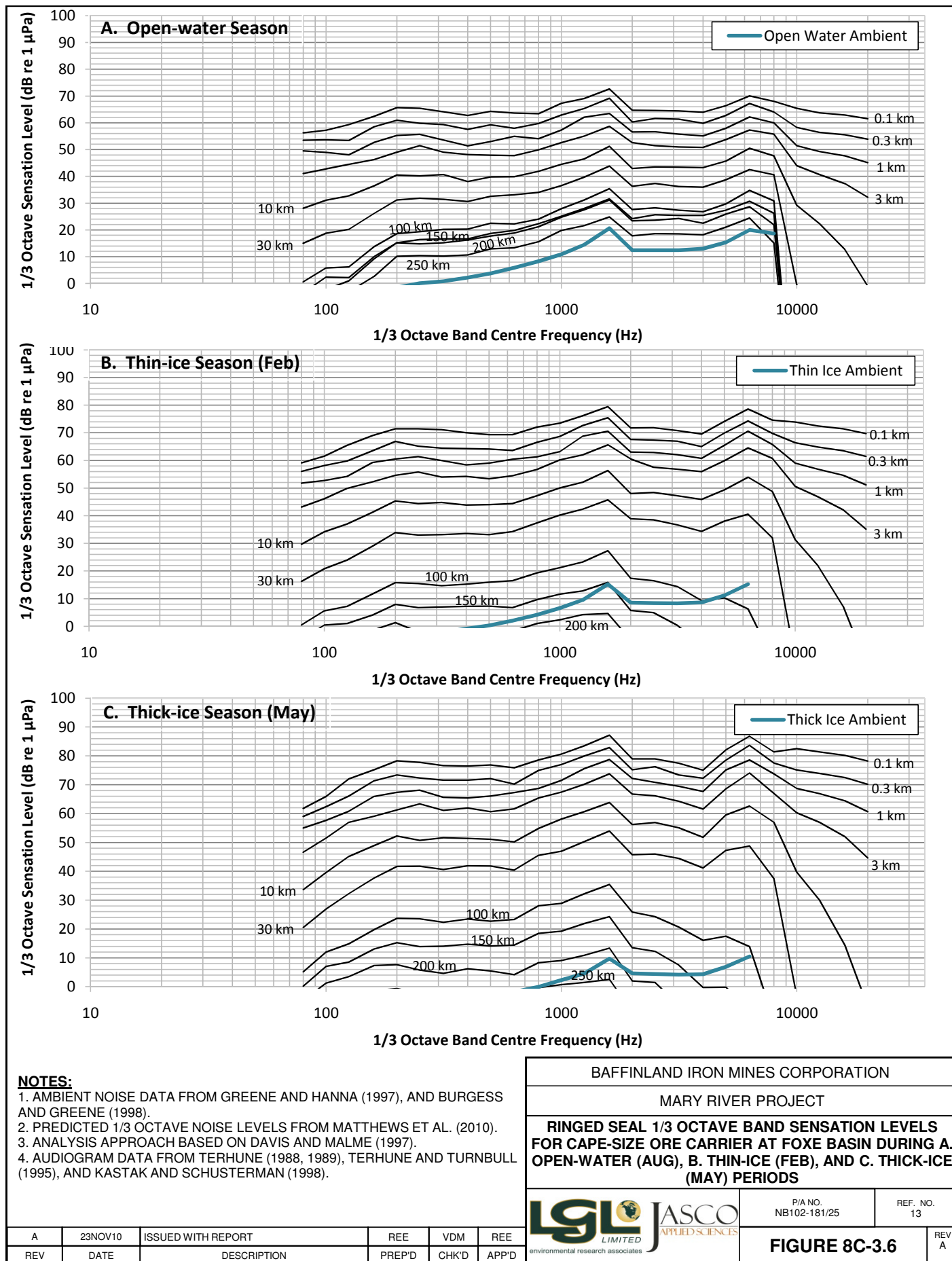
BAFFINLAND IRON MINES CORPORATION

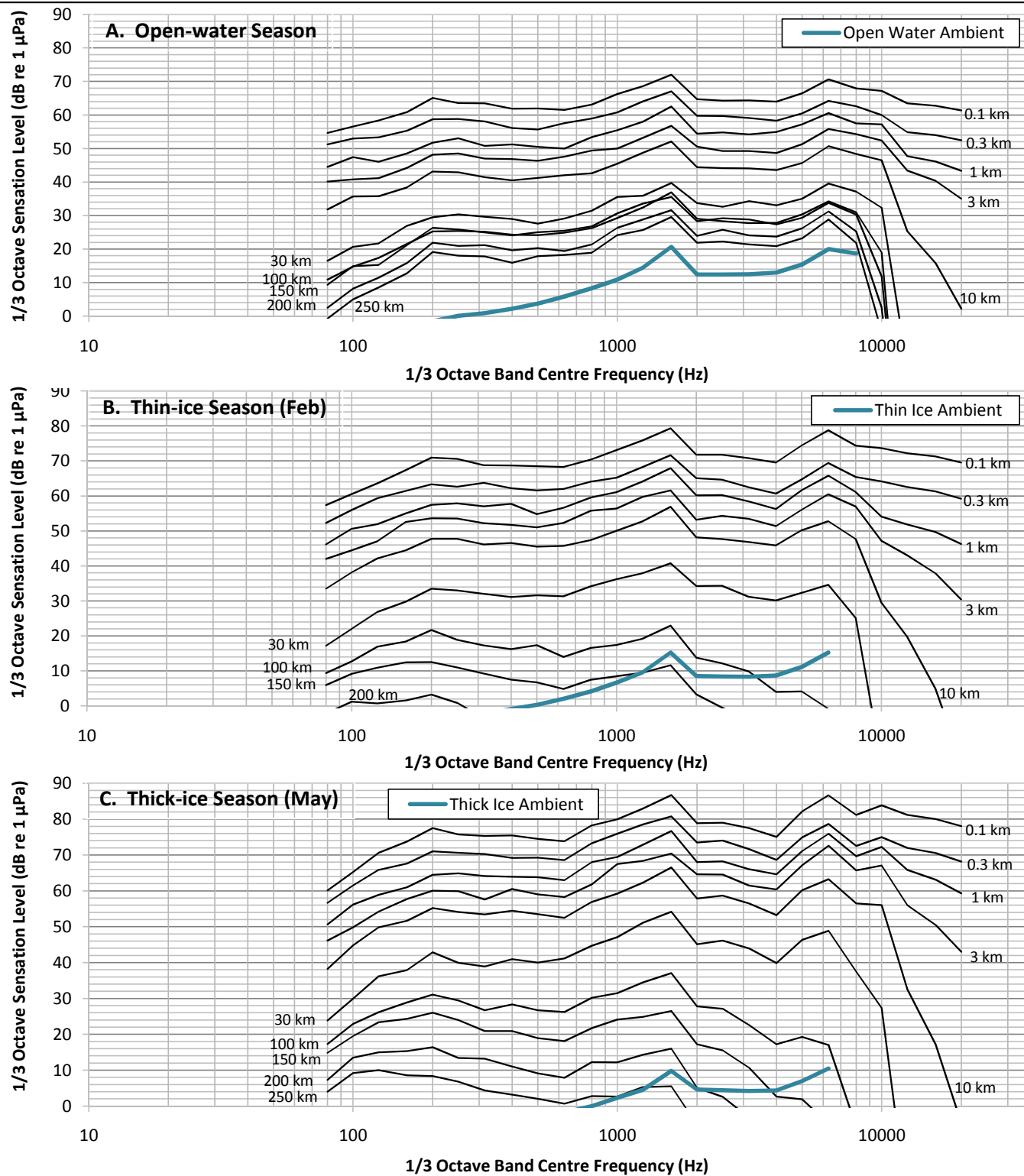
MARY RIVER PROJECT

**RINGED SEAL 1/3 OCTAVE BAND SENSATION LEVELS
FOR CAPE-SIZE ORE CARRIER AT STEENSBY PORT
DURING A. OPEN-WATER (AUG), B. THIN-ICE (FEB), AND C.
THICK-ICE (MAY) PERIODS**

P/A NO.
NB102-181/25REF. NO.
13**FIGURE 8C-3.5**REV
A

A	23NOV10	ISSUED WITH REPORT	REE	VDM	REE
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D



**NOTES:**

1. AMBIENT NOISE DATA FROM GREENE AND HANNA (1997), AND BURGESS AND GREENE (1998).
2. PREDICTED 1/3 OCTAVE NOISE LEVELS FROM MATTHEWS ET AL. (2010).
3. ANALYSIS APPROACH BASED ON DAVIS AND MALME (1997).
4. AUDIOGRAM DATA FROM TERHUNE (1988, 1989), TERHUNE AND TURNBULL (1995), AND KASTAK AND SCHUSTERMAN (1998).

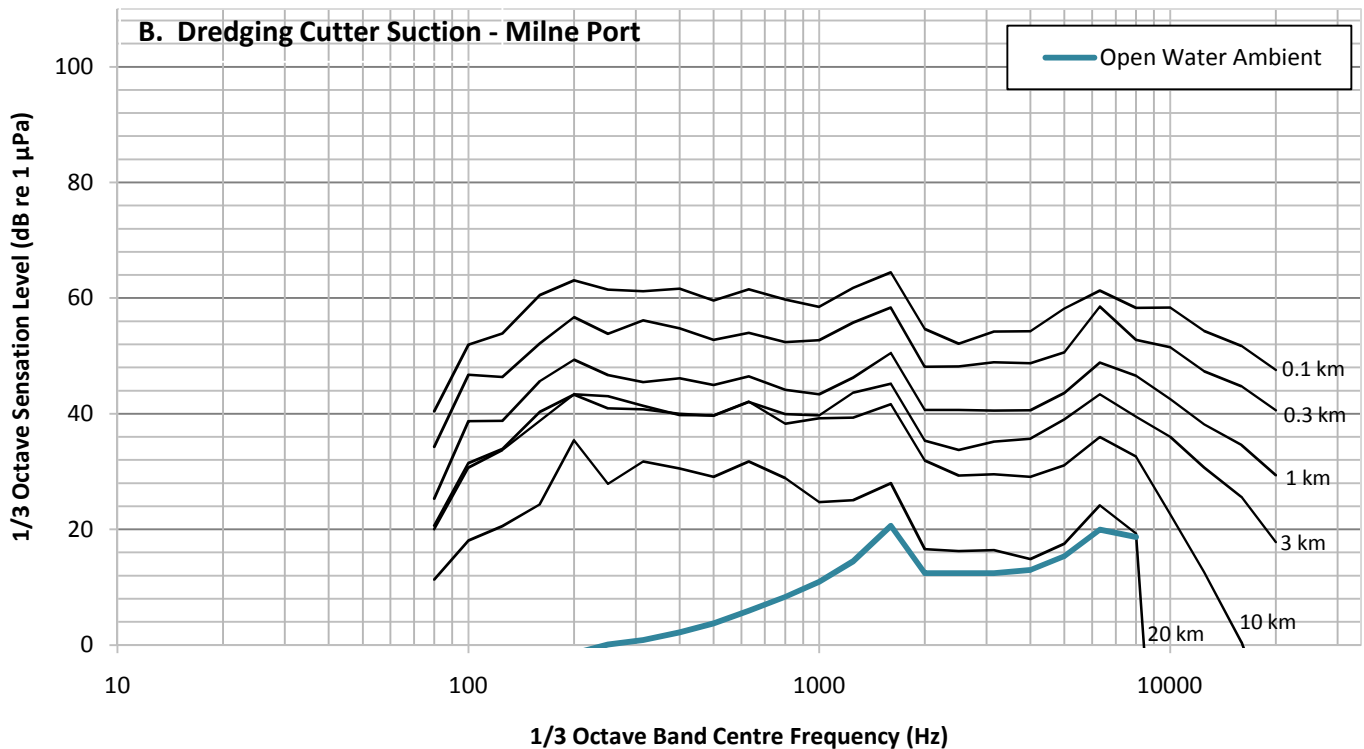
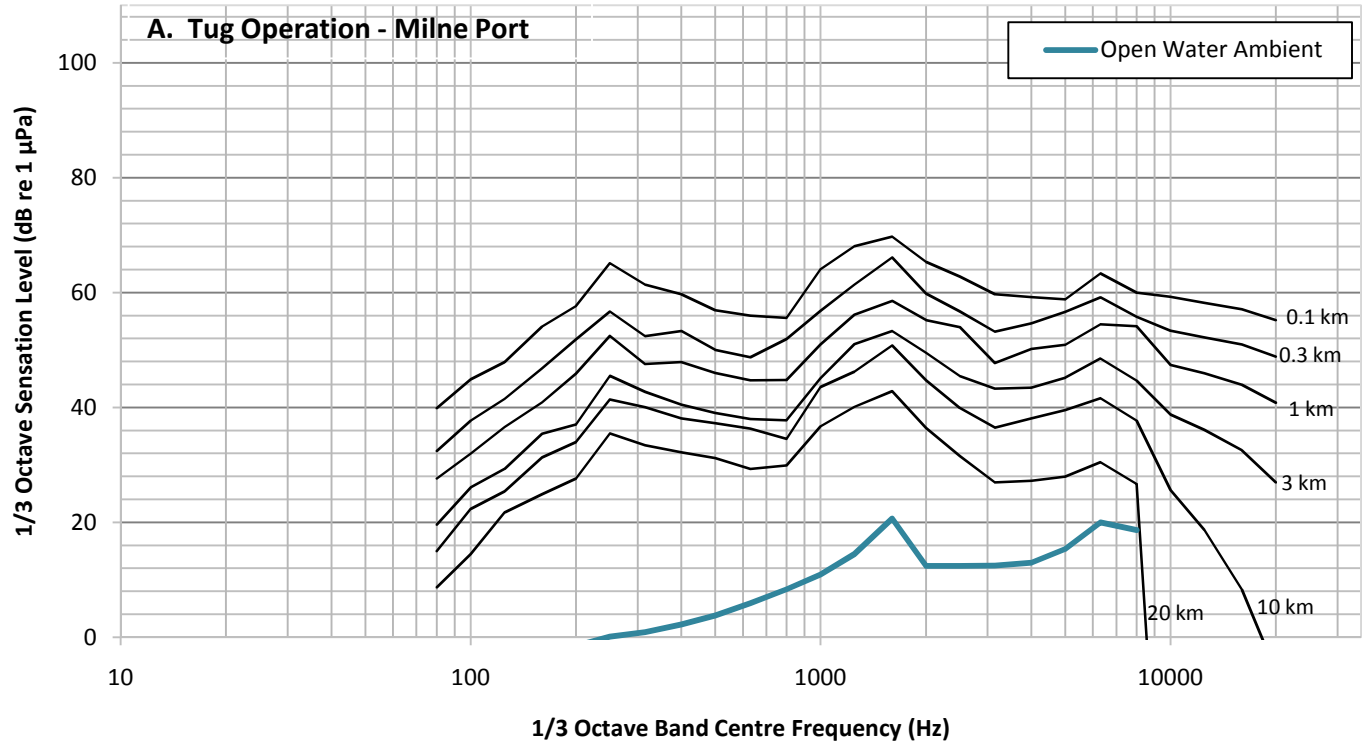
BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

**RINGED SEAL 1/3 OCTAVE BAND SENSATION LEVELS
FOR CAPE-SIZE ORE CARRIER AT HUDSON STRAIT
DURING A. OPEN-WATER (AUG), B. THIN-ICE (FEB), AND C.
THICK-ICE (MAY) PERIODS**

P/A NO.
NB102-181/25REF. NO.
13**FIGURE 8C-3.7**REV
A

A	23NOV10	ISSUED WITH REPORT	REE	VDM	REE
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

**NOTES:**

1. AMBIENT NOISE DATA FROM BURGESS AND GREENE (1998).
2. PREDICTED 1/3 OCTAVE NOISE LEVELS FROM MATTHEWS AND ZYKOV (2010).
3. ANALYSIS APPROACH BASED ON DAVIS AND MALME (1997).
4. AUDIOGRAM DATA FROM TERHUNE (1988, 1989), TERHUNE AND TURNBULL (1995), AND KASTAK AND SCHUSTERMAN (1998).

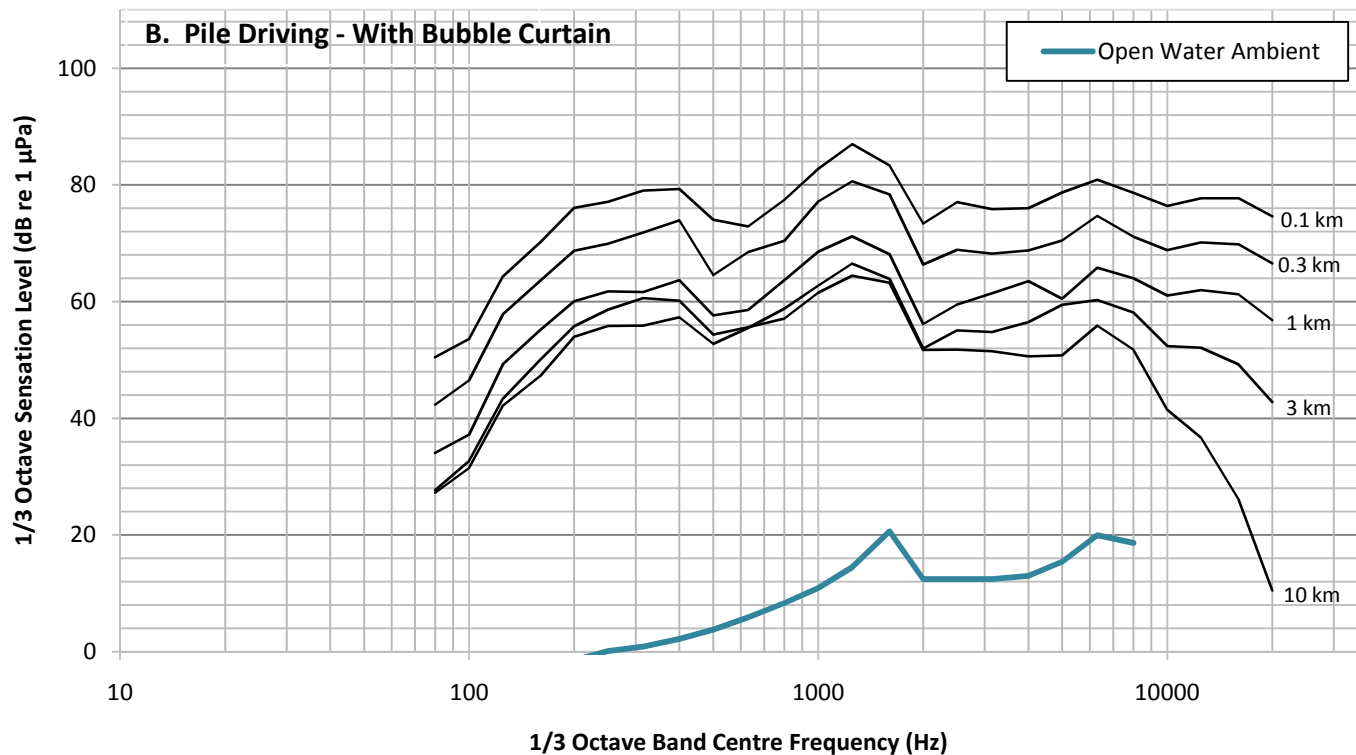
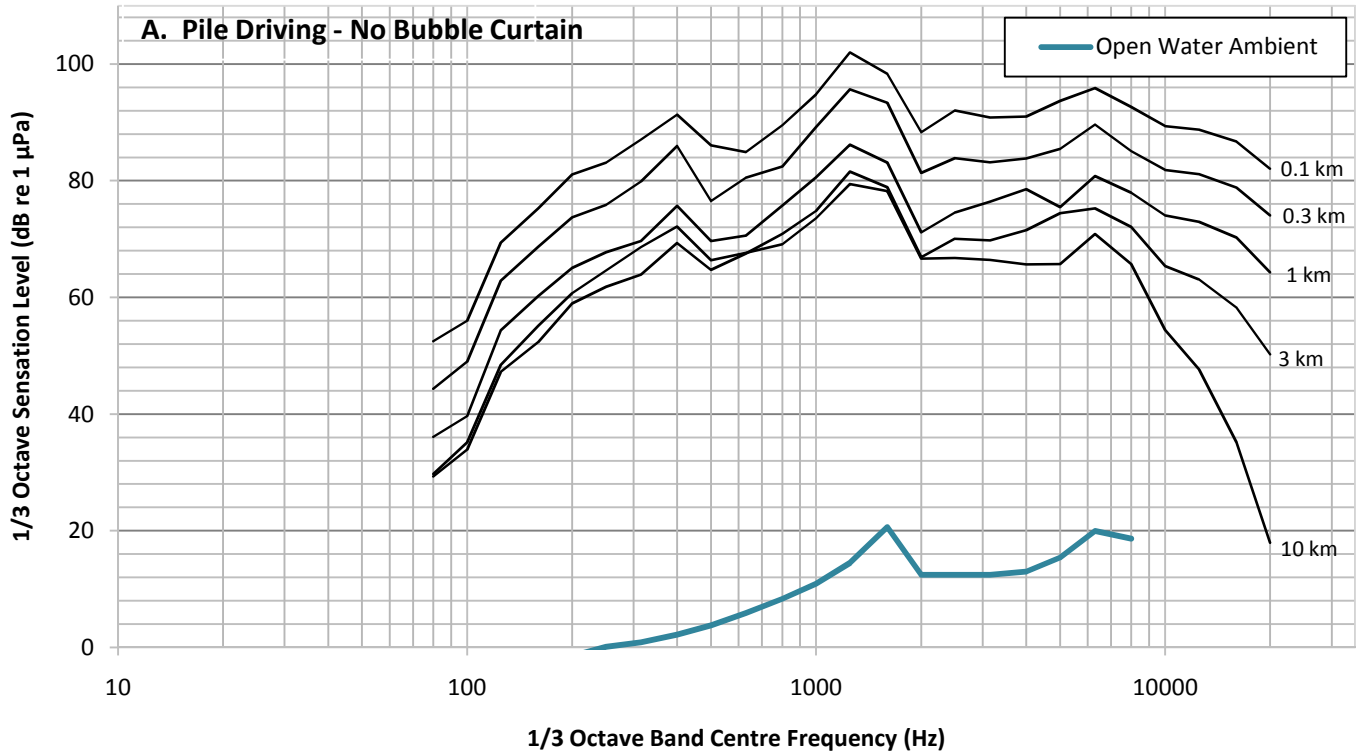
BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

**RINGED SEAL 1/3 OCTAVE BAND SENSATION LEVELS
DURING THE OPEN-WATER PERIOD (AUG) AT MILNE
PORT FOR A. TUG, AND B. DREDGING CUTTER SUCTION**

P/A NO.
NB102-181/25REF. NO.
13**FIGURE 8C-3.8**REV
A

A	23NOV10	ISSUED WITH REPORT	REE	VDM	REE
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

**NOTES:**

1. AMBIENT NOISE DATA FROM BURGESS AND GREENE (1998).
2. PREDICTED 1/3 OCTAVE NOISE LEVELS FROM MATTHEWS AND ZYKOV (2010).
3. ANALYSIS APPROACH BASED ON DAVIS AND MALME (1997).
4. AUDIOGRAM DATA FROM TERHUNE (1988, 1989), TERHUNE AND TURNBULL (1995), AND KASTAK AND SCHUSTERMAN (1998).

