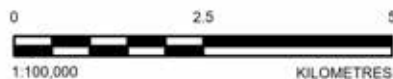


LEGEND

- ACOUSTIC RECORDER (AMAR) LOCATION
- CLOSEST POINT OF APPROACH (VESSEL)
- CLOSEST POINT OF APPROACH (FOCAL FOLLOW)
- ★ OBSERVER LOCATION
- FOCAL FOLLOW TRACK 110 (2022)
- ACTIVE VESSEL TRANSIT (NORDIC NULUJAAK)
- NON-ACTIVE VESSEL TRANSIT (NORDIC NULUJAAK)
- BEHAVIOURAL STUDY AREA (BSA)
- STRATIFIED STUDY AREA (SSA) SUBSTRATA



REFERENCE(S)

SUBSTRATA AND OBSERVER LOCATION DIGITIZED FROM LGL SHORE-BASED MONITORING OF NARWHALS AND VESSELS AT BRUCE HEAD, MILNE INLET, 2016 REPORT. SHIPPING ROUTE DATA BY CLIENT, JULY 14, 2020. HYDROGRAPHY, POPULATED PLACE, AND PROVINCIAL BOUNDARY DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED. IMAGERY COPYRIGHT ©20240729 AND 20230728 ESRI AND ITS LICENSORS. SOURCE: MAXAR, USED UNDER LICENSE, ALL RIGHTS RESERVED. PROJECTED COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N

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PROJECT

MARY RIVER PROJECT

TITLE

FOCAL FOLLOW 110 (2022) AND ACTIVE VESSEL TRANSIT

CONSULTANT



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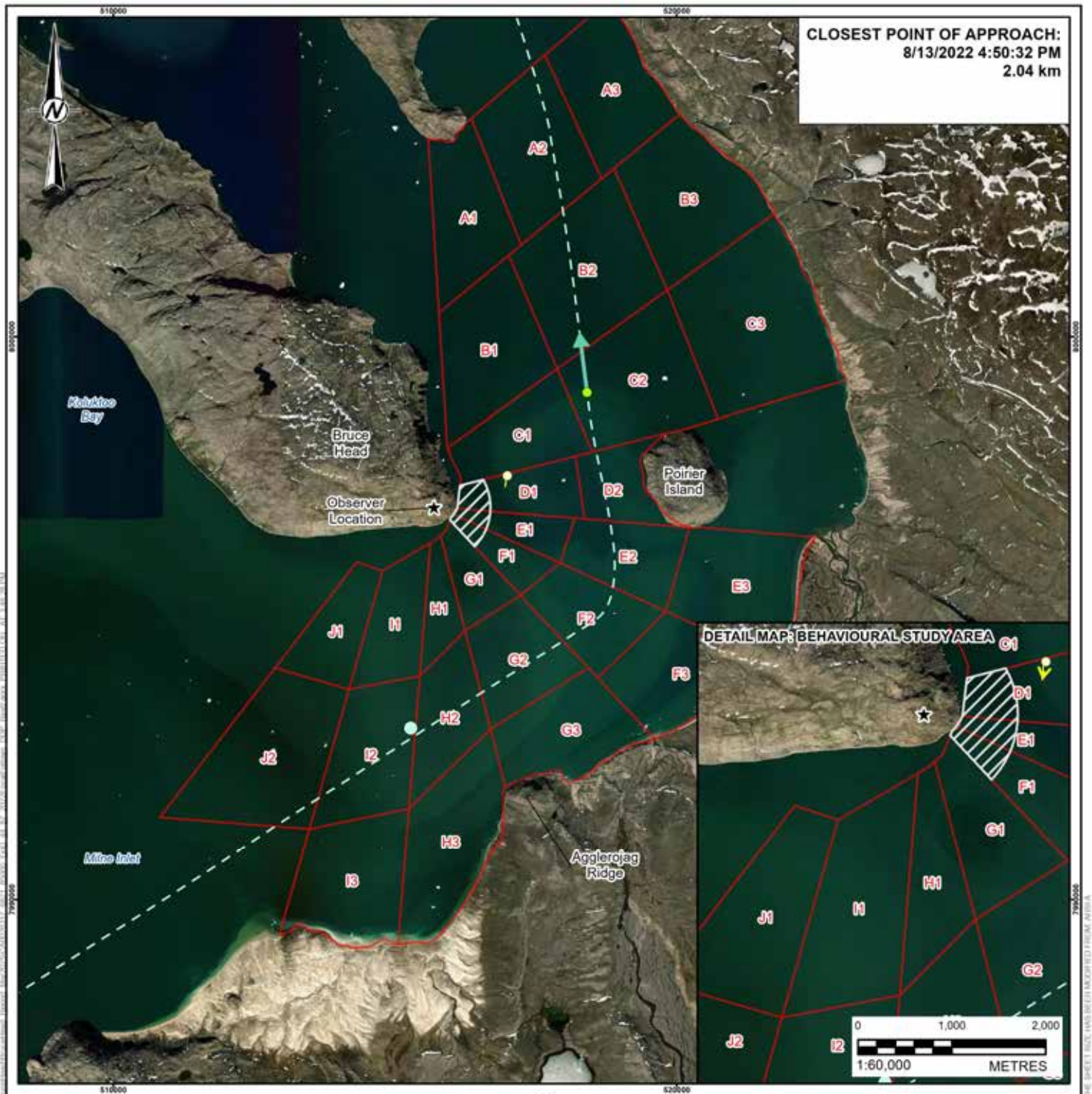
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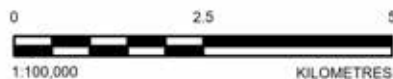
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FIGURE
D-75



LEGEND

- ACOUSTIC RECORDER (AMAR) LOCATION
- CLOSEST POINT OF APPROACH (VESSEL)
- CLOSEST POINT OF APPROACH (FOCAL FOLLOW)
- ★ OBSERVER LOCATION
- FOCAL FOLLOW TRACK 111 (2022)
- ACTIVE VESSEL TRANSIT (NORDIC NULUJAAK)
- NON-ACTIVE VESSEL TRANSIT (NORDIC NULUJAAK)
- BEHAVIOURAL STUDY AREA (BSA)
- STRATIFIED STUDY AREA (SSA) SUBSTRATA



REFERENCE(S)

SUBSTRATA AND OBSERVER LOCATION DIGITIZED FROM LGL SHORE-BASED MONITORING OF NARWHALS AND VESSELS AT BRUCE HEAD, MILNE INLET, 2016 REPORT. SHIPPING ROUTE DATA BY CLIENT, JULY 14, 2020. HYDROGRAPHY, POPULATED PLACE, AND PROVINCIAL BOUNDARY DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED. IMAGERY COPYRIGHT ©20240729 AND 20230728 ESRI AND ITS LICENSORS. SOURCE: MAXAR, USED UNDER LICENSE, ALL RIGHTS RESERVED. PROJECTED COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N

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PROJECT

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TITLE

FOCAL FOLLOW 111 (2022) AND ACTIVE VESSEL TRANSIT

CONSULTANT



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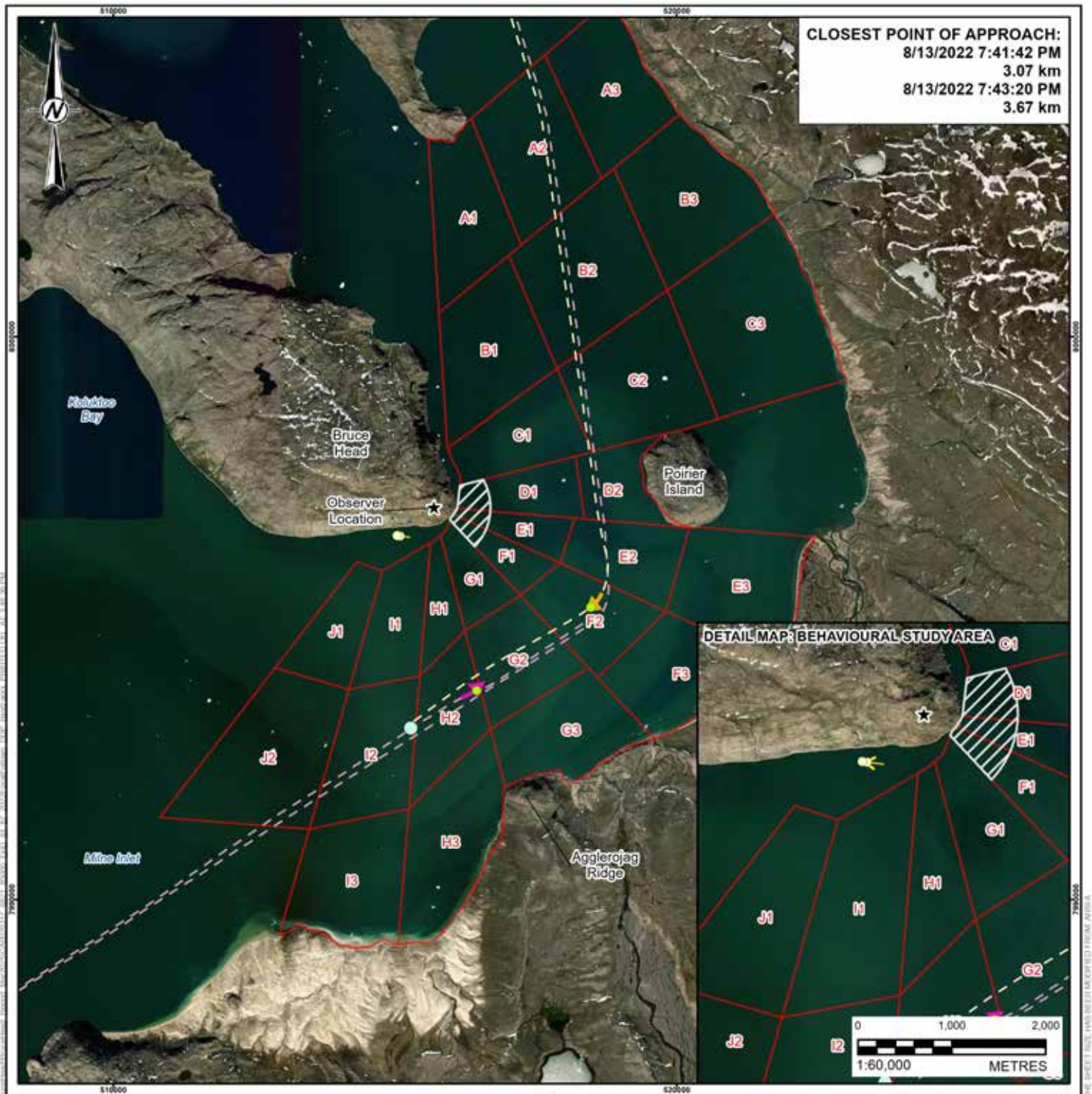
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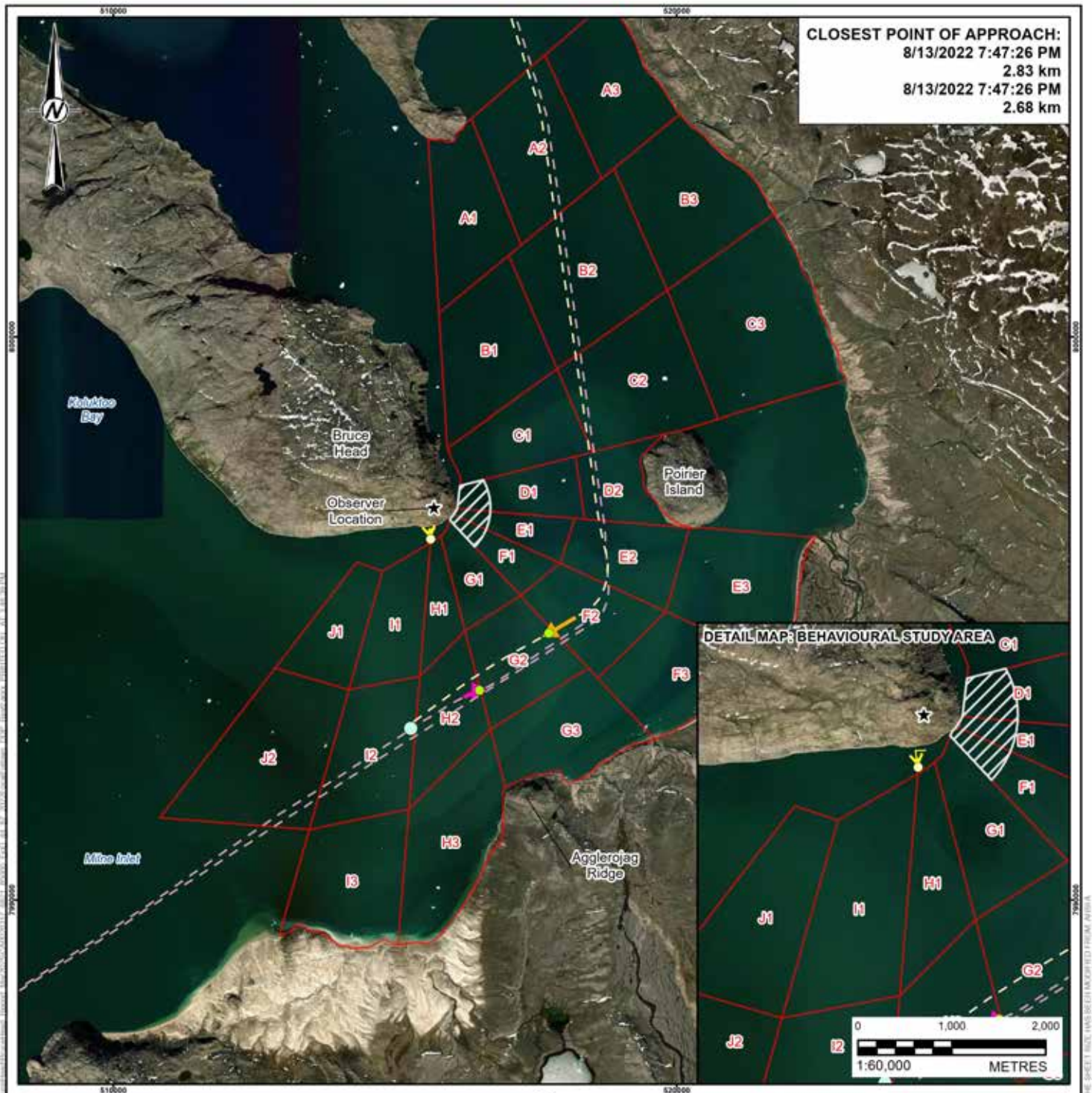
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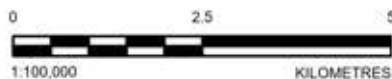
FIGURE
D-76





LEGEND

- ACOUSTIC RECORDER (AMAR) LOCATION
- CLOSEST POINT OF APPROACH (VESSEL)
- CLOSEST POINT OF APPROACH (FOCAL FOLLOW)
- ★ OBSERVER LOCATION
- FOCAL FOLLOW TRACK 114 (2022)
- ACTIVE VESSEL TRANSIT (BOTNICA)
- ACTIVE VESSEL TRANSIT (GOLDEN STRENGTH)
- NON-ACTIVE VESSEL TRANSIT (GOLDEN STRENGTH)
- ▭ BEHAVIOURAL STUDY AREA (BSA)
- ▭ STRATIFIED STUDY AREA (SSA) SUBSTRATA



REFERENCE(S)

SUBSTRATA AND OBSERVER LOCATION DIGITIZED FROM LGL SHORE-BASED MONITORING OF NARWHALS AND VESSELS AT BRUCE HEAD, MILNE INLET, 2016 REPORT. SHIPPING ROUTE DATA BY CLIENT, JULY 14, 2020. HYDROGRAPHY, POPULATED PLACE, AND PROVINCIAL BOUNDARY DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED. IMAGERY COPYRIGHT ©20240729 AND 20230728 ESRI AND ITS LICENSORS. SOURCE: MAXAR, USED UNDER LICENSE, ALL RIGHTS RESERVED. PROJECTED COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N

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PROJECT

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TITLE

FOCAL FOLLOW 114 (2022) AND ACTIVE VESSEL TRANSIT

CONSULTANT



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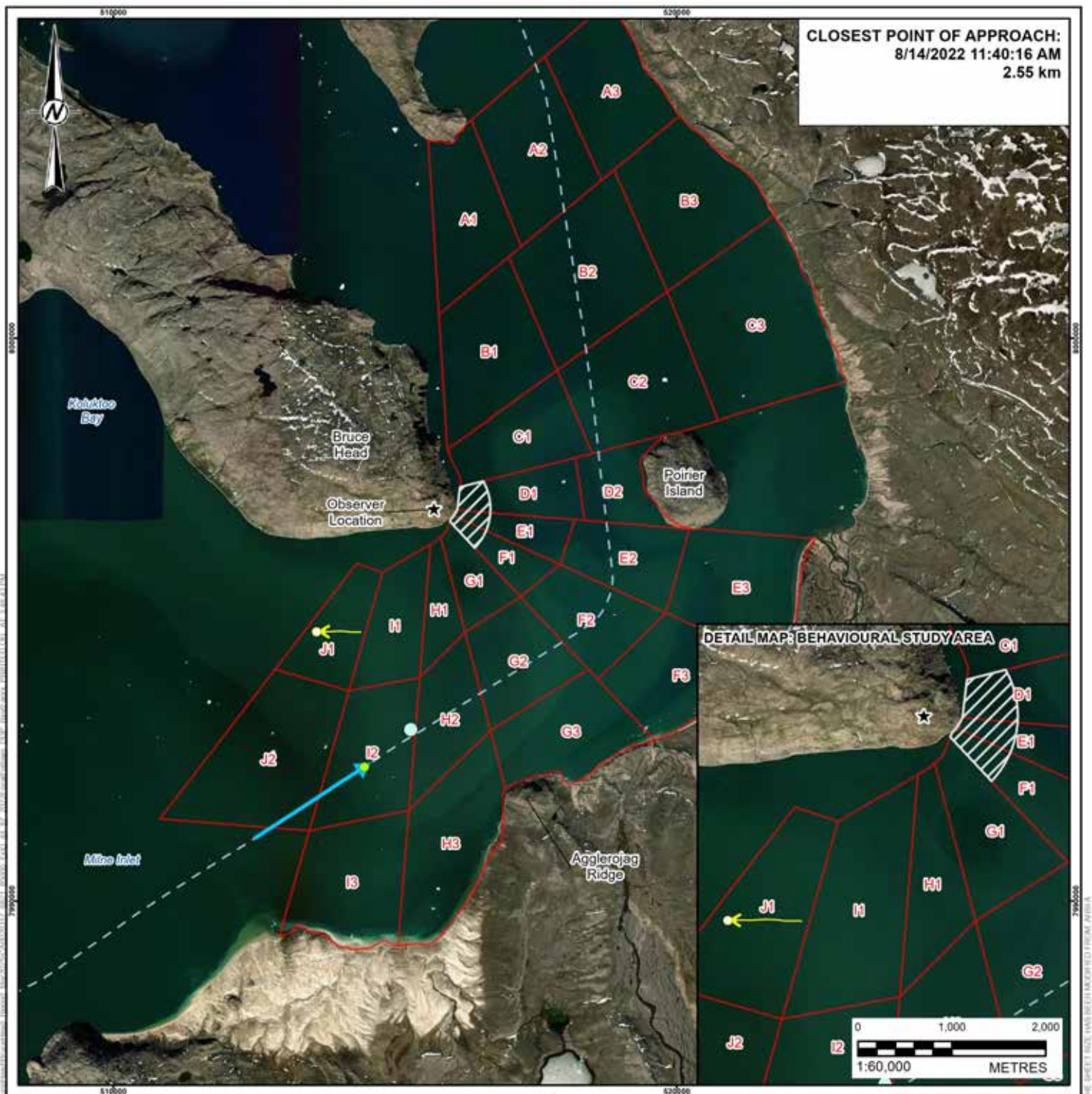
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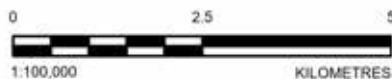
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FIGURE
D-79