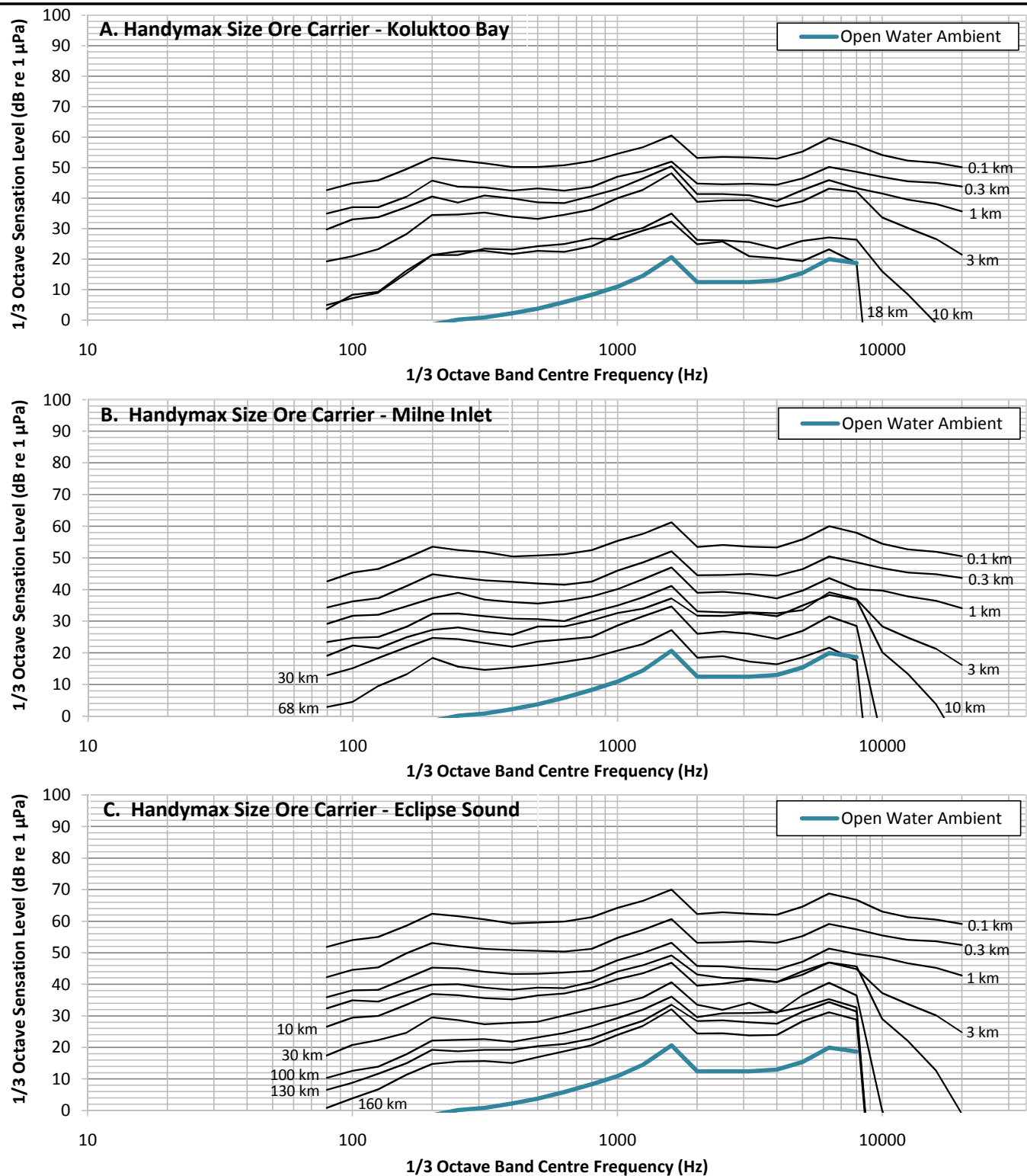
BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

**RINGED SEAL 1/3 OCTAVE BAND SENSATION LEVELS
DURING PILE DRIVING IN THE OPEN-WATER PERIOD
(AUG) AT MILNE PORT A. WITHOUT BUBBLE CURTAIN,
AND B. WITH BUBBLE CURTAIN**

P/A NO.
NB102-181/25REF. NO.
13**FIGURE 8C-3.9**REV
A

A	23NOV10	ISSUED WITH REPORT	REE	VDM	REE
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

**NOTES:**

1. AMBIENT NOISE DATA FROM BURGESS AND GREENE (1998).
2. PREDICTED 1/3 OCTAVE NOISE LEVELS FROM ZYKOV AND MATTHEWS (2010).
3. ANALYSIS APPROACH BASED ON DAVIS AND MALME (1997).
4. AUDIOGRAM DATA FROM TERHUNE (1988, 1989), TERHUNE AND TURNBULL (1995), AND KASTAK AND SCHUSTERMAN (1998).

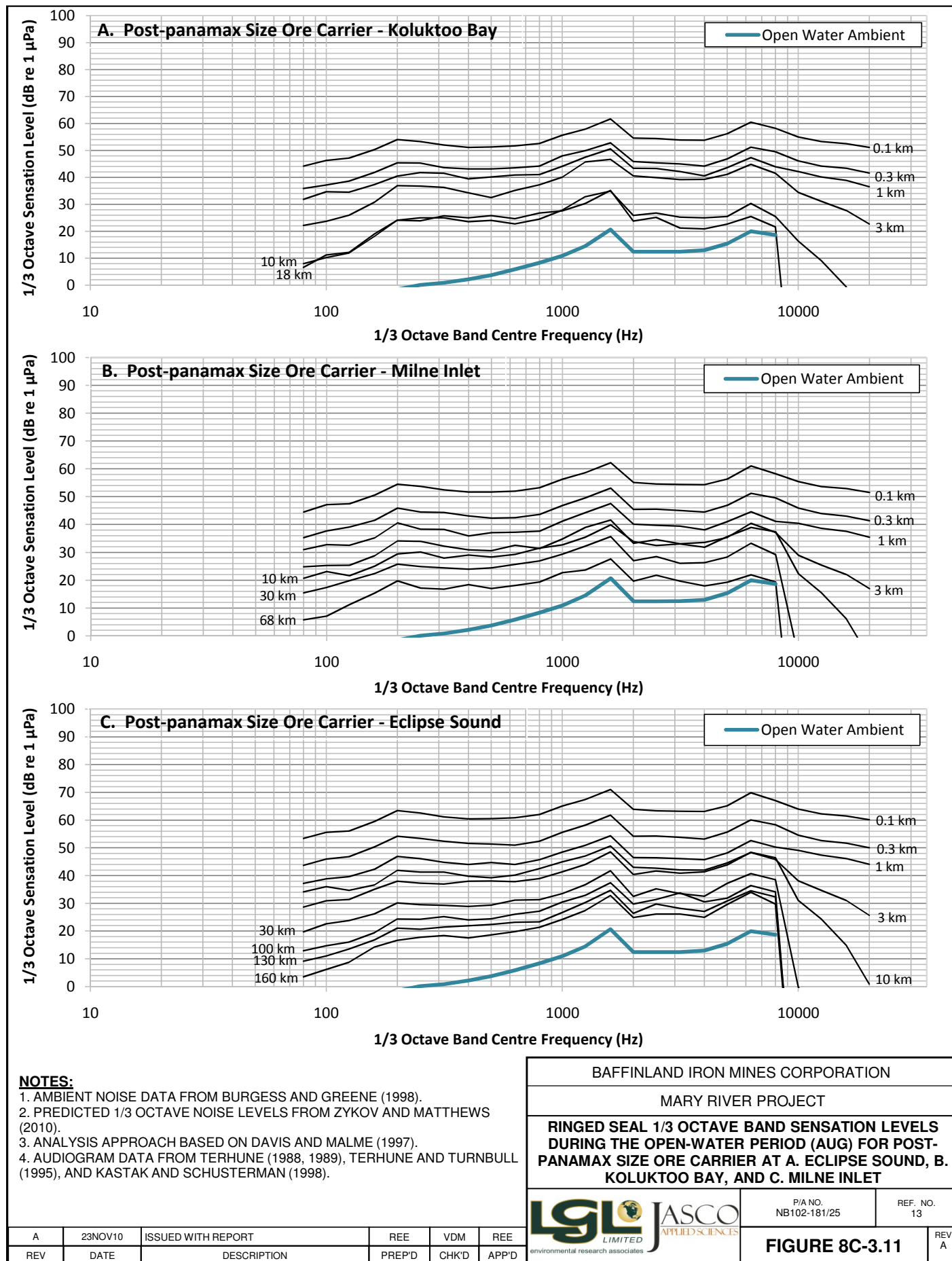
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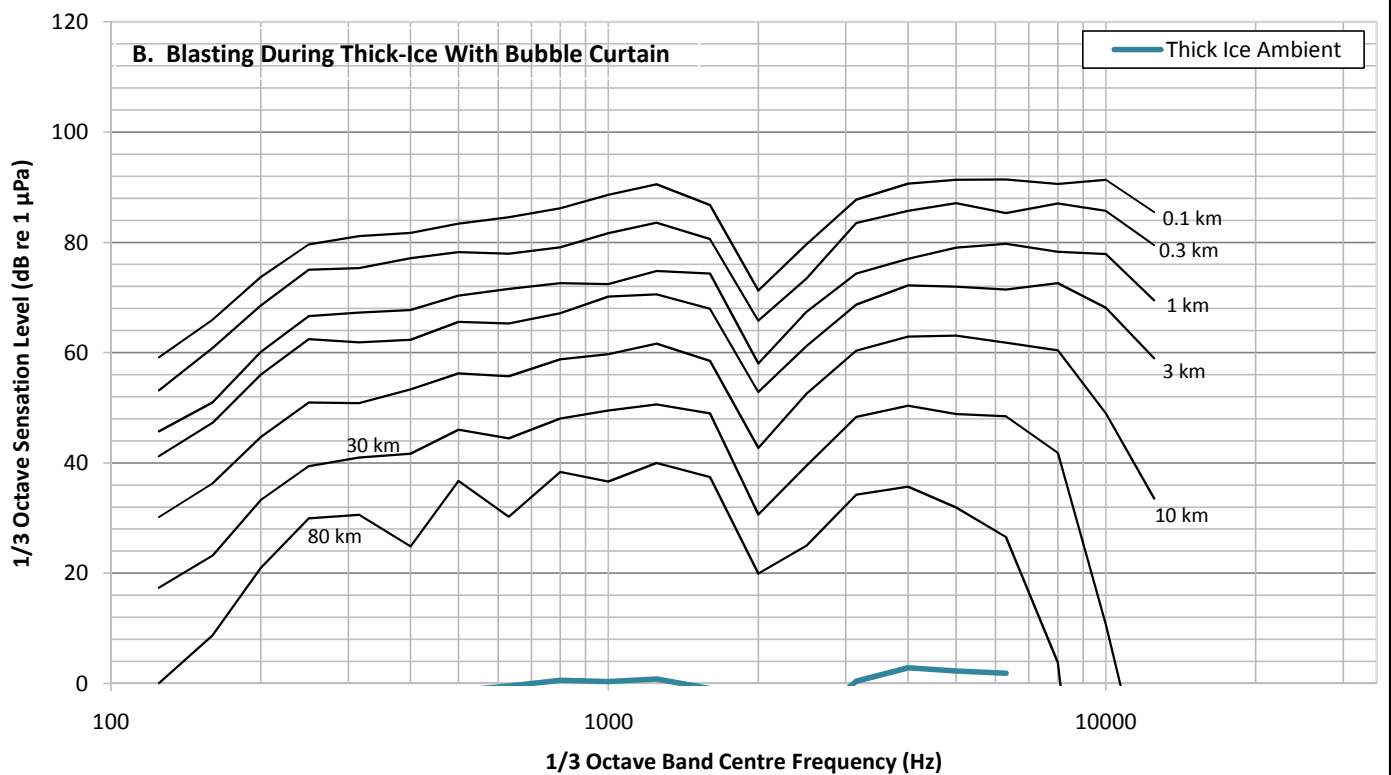
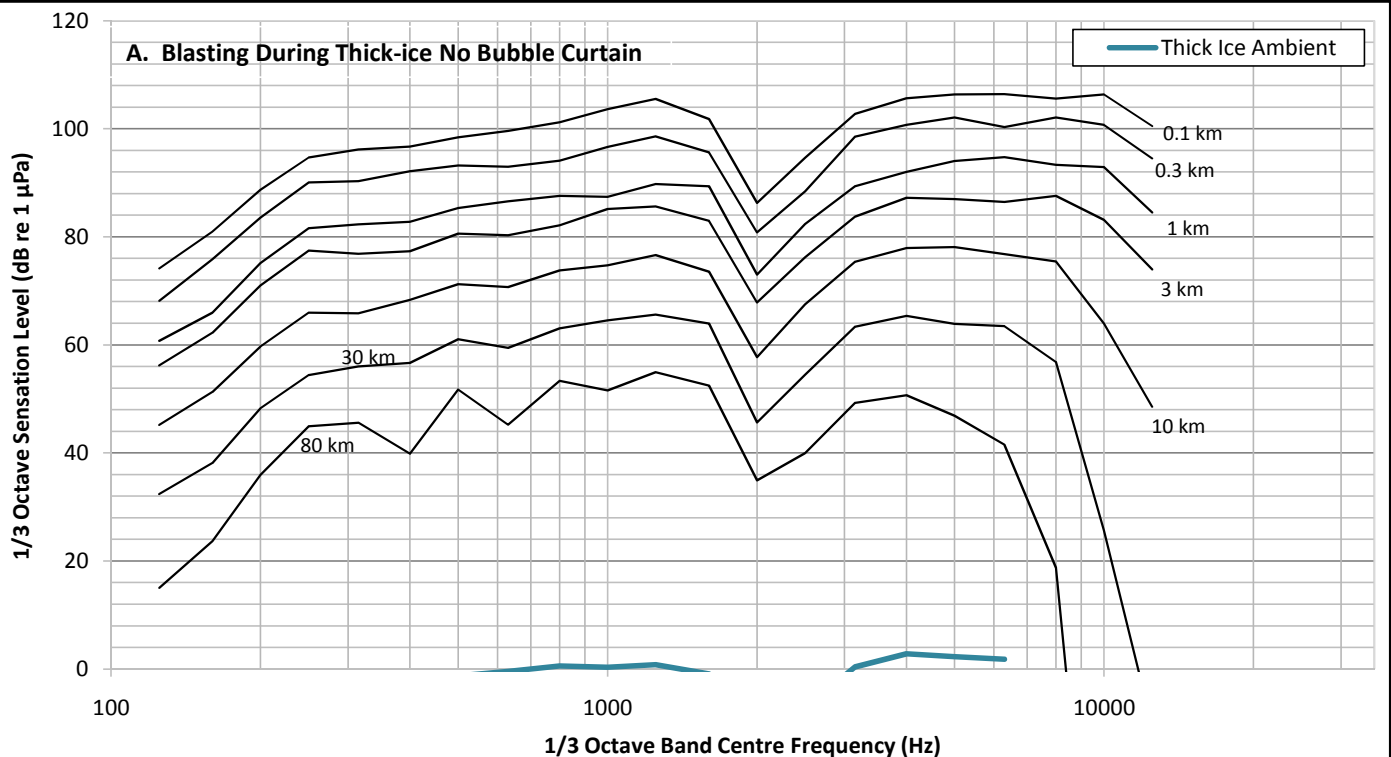
MARY RIVER PROJECT

**RINGED SEAL 1/3 OCTAVE BAND SENSATION LEVELS
DURING THE OPEN-WATER PERIOD (AUG) FOR
HANDYMAX-SIZE ORE CARRIER AT A. ECLIPSE SOUND, B.
KOLUKTOO BAY, AND C. MILNE INLET**

P/A NO.
NB102-181/25REF. NO.
13**FIGURE 8C-3.10**REV
A

A	23NOV10	ISSUED WITH REPORT	REE	VDM	REE
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D



**NOTES:**

1. AMBIENT NOISE DATA FROM GREENE AND HANNA (1997).
2. PREDICTED 1/3 OCTAVE NOISE LEVELS FROM MATTHEWS ET AL. (2010).
3. ANALYSIS APPROACH BASED ON DAVIS AND MALME (1997).
4. AUDIOGRAM DATA FROM KASTELEIN ET AL. (2002).