LEGEND

- ACOUSTIC RECORDER (AMAR) LOCATION
- CLOSEST POINT OF APPROACH (VESSEL)
- CLOSEST POINT OF APPROACH (FOCAL FOLLOW)
- ★ OBSERVER LOCATION
- FOCAL FOLLOW TRACK 120 (2022)
- ACTIVE VESSEL TRANSIT (GOLDEN SUEK)
- NON-ACTIVE VESSEL TRANSIT (GOLDEN SUEK)
- BEHAVIOURAL STUDY AREA (BSA)
- STRATIFIED STUDY AREA (SSA) SUBSTRATA



REFERENCE(S)

SUBSTRATA AND OBSERVER LOCATION DIGITIZED FROM LGL SHORE-BASED MONITORING OF NARWHALS AND VESSELS AT BRUCE HEAD, MILNE INLET, 2016 REPORT. SHIPPING ROUTE DATA BY CLIENT, JULY 14, 2020. HYDROGRAPHY, POPULATED PLACE, AND PROVINCIAL BOUNDARY DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED. IMAGERY COPYRIGHT ©20240729 AND 20230728 ESRI AND ITS LICENSORS. SOURCE: MAXAR, USED UNDER LICENSE, ALL RIGHTS RESERVED. PROJECTED COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N

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TITLE

FOCAL FOLLOW 120 (2022) AND ACTIVE VESSEL TRANSIT

CONSULTANT



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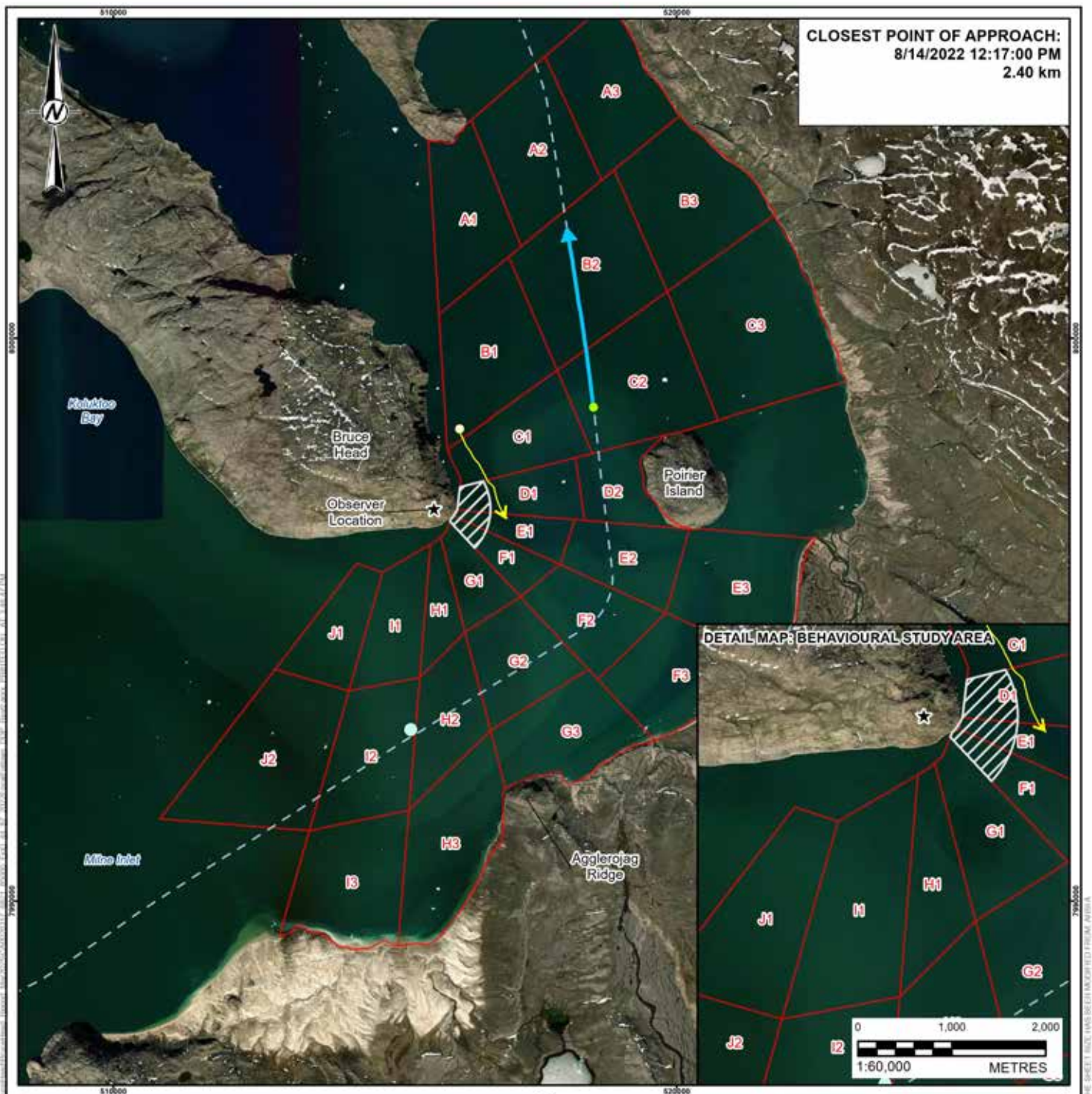
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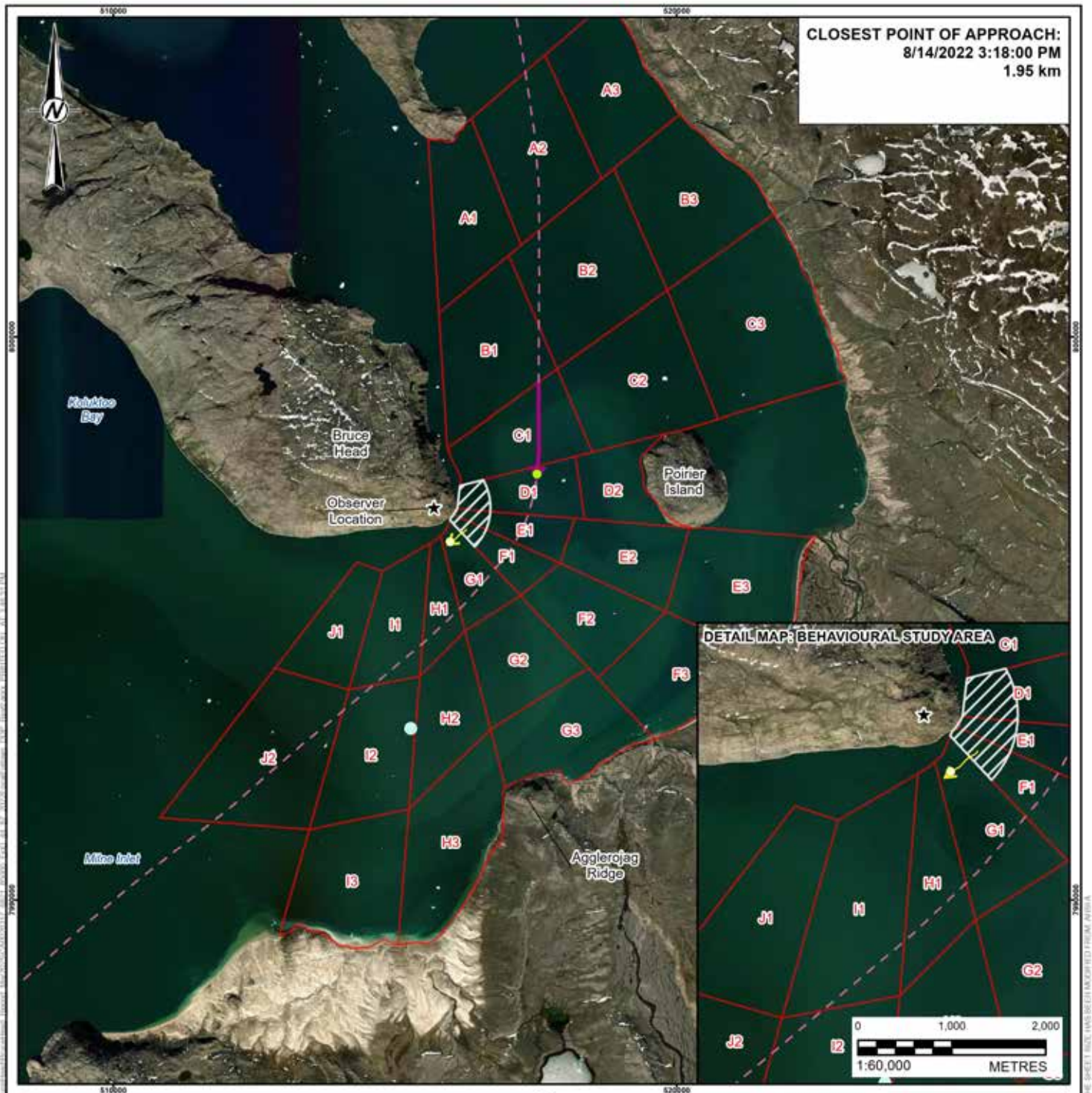
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FIGURE
D-80



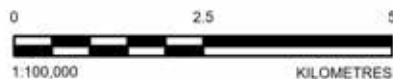
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 METRES
 0 2.5 5
 KILOMETRES
 1:100,000

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LEGEND

- ACOUSTIC RECORDER (AMAR) LOCATION
- CLOSEST POINT OF APPROACH (VESSEL)
- CLOSEST POINT OF APPROACH (FOCAL FOLLOW)
- ★ OBSERVER LOCATION
- FOCAL FOLLOW TRACK 124 (2022)
- ACTIVE VESSEL TRANSIT (SAGAR SAMRAT)
- - - NON-ACTIVE VESSEL TRANSIT (SAGAR SAMRAT)
- BEHAVIOURAL STUDY AREA (BSA)
- STRATIFIED STUDY AREA (SSA) SUBSTRATA



REFERENCE(S)

SUBSTRATA AND OBSERVER LOCATION DIGITIZED FROM LGL SHORE-BASED MONITORING OF NARWHALS AND VESSELS AT BRUCE HEAD, MILNE INLET, 2016 REPORT. SHIPPING ROUTE DATA BY CLIENT, JULY 14, 2020. HYDROGRAPHY, POPULATED PLACE, AND PROVINCIAL BOUNDARY DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA, ALL RIGHTS RESERVED. IMAGERY COPYRIGHT ©20240729 AND 20230728 ESRI AND ITS LICENSORS. SOURCE: MAXAR, USED UNDER LICENSE, ALL RIGHTS RESERVED. PROJECTED COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N

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PROJECT

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TITLE

FOCAL FOLLOW 124 (2022) AND ACTIVE VESSEL TRANSIT

CONSULTANT



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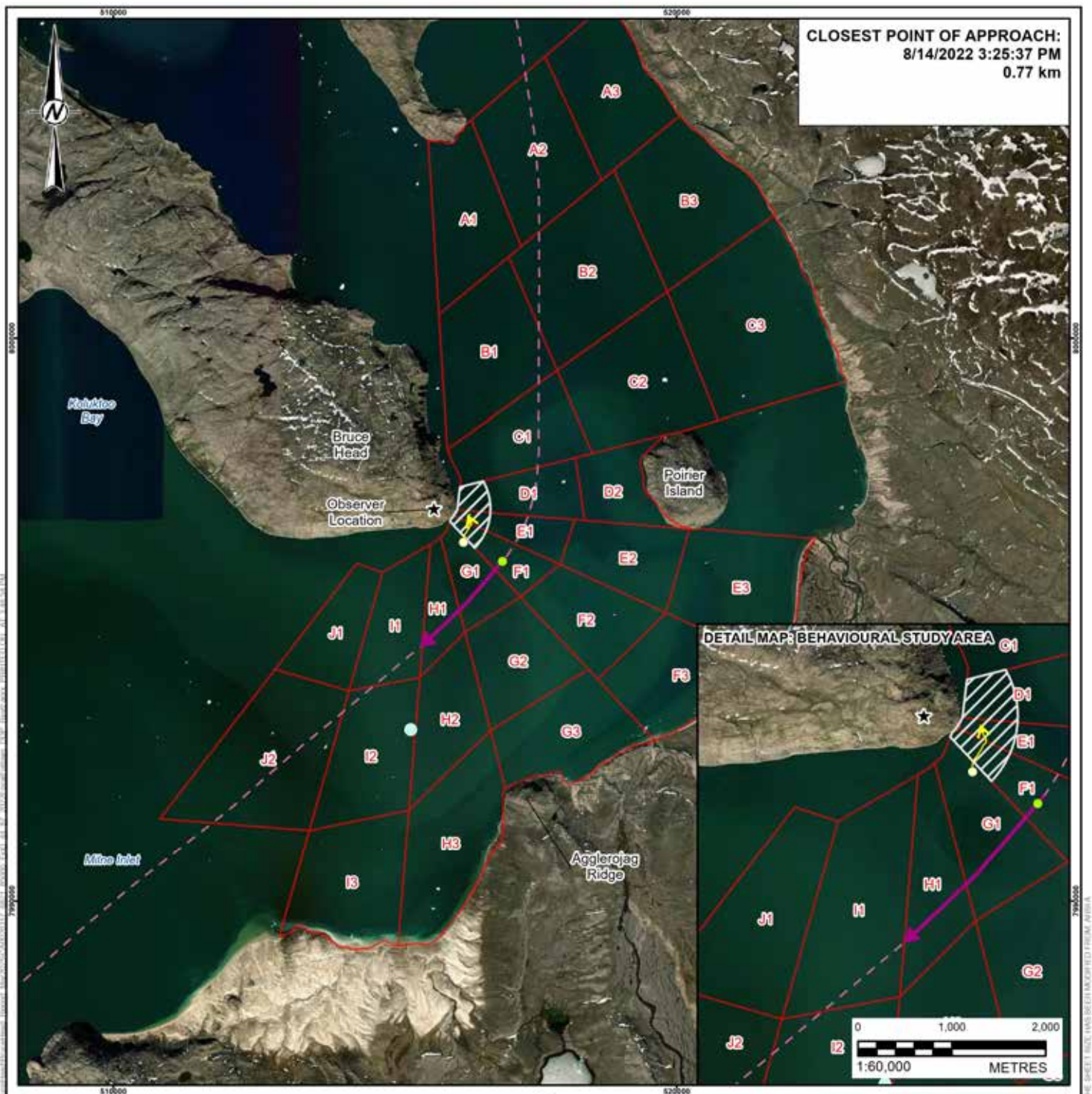
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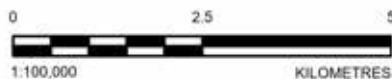
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FIGURE
D-82



LEGEND

- ACOUSTIC RECORDER (AMAR) LOCATION
- CLOSEST POINT OF APPROACH (VESSEL)
- CLOSEST POINT OF APPROACH (FOCAL FOLLOW)
- ★ OBSERVER LOCATION
- FOCAL FOLLOW TRACK 125 (2022)
- ACTIVE VESSEL TRANSIT (SAGAR SAMRAT)
- - - NON-ACTIVE VESSEL TRANSIT (SAGAR SAMRAT)
- BEHAVIOURAL STUDY AREA (BSA)
- STRATIFIED STUDY AREA (SSA) SUBSTRATA



REFERENCE(S)

SUBSTRATA AND OBSERVER LOCATION DIGITIZED FROM LGL SHORE-BASED MONITORING OF NARWHALS AND VESSELS AT BRUCE HEAD, MILNE INLET, 2016 REPORT. SHIPPING ROUTE DATA BY CLIENT, JULY 14, 2020. HYDROGRAPHY, POPULATED PLACE, AND PROVINCIAL BOUNDARY DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED. IMAGERY COPYRIGHT ©20240729 AND 20230728 ESRI AND ITS LICENSORS. SOURCE: MAXAR, USED UNDER LICENSE, ALL RIGHTS RESERVED. PROJECTED COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N