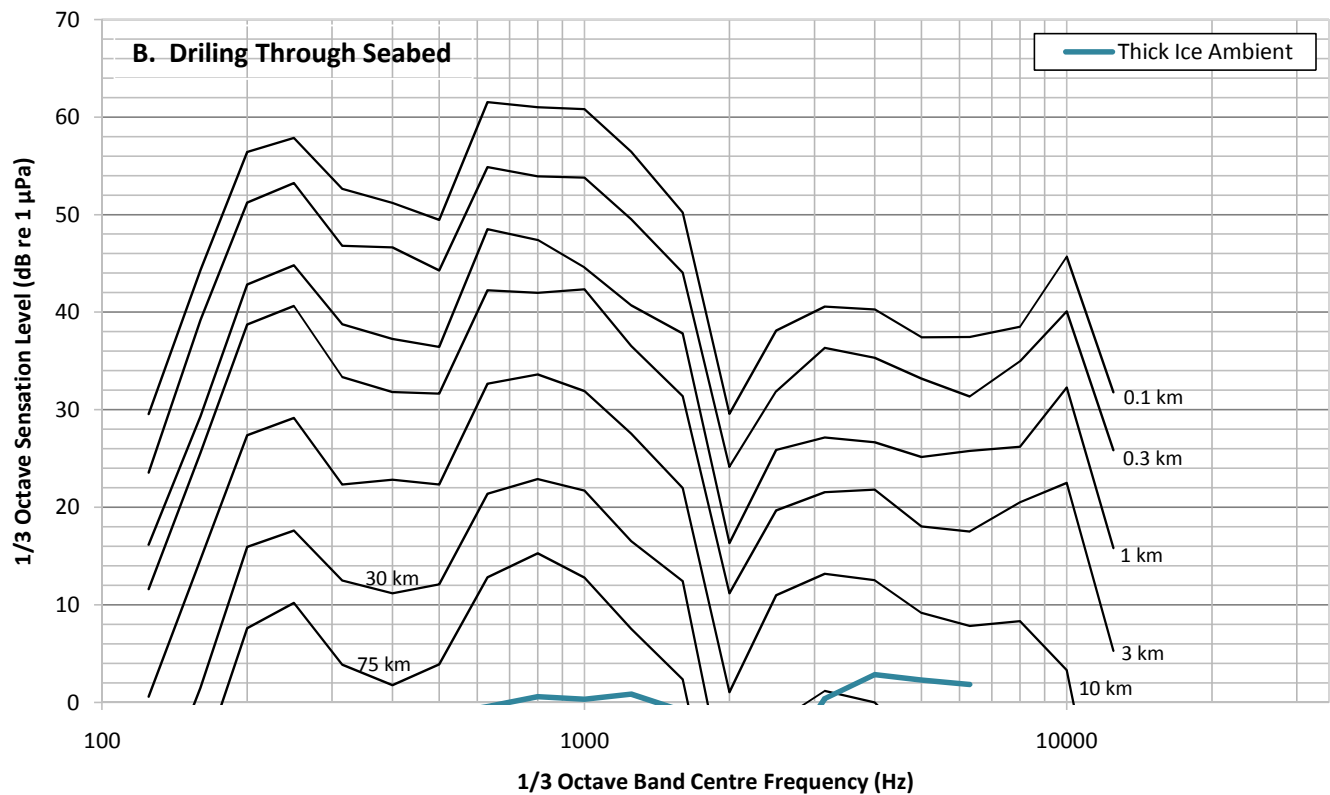
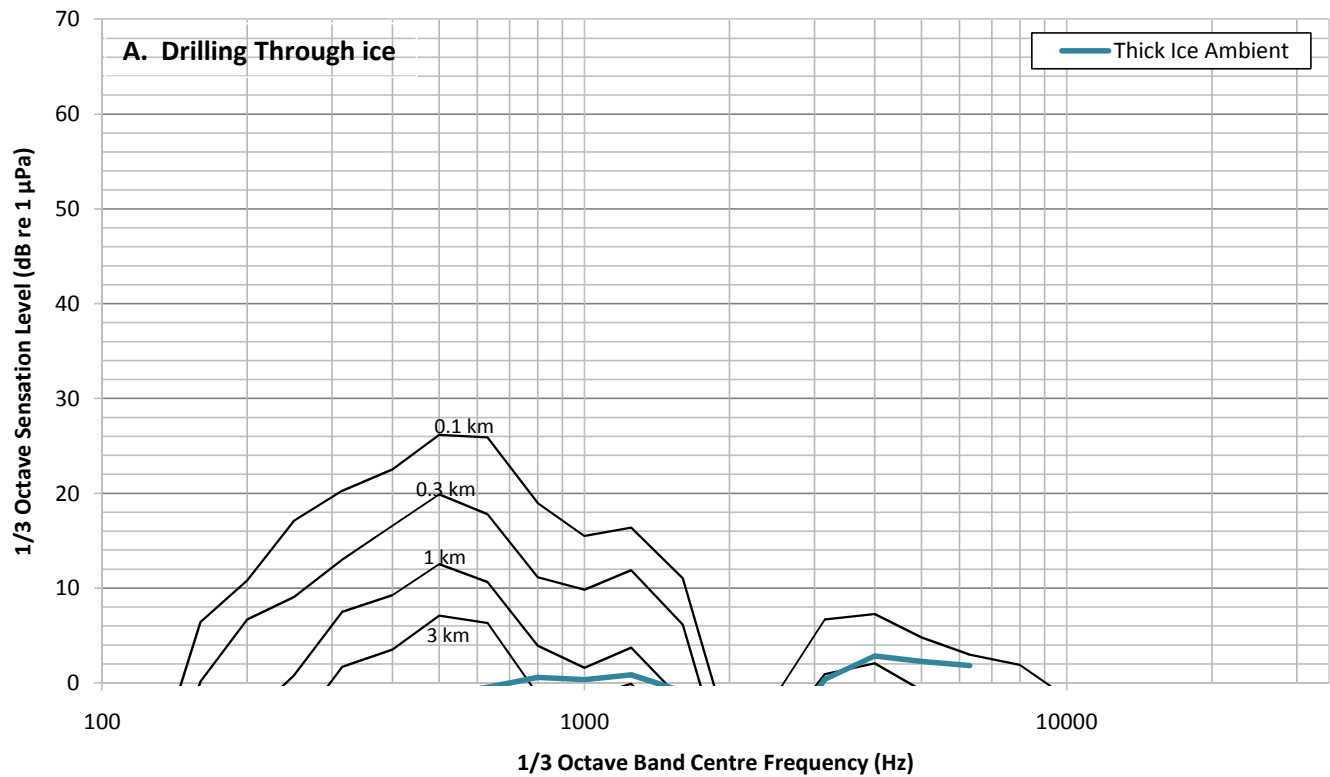
BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

WALRUS 1/3 OCTAVE BAND SENSATION LEVELS DURING THE THICK-ICE PERIOD (MAY) AT STEENSBY PORT FOR A. BLASTING WITH NO BUBBLE CURTAIN, AND B. BLASTING WITH BUBBLE CURTAIN

P/A NO.
NB102-181/25REF. NO.
13**FIGURE 8C-3.12**REV
A

A	23NOV10	ISSUED WITH REPORT	REE	VDM	REE
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

**NOTES:**

1. AMBIENT NOISE DATA FROM GREENE AND HANNA (1997).
2. PREDICTED 1/3 OCTAVE NOISE LEVELS FROM MATTHEWS ET AL. (2010).
3. ANALYSIS APPROACH BASED ON DAVIS AND MALME (1997).
4. AUDIOGRAM DATA FROM KASTELEIN ET AL. (2002).

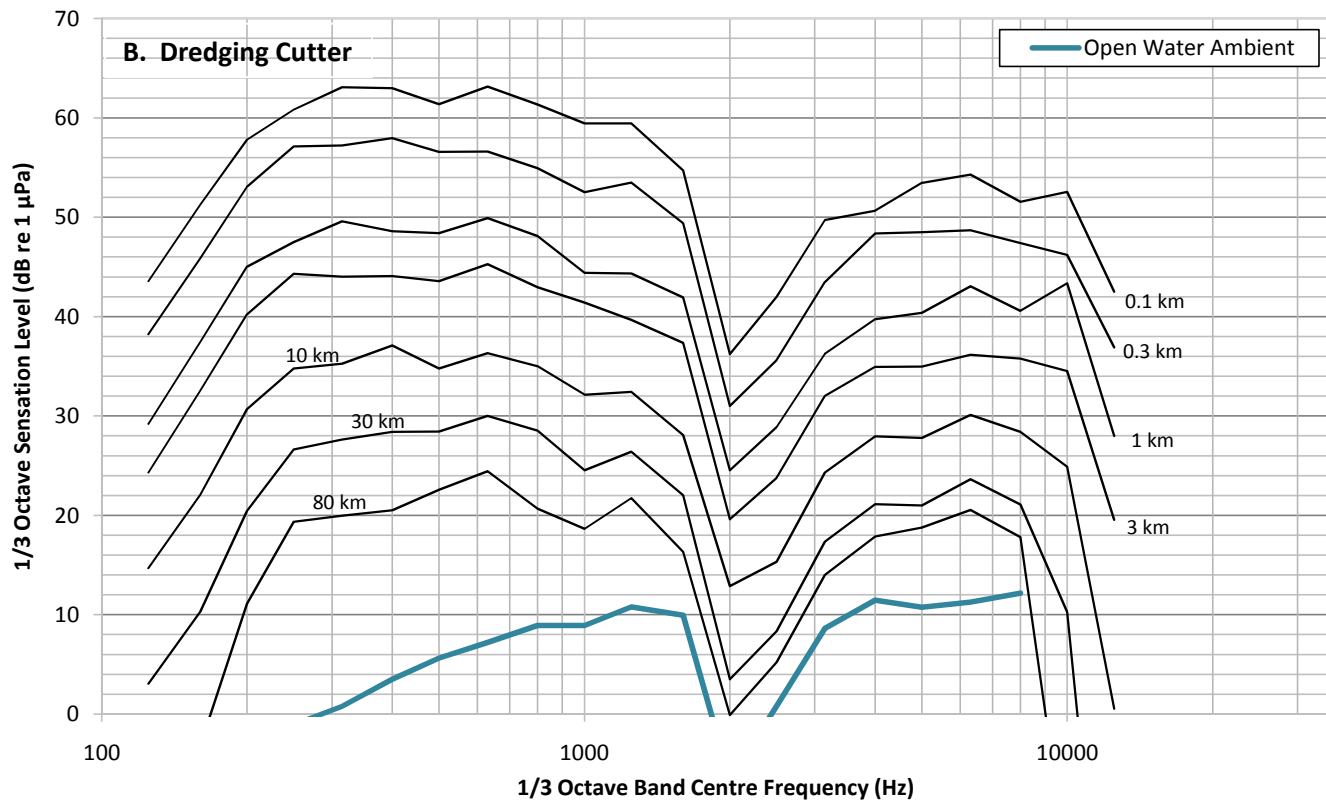
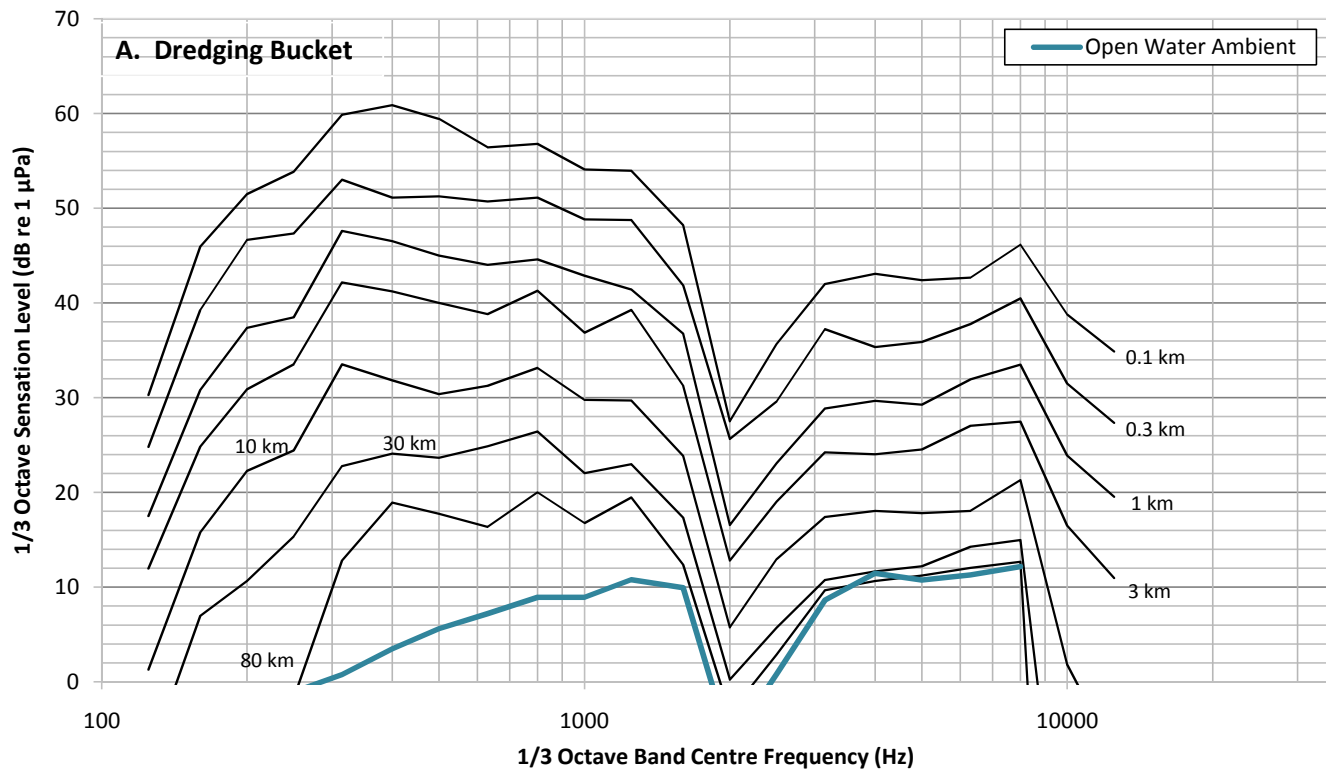
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MARY RIVER PROJECT

WALRUS 1/3 OCTAVE BAND SENSATION LEVELS DURING THE THICK-ICE PERIOD (MAY) AT STEENSBY PORT FOR A. DRILLING THROUGH ICE, AND B. DRILLING THROUGH SEABED

P/A NO.
NB102-181/25REF. NO.
13**FIGURE 8C-3.13**REV
A

A	23NOV10	ISSUED WITH REPORT	REE	VDM	REE
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

**NOTES:**

1. AMBIENT NOISE DATA FROM BURGESS AND GREENE (1998).
2. PREDICTED 1/3 OCTAVE NOISE LEVELS FROM MATTHEWS ET AL. (2010).
3. ANALYSIS APPROACH BASED ON DAVIS AND MALME (1997).
4. AUDIOGRAM DATA FROM KASTELEIN ET AL. (2002).

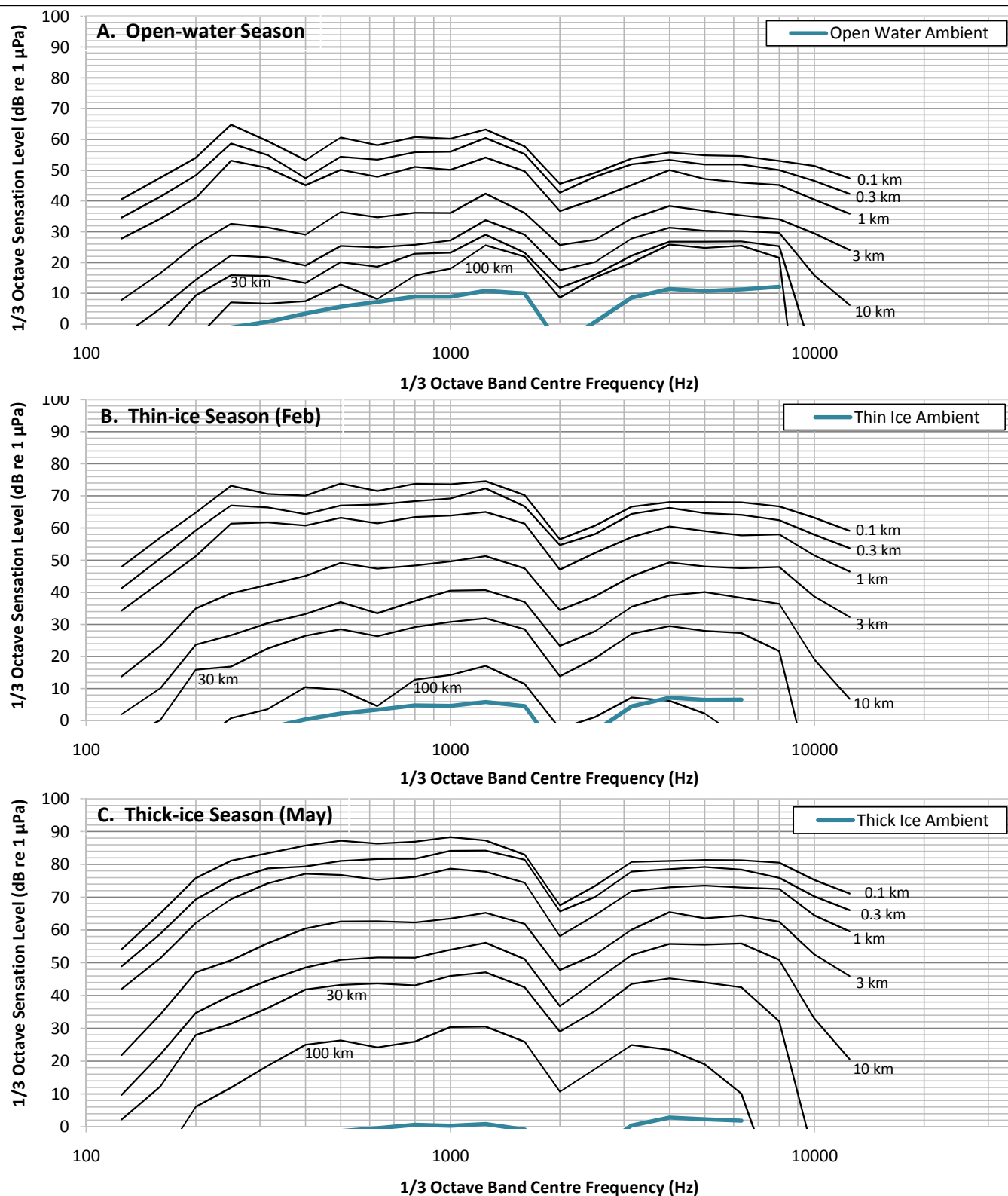
BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

**WALRUS 1/3 OCTAVE BAND SENSATION LEVELS DURING
THE OPEN-WATER PERIOD (AUG) AT STEENSBY PORT
FOR A. DREDGING BUCKET, AND B. DREDGING CUTTER**

P/A NO.
NB102-181/25REF. NO.
13**FIGURE 8C-3.14**REV
A

A	23NOV10	ISSUED WITH REPORT	REE	VDM	REE
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

**NOTES:**

1. AMBIENT NOISE DATA FROM GREENE AND HANNA (1997), AND BURGESS AND GREENE (1998).
2. PREDICTED 1/3 OCTAVE NOISE LEVELS FROM MATTHEWS ET AL. (2010).
3. ANALYSIS APPROACH BASED ON DAVIS AND MALME (1997).
4. AUDIOGRAM DATA FROM KASTELEIN ET AL. (2002).

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MARY RIVER PROJECT

WALRUS 1/3 OCTAVE BAND SENSATION LEVELS FOR TUGS AT STEENSBY PORT DURING A. OPEN-WATER (AUG), B. THIN-ICE (FEB), AND C. THICK-ICE (MAY) PERIODS

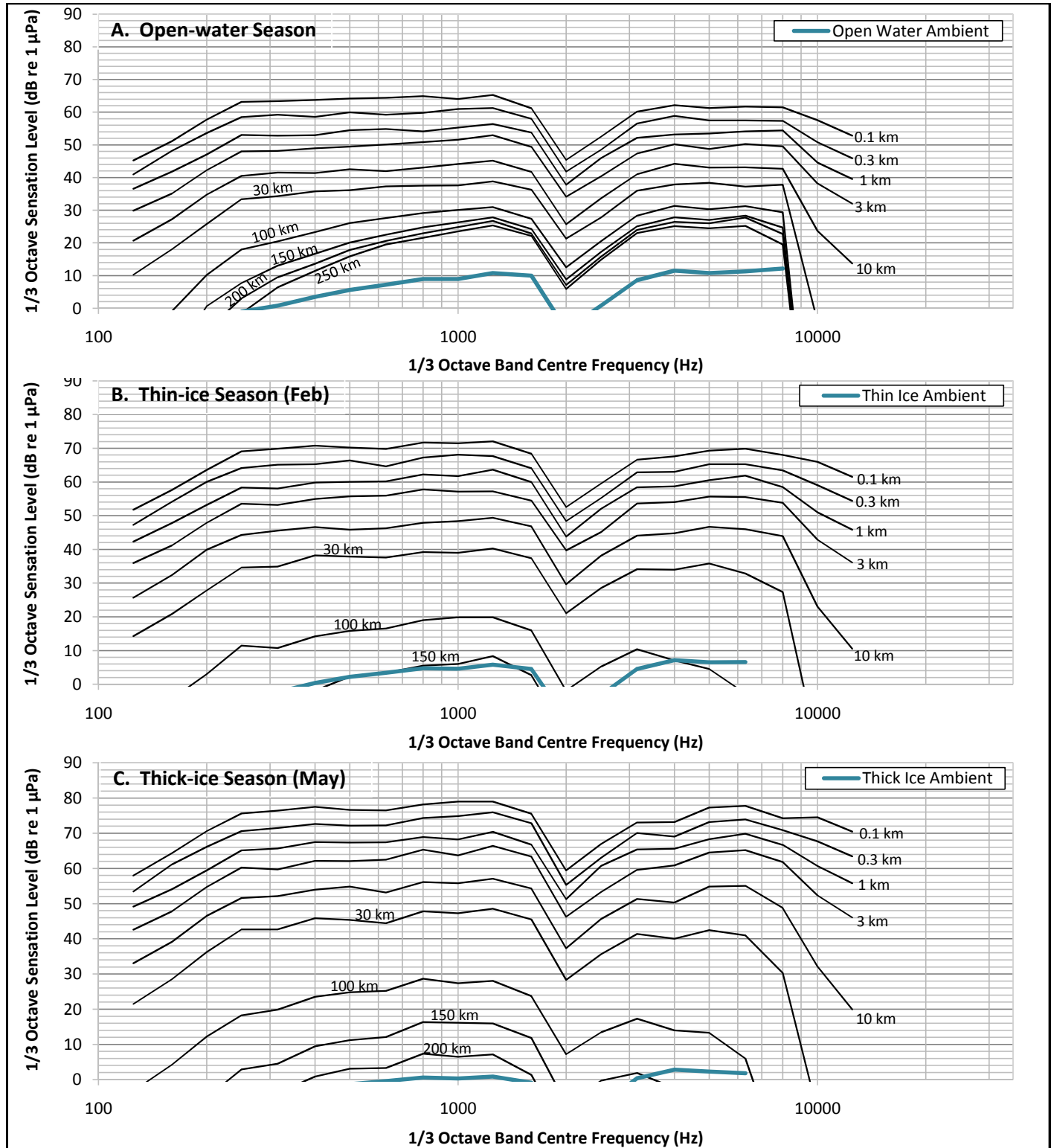


P/A NO.
NB102-181/25

REF. NO.
13

FIGURE 8C-3.15REV
A

A	23NOV10	ISSUED WITH REPORT	REE	VDM	REE
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

**NOTES:**

1. AMBIENT NOISE DATA FROM GREENE AND HANNA (1997), AND BURGESS AND GREENE (1998).
2. PREDICTED 1/3 OCTAVE NOISE LEVELS FROM MATTHEWS ET AL. (2010).
3. ANALYSIS APPROACH BASED ON DAVIS AND MALME (1997).
4. AUDIOGRAM DATA FROM KASTELEIN ET AL. (2002).

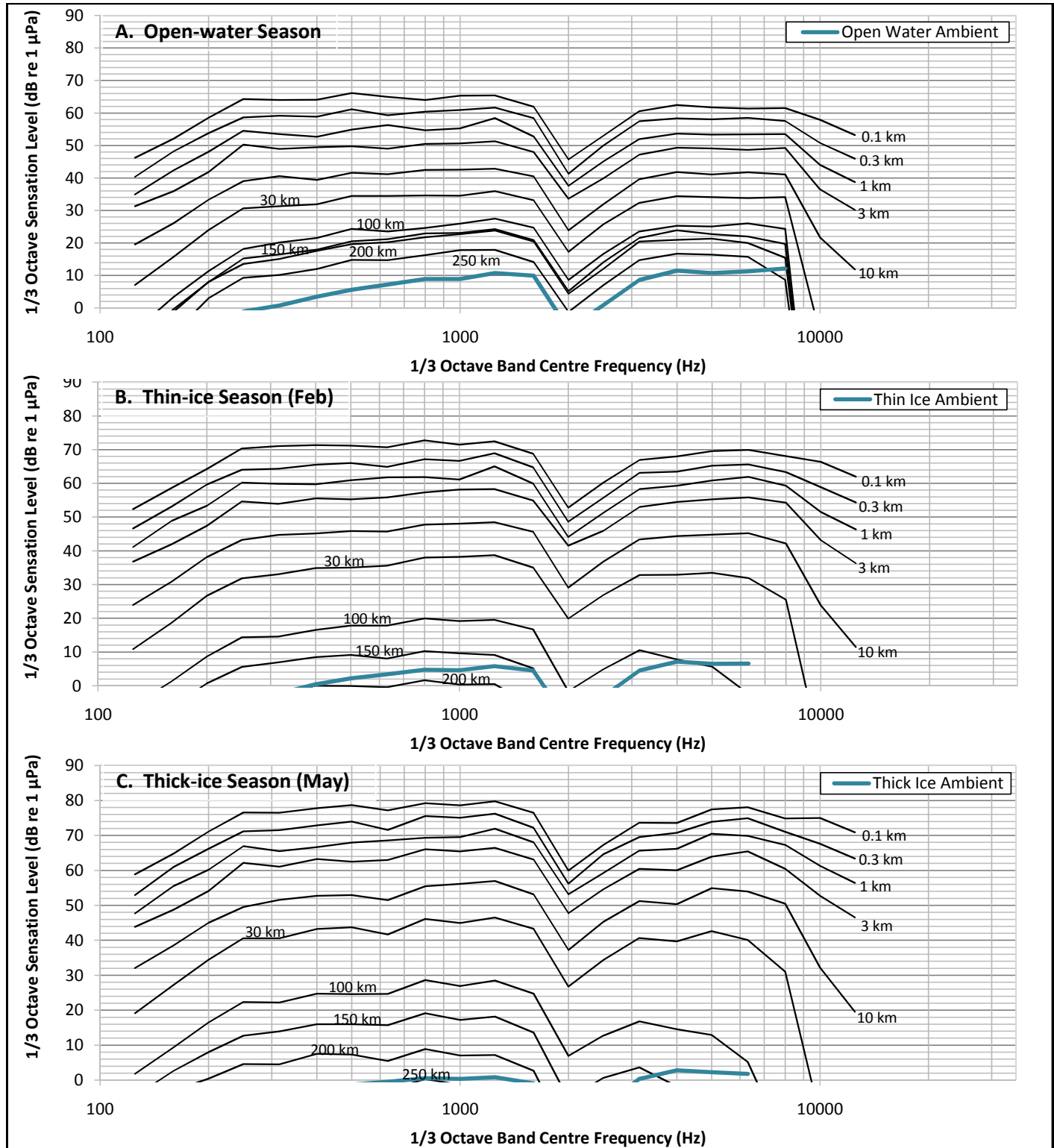
BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

WALRUS 1/3 OCTAVE BAND SENSATION LEVELS FOR CAPE-SIZE ORE CARRIER AT STEENSBY PORT DURING A. OPEN-WATER (AUG), B. THIN-ICE (FEB), AND C. THICK-ICE (MAY) PERIODS

P/A NO.
NB102-181/25REF. NO.
13**FIGURE 8C-3.16**REV
A

A	23NOV10	ISSUED WITH REPORT	REE	VDM	REE
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

**NOTES:**

1. AMBIENT NOISE DATA FROM GREENE AND HANNA (1997), AND BURGESS AND GREENE (1998).
2. PREDICTED 1/3 OCTAVE NOISE LEVELS FROM MATTHEWS ET AL. (2010).
3. ANALYSIS APPROACH BASED ON DAVIS AND MALME (1997).
4. AUDIOGRAM DATA FROM KASTELEIN ET AL. (2002).

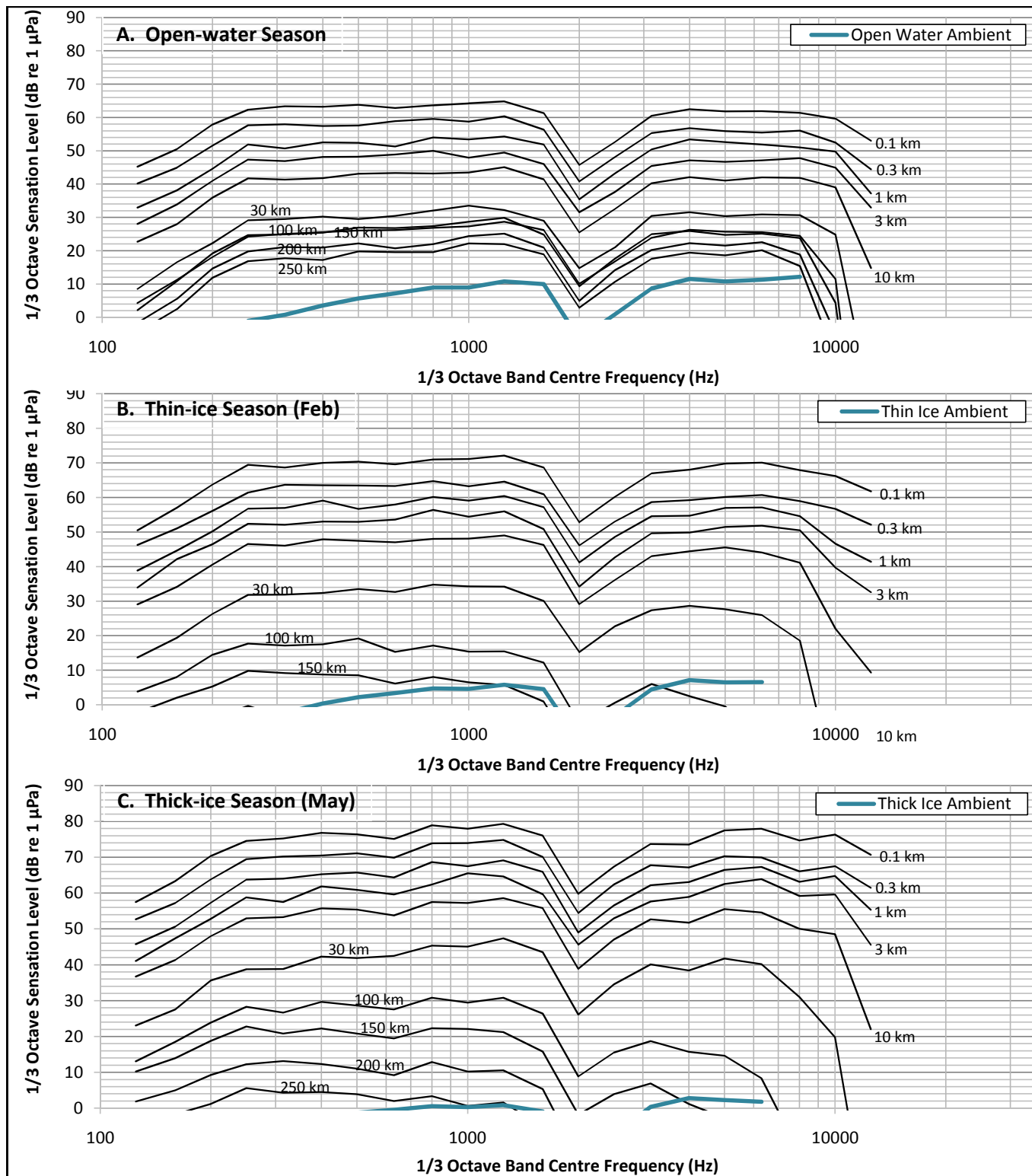
BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

WALRUS 1/3 OCTAVE BAND SENSATION LEVELS FOR CAPE-SIZE ORE CARRIER AT FOXE BASIN DURING A. OPEN-WATER (AUG), B. THIN-ICE (FEB), AND C. THICK-ICE (MAY) PERIODS

P/A NO.
NB102-181/25REF. NO.
13**FIGURE 8C-3.17**REV
A

A	23NOV10	ISSUED WITH REPORT	REE	VDM	REE
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

**NOTES:**

1. AMBIENT NOISE DATA FROM GREENE AND HANNA (1997), AND BURGESS AND GREENE (1998).
2. PREDICTED 1/3 OCTAVE NOISE LEVELS FROM MATTHEWS ET AL. (2010).
3. ANALYSIS APPROACH BASED ON DAVIS AND MALME (1997).
4. AUDIOGRAM DATA FROM KASTELEIN ET AL. (2002).

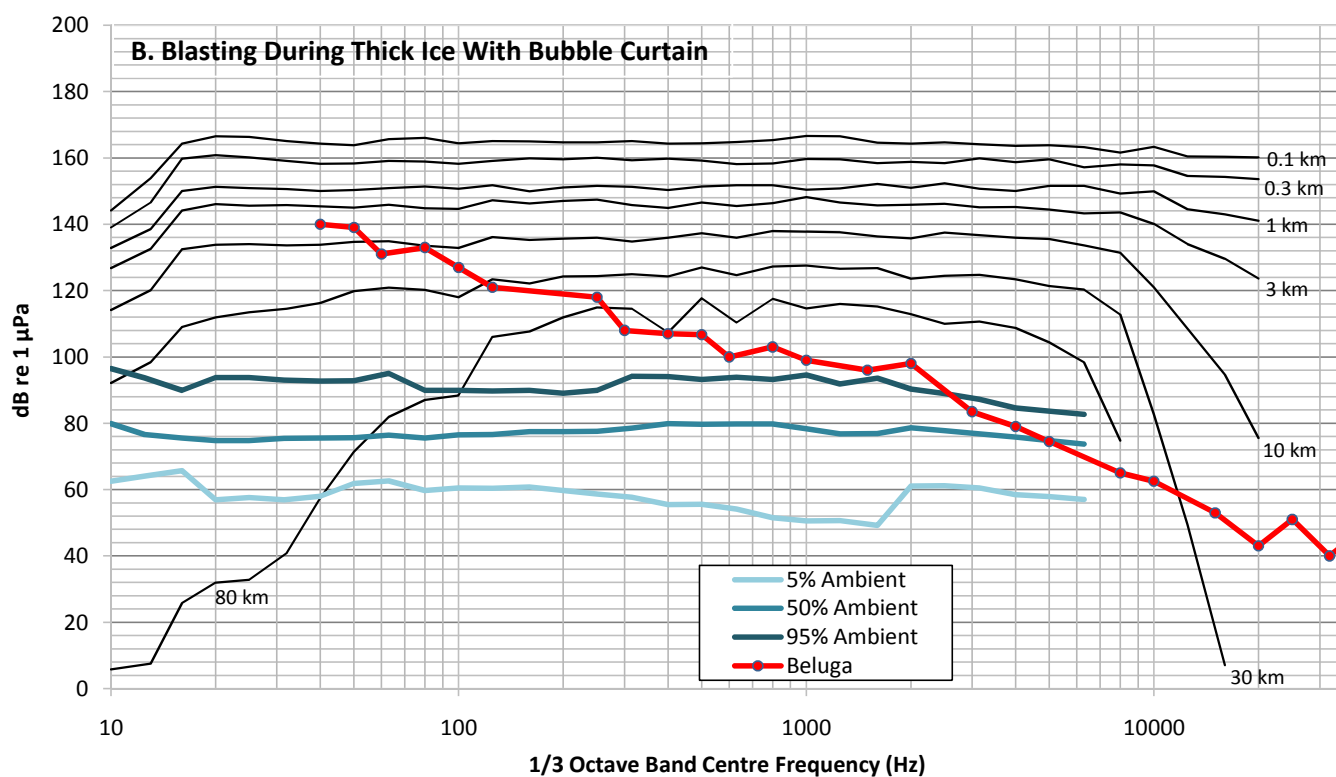
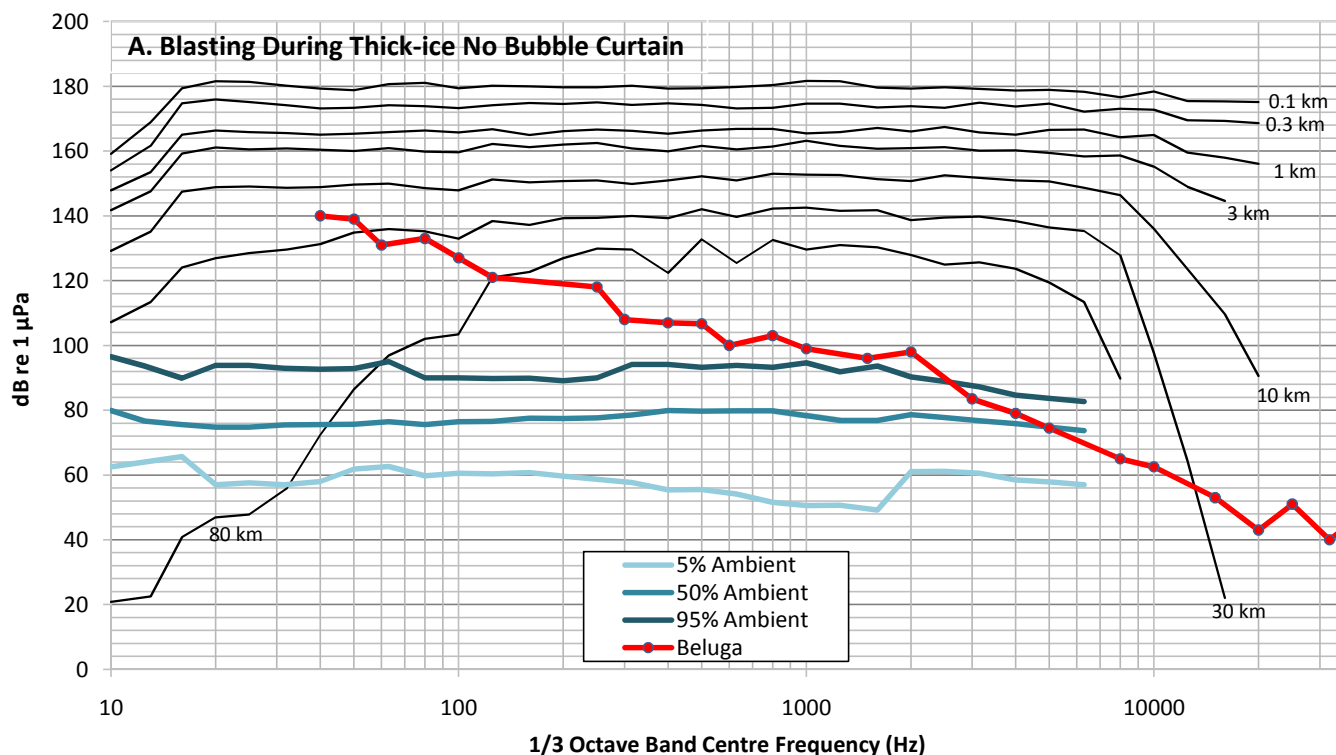
BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

**WALRUS 1/3 OCTAVE BAND SENSATION LEVELS FOR
CAPE-SIZE ORE CARRIER AT HUDSON STRAIT BASIN
DURING A. OPEN-WATER (AUG), B. THIN-ICE (FEB), AND C.
THICK-ICE (MAY) PERIODS**

P/A NO.
NB102-181/25REF. NO.
13**FIGURE 8C-3.18**REV
A

A	23NOV10	ISSUED WITH REPORT	REE	VDM	REE
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

**NOTES:**

1. AMBIENT NOISE DATA FROM GREENE AND HANNA (1997).
2. PREDICTED 1/3 OCTAVE NOISE LEVELS FROM MATTHEWS ET AL. (2010).
3. ANALYSIS APPROACH BASED ON RICHARDSON ET AL. (1995).
4. AUDIOGRAM DATA FROM WHITE ET AL. (1978), AWBREY ET AL. (1988), JOHNSON ET AL. (1989), AND ERBE AND FARMER (1998).

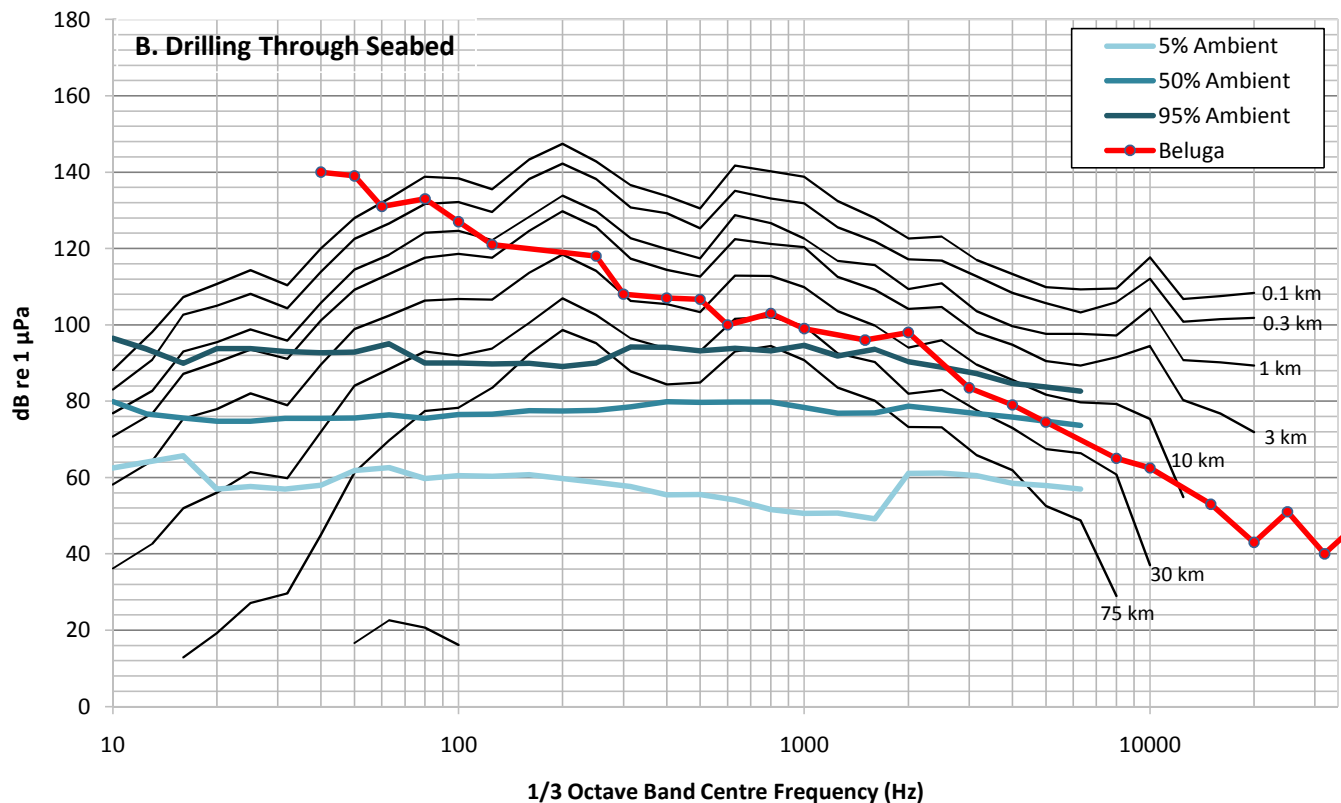
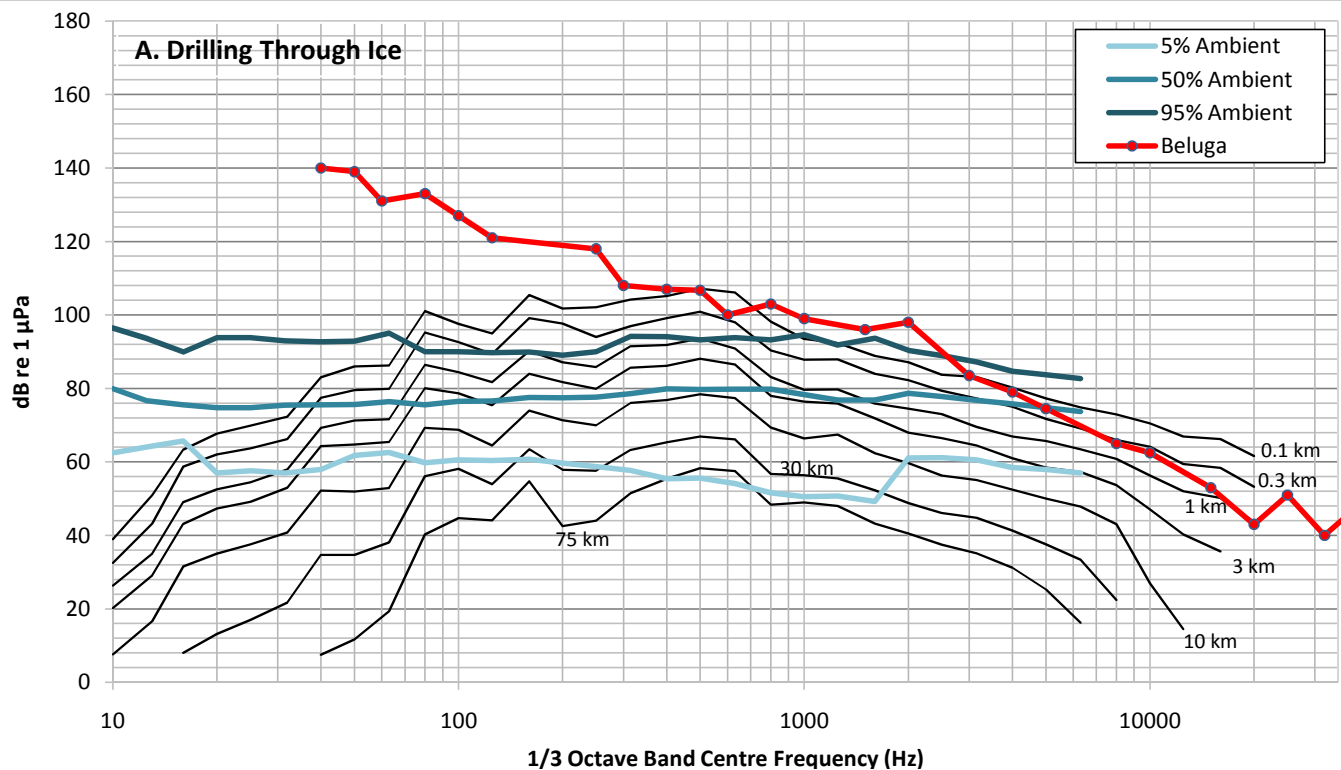
BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