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PROJECT

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TITLE

FOCAL FOLLOW 125 (2022) AND ACTIVE VESSEL TRANSIT

CONSULTANT



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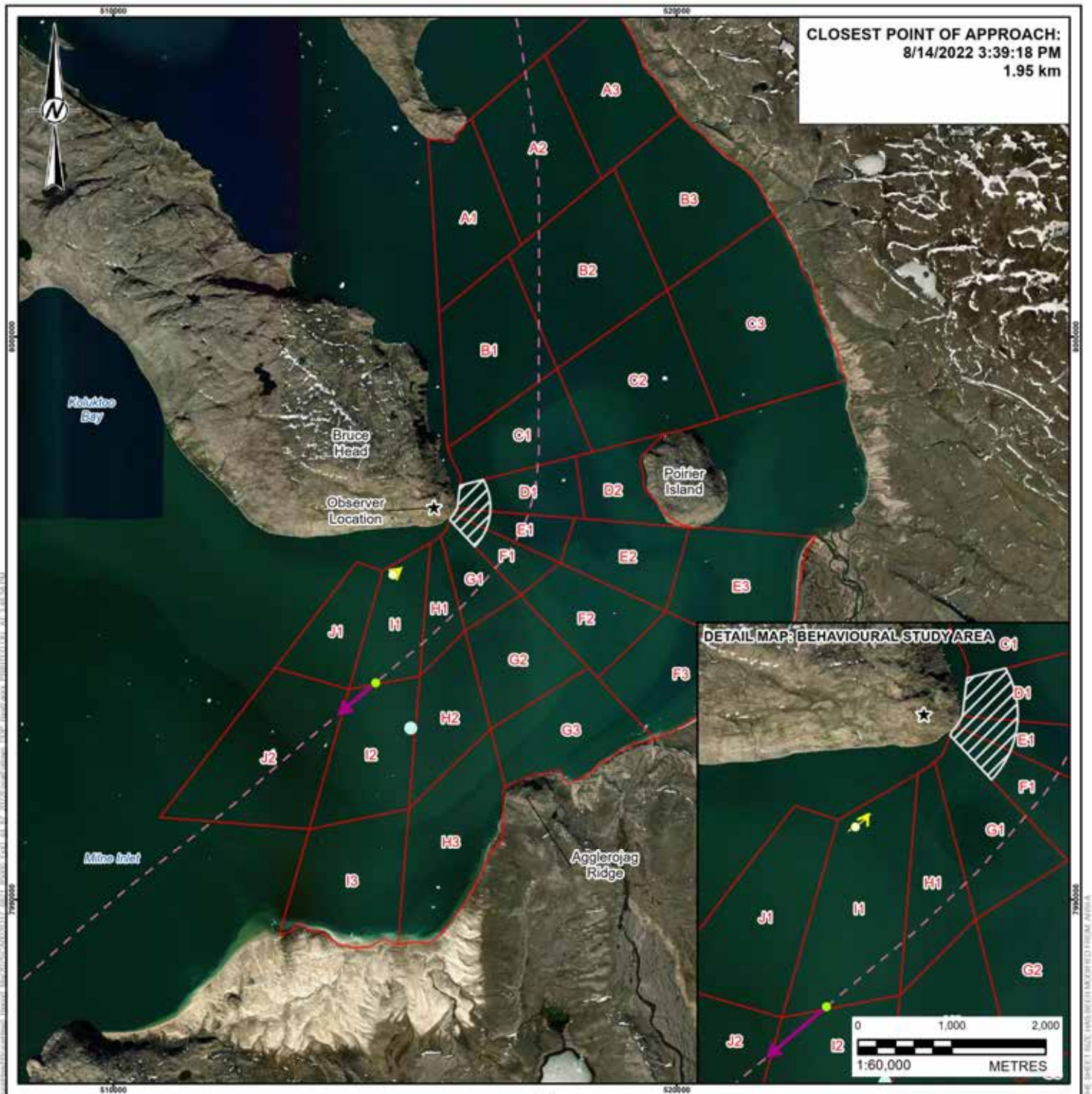
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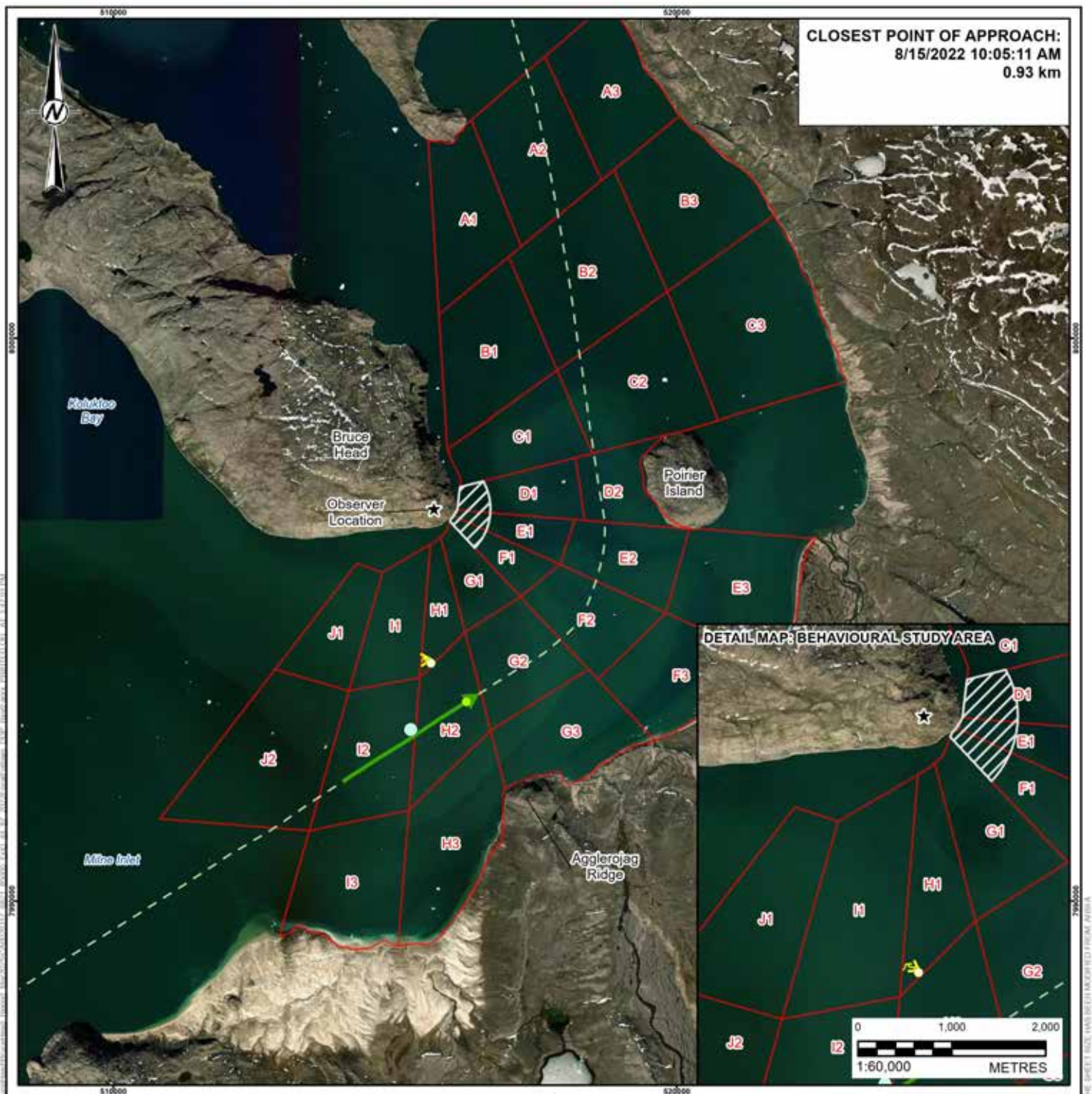
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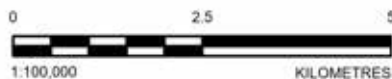
FIGURE
D-83





LEGEND

- ACOUSTIC RECORDER (AMAR) LOCATION
- CLOSEST POINT OF APPROACH (VESSEL)
- CLOSEST POINT OF APPROACH (FOCAL FOLLOW)
- ★ OBSERVER LOCATION
- FOCAL FOLLOW TRACK 127 (2022)
- ACTIVE VESSEL TRANSIT (GOLDEN FAST)
- NON-ACTIVE VESSEL TRANSIT (GOLDEN FAST)
- BEHAVIOURAL STUDY AREA (BSA)
- STRATIFIED STUDY AREA (SSA) SUBSTRATA



REFERENCE(S)

SUBSTRATA AND OBSERVER LOCATION DIGITIZED FROM LGL SHORE-BASED MONITORING OF NARWHALS AND VESSELS AT BRUCE HEAD, MILNE INLET, 2016 REPORT. SHIPPING ROUTE DATA BY CLIENT, JULY 14, 2020. HYDROGRAPHY, POPULATED PLACE, AND PROVINCIAL BOUNDARY DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA, ALL RIGHTS RESERVED. IMAGERY COPYRIGHT ©20240729 AND 20230728 ESRI AND ITS LICENSORS. SOURCE: MAXAR, USED UNDER LICENSE, ALL RIGHTS RESERVED. PROJECTED COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N

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PROJECT

MARY RIVER PROJECT

TITLE

FOCAL FOLLOW 127 (2022) AND ACTIVE VESSEL TRANSIT

CONSULTANT



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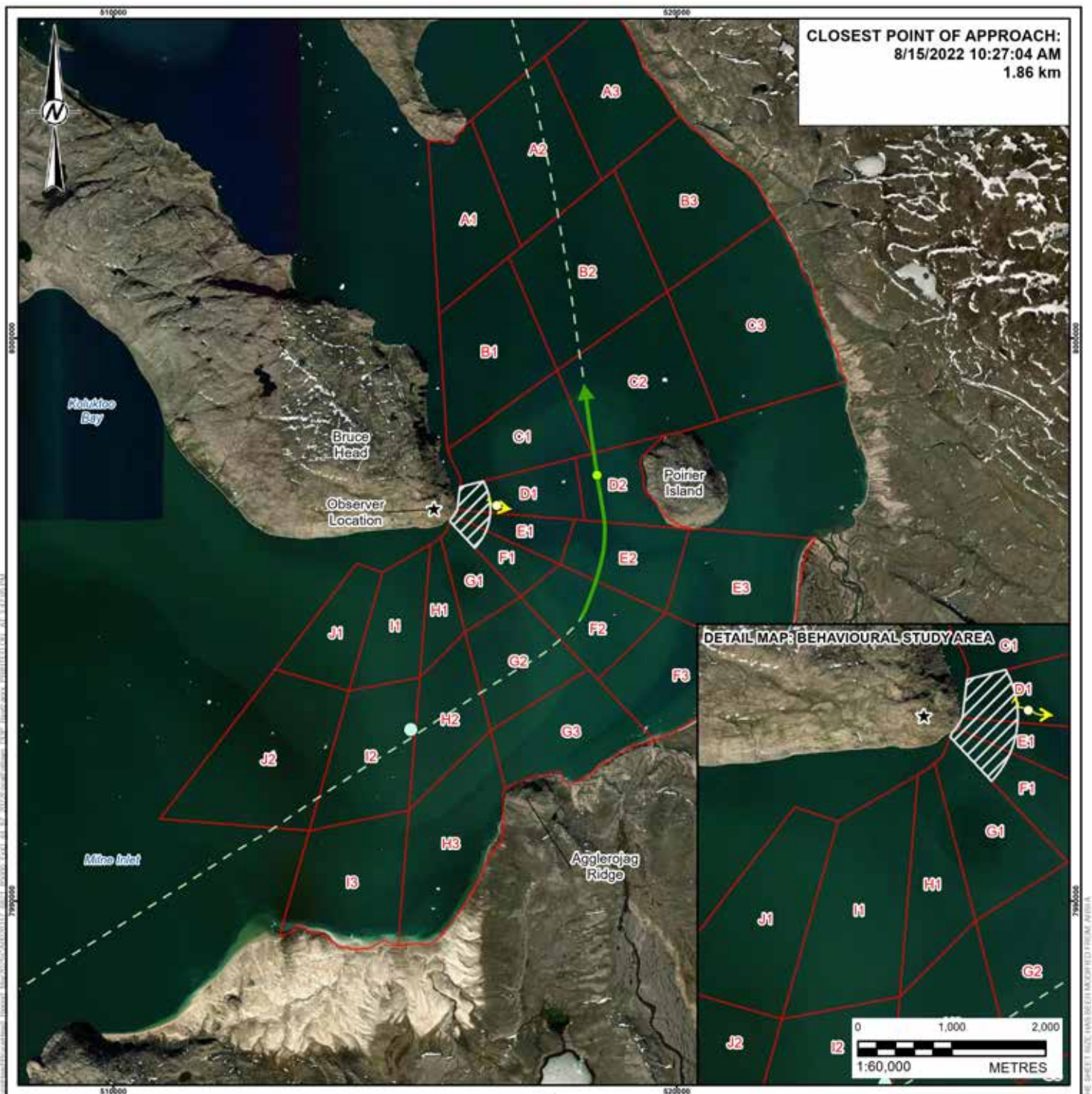
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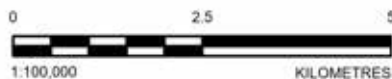
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FIGURE
D-85



LEGEND

- ACOUSTIC RECORDER (AMAR) LOCATION
- CLOSEST POINT OF APPROACH (VESSEL)
- CLOSEST POINT OF APPROACH (FOCAL FOLLOW)
- ★ OBSERVER LOCATION
- FOCAL FOLLOW TRACK 128 (2022)
- ACTIVE VESSEL TRANSIT (GOLDEN FAST)
- NON-ACTIVE VESSEL TRANSIT (GOLDEN FAST)
- BEHAVIOURAL STUDY AREA (BSA)
- STRATIFIED STUDY AREA (SSA) SUBSTRATA



REFERENCE(S)

SUBSTRATA AND OBSERVER LOCATION DIGITIZED FROM LGL SHORE-BASED MONITORING OF NARWHALS AND VESSELS AT BRUCE HEAD, MILNE INLET, 2016 REPORT. SHIPPING ROUTE DATA BY CLIENT, JULY 14, 2020. HYDROGRAPHY, POPULATED PLACE, AND PROVINCIAL BOUNDARY DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED. IMAGERY COPYRIGHT ©20240729 AND 20230728 ESRI AND ITS LICENSORS. SOURCE: MAXAR, USED UNDER LICENSE, ALL RIGHTS RESERVED. PROJECTED COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N

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FOCAL FOLLOW 128 (2022) AND ACTIVE VESSEL TRANSIT

CONSULTANT



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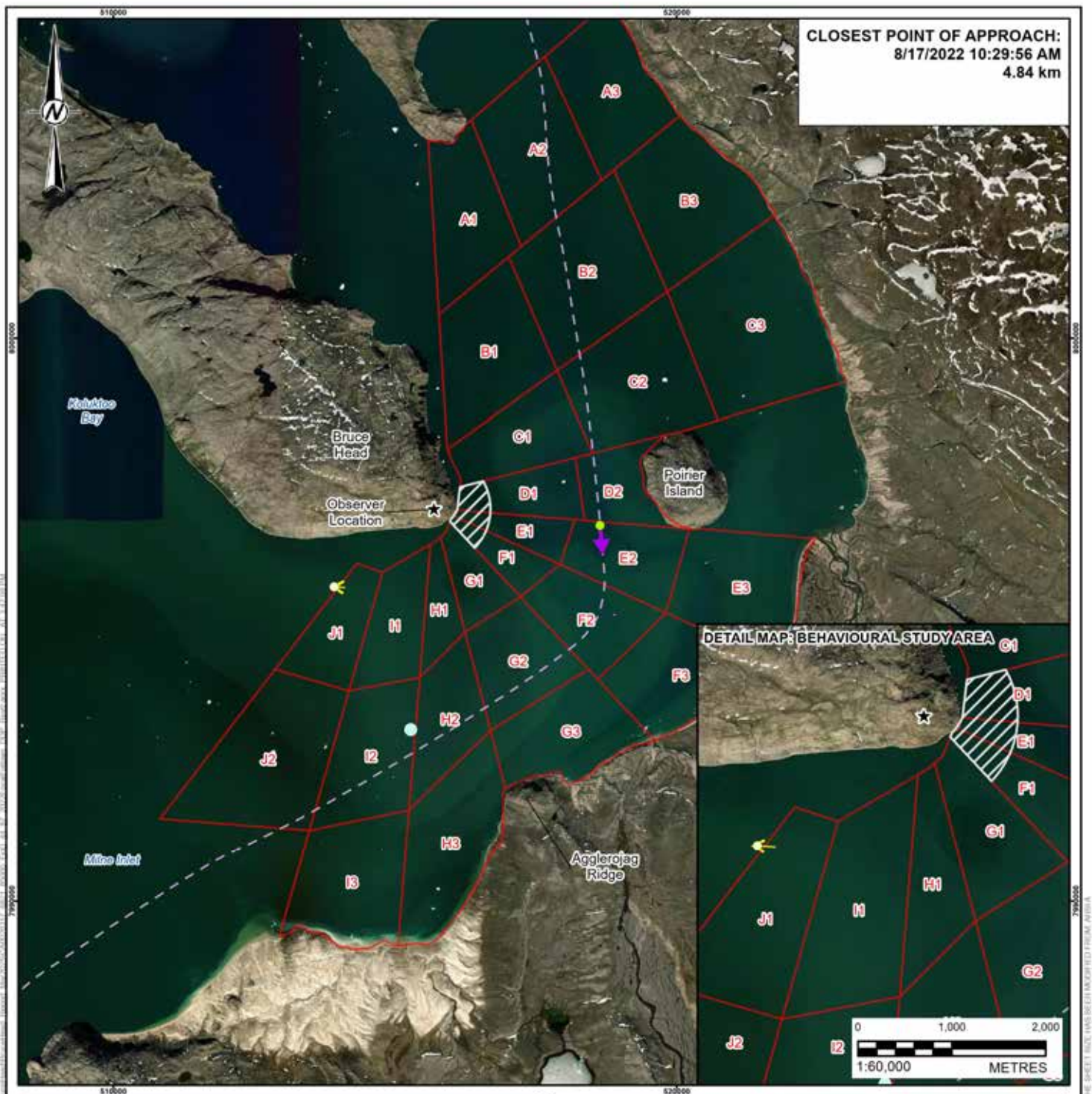
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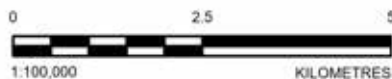
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FIGURE
D-86



LEGEND

- ACOUSTIC RECORDER (AMAR) LOCATION
- CLOSEST POINT OF APPROACH (VESSEL)
- CLOSEST POINT OF APPROACH (FOCAL FOLLOW)
- ★ OBSERVER LOCATION
- FOCAL FOLLOW TRACK 137 (2022)
- ACTIVE VESSEL TRANSIT (ELENA VE)
- NON-ACTIVE VESSEL TRANSIT (ELENA VE)
- BEHAVIOURAL STUDY AREA (BSA)
- STRATIFIED STUDY AREA (SSA) SUBSTRATA



REFERENCE(S)

SUBSTRATA AND OBSERVER LOCATION DIGITIZED FROM LGL SHORE-BASED MONITORING OF NARWHALS AND VESSELS AT BRUCE HEAD, MILNE INLET, 2016 REPORT. SHIPPING ROUTE DATA BY CLIENT, JULY 14, 2020. HYDROGRAPHY, POPULATED PLACE, AND PROVINCIAL BOUNDARY DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA, ALL RIGHTS RESERVED. IMAGERY COPYRIGHT ©20240729 AND 20230728 ESRI AND ITS LICENSORS. SOURCE: MAXAR, USED UNDER LICENSE, ALL RIGHTS RESERVED. PROJECTED COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N

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FOCAL FOLLOW 137 (2022) AND ACTIVE VESSEL TRANSIT

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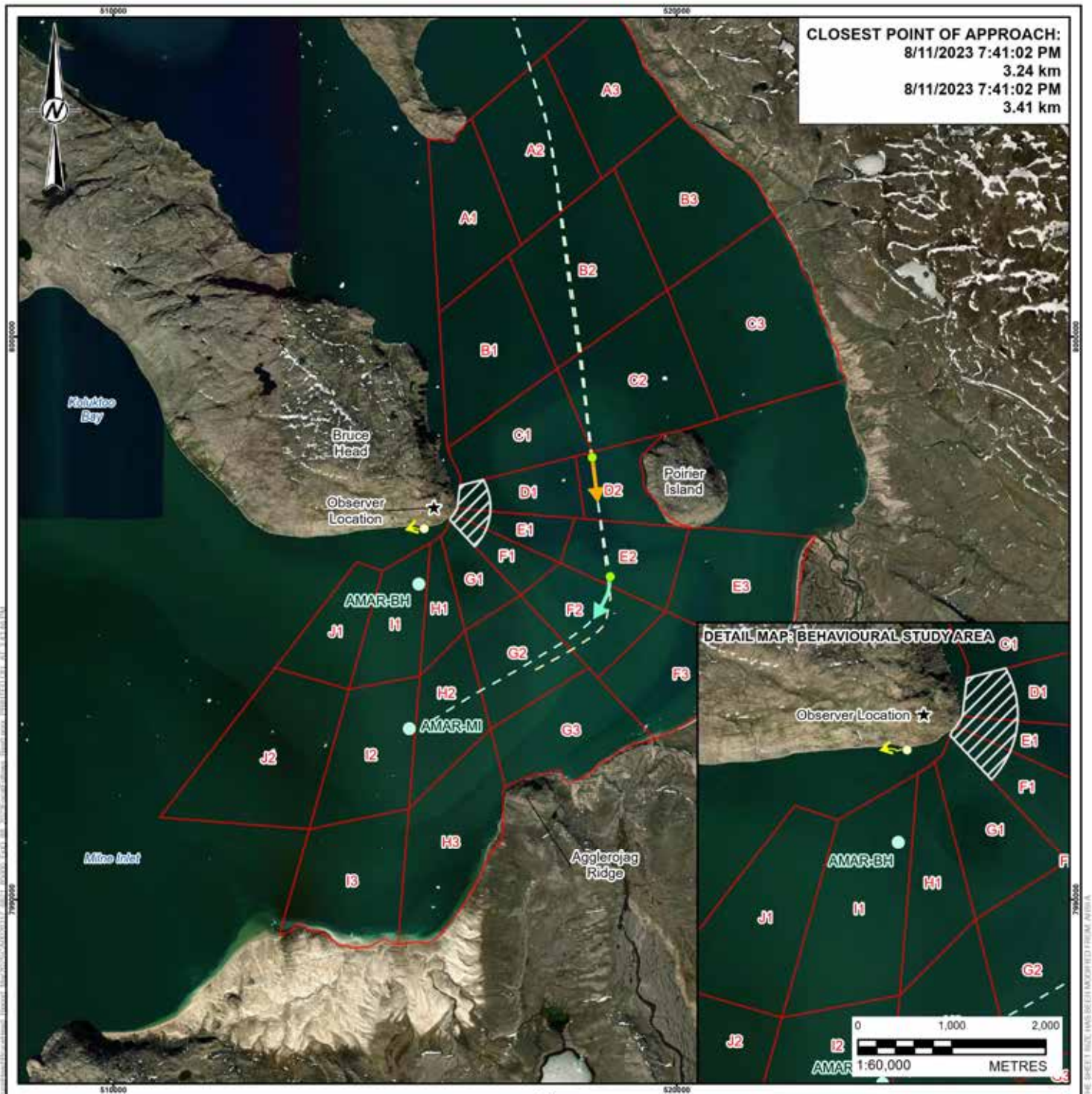
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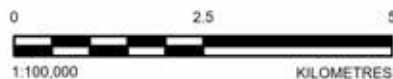
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FIGURE
D-87