BELUGA AUDIOGRAM AND 1/3 OCTAVE BAND NOISE LEVELS DURING THE THICK-ICE PERIOD (MAY) AT STEENSBY PORT FOR A. BLASTING WITH NO BUBBLE CURTAIN, AND B. BLASTING WITH BUBBLE CURTAIN

P/A NO.
NB102-181/25REF. NO.
13**FIGURE 8C-3.19**REV
A

A	23NOV10	ISSUED WITH REPORT	REE	VDM	REE
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

**NOTES:**

1. AMBIENT NOISE DATA FROM GREENE AND HANNA (1997).
2. PREDICTED 1/3 OCTAVE NOISE LEVELS FROM MATTHEWS ET AL. (2010).
3. ANALYSIS APPROACH BASED ON RICHARDSON ET AL. (1995).
4. AUDIOGRAM DATA FROM WHITE ET AL. (1978), AWBREY ET AL. (1988), JOHNSON ET AL. (1989), AND ERBE AND FARMER (1998).

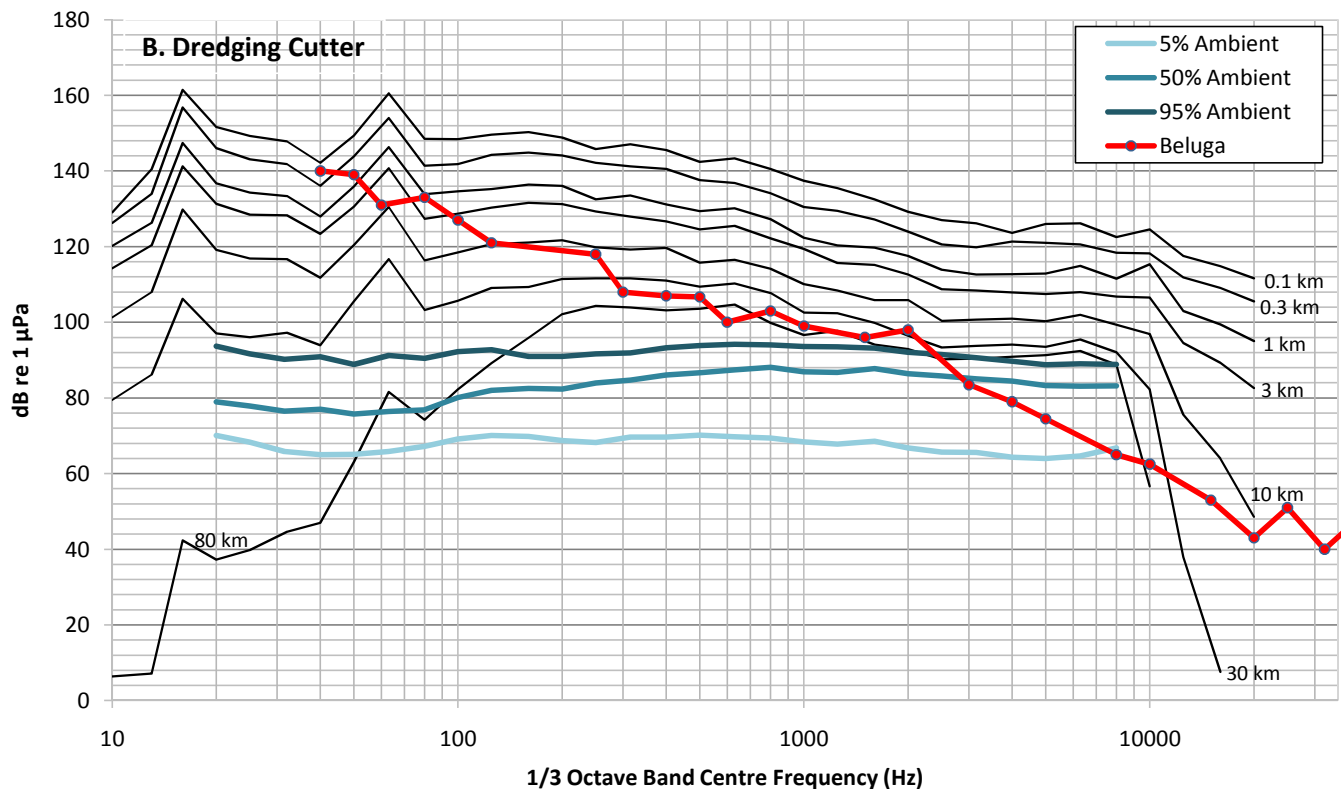
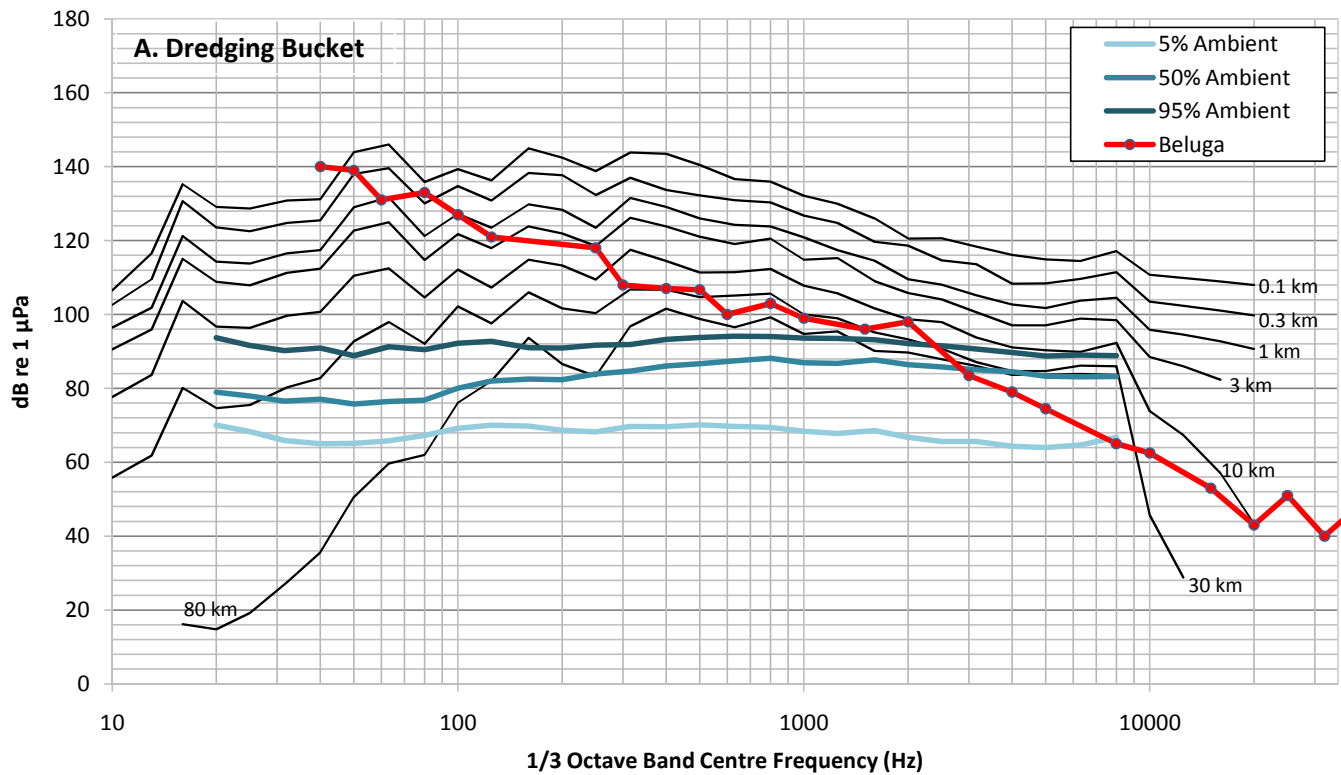
BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

BELUGA AUDIOGRAM AND 1/3 OCTAVE BAND NOISE LEVELS DURING THE THICK-ICE PERIOD (MAY) AT STEENSBY PORT FOR A. DRILLING THROUGH ICE, AND B. DRILLING THROUGH SEABED

P/A NO.
NB102-181/25REF. NO.
13**FIGURE 8C-3.20**REV
A

A	23NOV10	ISSUED WITH REPORT	REE	VDM	REE
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

**NOTES:**

1. AMBIENT NOISE DATA FROM BURGESS AND GREENE (1998).
2. PREDICTED 1/3 OCTAVE NOISE LEVELS FROM MATTHEWS ET AL. (2010).
3. ANALYSIS APPROACH BASED ON RICHARDSON ET AL. (1995).
4. AUDIOGRAM DATA FROM WHITE ET AL. (1978), AWBREY ET AL. (1988), JOHNSON ET AL. (1989), AND ERBE AND FARMER (1998).

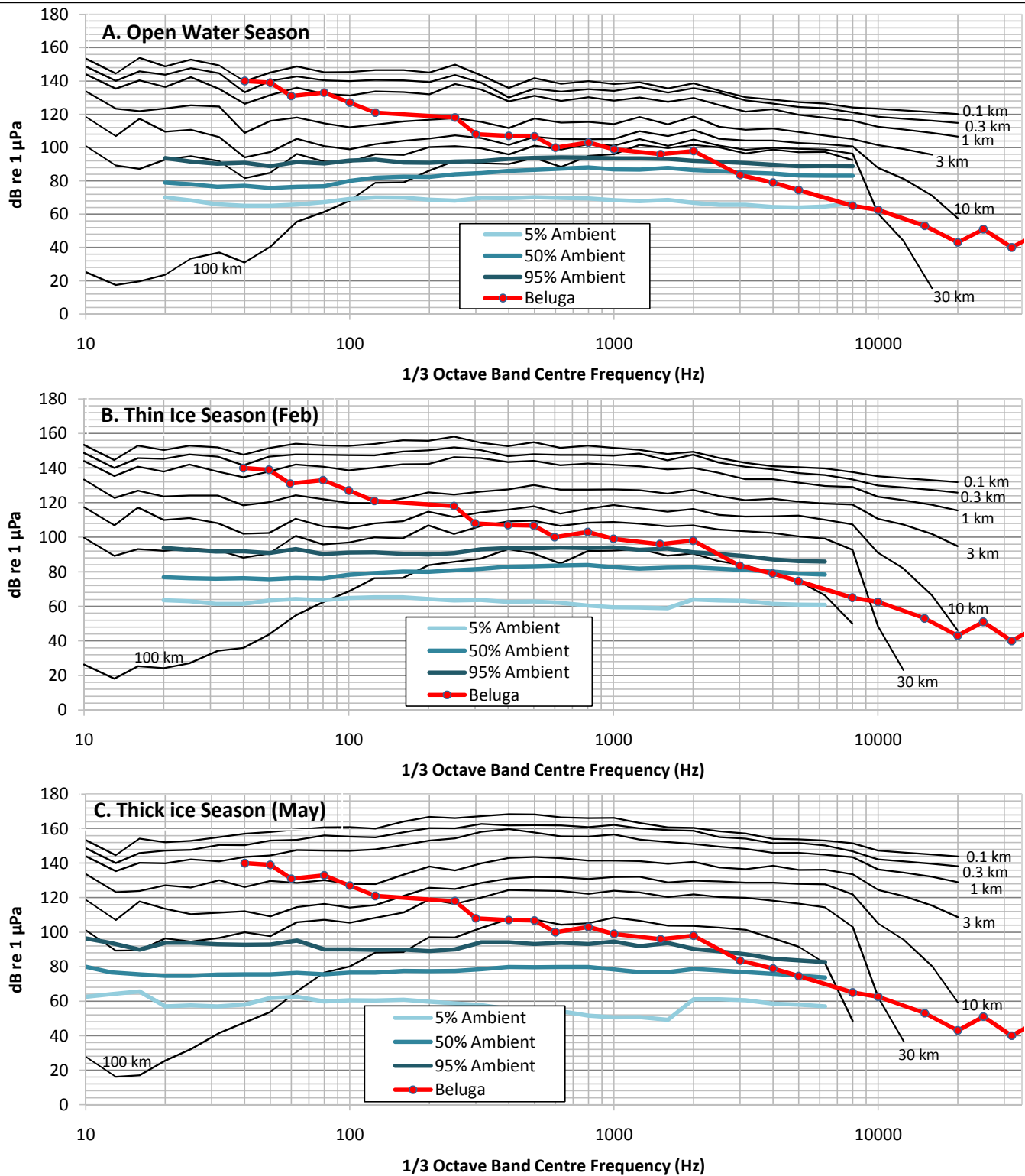
BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

BELUGA AUDIOGRAM AND 1/3 OCTAVE BAND NOISE LEVELS DURING THE OPEN-WATER PERIOD (AUG) AT STEENSBY PORT FOR A. DREDGING BUCKET, AND B. DREDGING CUTTER

P/A NO.
NB102-181/25REF. NO.
13**FIGURE 8C-3.21**REV
A

A	23NOV10	ISSUED WITH REPORT	REE	VDM	REE
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

**NOTES:**

1. AMBIENT NOISE DATA FROM GREENE AND HANNA (1997), AND BURGESS AND GREENE (1998).
2. PREDICTED 1/3 OCTAVE NOISE LEVELS FROM MATTHEWS ET AL. (2010).
3. ANALYSIS APPROACH BASED ON RICHARDSON ET AL. (1995).
4. AUDIOGRAM DATA FROM WHITE ET AL. (1978), AWBREY ET AL. (1988), JOHNSON ET AL. (1989), AND ERBE AND FARMER (1998).

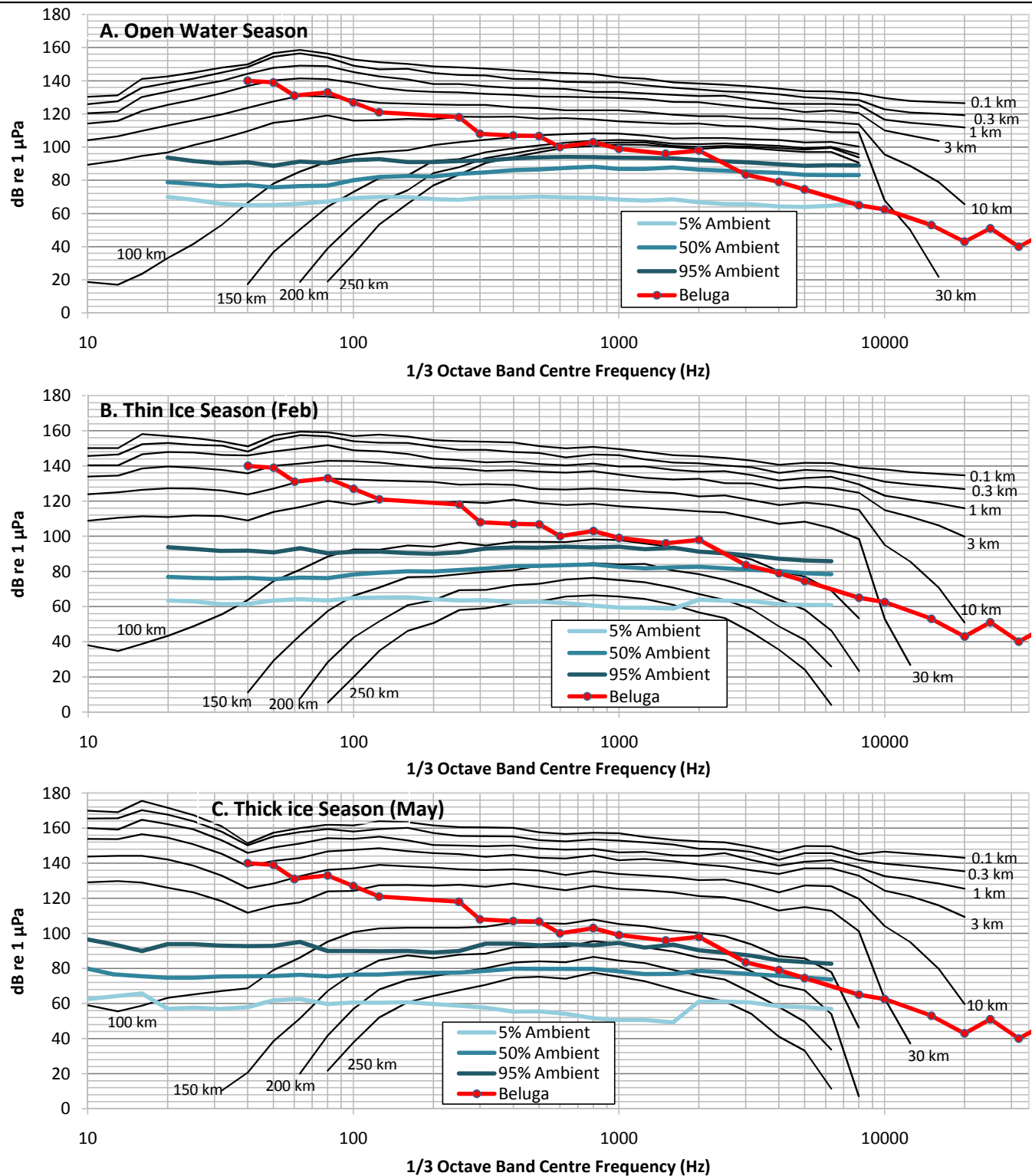
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MARY RIVER PROJECT

BELUGA AUDIOGRAM AND 1/3 OCTAVE BAND NOISE LEVELS FOR TUGS AT STEENSBY PORT DURING A. OPEN-WATER (AUG), B. THIN-ICE (FEB), AND C. THICK-ICE (MAY) PERIODS

P/A NO.
NB102-181/25REF. NO.
13**FIGURE 8C-3.22**REV
A

A	23NOV10	ISSUED WITH REPORT	REE	VDM	REE
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

**NOTES:**

1. AMBIENT NOISE DATA FROM GREENE AND HANNA (1997), AND BURGESS AND GREENE (1998).
2. PREDICTED 1/3 OCTAVE NOISE LEVELS FROM MATTHEWS ET AL. (2010).
3. ANALYSIS APPROACH BASED ON RICHARDSON ET AL. (1995).
4. AUDIOGRAM DATA FROM WHITE ET AL. (1978), AWBREY ET AL. (1988), JOHNSON ET AL. (1989), AND ERBE AND FARMER (1998).

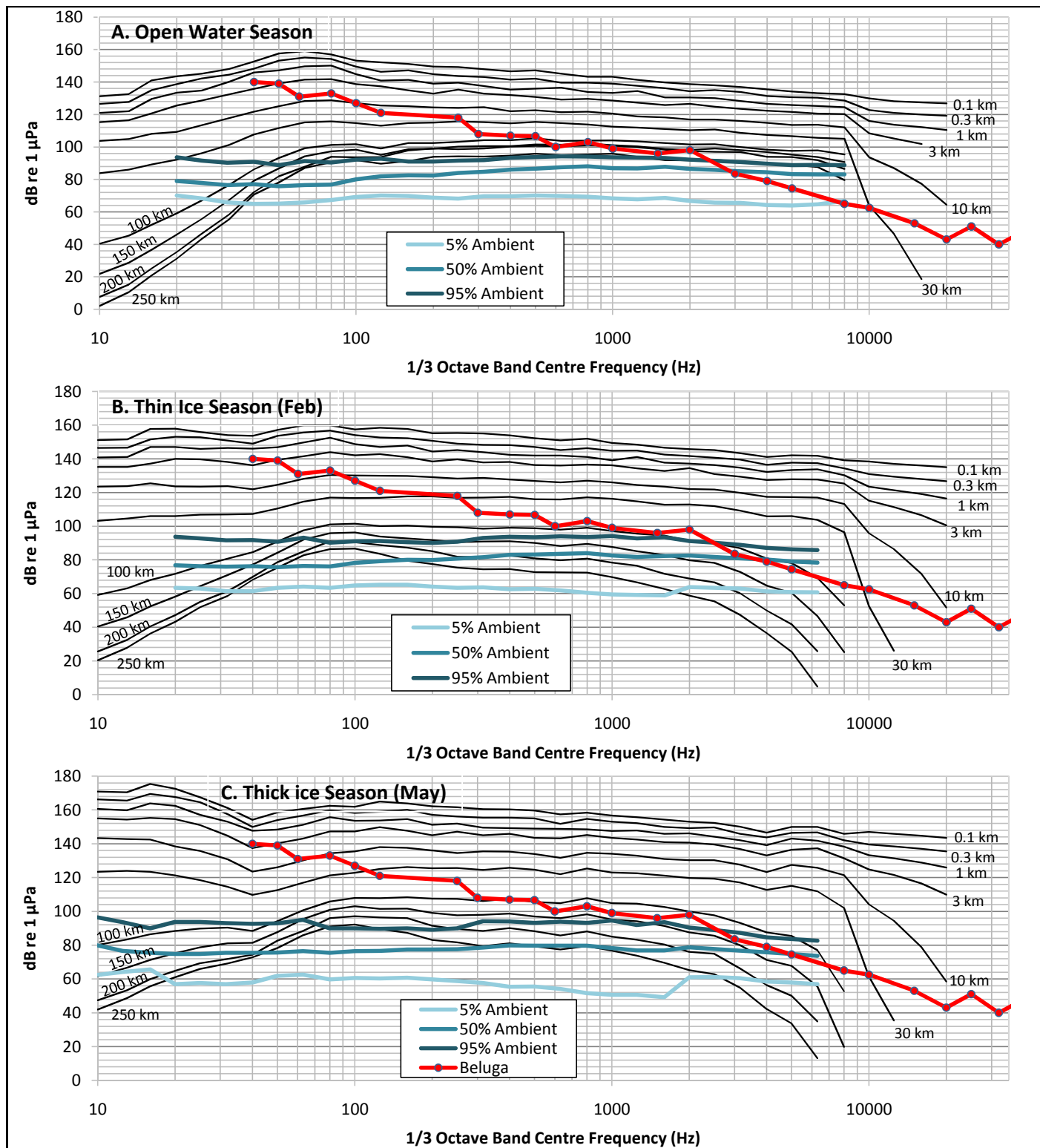
BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

BELUGA AUDIOGRAM AND 1/3 OCTAVE BAND NOISE LEVELS FOR CAPE-SIZE ORE CARRIER AT STEENSBY INLET DURING A. OPEN-WATER (AUG), B. THIN-ICE (FEB), AND C. THICK-ICE (MAY) PERIODS

P/A NO.
NB102-181/25REF. NO.
13**FIGURE 8C-3.23**REV
A

A	23NOV10	ISSUED WITH REPORT	REE	VDM	REE
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

**NOTES:**

1. AMBIENT NOISE DATA FROM GREENE AND HANNA (1997), AND BURGESS AND GREENE (1998).
2. PREDICTED 1/3 OCTAVE NOISE LEVELS FROM MATTHEWS ET AL. (2010).
3. ANALYSIS APPROACH BASED ON RICHARDSON ET AL. (1995).
4. AUDIOGRAM DATA FROM WHITE ET AL. (1978), AWBREY ET AL. (1988), JOHNSON ET AL. (1989), AND ERBE AND FARMER (1998).

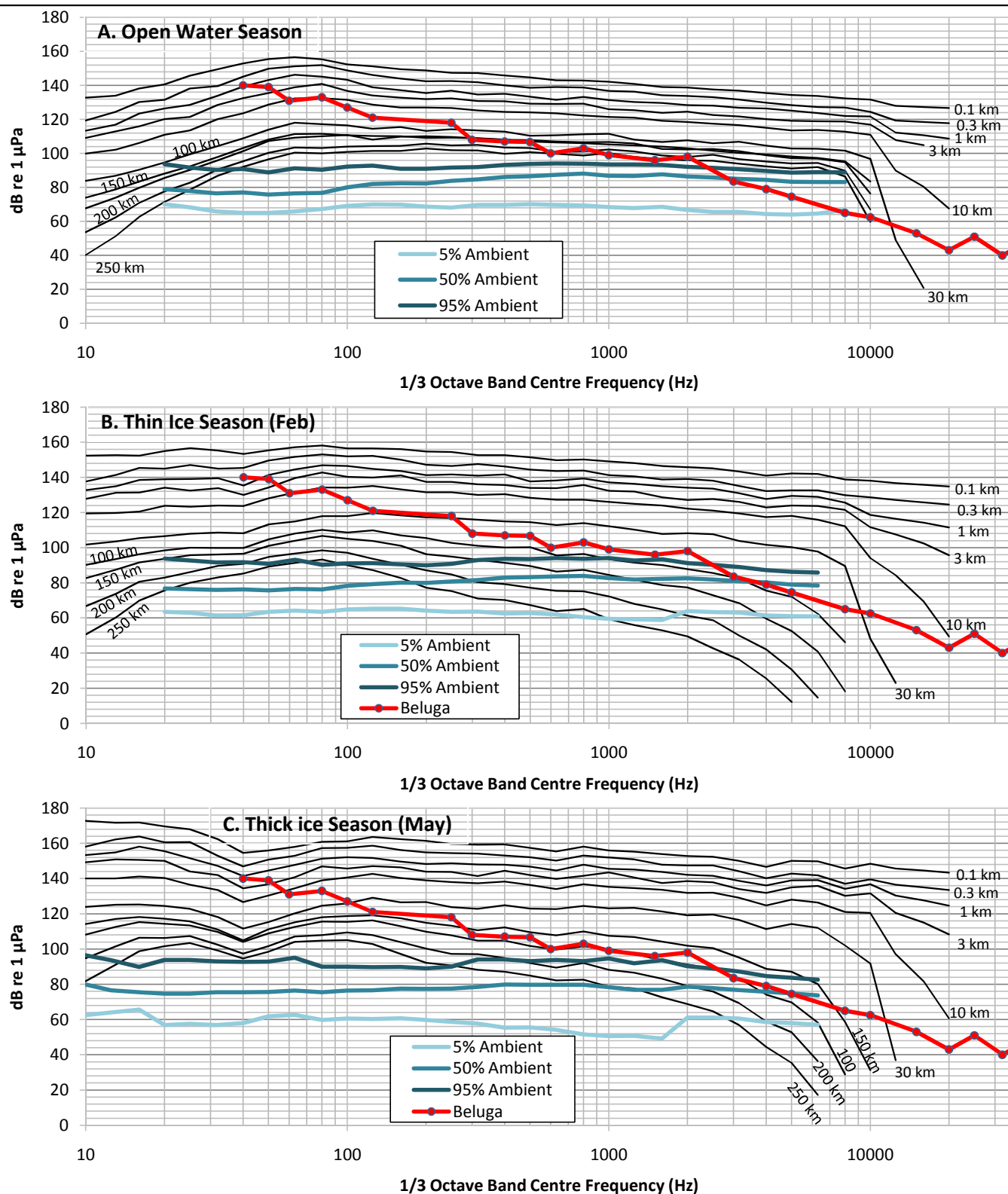
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MARY RIVER PROJECT

BELUGA AUDIOGRAM AND 1/3 OCTAVE BAND NOISE LEVELS FOR CAPE-SIZE ORE CARRIER AT FOXE BASIN DURING A. OPEN-WATER (AUG), B. THIN-ICE (FEB), AND C. THICK-ICE (MAY) PERIODS

P/A NO.
NB102-181/25REF. NO.
13**FIGURE 8C-3.24**REV
A

A	23NOV10	ISSUED WITH REPORT	REE	VDM	REE
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

**NOTES:**

1. AMBIENT NOISE DATA FROM GREENE AND HANNA (1997), AND BURGESS AND GREENE (1998).
2. PREDICTED 1/3 OCTAVE NOISE LEVELS FROM MATTHEWS ET AL. (2010).
3. ANALYSIS APPROACH BASED ON RICHARDSON ET AL. (1995).
4. AUDIOGRAM DATA FROM WHITE ET AL. (1978), AWBREY ET AL. (1988), JOHNSON ET AL. (1989), AND ERBE AND FARMER (1998).

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

BELUGA AUDIOGRAM AND 1/3 OCTAVE BAND NOISE LEVELS FOR CAPE-SIZE ORE CARRIER AT HUDSON STRAIT DURING A. OPEN-WATER (AUG), B. THIN-ICE (FEB), AND C. THICK-ICE (MAY) PERIODS



P/A NO.

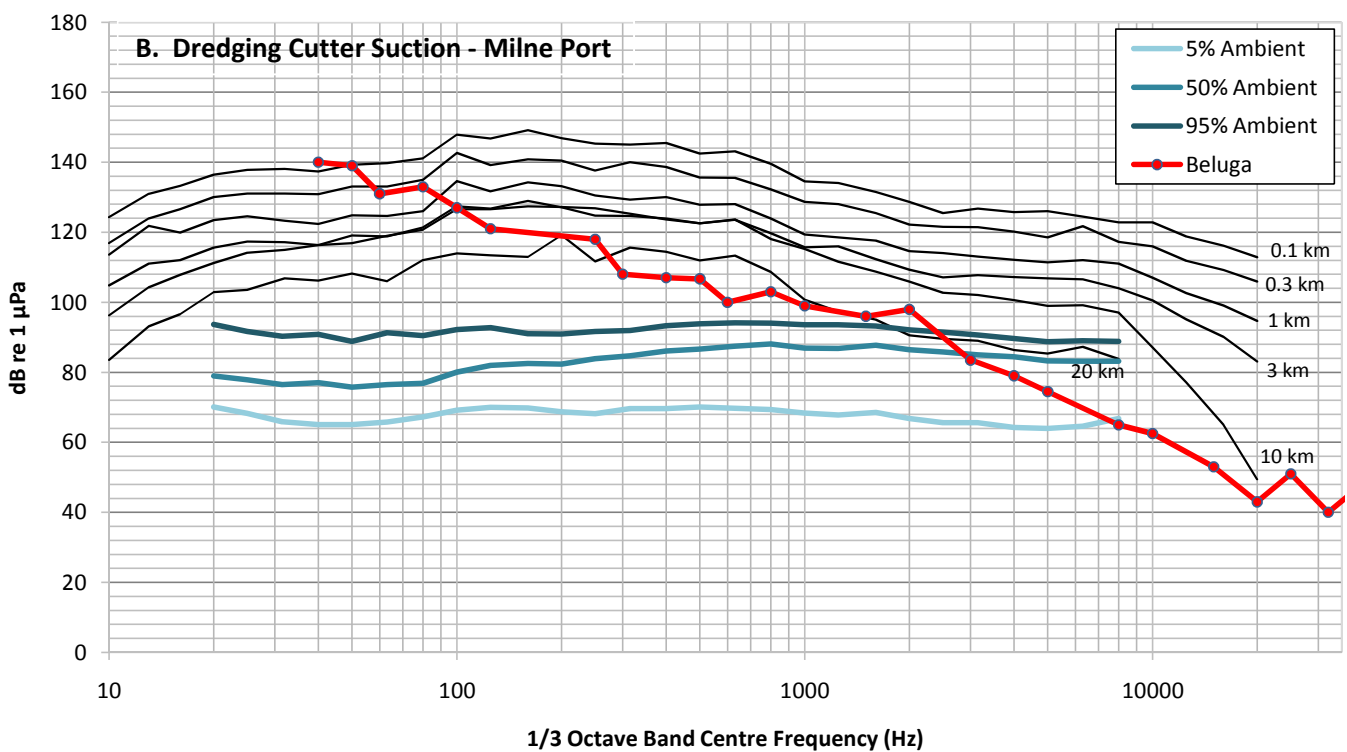
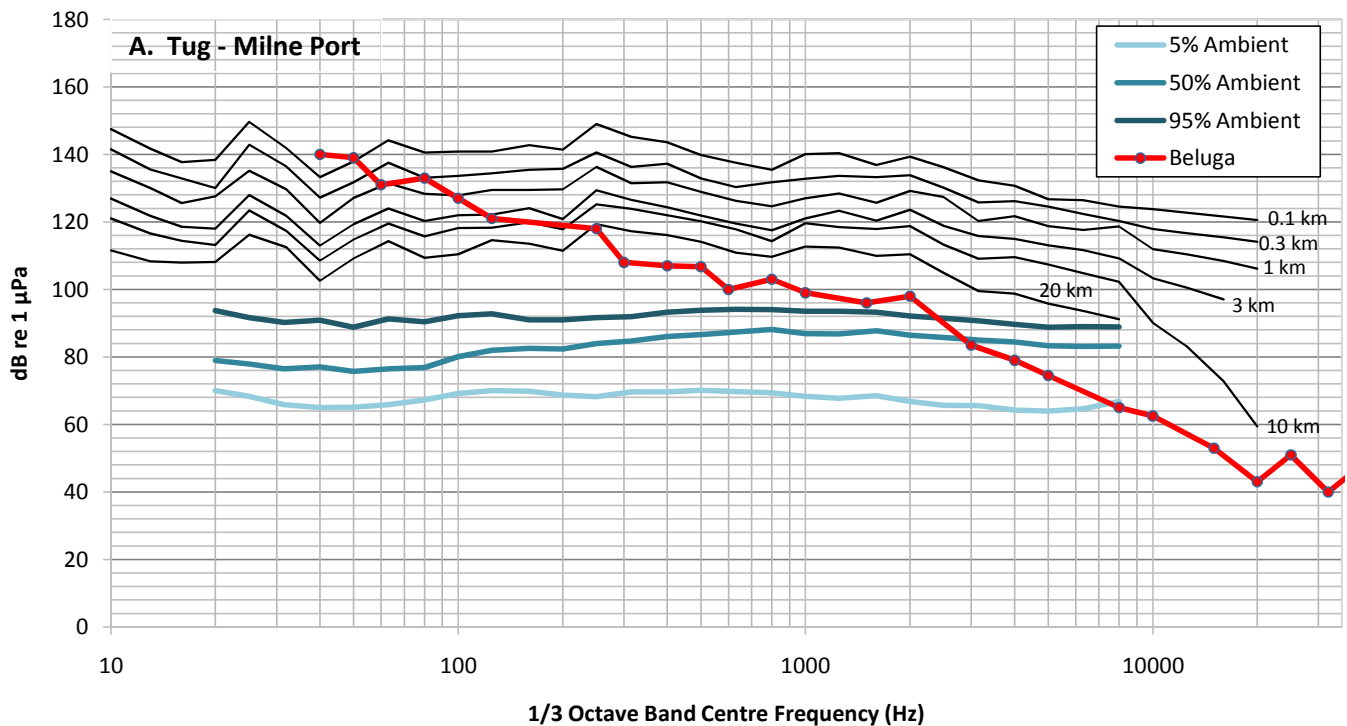
NB102-181/25

REF. NO.

13

FIGURE 8C-3.25REV
A

A	23NOV10	ISSUED WITH REPORT	REE	VDM	REE
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

**NOTES:**

1. AMBIENT NOISE DATA FROM BURGESS AND GREENE (1998).
2. PREDICTED 1/3 OCTAVE NOISE LEVELS FROM ZYKOV AND MATTHEWS (2010).
3. ANALYSIS APPROACH BASED ON RICHARDSON ET AL. (1995).
4. AUDIOGRAM DATA FROM WHITE ET AL. (1978), AWBREY ET AL. (1988), JOHNSON ET AL. (1989), AND ERBE AND FARMER (1998)

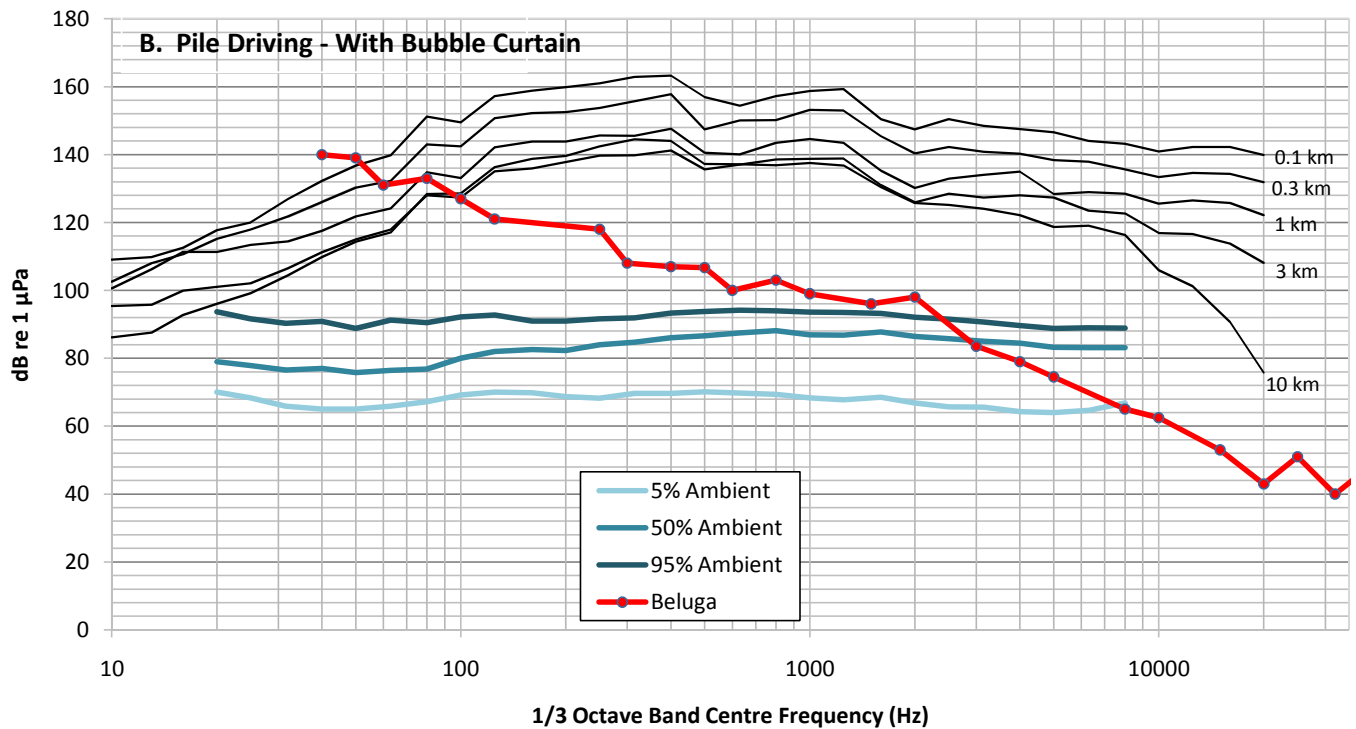
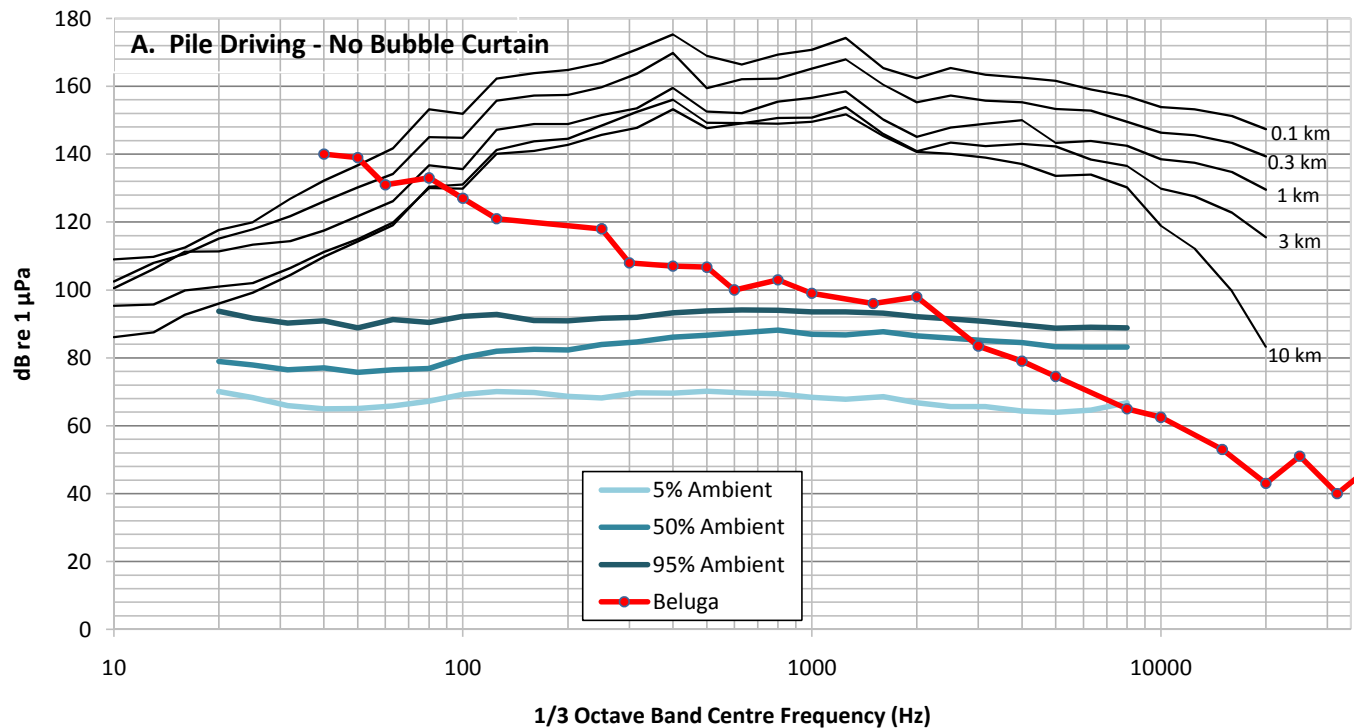
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MARY RIVER PROJECT