LEGEND

- ACOUSTIC RECORDER (AMAR) LOCATION
- CLOSEST POINT OF APPROACH (FOCAL FOLLOW)
- CLOSEST POINT OF APPROACH (VESSEL)
- ★ OBSERVER LOCATION
- FOCAL FOLLOW TRACK 1 (2023)
- ACTIVE VESSEL TRANSIT (GOLDEN OPAL)
- ACTIVE VESSEL TRANSIT (NORDIC ODYSSEY)
- NON-ACTIVE VESSEL TRANSIT (GOLDEN OPAL)
- NON-ACTIVE VESSEL TRANSIT (NORDIC ODYSSEY)
- BEHAVIOURAL STUDY AREA (BSA)
- STRATIFIED STUDY AREA (SSA) SUBSTRATA



REFERENCE(S)

SUBSTRATA AND OBSERVER LOCATION DIGITIZED FROM LGL SHORE-BASED MONITORING OF NARWHALS AND VESSELS AT BRUCE HEAD, MILNE INLET, 2016 REPORT. SHIPPING ROUTE DATA BY CLIENT, JULY 14, 2020. HYDROGRAPHY, POPULATED PLACE, AND PROVINCIAL BOUNDARY DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED. IMAGERY COPYRIGHT ©20240729 AND 20230728 ESRI AND ITS LICENSORS. SOURCE: MAXAR, USED UNDER LICENSE, ALL RIGHTS RESERVED. PROJECTED COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N

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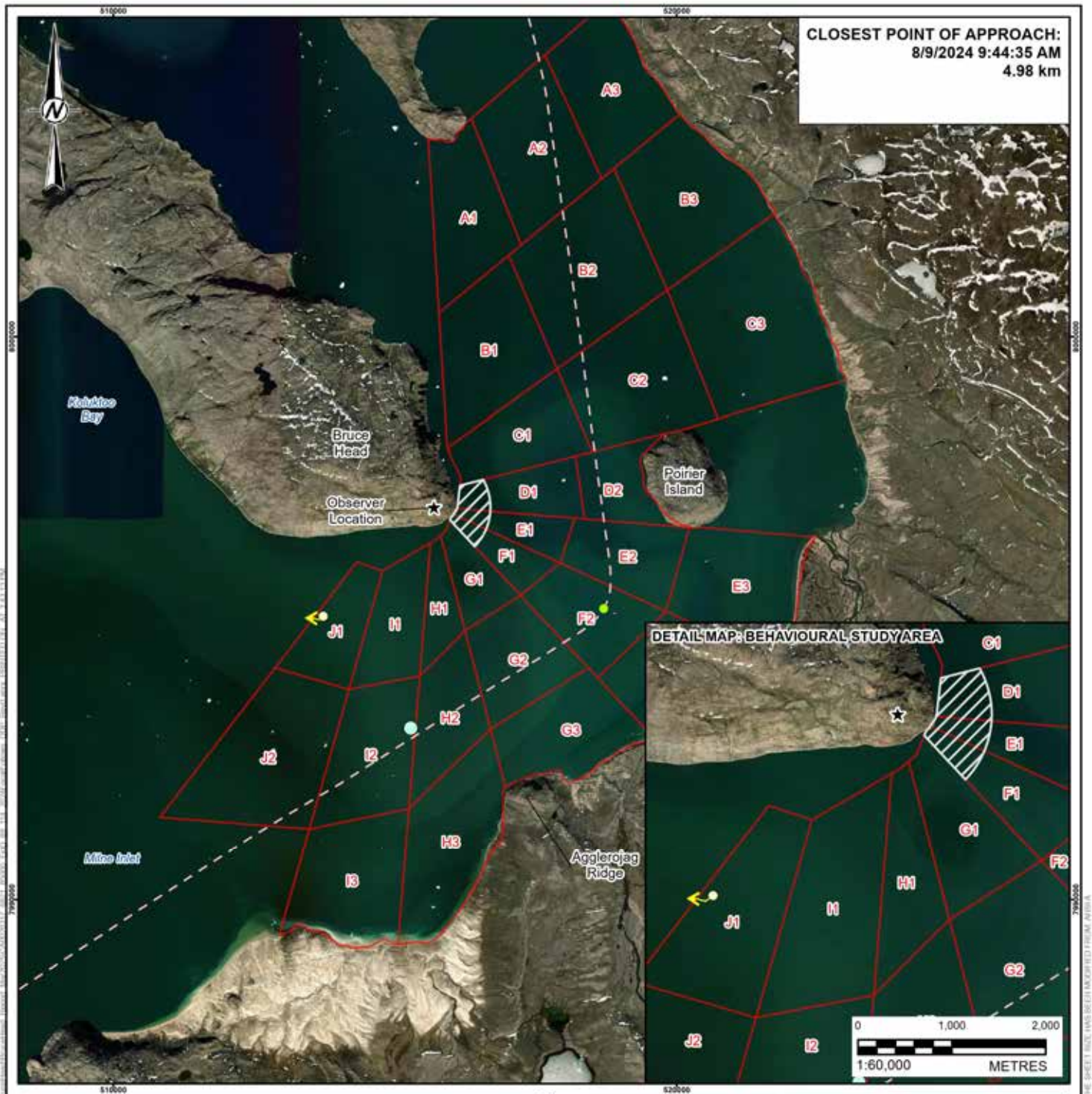
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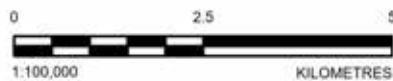
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FIGURE
D-88



LEGEND

- ACOUSTIC RECORDER (AMAR) LOCATION
- CLOSEST POINT OF APPROACH (VESSEL)
- CLOSEST POINT OF APPROACH (FOCAL FOLLOW)
- ★ OBSERVER LOCATION
- FOCAL FOLLOW TRACK 3 (2024)
- NON-ACTIVE VESSEL TRANSIT (NORDIC OSHIMA)
- BEHAVIOURAL STUDY AREA (BSA)
- STRATIFIED STUDY AREA (SSA) SUBSTRATA



REFERENCE(S)

SUBSTRATA AND OBSERVER LOCATION DIGITIZED FROM LGL SHORE-BASED MONITORING OF NARWHALS AND VESSELS AT BRUCE HEAD, MILNE INLET, 2016 REPORT. SHIPPING ROUTE DATA BY CLIENT, JULY 14, 2020. HYDROGRAPHY, POPULATED PLACE, AND PROVINCIAL BOUNDARY DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED. IMAGERY COPYRIGHT ©20240729 AND 20230728 ESRI AND ITS LICENSORS. SOURCE: MAXAR, USED UNDER LICENSE, ALL RIGHTS RESERVED. PROJECTED COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N

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FOCAL FOLLOW 3 (2024) AND ACTIVE VESSEL TRANSIT

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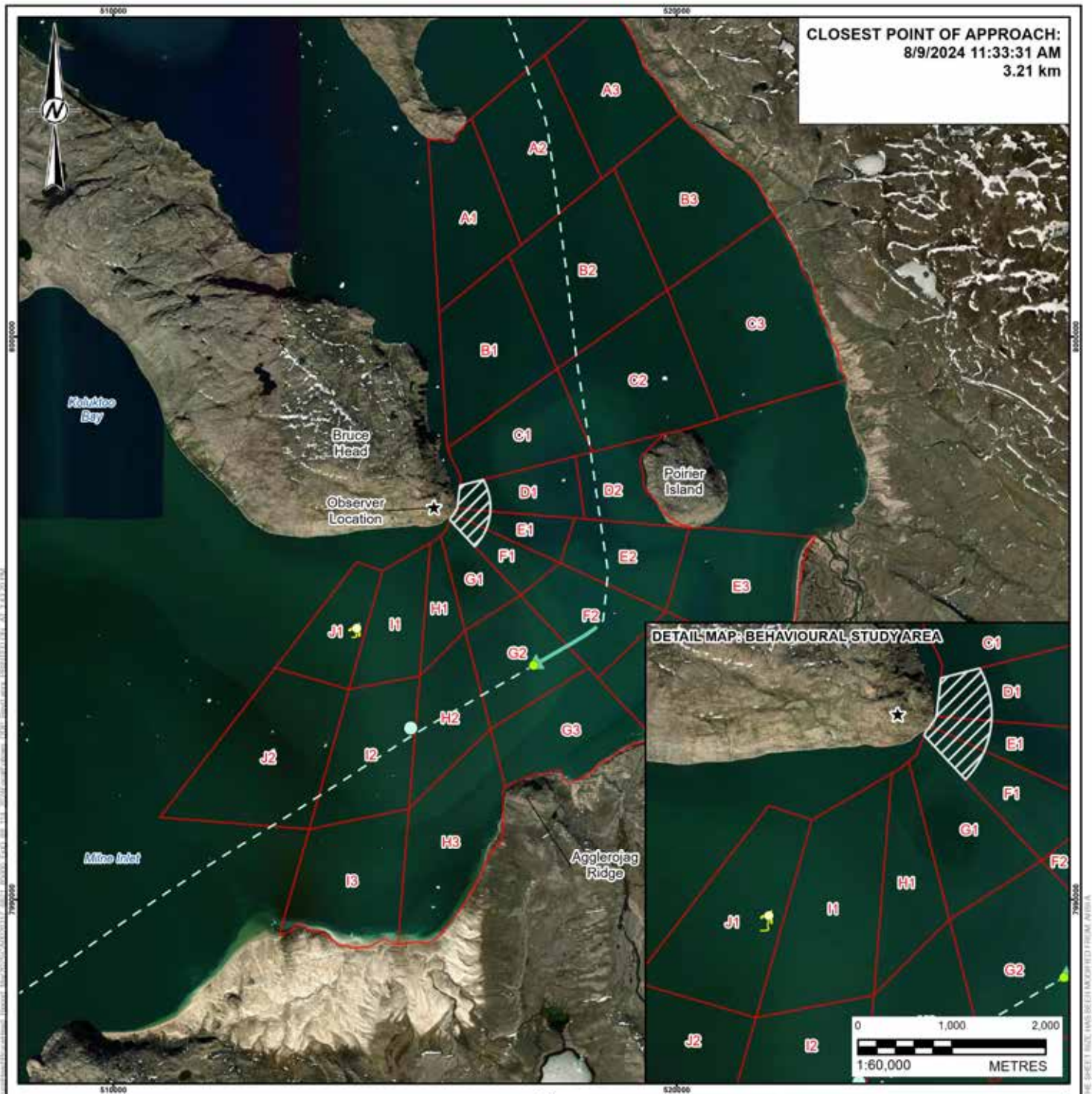
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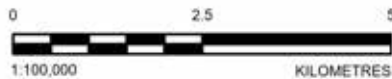
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FIGURE
D-90



LEGEND

- ACOUSTIC RECORDER (AMAR) LOCATION
- CLOSEST POINT OF APPROACH (VESSEL)
- CLOSEST POINT OF APPROACH (FOCAL FOLLOW)
- OBSERVER LOCATION
- FOCAL FOLLOW TRACK 8 (2024)
- ACTIVE VESSEL TRANSIT (NORDIC NULUJAAK)
- NON-ACTIVE VESSEL TRANSIT (NORDIC NULUJAAK)
- BEHAVIOURAL STUDY AREA (BSA)
- STRATIFIED STUDY AREA (SSA) SUBSTRATA



REFERENCE(S)

SUBSTRATA AND OBSERVER LOCATION DIGITIZED FROM LGL SHORE-BASED MONITORING OF NARWHALS AND VESSELS AT BRUCE HEAD, MILNE INLET, 2016 REPORT. SHIPPING ROUTE DATA BY CLIENT, JULY 14, 2020. HYDROGRAPHY, POPULATED PLACE, AND PROVINCIAL BOUNDARY DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED. IMAGERY COPYRIGHT ©20240729 AND 20230728 ESRI AND ITS LICENSORS. SOURCE: MAXAR, USED UNDER LICENSE, ALL RIGHTS RESERVED. PROJECTED COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N

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PROJECT

MARY RIVER PROJECT

TITLE

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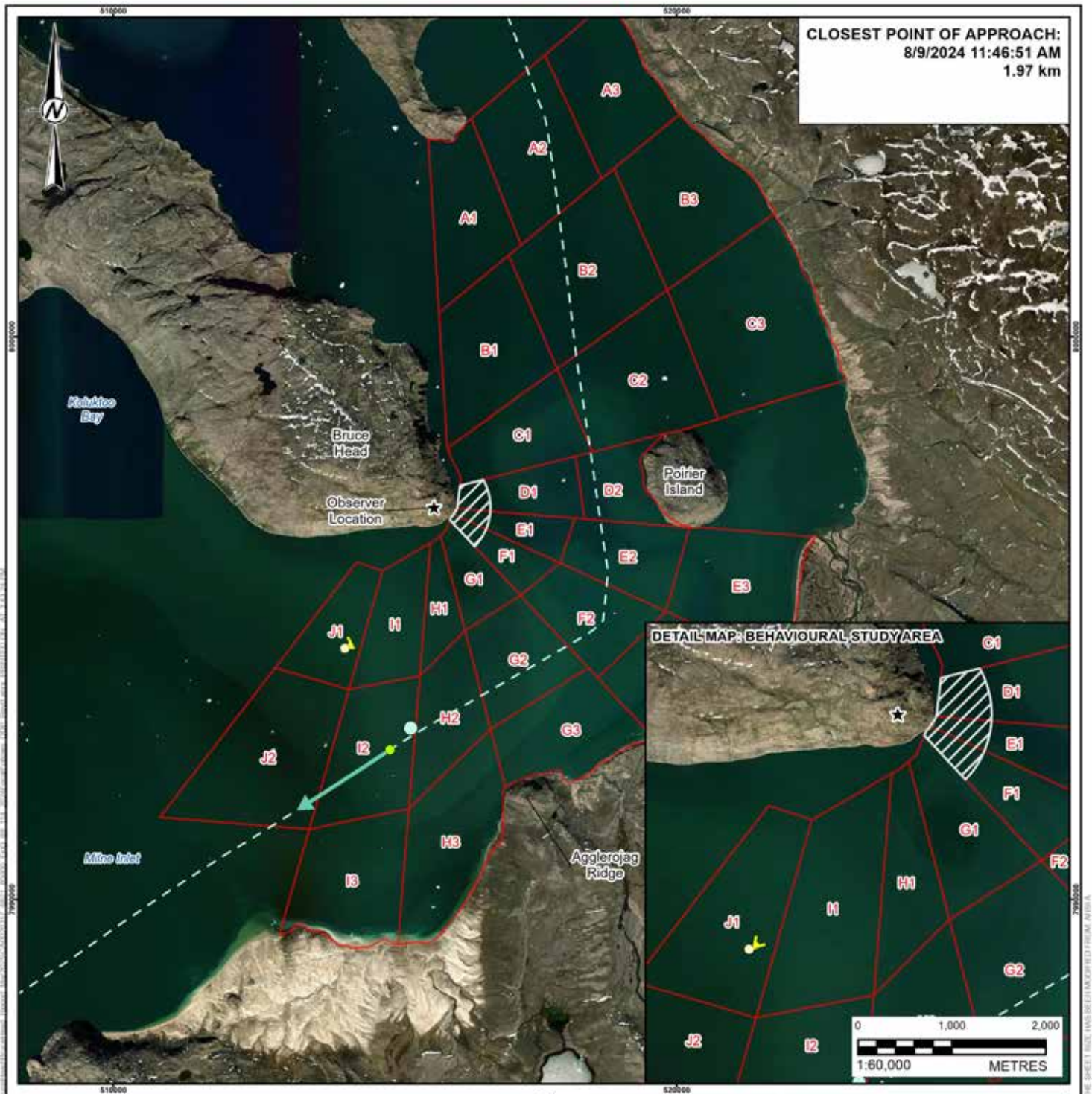
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FIGURE
D-91



LEGEND

- ACOUSTIC RECORDER (AMAR) LOCATION
- CLOSEST POINT OF APPROACH (VESSEL)
- CLOSEST POINT OF APPROACH (FOCAL FOLLOW)
- OBSERVER LOCATION
- FOCAL FOLLOW TRACK 9 (2024)
- ACTIVE VESSEL TRANSIT (NORDIC NULUJAAK)
- NON-ACTIVE VESSEL TRANSIT (NORDIC NULUJAAK)
- BEHAVIOURAL STUDY AREA (BSA)
- STRATIFIED STUDY AREA (SSA) SUBSTRATA

REFERENCE(S)

SUBSTRATA AND OBSERVER LOCATION DIGITIZED FROM LGL SHORE-BASED MONITORING OF NARWHALS AND VESSELS AT BRUCE HEAD, MILNE INLET, 2016 REPORT. SHIPPING ROUTE DATA BY CLIENT, JULY 14, 2020. HYDROGRAPHY, POPULATED PLACE, AND PROVINCIAL BOUNDARY DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED. IMAGERY COPYRIGHT ©20240729 AND 20230728 ESRI AND ITS LICENSORS. SOURCE: MAXAR, USED UNDER LICENSE, ALL RIGHTS RESERVED. PROJECTED COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N

CLIENT

BAFFINLAND IRON MINES CORPORATION

PROJECT

MARY RIVER PROJECT

TITLE

FOCAL FOLLOW 9 (2024) AND ACTIVE VESSEL TRANSIT

CONSULTANT



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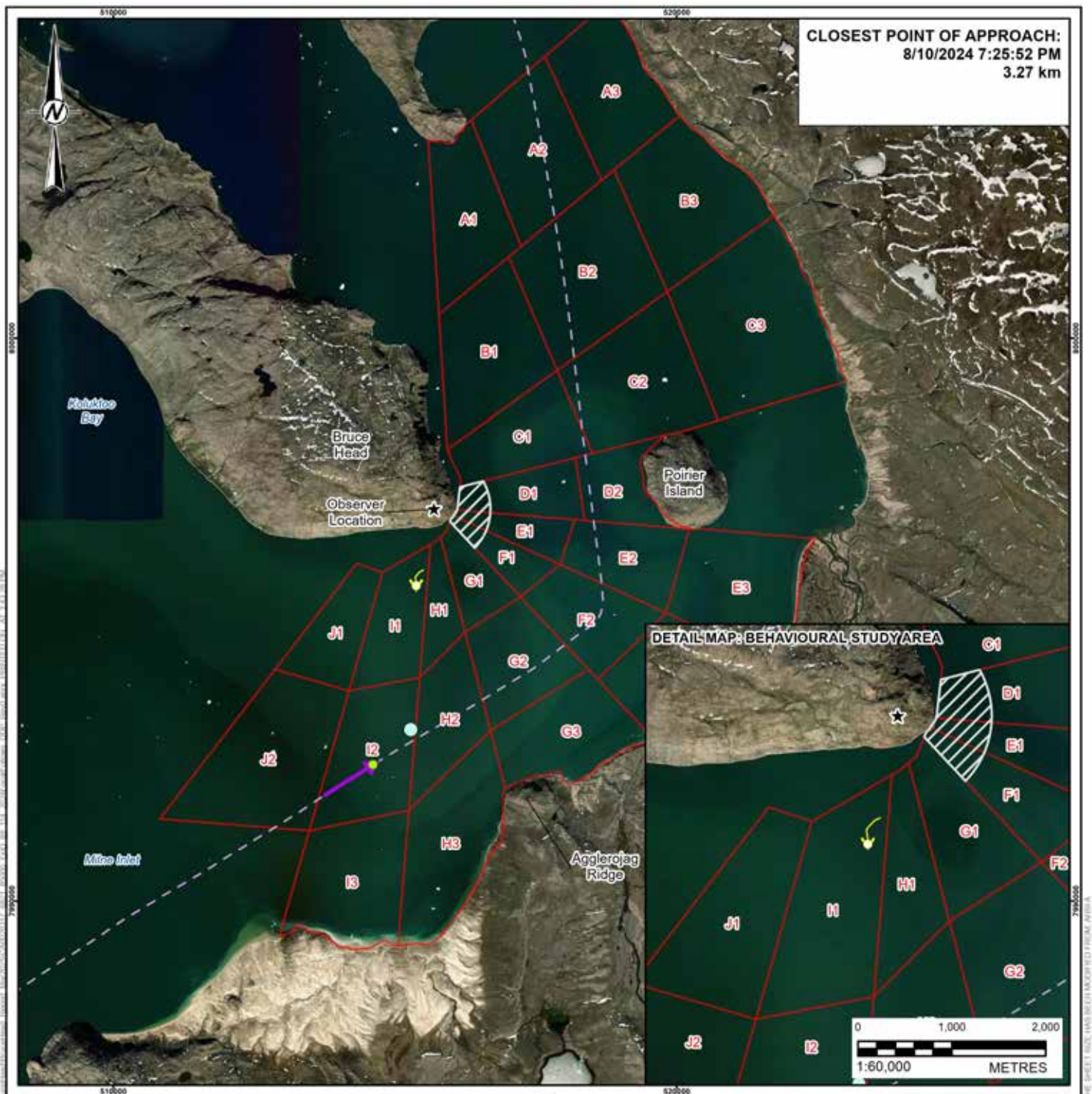
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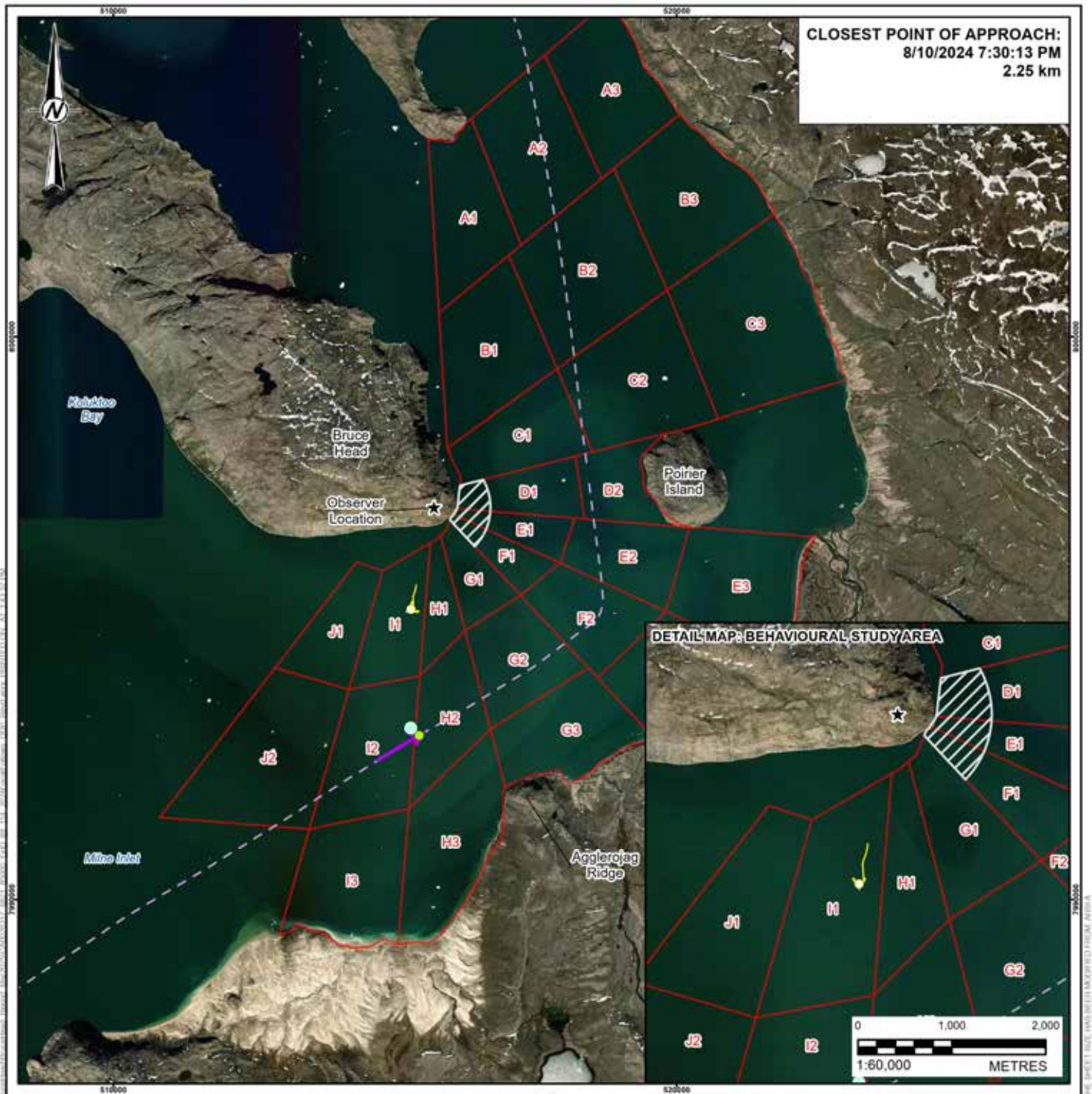
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CA0026317.6821

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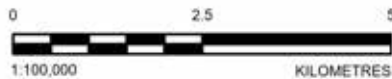
FIGURE
D-92





LEGEND

- ACOUSTIC RECORDER (AMAR) LOCATION
- CLOSEST POINT OF APPROACH (VESSEL)
- CLOSEST POINT OF APPROACH (FOCAL FOLLOW)
- ★ OBSERVER LOCATION
- FOCAL FOLLOW TRACK 21 (2024)
- ACTIVE VESSEL TRANSIT (CLAUDE A. DESGAGNES)
- NON-ACTIVE VESSEL TRANSIT (CLAUDE A. DESGAGNES)
- BEHAVIOURAL STUDY AREA (BSA)
- STRATIFIED STUDY AREA (SSA) SUBSTRATA



REFERENCE(S)

SUBSTRATA AND OBSERVER LOCATION DIGITIZED FROM LGL SHORE-BASED MONITORING OF NARWHALS AND VESSELS AT BRUCE HEAD, MILNE INLET, 2016 REPORT. SHIPPING ROUTE DATA BY CLIENT, JULY 14, 2020. HYDROGRAPHY, POPULATED PLACE, AND PROVINCIAL BOUNDARY DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED. IMAGERY COPYRIGHT ©20240729 AND 20230728 ESRI AND ITS LICENSORS. SOURCE: MAXAR, USED UNDER LICENSE, ALL RIGHTS RESERVED. PROJECTED COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N

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BAFFINLAND IRON MINES CORPORATION

PROJECT

MARY RIVER PROJECT

TITLE

FOCAL FOLLOW 21 (2024) AND ACTIVE VESSEL TRANSIT

CONSULTANT



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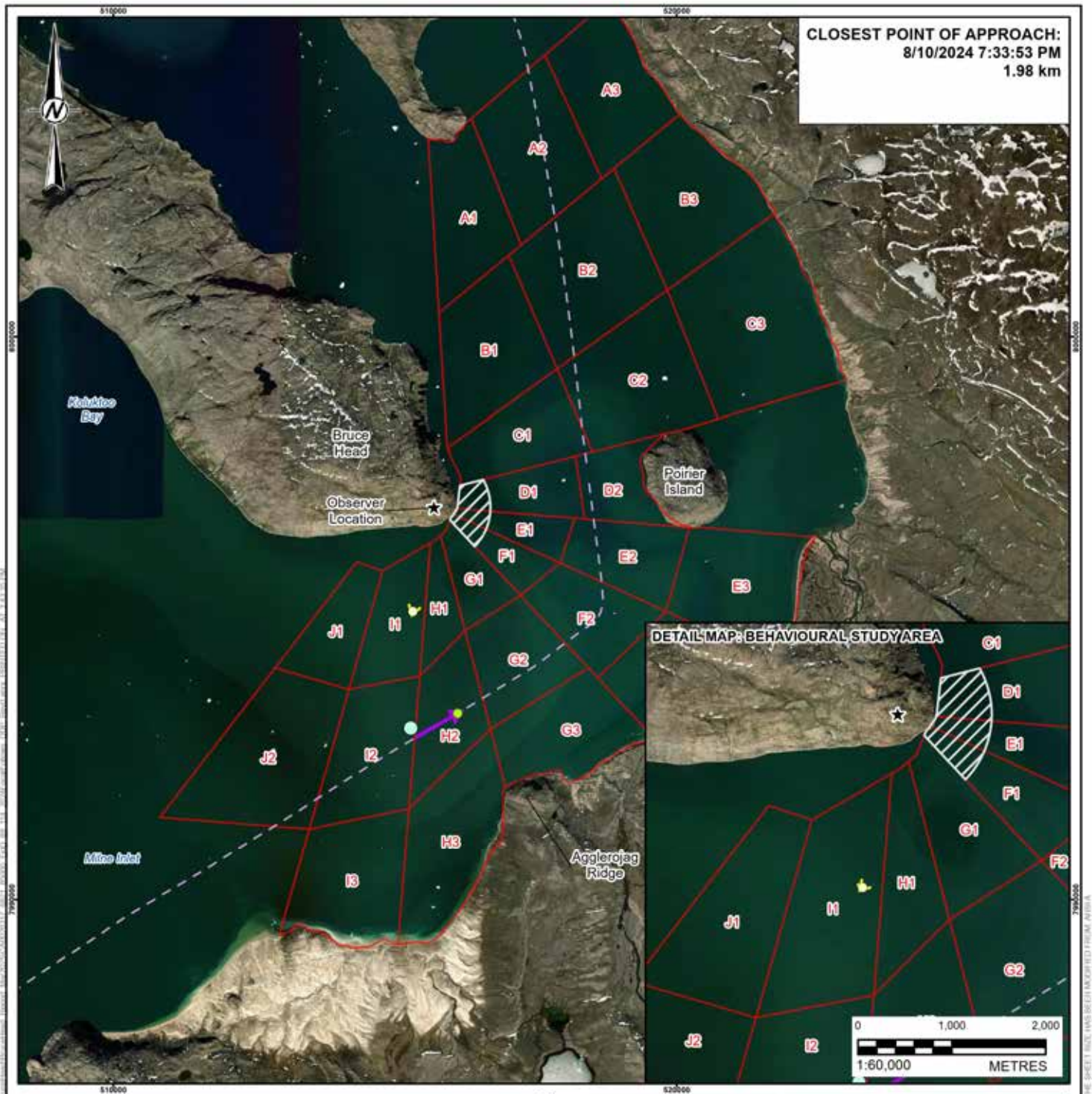
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FIGURE
D-94

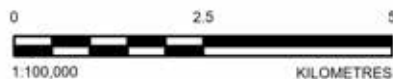
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CLOSEST POINT OF APPROACH:
8/10/2024 7:33:53 PM
1.98 km

LEGEND

- ACOUSTIC RECORDER (AMAR) LOCATION
- CLOSEST POINT OF APPROACH (VESSEL)
- CLOSEST POINT OF APPROACH (FOCAL FOLLOW)
- ★ OBSERVER LOCATION
- FOCAL FOLLOW TRACK 22 (2024)
- ACTIVE VESSEL TRANSIT (CLAUDE A. DESGAGNES)
- NON-ACTIVE VESSEL TRANSIT (CLAUDE A. DESGAGNES)
- BEHAVIOURAL STUDY AREA (BSA)
- STRATIFIED STUDY AREA (SSA) SUBSTRATA



REFERENCE(S)

SUBSTRATA AND OBSERVER LOCATION DIGITIZED FROM LGL SHORE-BASED MONITORING OF NARWHALS AND VESSELS AT BRUCE HEAD, MILNE INLET, 2016 REPORT. SHIPPING ROUTE DATA BY CLIENT, JULY 14, 2020. HYDROGRAPHY, POPULATED PLACE, AND PROVINCIAL BOUNDARY DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED. IMAGERY COPYRIGHT ©20240729 AND 20230728 ESRI AND ITS LICENSORS. SOURCE: MAXAR, USED UNDER LICENSE, ALL RIGHTS RESERVED. PROJECTED COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N

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PROJECT

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TITLE

FOCAL FOLLOW 22 (2024) AND ACTIVE VESSEL TRANSIT

CONSULTANT



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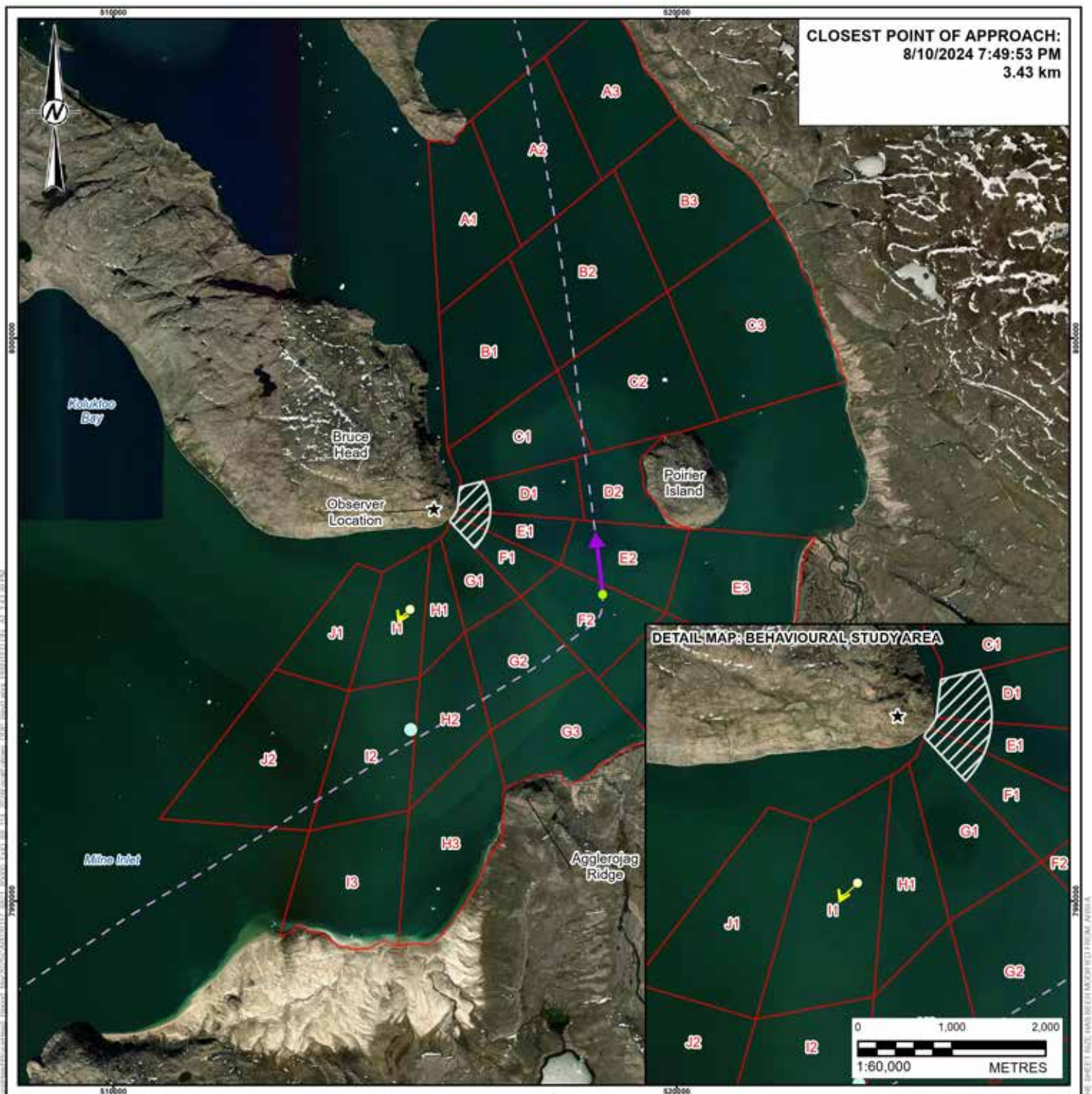
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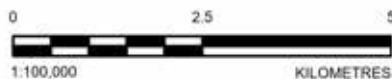
REV.
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FIGURE
D-95



LEGEND

- ACOUSTIC RECORDER (AMAR) LOCATION
- CLOSEST POINT OF APPROACH (VESSEL)
- CLOSEST POINT OF APPROACH (FOCAL FOLLOW)
- ★ OBSERVER LOCATION
- FOCAL FOLLOW TRACK 23 (2024)
- ACTIVE VESSEL TRANSIT (CLAUDE A. DESGAGNES)
- NON-ACTIVE VESSEL TRANSIT (CLAUDE A. DESGAGNES)
- BEHAVIOURAL STUDY AREA (BSA)
- STRATIFIED STUDY AREA (SSA) SUBSTRATA



REFERENCE(S)

SUBSTRATA AND OBSERVER LOCATION DIGITIZED FROM LGL SHORE-BASED MONITORING OF NARWHALS AND VESSELS AT BRUCE HEAD, MILNE INLET, 2016 REPORT. SHIPPING ROUTE DATA BY CLIENT, JULY 14, 2020. HYDROGRAPHY, POPULATED PLACE, AND PROVINCIAL BOUNDARY DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED. IMAGERY COPYRIGHT ©20240729 AND 20230728 ESRI AND ITS LICENSORS. SOURCE: MAXAR, USED UNDER LICENSE, ALL RIGHTS RESERVED. PROJECTED COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N

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PROJECT

MARY RIVER PROJECT

TITLE

FOCAL FOLLOW 23 (2024) AND ACTIVE VESSEL TRANSIT

CONSULTANT



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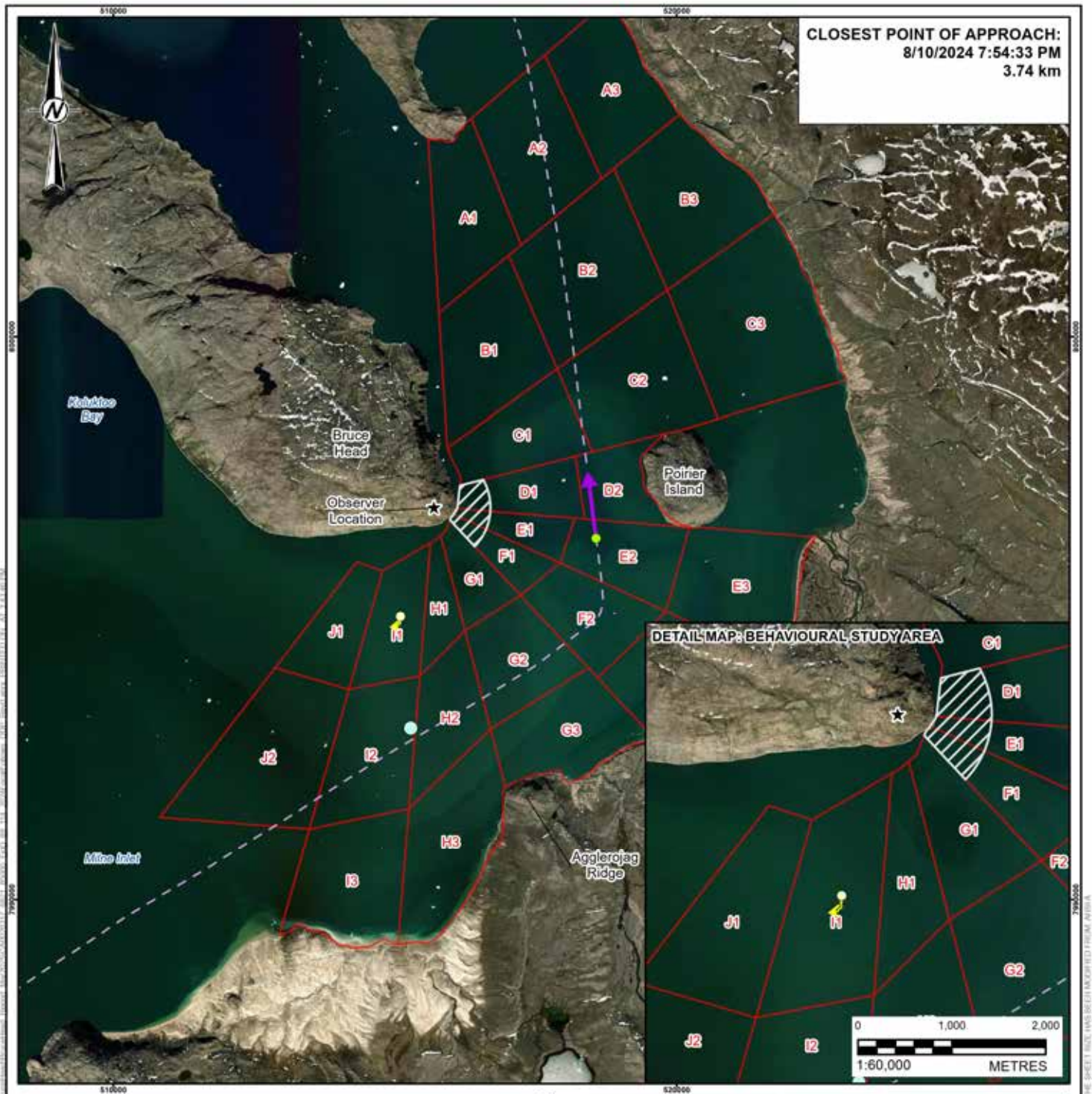
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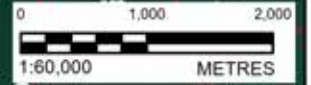
REV.
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FIGURE
D-96