BELUGA AUDIOGRAM AND 1/3 OCTAVE BAND NOISE LEVELS DURING THE OPEN-WATER PERIOD (AUG) AT MILNE PORT FOR A. TUG, AND B. DREDGING CUTTER SUCTION

P/A NO.
NB102-181/25REF. NO.
13**FIGURE 8C-3.26**REV
A

A	23NOV10	ISSUED WITH REPORT	REE	VDM	REE
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

**NOTES:**

1. AMBIENT NOISE DATA FROM BURGESS AND GREENE (1998).
2. PREDICTED 1/3 OCTAVE NOISE LEVELS FROM ZYKOV AND MATTHEWS (2010).
3. ANALYSIS APPROACH BASED ON RICHARDSON ET AL. (1995).
4. AUDIOGRAM DATA FROM WHITE ET AL. (1978), AWBREY ET AL. (1988), JOHNSON ET AL. (1989), AND ERBE AND FARMER (1998)

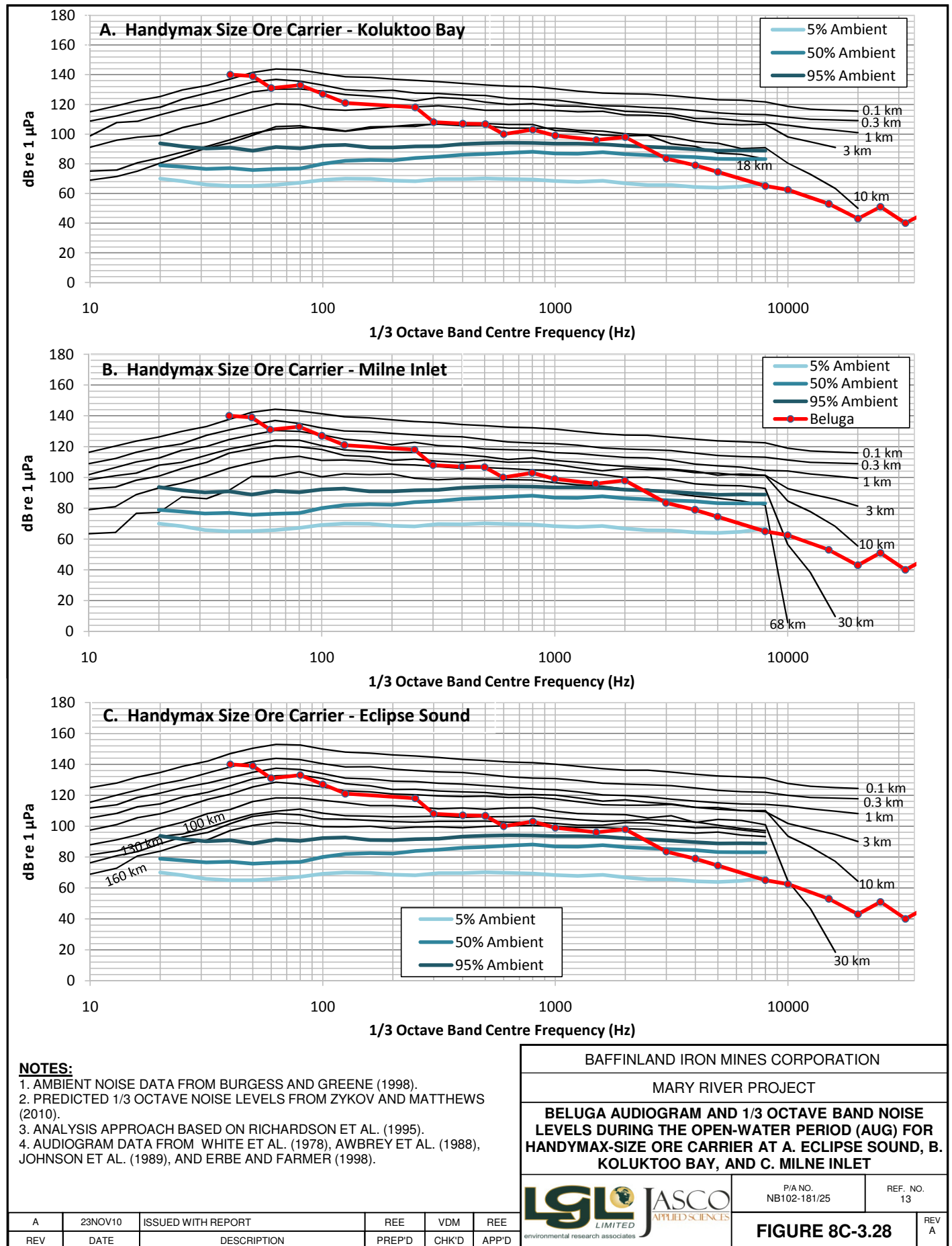
BAFFINLAND IRON MINES CORPORATION

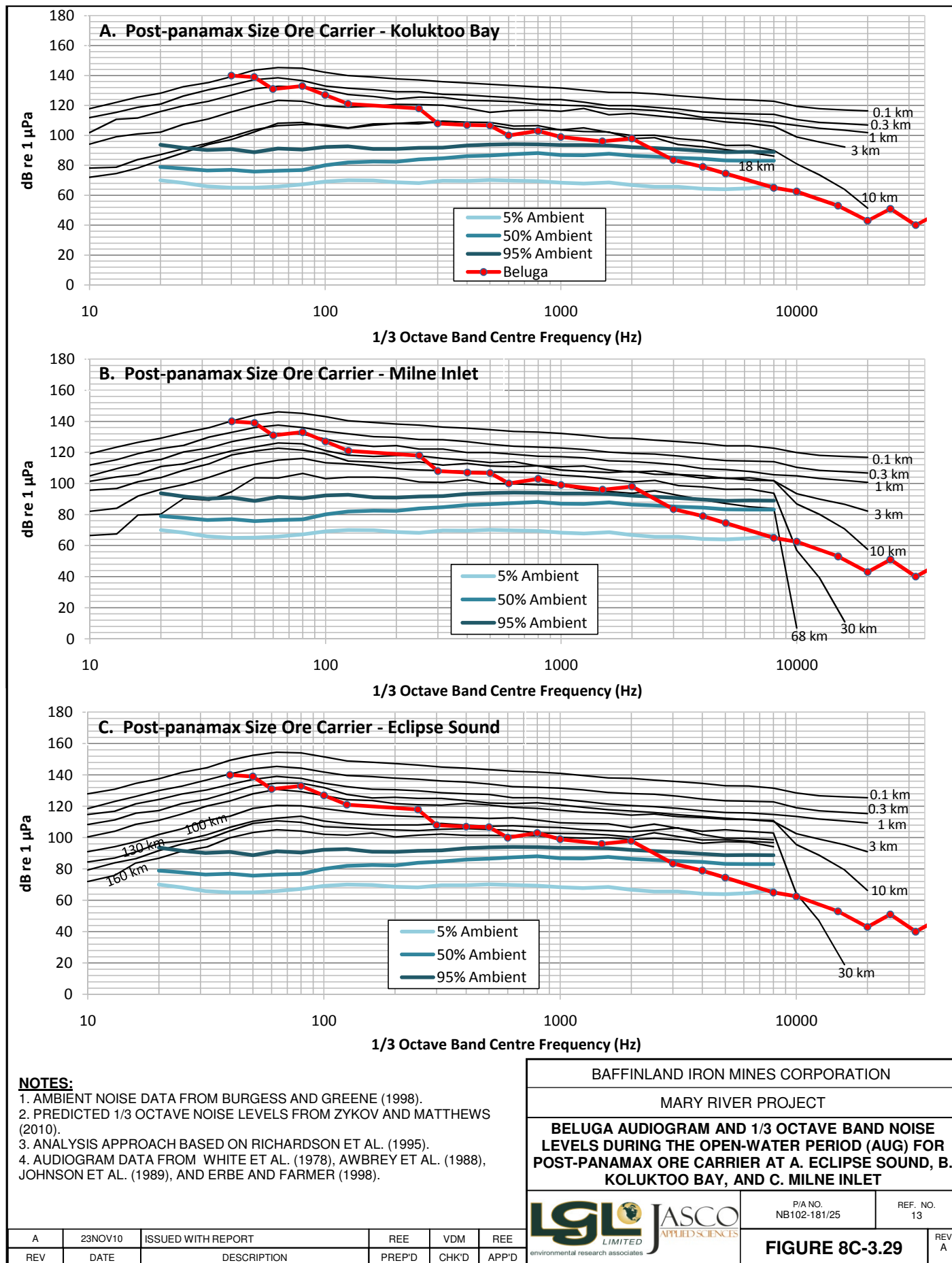
MARY RIVER PROJECT

BELUGA AUDIOGRAM AND 1/3 OCTAVE BAND NOISE LEVELS DURING PILE DRIVING IN THE OPEN-WATER PERIOD (AUG) AT MILNE PORT A. WITHOUT BUBBLE CURTAIN, AND B. WITH BUBBLE CURTAIN

P/A NO.
NB102-181/25REF. NO.
13**FIGURE 8C-3.27**REV
A

A	23NOV10	ISSUED WITH REPORT	REE	VDM	REE
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D





BAFFINLAND IRON MINES CORPORATION
MARY RIVER PROJECT

Estimated distances ringed seals would be exposed to sensation levels that may cause disturbance 'on-set', avoidance, and hearing impairment (TTS).

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Project Activity	Area	Time Period	Estimated Distance (km)		
			Disturbance 'On-set'	Avoidance	TTS
Blasting; no bubble curtain	Steensby Port	Thick Ice	50	20	1.75
Blasting; with bubble curtain	Steensby Port	Thick Ice	10	3	0.1
Drilling through ice	Steensby Port	Thick Ice	-	-	-
Drilling through seabed	Steensby Port	Thick Ice	-	-	-
Dredging basket	Steensby Port	Open-water	-	-	-
Dredging cutter	Steensby Port	Open-water	-	-	-
Tug	Steensby Port	Open-water	-	-	-
Tug	Steensby Port	Thin Ice	1.25	0.1	-
Tug	Steensby Port	Thick Ice	5	1.75	-
Ore Carrier (Cape-size)	Steensby Inlet	Open-water	0.2	-	-
Ore Carrier (Cape-size)	Steensby Inlet	Thin Ice	1	0.1	-
Ore Carrier (Cape-size)	Steensby Inlet	Thick Ice	6	0.7	-
Ore Carrier (Cape-size)	Foxe Basin	Open-water	0.2	-	-
Ore Carrier (Cape-size)	Foxe Basin	Thin Ice	1	0.1	-
Ore Carrier (Cape-size)	Foxe Basin	Thick Ice	6	0.7	-
Ore Carrier (Cape-size)	Hudson Strait	Open-water	0.2	-	-
Ore Carrier (Cape-size)	Hudson Strait	Thin Ice	0.6	0.1	-
Ore Carrier (Cape-size)	Hudson Strait	Thick Ice	5	0.3	-
Tug	Milne Port	Open-water	0.1	-	-
Dredging	Milne Port	Open-water	-	-	-
Pile driving; no bubble curtain	Milne Port	Open-water	>10	7	0.15
Pile driving; with bubble curtain	Milne Port	Open-water	2	0.3	
Ore Carrier (Handymax-size)	Eclipse Sound	Open-water	0.1	-	-
Ore Carrier (Handymax-size)	Koluktoo Bay	Open-water	-	-	-
Ore Carrier (Handymax-size)	Milne Inlet	Open-water	-	-	-
Ore Carrier (Post-Panamax-size)	Eclipse Sound	Open-water	0.1	-	-
Ore Carrier (Post-Panamax-size)	Koluktoo Bay	Open-water	-	-	-
Ore Carrier (Post-Panamax-size)	Milne Inlet	Open-water	-	-	-

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NOTES:

1. BASED ON METHODS OUTLINED IN DAVIS AND MALME (1997).
2. DISTURBANCE "ON-SET" ASSUMED AT A 70 dB SENSATION LEVEL.
3. AVOIDANCE ASSUMED AT A 80 dB SENSATION LEVEL.
4. HEARING IMPAIRMENT (TTS) ASSUMED AT A 100 dB SENSATION LEVEL FOR CONTINUOUS SOUND AND 190 dB (rms) FOR PULSED SOUND.

A	23NOV'10	ISSUED WITH REPORT	REE	VDM	VDM
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

TABLE 8C-3.2

**BAFFINLAND IRON MINES CORPORATION
MARY RIVER PROJECT**

Estimated numbers of ringed seals potentially affected by Project activities during the ice-covered period (June).

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		Estimated No. of Ringed Seal during Ice-covered Season (June)			
		Ringed Seal Avg. Density (individuals/100 km ²)	Disturbance "On-set"	Avoidance	TTS
Project Activity	Area				
A. Steensby Port and Shipping Route (JUNE)					
Blasting; no bubble curtain	Steensby Port	70.60	3017	1067	17
Blasting; with bubble curtain	Steensby Port	70.60	396	52	0
Drilling through ice	Steensby Port	70.60	0	0	0
Drilling through seabed	Steensby Port	70.60	0	0	0
Dredging basket	Steensby Port	70.60	0	0	0
Dredging cutter	Steensby Port	70.60	0	0	0
Tug	Steensby Port	70.60	126	17	0
Ore Carrier (Cape-size)	Steensby Inlet	70.60	1521	179	0
Ore Carrier (Cape-size)	Foxe Basin	3.10	372	43	0
Ore Carrier (Cape-size)	Hudson Strait	0.20	6	1	0
B. Milne Port and Shipping Route (AUG-OCT)					
Tug	Milne Port				
Dredging	Milne Port				
Pile driving; no bubble curtain	Milne Port				
Pile driving; with bubble curtain	Milne Port				
Ore Carrier (Handymax-size)	Eclipse Sound				
Ore Carrier (Handymax-size)	Koluktoo Bay				
Ore Carrier (Handymax-size)	Milne Inlet				
Ore Carrier (Handymax-size)	Other bays/inlets				
Ore Carrier (Post-Panamax-size)	Eclipse Sound				
Ore Carrier (Post-Panamax-size)	Koluktoo Bay				
Ore Carrier (Post-Panamax-size)	Milne Inlet				
Ore Carrier (Post-Panamax-size)	Other bays/inlets				

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NOTES:

1. CORRECTION FACTORS OF 2.33 FOR AVAILABILITY BIAS AND 1.22 FOR DETECTION BIAS IN JUNE WERE APPLIED TO DENSITY ESTIMATES.
2. BASED ON METHODS OUTLINED IN DAVIS AND MALME (1997).
3. DISTURBANCE "ON-SET" ASSUMED AT A 70 dB SENSATION LEVEL.
4. AVOIDANCE ASSUMED AT A 80 dB SENSATION LEVEL.
5. HEARING IMPAIRMENT (TTS) ASSUMED AT A 100 dB SENSATION LEVEL FOR CONTINUOUS SOUND AND 190 dB (rms) FOR PULSED SOUND.
6. 17 RINGED SEALS ARE PREDICTED TO BE EXPOSED TO SOUND LEVELS WHICH MAY CAUSE TTS DURING BLASTING IF NO BUBBLE CURTAIN IS USED. NO RINGED SEALS ARE PREDICTED TO BE EXPOSED TO 190 DB (RMS) IF A BUBBLE CURTAIN IS USED.
7. NO RINGED SEAL DENSITY DATA SPECIFIC TO THE RSA FOR THE OPEN-WATER PERIOD ARE AVAILABLE. HOWEVER, DENSITIES ARE EXPECTED TO BE MUCH REDUCED RELATIVE TO DENSITIES DURING JUNE.

A	23NOV'10	ISSUED WITH REPORT	REE	VDM	VDM
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

TABLE 8C-3.3

**BAFFINLAND IRON MINES CORPORATION
MARY RIVER PROJECT**

Estimated distances walrus would be exposed to sensation levels that may cause disturbance 'on-set', avoidance, and hearing impairment (TTS).

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Project Activity	Area	Time Period	Estimated Distance (km)		
			Disturbance 'On-set'	Avoidance	TTS
Blasting; no bubble curtain	Steensby Port	Thick Ice	20	8	0.5
Blasting; with bubble curtain	Steensby Port	Thick Ice	5	1	-
Drilling through ice	Steensby Port	Thick Ice	-	-	-
Drilling through seabed	Steensby Port	Thick Ice	-	-	-
Dredging basket	Steensby Port	Open-water	-	-	-
Dredging cutter	Steensby Port	Open-water	-	-	-
Tug	Steensby Port	Open-water	-	-	-
Tug	Steensby Port	Thin Ice	0.5	-	-
Tug	Steensby Port	Thick Ice	2.25	0.8	-
Ore Carrier (Cape-size)	Steensby Inlet	Open-water	-	-	-
Ore Carrier (Cape-size)	Steensby Inlet	Thin Ice	0.2	-	-
Ore Carrier (Cape-size)	Steensby Inlet	Thick Ice	1	-	-
Ore Carrier (Cape-size)	Foxe Basin	Open-water	-	-	-
Ore Carrier (Cape-size)	Foxe Basin	Thin Ice	0.2	-	-
Ore Carrier (Cape-size)	Foxe Basin	Thick Ice	1.5	0.1	-
Ore Carrier (Cape-size)	Hudson Strait	Open-water	-	-	-
Ore Carrier (Cape-size)	Hudson Strait	Thin Ice	0.15	-	-
Ore Carrier (Cape-size)	Hudson Strait	Thick Ice	0.9	-	-

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NOTES:

1. BASED ON METHODS OUTLINED IN DAVIS AND MALME (1997).
2. DISTURBANCE "ON-SET" ASSUMED AT A 70 dB SENSATION LEVEL.
3. AVOIDANCE ASSUMED AT A 80 dB SENSATION LEVEL.
4. HEARING IMPAIRMENT (TTS) ASSUMED AT A 100 dB SENSATION LEVEL FOR CONTINUOUS SOUND AND 190 dB (rms) FOR PULSED SOUND.

A	23NOV'10	ISSUED WITH REPORT	REE	VDM	VDM
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

TABLE 8C-3.4

**BAFFINLAND IRON MINES CORPORATION
MARY RIVER PROJECT**

Estimated numbers of walrus potentially affected by Project activities during the ice-covered (Apr, Jun) and open-water periods (Aug, Sep, Oct).