CLOSEST POINT OF APPROACH:
8/10/2024 7:54:33 PM
3.74 km

DETAIL MAP: BEHAVIOURAL STUDY AREA



LEGEND

- ACOUSTIC RECORDER (AMAR) LOCATION
- CLOSEST POINT OF APPROACH (VESSEL)
- CLOSEST POINT OF APPROACH (FOCAL FOLLOW)
- ★ OBSERVER LOCATION
- FOCAL FOLLOW TRACK 24 (2024)
- ACTIVE VESSEL TRANSIT (CLAUDE A. DESGAGNES)
- NON-ACTIVE VESSEL TRANSIT (CLAUDE A. DESGAGNES)
- BEHAVIOURAL STUDY AREA (BSA)
- STRATIFIED STUDY AREA (SSA) SUBSTRATA



REFERENCE(S)

SUBSTRATA AND OBSERVER LOCATION DIGITIZED FROM LGL SHORE-BASED MONITORING OF NARWHALS AND VESSELS AT BRUCE HEAD, MILNE INLET, 2016 REPORT. SHIPPING ROUTE DATA BY CLIENT, JULY 14, 2020. HYDROGRAPHY, POPULATED PLACE, AND PROVINCIAL BOUNDARY DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED. IMAGERY COPYRIGHT ©20240729 AND 20230728 ESRI AND ITS LICENSORS. SOURCE: MAXAR, USED UNDER LICENSE, ALL RIGHTS RESERVED. PROJECTED COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N

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PROJECT

MARY RIVER PROJECT

TITLE

FOCAL FOLLOW 24 (2024) AND ACTIVE VESSEL TRANSIT

CONSULTANT



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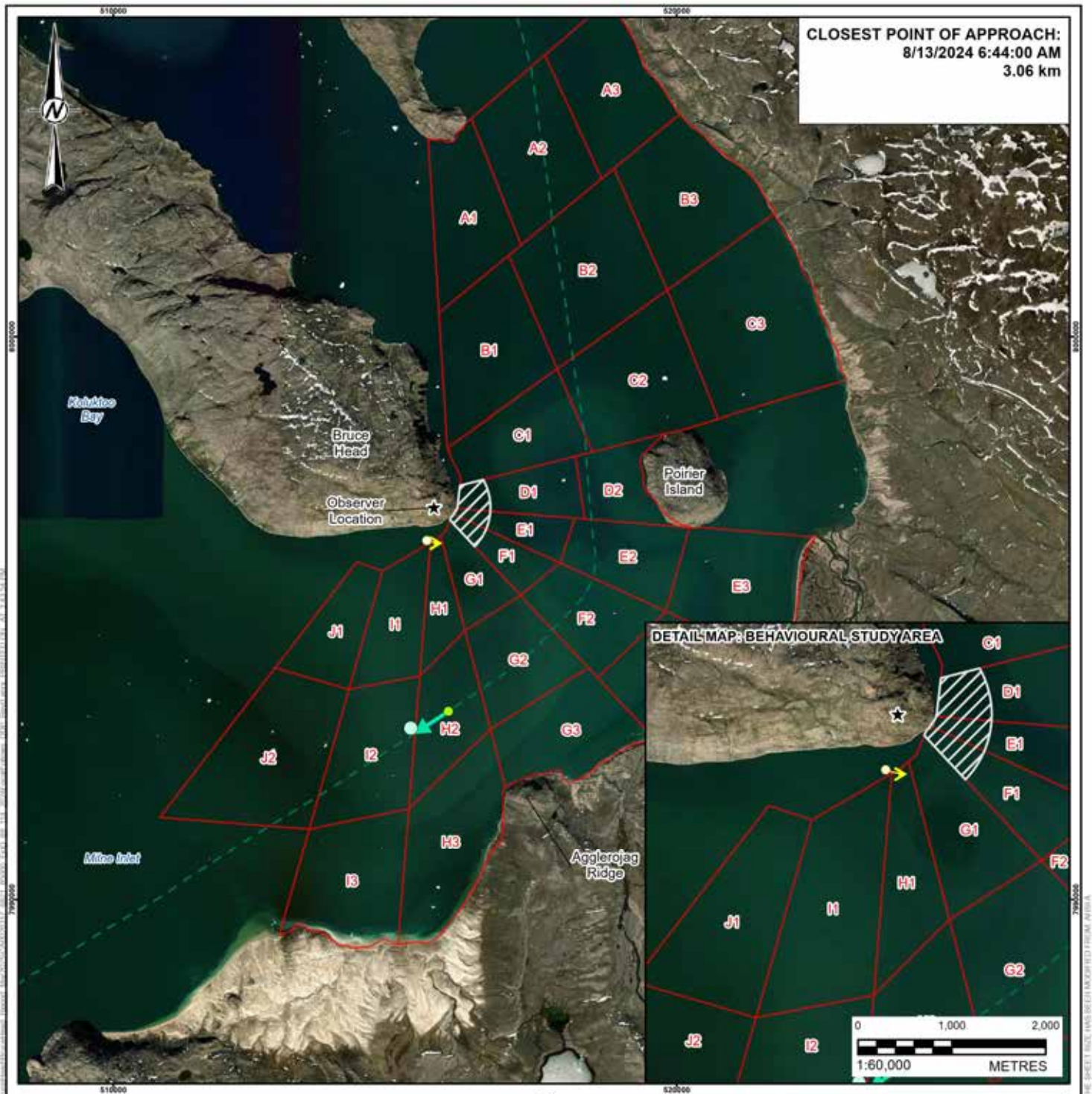
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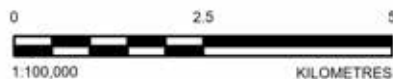
FIGURE
D-97



CLOSEST POINT OF APPROACH:
8/13/2024 6:44:00 AM
3.06 km

LEGEND

- ACOUSTIC RECORDER (AMAR) LOCATION
- CLOSEST POINT OF APPROACH (VESSEL)
- CLOSEST POINT OF APPROACH (FOCAL FOLLOW)
- ★ OBSERVER LOCATION
- FOCAL FOLLOW TRACK 29 (2024)
- ACTIVE VESSEL TRANSIT (AM BUCHANAN)
- NON-ACTIVE VESSEL TRANSIT (AM BUCHANAN)
- BEHAVIOURAL STUDY AREA (BSA)
- STRATIFIED STUDY AREA (SSA) SUBSTRATA



REFERENCE(S)

SUBSTRATA AND OBSERVER LOCATION DIGITIZED FROM LGL SHORE-BASED MONITORING OF NARWHALS AND VESSELS AT BRUCE HEAD, MILNE INLET, 2016 REPORT. SHIPPING ROUTE DATA BY CLIENT, JULY 14, 2020. HYDROGRAPHY, POPULATED PLACE, AND PROVINCIAL BOUNDARY DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED. IMAGERY COPYRIGHT ©20240729 AND 20230728 ESRI AND ITS LICENSORS. SOURCE: MAXAR, USED UNDER LICENSE, ALL RIGHTS RESERVED. PROJECTED COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N

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PROJECT

MARY RIVER PROJECT

TITLE

FOCAL FOLLOW 29 (2024) AND ACTIVE VESSEL TRANSIT

CONSULTANT



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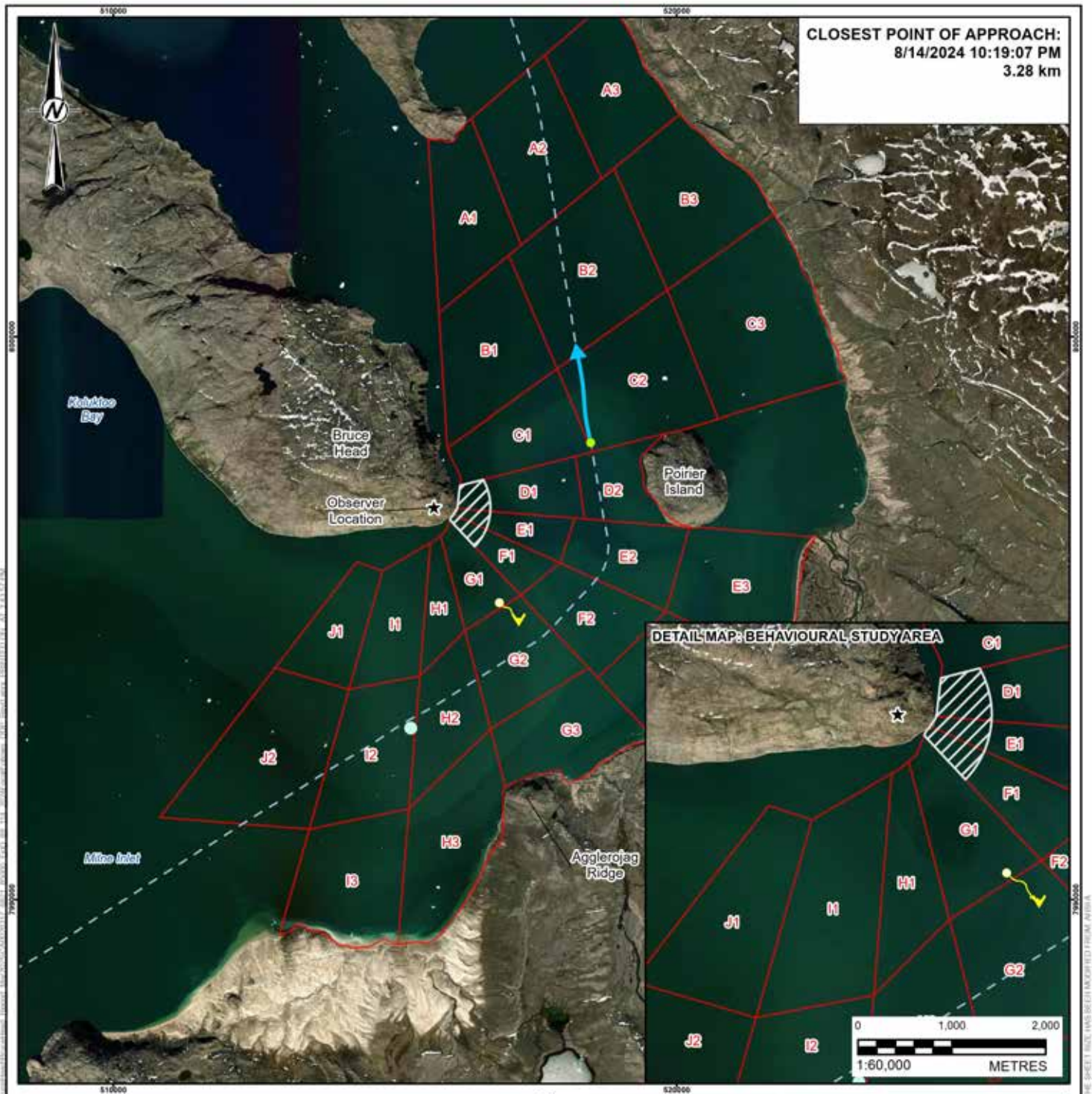
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FIGURE
D-99



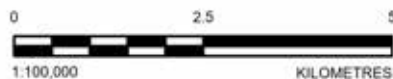
CLOSEST POINT OF APPROACH:
8/14/2024 10:19:07 PM
3.28 km

DETAIL MAP: BEHAVIOURAL STUDY AREA



LEGEND

- ACOUSTIC RECORDER (AMAR) LOCATION
- CLOSEST POINT OF APPROACH (VESSEL)
- CLOSEST POINT OF APPROACH (FOCAL FOLLOW)
- OBSERVER LOCATION
- FOCAL FOLLOW TRACK 32 (2024)
- ACTIVE VESSEL TRANSIT (GOLDEN PEARL)
- NON-ACTIVE VESSEL TRANSIT (GOLDEN PEARL)
- BEHAVIOURAL STUDY AREA (BSA)
- STRATIFIED STUDY AREA (SSA) SUBSTRATA



REFERENCE(S)

SUBSTRATA AND OBSERVER LOCATION DIGITIZED FROM LGL SHORE-BASED MONITORING OF NARWHALS AND VESSELS AT BRUCE HEAD, MILNE INLET, 2016 REPORT. SHIPPING ROUTE DATA BY CLIENT, JULY 14, 2020. HYDROGRAPHY, POPULATED PLACE, AND PROVINCIAL BOUNDARY DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED. IMAGERY COPYRIGHT ©20240729 AND 20230728 ESRI AND ITS LICENSORS. SOURCE: MAXAR, USED UNDER LICENSE, ALL RIGHTS RESERVED. PROJECTED COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N

CLIENT

BAFFINLAND IRON MINES CORPORATION

PROJECT

MARY RIVER PROJECT

TITLE

FOCAL FOLLOW 32 (2024) AND ACTIVE VESSEL TRANSIT

CONSULTANT



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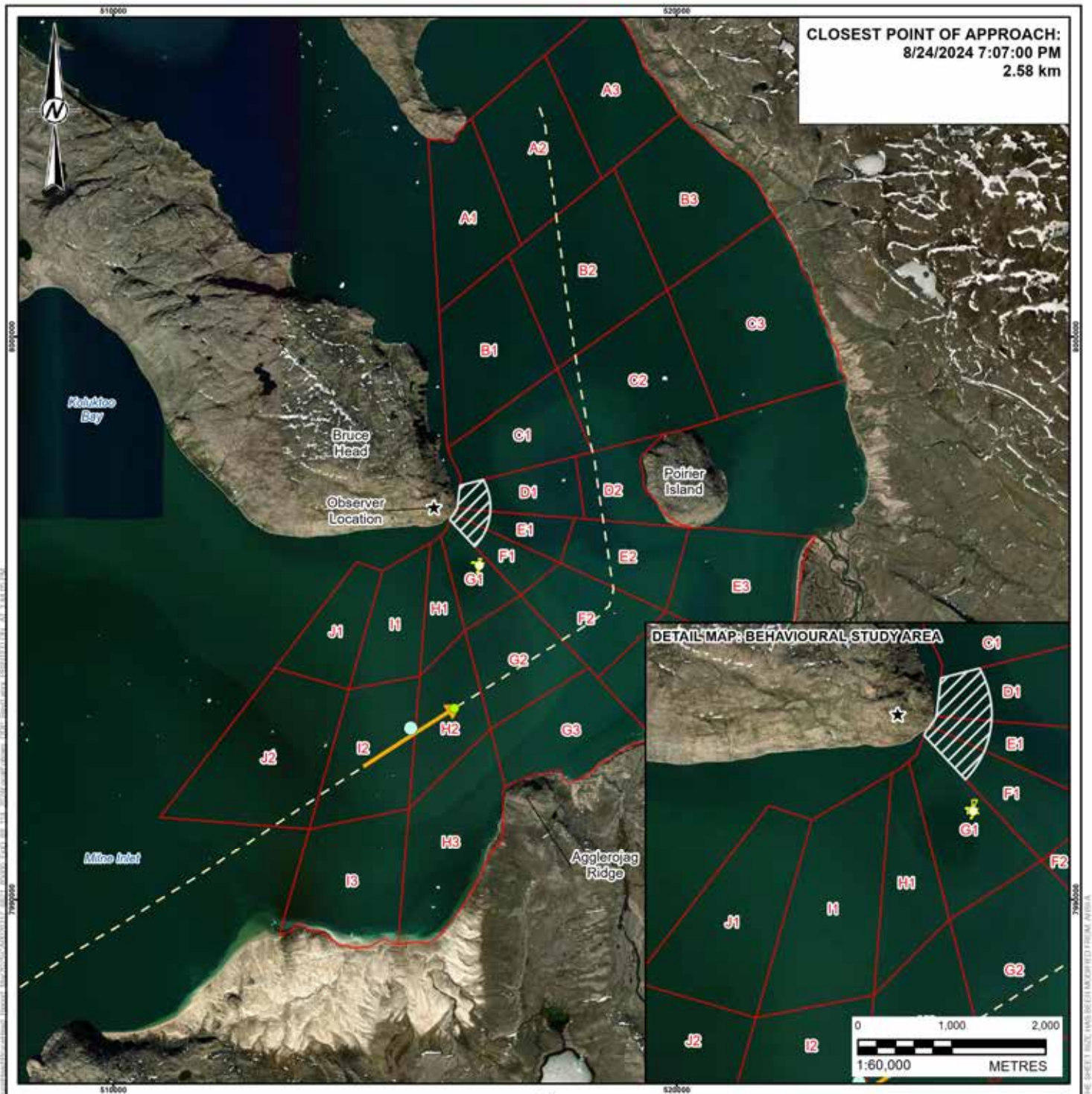
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CA0026317.6821

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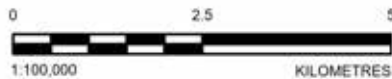
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FIGURE
D-100



LEGEND

- ACOUSTIC RECORDER (AMAR) LOCATION
- CLOSEST POINT OF APPROACH (VESSEL)
- CLOSEST POINT OF APPROACH (FOCAL FOLLOW)
- ★ OBSERVER LOCATION
- FOCAL FOLLOW TRACK 69 (2024)
- ACTIVE VESSEL TRANSIT (GOLDEN OPAL)
- NON-ACTIVE VESSEL TRANSIT (GOLDEN OPAL)
- BEHAVIOURAL STUDY AREA (BSA)
- STRATIFIED STUDY AREA (SSA) SUBSTRATA



REFERENCE(S)

SUBSTRATA AND OBSERVER LOCATION DIGITIZED FROM LGL SHORE-BASED MONITORING OF NARWHALS AND VESSELS AT BRUCE HEAD, MILNE INLET, 2016 REPORT. SHIPPING ROUTE DATA BY CLIENT, JULY 14, 2020. HYDROGRAPHY, POPULATED PLACE, AND PROVINCIAL BOUNDARY DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED. IMAGERY COPYRIGHT ©20240729 AND 20230728 ESRI AND ITS LICENSORS. SOURCE: MAXAR, USED UNDER LICENSE, ALL RIGHTS RESERVED. PROJECTED COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N