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Project Activity	Area	Walrus Avg. Density (individuals/100 km ²)					Estimated No. of Walrus (Disturbance "On-set")					Estimated No. of Walrus (Avoidance)				
		Apr	Jun	Aug	Sep	Oct	Apr	Jun	Aug	Sep	Oct	Apr	Jun	Aug	Sep	Oct
Steensby Port and Shipping Route																
Blasting; no bubble curtain	Steensby Port	0.00	0.00	0.12	2.49	0.70	0	0	0	0	0	0	0	0	0	0
Blasting; with bubble curtain	Steensby Port	0.00	0.00	0.12	2.49	0.70	0	0	0	0	0	0	0	0	0	0
Drilling through ice	Steensby Port	0.00	0.00	0.12	2.49	0.70	0	0	0	0	0	0	0	0	0	0
Drilling through seabed	Steensby Port	0.00	0.00	0.12	2.49	0.70	0	0	0	0	0	0	0	0	0	0
Dredging basket	Steensby Port	0.00	0.00	0.12	2.49	0.70	0	0	0	0	0	0	0	0	0	0
Dredging cutter	Steensby Port	0.00	0.00	0.12	2.49	0.70	0	0	0	0	0	0	0	0	0	0
Tug	Steensby Port	0.00	0.00	0.12	2.49	0.70	0	0	0	0	0	0	0	0	0	0
Ore Carrier (Cape-size)	Steensby Inlet	0.00	0.00	0.12	2.49	0.70	0	0	0	1	0	0	0	0	0	0
Ore Carrier (Cape-size)	Foxe Basin	0.65	0.90	3.45	2.46	0.10	32	34	86	6	0	2	2	0	0	0
Ore Carrier (Cape-size)	Hudson Strait	0.20	0.10	0.20	0.00	0.00	4	1	1	0	0	0	0	0	0	0

#REF!

NOTES:

1. CORRECTION FACTORS OF 2.281, 1.22, AND 4.7 WERE APPLIED FOR AVAILABILITY BIAS, DETECTION BIAS IN WINTER, AND DETECTION BIAS IN SUMMER, RESPECTIVELY.
2. TOO FEW WALRUS OBSERVED ALONG MILNE INLET SHIPPING ROUTE DURING AERIAL SURVEYS TO CALCULATE NUMBERS AFFECTED.
3. BASED ON METHODS OUTLINED IN DAVIS AND MALME (1997).
4. DISTURBANCE "ON-SET" ASSUMED AT A 70 dB SENSATION LEVEL.
5. AVOIDANCE ASSUMED AT A 80 dB SENSATION LEVEL.
6. HEARING IMPAIRMENT (TTS) ASSUMED AT A 100 dB SENSATION LEVEL FOR CONTINUOUS SOUND AND 190 dB (rms) FOR PULSED SOUND.
7. NO WALRUS ARE PREDICTED TO BE EXPOSED TO SOUND LEVELS HIGH ENOUGH TO CAUSE TTS.

A	23NOV'10	ISSUED WITH REPORT	REE	VDM	VDM
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

TABLE 8C-3.5

**BAFFINLAND IRON MINES CORPORATION
MARY RIVER PROJECT**

Estimated distances beluga and narwhal would be exposed to sound levels that may cause disturbance 'on-set', avoidance, and hearing impairment (TTS).

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Project Activity	Area	Time Period	Estimated Distance (km)		
			Disturbance 'Onset'	Avoidance	TTS
Blasting no bubble curtain	Steensby Port	Thick Ice	25	8	0.1
Blasting with bubble curtain	Steensby Port	Thick Ice	6	0.7	-
Drilling Through Ice	Steensby Port	Thick Ice	-	-	-
Drilling Through Seabed	Steensby Port	Thick Ice	8	0.8	-
Dredging basket	Steensby Port	Open-water	0.1	-	-
Dredging cutter	Steensby Port	Open-water	10	2	-
Tug	Steensby Port	Open-water	2.75	0.7	-
Tug	Steensby Port	Thin Ice	8	2	-
Tug	Steensby Port	Thick Ice	50	8	-
Ore Carrier (Cape-size)	Steensby Inlet	Open-water	25	6	-
Ore Carrier (Cape-size)	Steensby Inlet	Thin Ice	30	7	-
Ore Carrier (Cape-size)	Steensby Inlet	Thick Ice	50	15	0.1
Ore Carrier (Cape-size)	Foxe Basin	Open-water	20	6	-
Ore Carrier (Cape-size)	Foxe Basin	Thin Ice	25	7	-
Ore Carrier (Cape-size)	Foxe Basin	Thick Ice	60	15	0.1
Ore Carrier (Cape-size)	Hudson Strait	Open-water	20	7	-
Ore Carrier (Cape-size)	Hudson Strait	Thin Ice	25	10	-
Ore Carrier (Cape-size)	Hudson Strait	Thick Ice	60	20	-
Tug	Milne Port	Open-water	20	1	-
Dredging	Milne Port	Open-water	15	0.8	-
Pile driving; no bubble curtain	Milne Port	Open-water	>10	5	
Pile driving; with bubble curtain	Milne Port	Open-water	2	0.5	
Ore Carrier (Handymax-size)	Eclipse Sound	Open-water	15	2	-
Ore Carrier (Handymax-size)	Koluktoo Bay	Open-water	3	0.5	-
Ore Carrier (Handymax-size)	Milne Inlet	Open-water	2	0.5	-
Ore Carrier (Post-Panamax-size)	Eclipse Sound	Open-water	20	3	-
Ore Carrier (Post-Panamax-size)	Koluktoo Bay	Open-water	3	0.7	-
Ore Carrier (Post-Panamax-size)	Milne Inlet	Open-water	2	0.6	-

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NOTES:

1. DISTURBANCE "ON-SET" SOUND LEVEL OF 120 dB (rms) AND 145 dB (rms) WERE ASSUMED FOR CONTINUOUS AND PULSED SOUNDS, RESPECTIVELY.
2. AVOIDANCE SOUND LEVEL OF 135 dB (rms) AND 155 dB (rms) WERE ASSUMED FOR CONTINUOUS AND PULSED SOUNDS, RESPECTIVELY.
3. HEARING IMPAIRMENT (TTS) SOUND LEVELS OF 175 dB (rms), 100 sec EXPOSURE FOR CONTINUOUS SOUND AND 180 dB (rms) FOR PULSED SOUND WERE ASSUMED.

A	23NOV'10	ISSUED WITH REPORT	REF	VDM	VDM
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

TABLE 8C-3.6

**BAFFINLAND IRON MINES CORPORATION
MARY RIVER PROJECT**

Estimated numbers of beluga whales potentially affected by Project activities during the ice-covered (Apr, Jun) and open-water periods (Aug, Sep, Oct).

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Project ActivityArea		Beluga Avg. Density (individuals/100 km ²)					Estimated No. of Beluga (Disturbance "On-set")					Estimated No. of Beluga (Avoidance)				
		Apr	Jun	Aug	Sep	Oct	Apr	Jun	Aug	Sep	Oct	Apr	Jun	Aug	Sep	Oct
A. Steensby Port and Shipping Route																
Blasting; no bubble curtain	Steensby Port	0.00	0.00	0.00	0.53	0.10	0	0	0	0	0	0	0	0	0	0
Blasting; with bubble curtain	Steensby Port	0.00	0.00	0.00	0.53	0.10	0	0	0	0	0	0	0	0	0	0
Drilling through ice	Steensby Port	0.00	0.00	0.00	0.53	0.10	0	0	0	0	0	0	0	0	0	0
Drilling through seabed	Steensby Port	0.00	0.00	0.00	0.53	0.10	0	0	0	0	0	0	0	0	0	0
Dredging basket	Steensby Port	0.00	0.00	0.00	0.53	0.10	0	0	0	0	0	0	0	0	0	0
Dredging cutter	Steensby Port	0.00	0.00	0.00	0.53	0.10	0	0	0	7	1	0	0	0	3	1
Tug	Steensby Port	0.00	0.00	0.00	0.53	0.10	0	0	0	2	0	0	0	0	0	0
Ore Carrier (Cape-size)	Steensby Inlet	0.00	0.00	0.00	0.53	0.10	0	0	0	74	14	0	0	0	26	5
Ore Carrier (Cape-size)	Foxe Basin	0.15	0.25	0.25	0.36	0.10	757	2083	790	617	127	255	588	209	165	35
Ore Carrier (Cape-size)	Hudson Strait	3.00	2.00	0.60	0.30	0.00	27238	13433	1558	779	0	10125	4796	459	230	0
B. Milne Port and Shipping Route																
Tug	Milne Port			0.08	0.12				0	0				0	0	
Dredging	Milne Port			0.08	0.12				0	0				0	0	
Pile driving; no bubble curtain	Milne Port			0.08	0.12				0	0				0	0	
Pile driving; with bubble curtain	Milne Port			0.08	0.12				0	0				0	0	
Ore Carrier (Handymax-size)	Eclipse Sound			0.00	0.02				0	4				0	2	
Ore Carrier (Handymax-size)	Koluktoo Bay			0.08	0.12				1	1				0	0	
Ore Carrier (Handymax-size)	Milne Inlet			0.19	0.00				2	0				1	0	
Ore Carrier (Handymax-size)	Other bays/inlets			0.71	0.04				0	0				0	0	
Ore Carrier (Post-Panamax-size)	Eclipse Sound			0.00	0.02				0	5				0	1	
Ore Carrier (Post-Panamax-size)	Koluktoo Bay			0.08	0.12				1	1				0	0	
Ore Carrier (Post-Panamax-size)	Milne Inlet			0.19	0.00				2	0				1	0	
Ore Carrier (Post-Panamax-size)	Other bays/inlets			0.71	0.04				0	0				0	0	

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NOTES:

1. CORRECTION FACTORS OF 5.0 AND 2.26 WERE APPLIED FOR AVAILABILITY BIAS IN WINTER AND SUMMER, RESPECTIVELY; AND 2.841 FOR DETECTION BIAS.
2. DISTURBANCE "ON-SET" SOUND LEVELS OF 120 dB (rms) AND 145 dB (rms) WERE ASSUMED FOR CONTINUOUS AND PULSED SOUND, RESPECTIVELY.
3. AVOIDANCE SOUND LEVELS OF 135 dB (rms) AND 155 dB (rms) WERE ASSUMED FOR CONTINUOUS AND PULSED SOUNDS, RESPECTIVELY.
4. HEARING IMPAIRMENT (TTS) SOUND LEVELS OF 175 dB (rms), 100 sec EXPOSURE FOR CONTINUOUS SOUND AND 180 dB (rms) FOR PULSED SOUND WERE ASSUMED.
5. 2-3 BELUGA WHALES IN FOXE BASIN ARE PREDICTED TO BE EXPOSED TO SOUND LEVELS FROM CAPE-SIZED ORE CARRIERS WHICH EXCEED ASSUMED TTS LEVEL DURING THE THICK-ICE SEASON .

A	23NOV10	ISSUED WITH REPORT	REE	VDM	VDM
REV	DATE	DESCRIPTION	PREPD	CHKD	APPD

TABLE 8C-3.7

**BAFFINLAND IRON MINES CORPORATION
MARY RIVER PROJECT**

Estimated numbers of narwhal potentially affected by Project activities during the ice-covered (Apr, Jun) and open-water periods (Aug, Sep, Oct).

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		Narwhal Avg. Density (individuals/100 km ²)					Estimated No. of Narwhal (Disturbance "On-set")					Estimated No. of Narwhal (Avoidance)				
Project Activity	Area	Apr	Jun	Aug	Sep	Oct	Apr	Jun	Aug	Sep	Oct	Apr	Jun	Aug	Sep	Oct
A. Steensby Port and Shipping Route																
Blasting; no bubble curtain	Steensby Port	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0
Blasting; with bubble curtain	Steensby Port	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0
Drilling through ice	Steensby Port	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0
Drilling through seabed	Steensby Port	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0
Dredging basket	Steensby Port	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0
Dredging cutter	Steensby Port	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0
Tug	Steensby Port	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0
Ore Carrier (Cape-size)	Steensby Inlet	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0
Ore Carrier (Cape-size)	Foxe Basin	0.20	0.20	0.00	0.00	0.00	200	341	0	0	0	58	92	0	0	0
Ore Carrier (Cape-size)	Hudson Strait	0.60	0.80	0.00	0.60	0.00	1009	1039	0	646	0	460	436	0	231	0
B. Milne Port and Shipping Route																
Tug	Milne Port			193.89	20.17				387	40				16	2	
Dredging	Milne Port			193.89	20.17				260	27				11	1	
Pile driving; no bubble curtain	Milne Port			193.89	20.17				177	18				90	9	
Pile driving; with bubble curtain	Milne Port			193.89	20.17				47	5				5	1	
Ore Carrier (Handymax-size)	Eclipse Sound			11.91	50.43				1139	4822				220	931	
Ore Carrier (Handymax-size)	Koluktoo Bay			193.89	20.17				662	69				169	18	
Ore Carrier (Handymax-size)	Milne Inlet			106.07	22.14				707	148				182	38	
Ore Carrier (Handymax-size)	Other bays/inlets			93.83	21.79				1	0				0	0	
Ore Carrier (Post-Panamax-size)	Eclipse Sound			11.91	50.43				1236	5235				330	1397	
Ore Carrier (Post-Panamax-size)	Koluktoo Bay			193.89	20.17				662	69				238	25	
Ore Carrier (Post-Panamax-size)	Milne Inlet			106.07	22.14				707	148				219	46	
Ore Carrier (Post-Panamax-size)	Other bays/inlets			93.83	21.79				1	0				0	0	

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NOTES:

1. CORRECTION FACTORS OF 1.111 AND 2.905 WERE APPLIED FOR AVAILABILITY AND DETECTION BIASES , RESPECTIVELY.
2. DISTURBANCE "ON-SET" SOUND LEVEL OF 120 dB (rms) AND 145 dB (rms) WERE ASSUMED FOR CONTINUOUS AND PULSED SOUNDS, RESPECTIVELY.
3. AVOIDANCE SOUND LEVEL OF 135 dB (rms) AND 155 dB (rms) WERE ASSUMED FOR CONTINUOUS AND PULSED SOUNDS , RESPECTIVELY.
4. HEARING IMPAIRMENT (TTS) SOUND LEVELS OF 175 dB (rms), 100 sec EXPOSURE FOR CONTINUOUS SOUND AND 180 dB (rms) FOR PULSED SOUND WERE ASSUMED.
5. ONE NARWHAL IN EACH OF FOXE BASIN AND HUDSON STRAIT IS PREDICTED TO BE EXPOSED TO SOUND LEVELS FROM CAPE-SIZE ORE CARRIERS WHICH EXCEED ASSUMED TTS LEVELS DURING THE THICK-ICE PERIOD.

A	23NOV10	ISSUED WITH REPORT	REE	VDM	VDM
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

TABLE 8C-3.8

**BAFFINLAND IRON MINES CORPORATION
MARY RIVER PROJECT**

Estimated distances bowhead whales would be exposed to sound levels that may cause disturbance 'on-set', avoidance, and hearing impairment (TTS).

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Project Activity	Area	Time Period	Estimated Distance (km)		
			Disturbance 'On-set'	Avoidance	TTS
Blasting no bubble curtain	Steensby Port	Thick Ice	25	5	0.1
Blasting with bubble curtain	Steensby Port	Thick Ice	6	0.3	-
Drilling through ice	Steensby Port	Thick Ice	-	-	-
Drilling through seabed	Steensby Port	Thick Ice	8	0.8	-
Dredging basket	Steensby Port	Open-water	0.1	-	-
Dredging cutter	Steensby Port	Open-water	10	6	-
Tug	Steensby Port	Open-water	5	1	-
Tug	Steensby Port	Thin Ice	8	1.5	-
Tug	Steensby Port	Thick Ice	50	8	-
Ore Carrier (Cape-size)	Steensby Inlet	Open-water	30	6	-
Ore Carrier (Cape-size)	Steensby Inlet	Thin Ice	30	7	-
Ore Carrier (Cape-size)	Steensby Inlet	Thick Ice	50	11	0.1
Ore Carrier (Cape-size)	Foxe Basin	Open-water	25	6.5	-
Ore Carrier (Cape-size)	Foxe Basin	Thin Ice	30	8	-
Ore Carrier (Cape-size)	Foxe Basin	Thick Ice	60	15	0.1
Ore Carrier (Cape-size)	Hudson Strait	Open-water	25	7	-
Ore Carrier (Cape-size)	Hudson Strait	Thin Ice	30	10	-
Ore Carrier (Cape-size)	Hudson Strait	Thick Ice	100	20	-
Tug	Milne Port	Open-water	15	1	-
Dredging	Milne Port	Open-water	18	0.8	-
Pile driving; no bubble curtain	Milne Port	Open-water	>10	1	
Pile driving; with bubble curtain	Milne Port	Open-water	2	0.2	
Ore Carrier (Handymax-size)	Eclipse Sound	Open-water	30	2	-
Ore Carrier (Handymax-size)	Koluktoo Bay	Open-water	3	0.6	-
Ore Carrier (Handymax-size)	Milne Inlet	Open-water	10	0.6	-
Ore Carrier (Post-Panamax-size)	Eclipse Sound	Open-water	30	3	-
Ore Carrier (Post-Panamax-size)	Koluktoo Bay	Open-water	5	0.7	-
Ore Carrier (Post-Panamax-size)	Milne Inlet	Open-water	20	0.6	-

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NOTES:

1. DISTURBANCE "ON-SET" SOUND LEVELS OF 120 dB (rms) AND 145 dB (rms) WERE ASSUMED FOR CONTINUOUS AND PULSED SOUNDS, RESPECTIVELY.
2. AVOIDANCE SOUND LEVELS OF 135 dB (rms) AND 160 dB (rms) WERE ASSUMED FOR CONTINUOUS AND PULSED SOUNDS, RESPECTIVELY.
3. HEARING IMPAIRMENT (TTS) SOUND LEVELS OF 175 dB (rms), 100 sec EXPOSURE FOR CONTINUOUS SOUND AND 180 dB (rms) FOR PULSED SOUND WERE ASSUMED.

A	23NOV'10	ISSUED WITH REPORT	REE	VDM	VDM
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

TABLE 8C-3.9

**BAFFINLAND IRON MINES CORPORATION
MARY RIVER PROJECT**

Estimated numbers of bowhead whales potentially affected by Project activities during the ice-covered (Apr, Jun) and open-water periods (Aug, Sep, Oct).

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Project Activity	Area	Bowhead Avg. Density (individuals/100 km ²)					Estimated No. of Bowheads (Disturbance "On-set")					Estimated No. of Bowheads (Avoidance)				
		Apr	Jun	Aug	Sep	Oct	Apr	Jun	Aug	Sep	Oct	Apr	Jun	Aug	Sep	Oct
A. Steensby Port and Shipping Route																
Blasting; no bubble curtain	Steensby Port	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0
Blasting; with bubble curtain	Steensby Port	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0
Drilling through ice	Steensby Port	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0
Drilling through seabed	Steensby Port	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0
Dredging basket	Steensby Port	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0
Dredging cutter	Steensby Port	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0
Tug	Steensby Port	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0
Ore Carrier (Cape-size)	Steensby Inlet	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0
Ore Carrier (Cape-size)	Foxe Basin	0.00	0.00	0.00	0.03	0.00	0	0	2	71	1	0	0	0	23	0
Ore Carrier (Cape-size)	Hudson Strait	0.10	0.00	0.10	0.00	0.00	748	0	479	0	0	342	0	171	0	0
B. Milne Port and Shipping Route																
Tug	Milne Port			0.33	0.06				2	0				0	0	
Dredging	Milne Port			0.33	0.06				3	0				0	0	
Pile driving; no bubble curtain	Milne Port			0.33	0.06				1	0				0	0	
Pile driving; with bubble curtain	Milne Port			0.33	0.06				0	0				0	0	
Ore Carrier (Handymax-size)	Eclipse Sound			0.10	0.02				52	9				8	1	
Ore Carrier (Handymax-size)	Koluktoo Bay			0.33	0.06				5	1				2	0	
Ore Carrier (Handymax-size)	Milne Inlet			0.15	0.11				16	12				1	1	
Ore Carrier (Handymax-size)	Other bays/inlets			0.02	0.03				0	0				0	0	
Ore Carrier (Post-Panamax-size)	Eclipse Sound			0.10	0.02				52	9				12	2	
Ore Carrier (Post-Panamax-size)	Koluktoo Bay			0.33	0.06				6	1				2	0	
Ore Carrier (Post-Panamax-size)	Milne Inlet			0.15	0.11				16	12				1	1	
Ore Carrier (Post-Panamax-size)	Other bays/inlets			0.02	0.03				0	1				0	0	

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NOTES:

1. CORRECTION FACTORS OF 6.94 AND 2.07 WERE APPLIED FOR AVAILABILITY AND DETECTION BIASES, RESPECTIVELY.
2. DISTURBANCE "ON-SET" SOUND LEVELS OF 120 dB (rms) AND 145 dB (rms) WERE ASSUMED FOR CONTINUOUS AND PULSED SOUNDS, RESPECTIVELY.
3. AVOIDANCE SOUND LEVELS OF 135 dB (rms) AND 160 dB (rms) WERE ASSUMED FOR CONTINUOUS AND PULSED SOUNDS, RESPECTIVELY.
4. HEARING IMPAIRMENT (TTS) SOUND LEVELS OF 175 dB (rms), 100 sec EXPOSURE FOR CONTINUOUS SOUND AND 180 dB (rms) FOR PULSED SOUND WERE ASSUMED.
5. NO BOWHEADS ARE PREDICTED TO BE EXPOSED TO SOUND LEVELS WHICH MAY CAUSE TTS.

A	23NOV10	ISSUED WITH REPORT	REE	VDM	VDM
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D