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PROJECT

MARY RIVER PROJECT

TITLE

FOCAL FOLLOW 69 (2024) AND ACTIVE VESSEL TRANSIT

CONSULTANT



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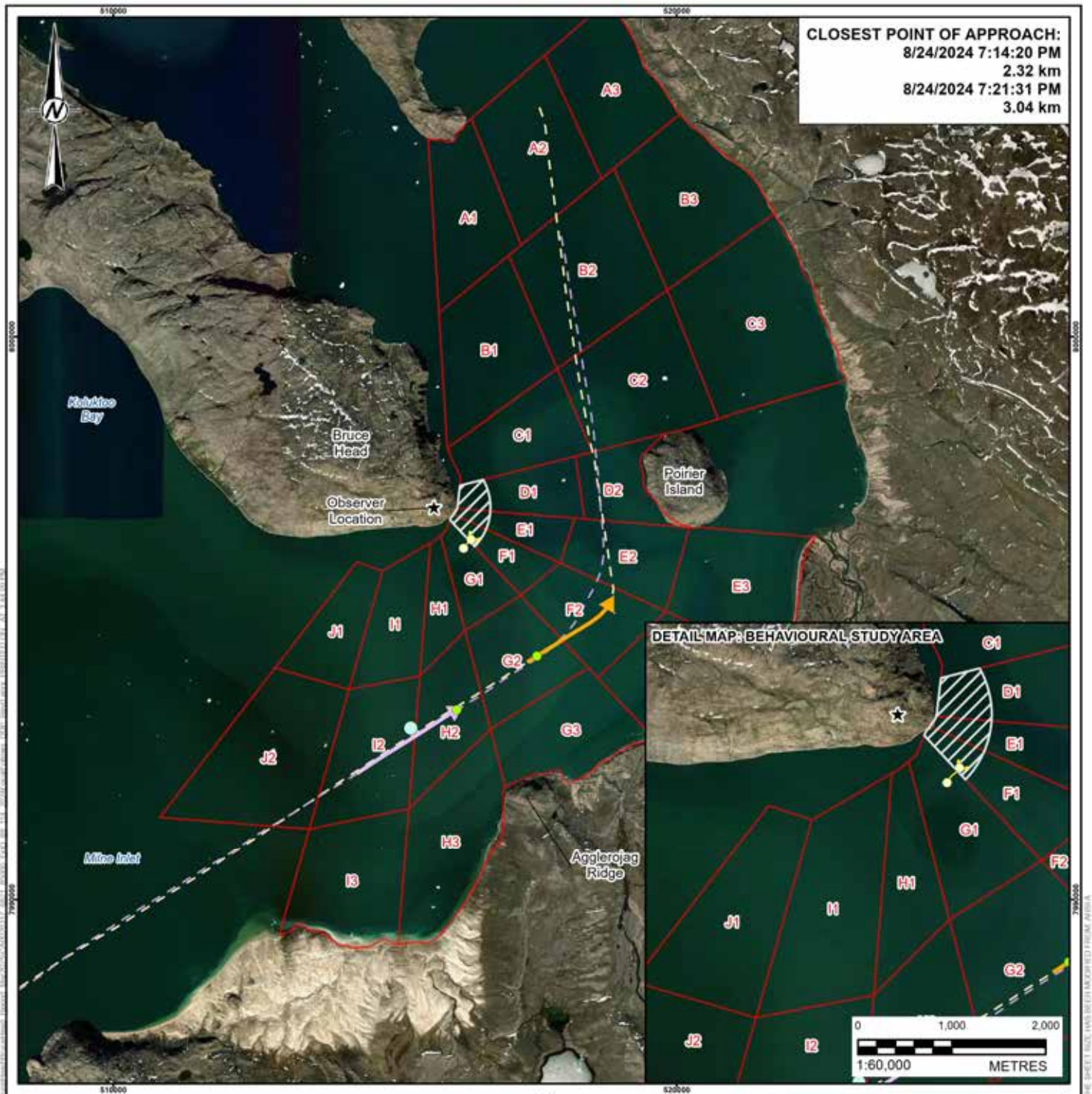
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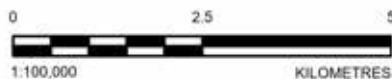
REV.
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FIGURE
D-102



LEGEND

- ACOUSTIC RECORDER (AMAR) LOCATION
- CLOSEST POINT OF APPROACH (VESSEL)
- CLOSEST POINT OF APPROACH (FOCAL FOLLOW)
- ★ OBSERVER LOCATION
- FOCAL FOLLOW TRACK 70 (2024)
- ACTIVE VESSEL TRANSIT (GOLDEN OPAL)
- ACTIVE VESSEL TRANSIT (SARAH DESGAGNES)
- NON-ACTIVE VESSEL TRANSIT (SARAH DESGAGNES)
- BEHAVIOURAL STUDY AREA (BSA)
- STRATIFIED STUDY AREA (SSA) SUBSTRATA



REFERENCE(S)

SUBSTRATA AND OBSERVER LOCATION DIGITIZED FROM LGL SHORE-BASED MONITORING OF NARWHALS AND VESSELS AT BRUCE HEAD, MILNE INLET, 2016 REPORT. SHIPPING ROUTE DATA BY CLIENT, JULY 14, 2020. HYDROGRAPHY, POPULATED PLACE, AND PROVINCIAL BOUNDARY DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED. IMAGERY COPYRIGHT ©20240729 AND 20230728 ESRI AND ITS LICENSORS. SOURCE: MAXAR, USED UNDER LICENSE, ALL RIGHTS RESERVED. PROJECTED COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N

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PROJECT

MARY RIVER PROJECT

TITLE

FOCAL FOLLOW 70 (2024) AND ACTIVE VESSEL TRANSIT

CONSULTANT



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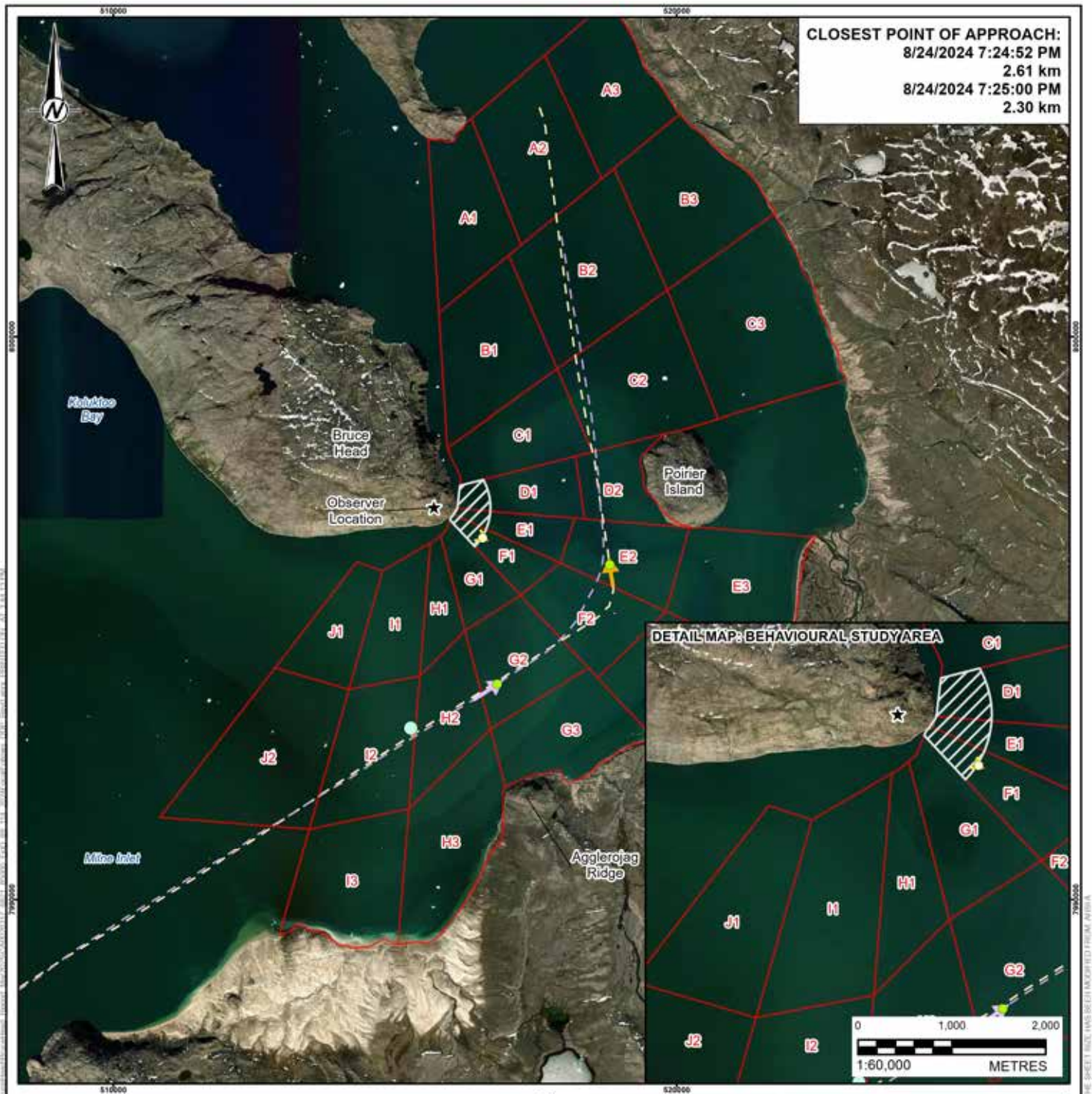
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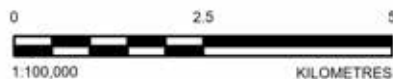
FIGURE
D-103



CLOSEST POINT OF APPROACH:
 8/24/2024 7:24:52 PM
 2.61 km
 8/24/2024 7:25:00 PM
 2.30 km

LEGEND

- ACOUSTIC RECORDER (AMAR) LOCATION
- CLOSEST POINT OF APPROACH (VESSEL)
- CLOSEST POINT OF APPROACH (FOCAL FOLLOW)
- ★ OBSERVER LOCATION
- FOCAL FOLLOW TRACK 71 (2024)
- ACTIVE VESSEL TRANSIT (GOLDEN OPAL)
- ACTIVE VESSEL TRANSIT (SARAH DESGAGNES)
- NON-ACTIVE VESSEL TRANSIT (SARAH DESGAGNES)
- BEHAVIOURAL STUDY AREA (BSA)
- STRATIFIED STUDY AREA (SSA) SUBSTRATA



REFERENCE(S)

SUBSTRATA AND OBSERVER LOCATION DIGITIZED FROM LGL SHORE-BASED MONITORING OF NARWHALS AND VESSELS AT BRUCE HEAD, MILNE INLET, 2016 REPORT. SHIPPING ROUTE DATA BY CLIENT, JULY 14, 2020. HYDROGRAPHY, POPULATED PLACE, AND PROVINCIAL BOUNDARY DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED. IMAGERY COPYRIGHT ©20240729 AND 20230728 ESRI AND ITS LICENSORS. SOURCE: MAXAR, USED UNDER LICENSE, ALL RIGHTS RESERVED. PROJECTED COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N

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PROJECT

MARY RIVER PROJECT

TITLE

FOCAL FOLLOW 71 (2024) AND ACTIVE VESSEL TRANSIT

CONSULTANT



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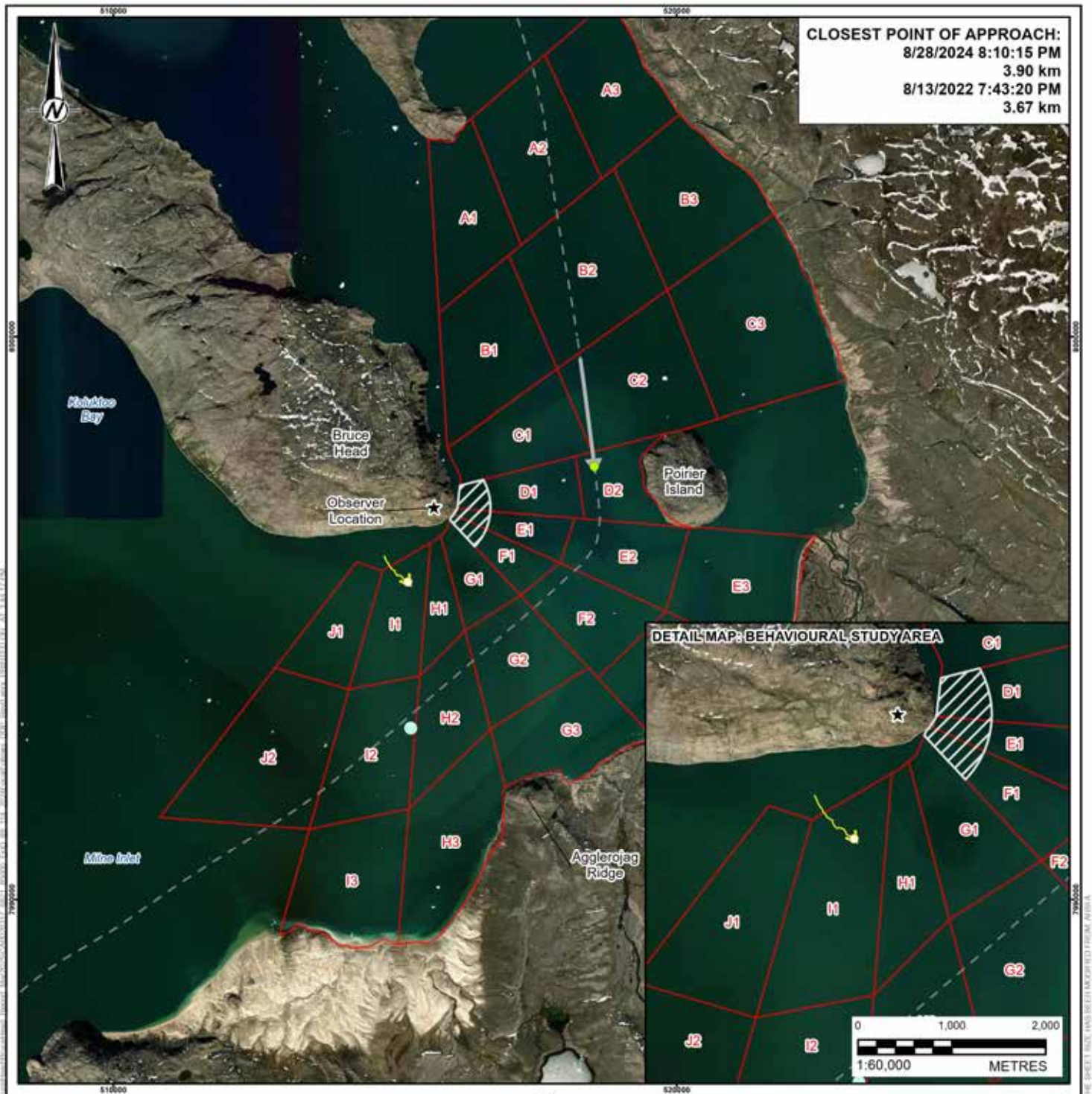
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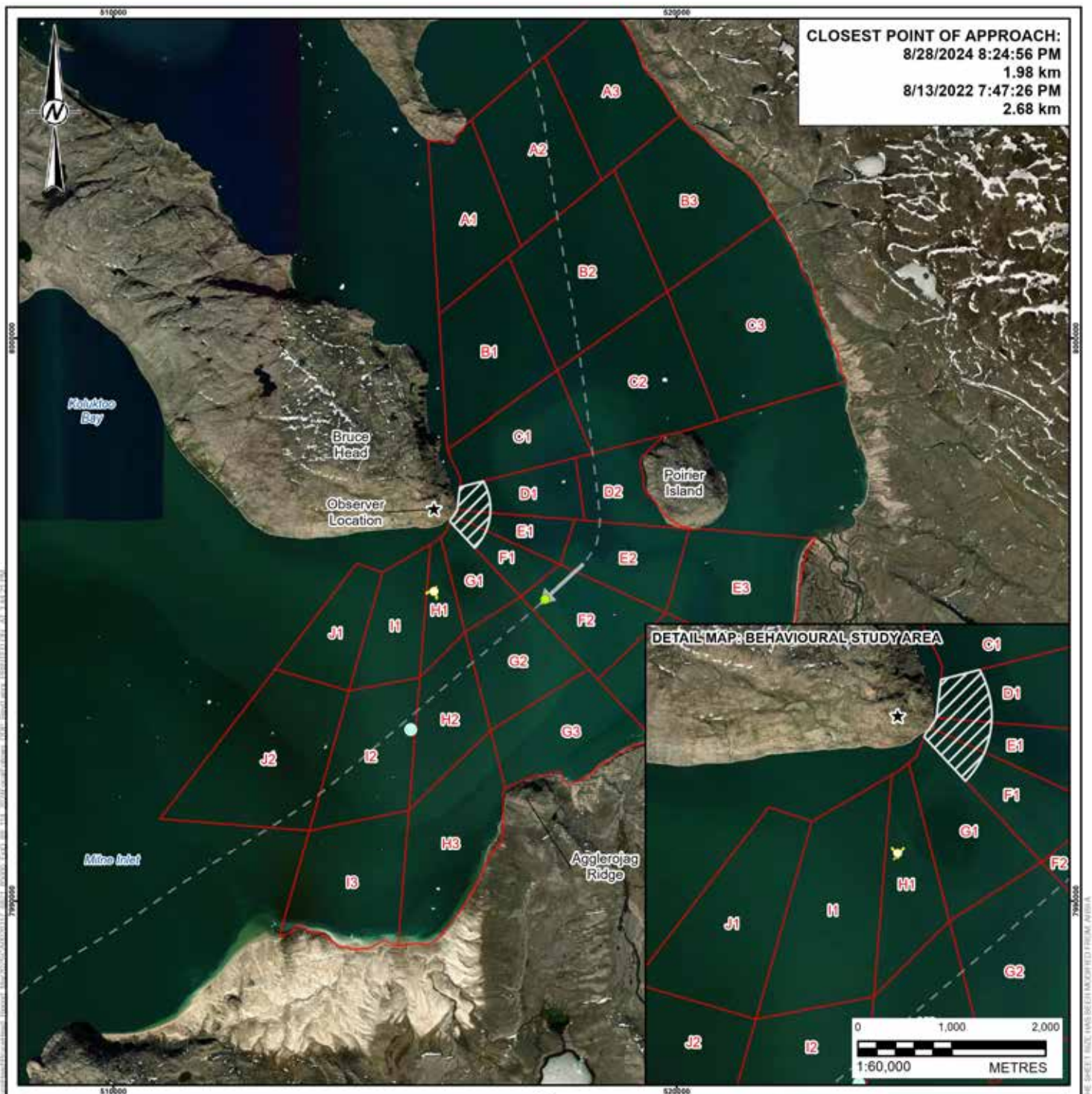
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FIGURE
D-104





LEGEND

- ACOUSTIC RECORDER (AMAR) LOCATION
- CLOSEST POINT OF APPROACH (VESSEL)
- CLOSEST POINT OF APPROACH (FOCAL FOLLOW)
- OBSERVER LOCATION
- FOCAL FOLLOW TRACK 88 (2024)
- ACTIVE VESSEL TRANSIT (GOLDEN GRACE)
- NON-ACTIVE VESSEL TRANSIT (GOLDEN GRACE)
- BEHAVIOURAL STUDY AREA (BSA)
- STRATIFIED STUDY AREA (SSA) SUBSTRATA

REFERENCE(S)

SUBSTRATA AND OBSERVER LOCATION DIGITIZED FROM LGL SHORE-BASED MONITORING OF NARWHALS AND VESSELS AT BRUCE HEAD, MILNE INLET, 2016 REPORT. SHIPPING ROUTE DATA BY CLIENT, JULY 14, 2020. HYDROGRAPHY, POPULATED PLACE, AND PROVINCIAL BOUNDARY DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED. IMAGERY COPYRIGHT ©20240729 AND 20230728 ESRI AND ITS LICENSORS. SOURCE: MAXAR, USED UNDER LICENSE, ALL RIGHTS RESERVED. PROJECTED COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N

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PROJECT

MARY RIVER PROJECT

TITLE

FOCAL FOLLOW 88 (2024) AND ACTIVE VESSEL TRANSIT

CONSULTANT



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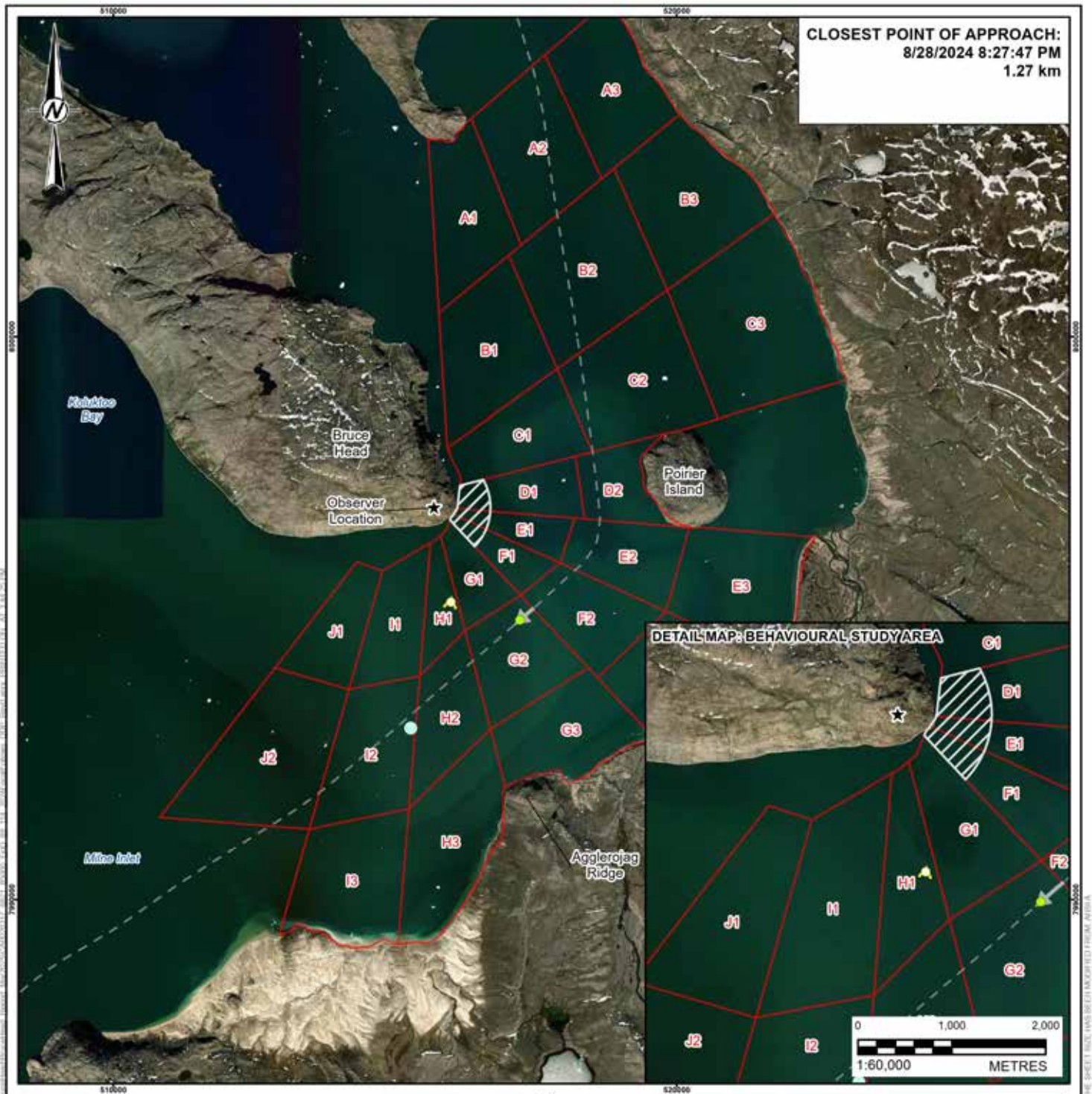
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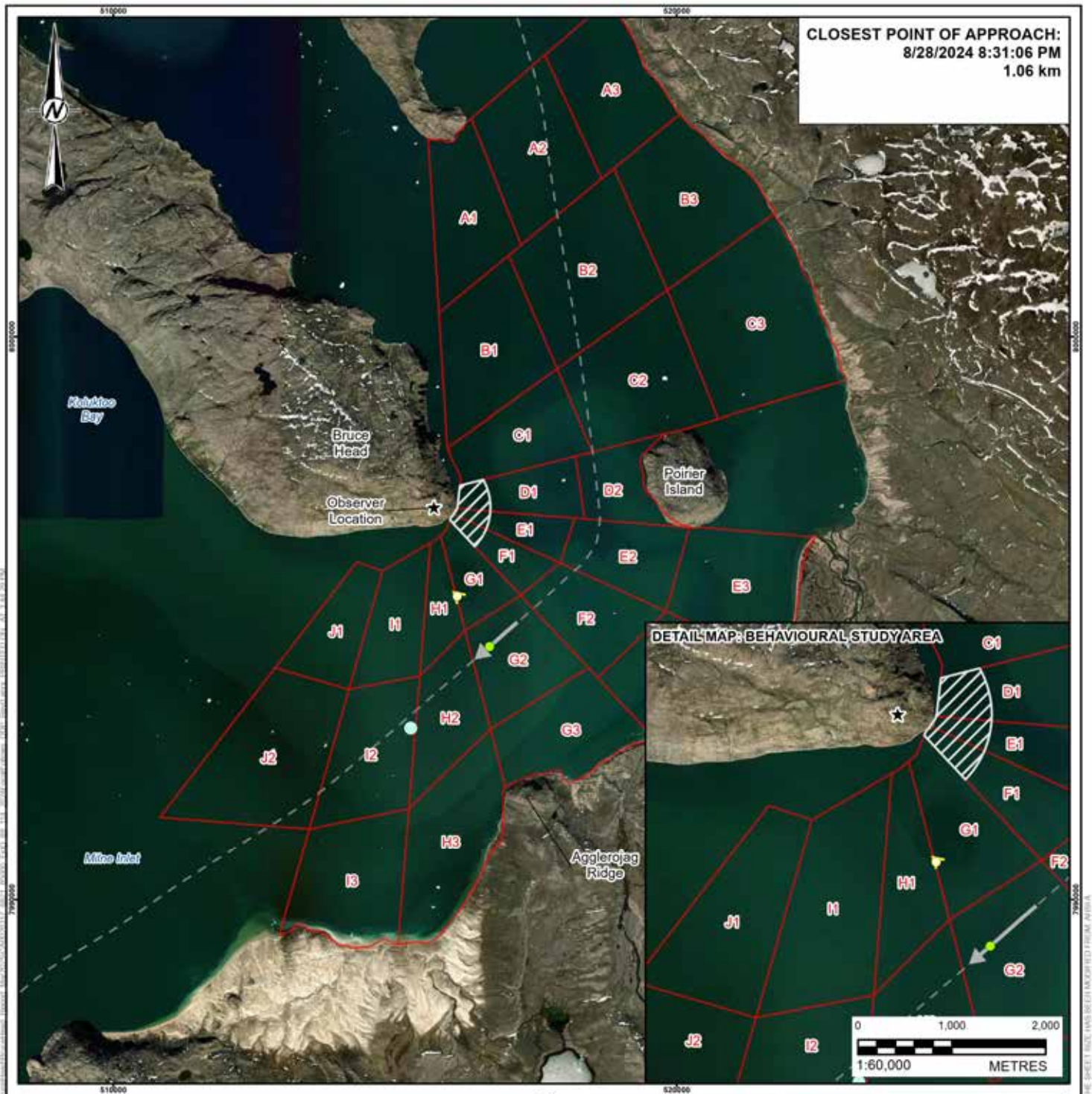
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FIGURE
D-106

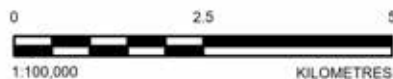
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LEGEND

- ACOUSTIC RECORDER (AMAR) LOCATION
- CLOSEST POINT OF APPROACH (VESSEL)
- CLOSEST POINT OF APPROACH (FOCAL FOLLOW)
- ★ OBSERVER LOCATION
- FOCAL FOLLOW TRACK 90 (2024)
- ACTIVE VESSEL TRANSIT (GOLDEN GRACE)
- NON-ACTIVE VESSEL TRANSIT (GOLDEN GRACE)
- BEHAVIOURAL STUDY AREA (BSA)
- STRATIFIED STUDY AREA (SSA) SUBSTRATA



REFERENCE(S)

SUBSTRATA AND OBSERVER LOCATION DIGITIZED FROM LGL SHORE-BASED MONITORING OF NARWHALS AND VESSELS AT BRUCE HEAD, MILNE INLET, 2016 REPORT. SHIPPING ROUTE DATA BY CLIENT, JULY 14, 2020. HYDROGRAPHY, POPULATED PLACE, AND PROVINCIAL BOUNDARY DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED. IMAGERY COPYRIGHT ©20240729 AND 20230728 ESRI AND ITS LICENSORS. SOURCE: MAXAR, USED UNDER LICENSE, ALL RIGHTS RESERVED. PROJECTED COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N

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PROJECT

MARY RIVER PROJECT

TITLE

FOCAL FOLLOW 90 (2024) AND ACTIVE VESSEL TRANSIT

CONSULTANT



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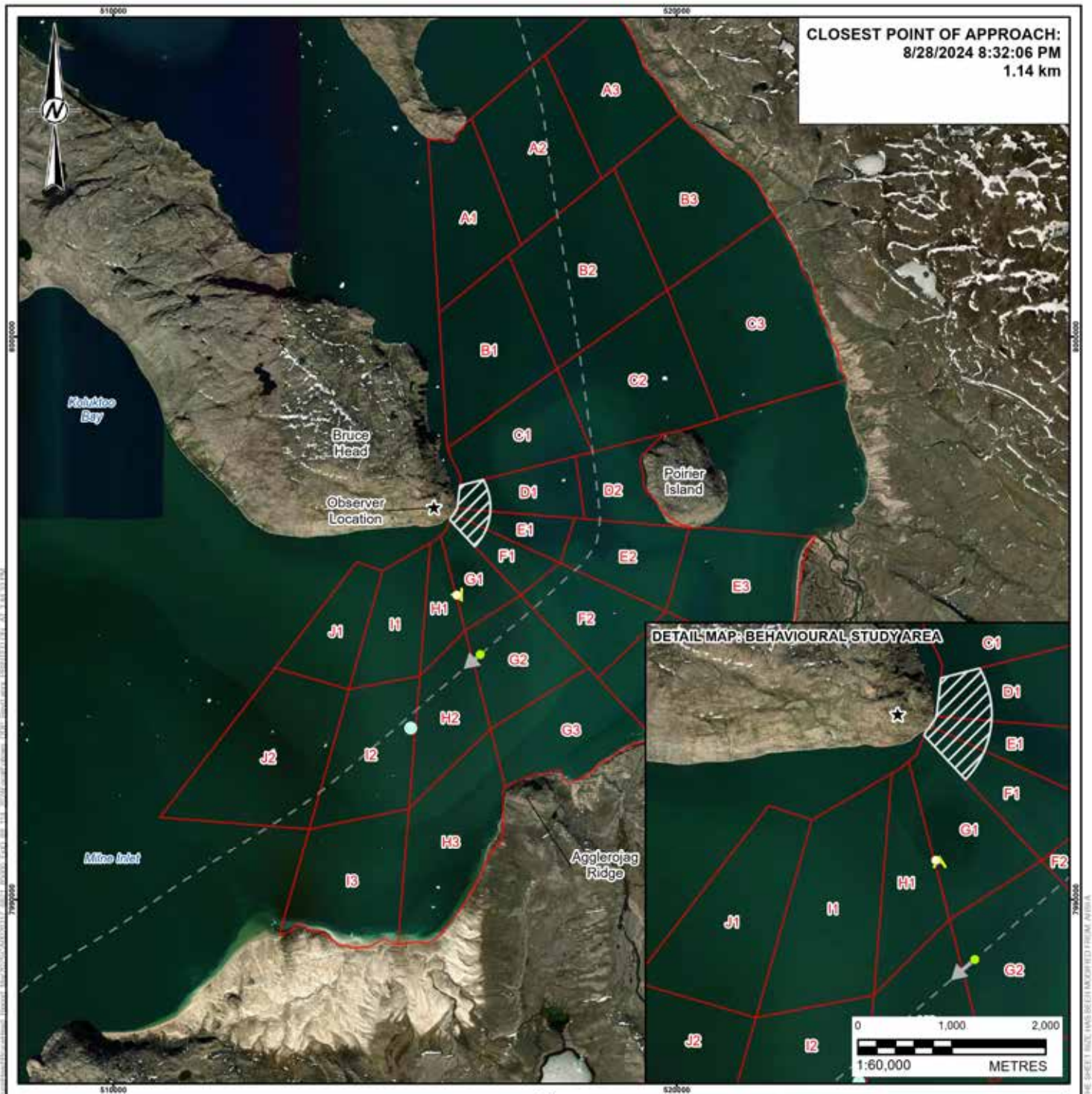
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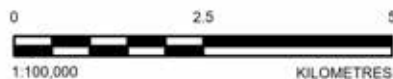
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FIGURE
D-108



LEGEND

- ACOUSTIC RECORDER (AMAR) LOCATION
- CLOSEST POINT OF APPROACH (VESSEL)
- CLOSEST POINT OF APPROACH (FOCAL FOLLOW)
- ★ OBSERVER LOCATION
- FOCAL FOLLOW TRACK 91 (2024)
- ACTIVE VESSEL TRANSIT (GOLDEN GRACE)
- NON-ACTIVE VESSEL TRANSIT (GOLDEN GRACE)
- BEHAVIOURAL STUDY AREA (BSA)
- STRATIFIED STUDY AREA (SSA) SUBSTRATA



REFERENCE(S)

SUBSTRATA AND OBSERVER LOCATION DIGITIZED FROM LGL SHORE-BASED MONITORING OF NARWHALS AND VESSELS AT BRUCE HEAD, MILNE INLET, 2016 REPORT. SHIPPING ROUTE DATA BY CLIENT, JULY 14, 2020. HYDROGRAPHY, POPULATED PLACE, AND PROVINCIAL BOUNDARY DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED. IMAGERY COPYRIGHT ©20240729 AND 20230728 ESRI AND ITS LICENSORS. SOURCE: MAXAR, USED UNDER LICENSE, ALL RIGHTS RESERVED. PROJECTED COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N

CLIENT

BAFFINLAND IRON MINES CORPORATION

PROJECT

MARY RIVER PROJECT

TITLE

FOCAL FOLLOW 91 (2024) AND ACTIVE VESSEL TRANSIT

CONSULTANT



YYYY-MM-DD 2025-04-24

DESIGNED SU

PREPARED AA

REVIEWED PA

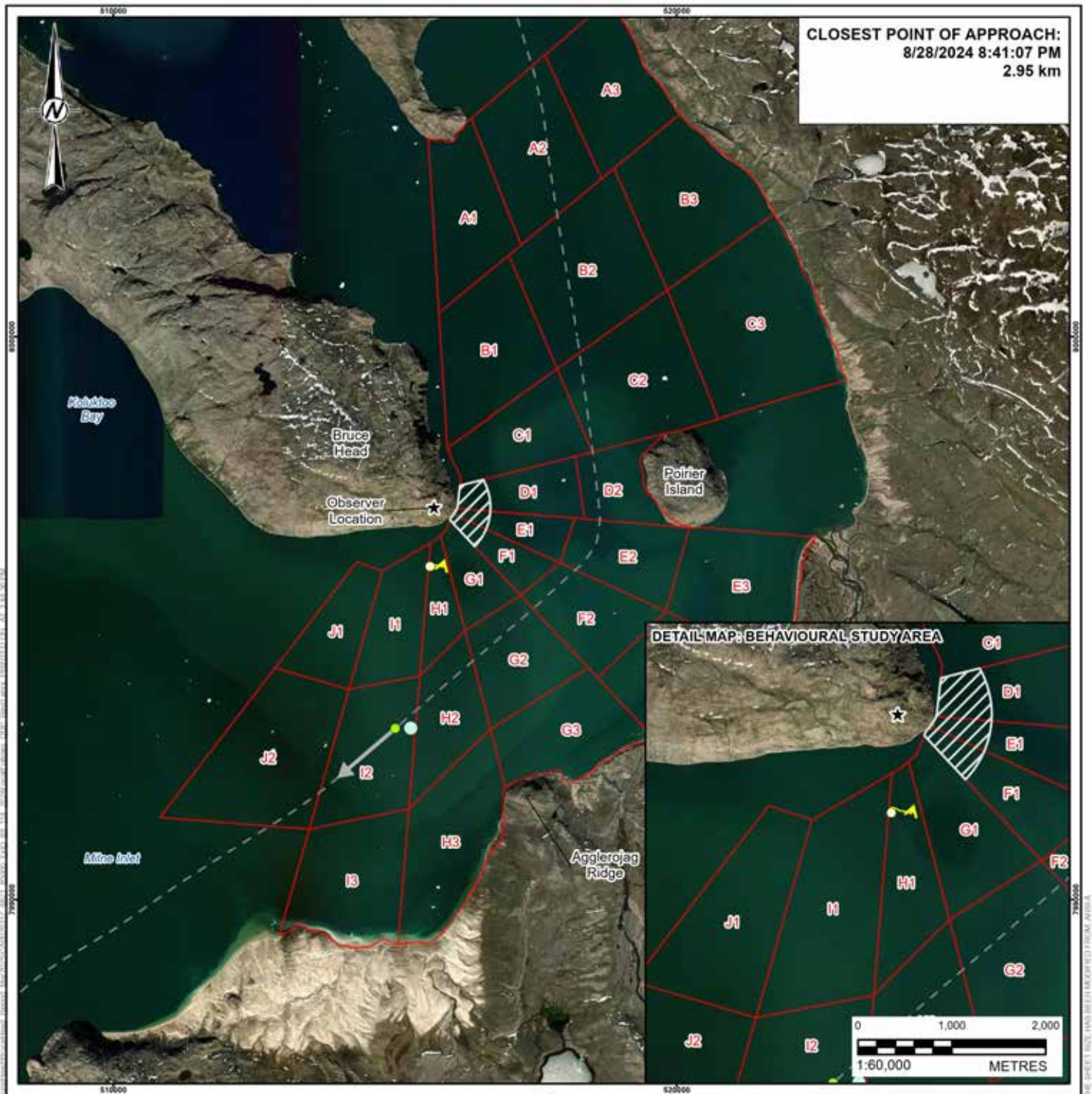
APPROVED PA

PROJECT NO.
CA0026317.6821

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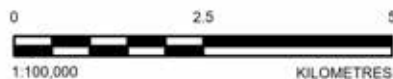
REV.
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FIGURE
D-109



LEGEND

- ACOUSTIC RECORDER (AMAR) LOCATION
- CLOSEST POINT OF APPROACH (VESSEL)
- CLOSEST POINT OF APPROACH (FOCAL FOLLOW)
- ★ OBSERVER LOCATION
- FOCAL FOLLOW TRACK 92 (2024)
- ACTIVE VESSEL TRANSIT (GOLDEN GRACE)
- NON-ACTIVE VESSEL TRANSIT (GOLDEN GRACE)
- BEHAVIOURAL STUDY AREA (BSA)
- STRATIFIED STUDY AREA (SSA) SUBSTRATA



REFERENCE(S)

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BAFFINLAND IRON MINES CORPORATION

PROJECT

MARY RIVER PROJECT

TITLE

FOCAL FOLLOW 92 (2024) AND ACTIVE VESSEL TRANSIT

CONSULTANT



YYYY-MM-DD 2025-04-24

DESIGNED SU

PREPARED AA

REVIEWED PA

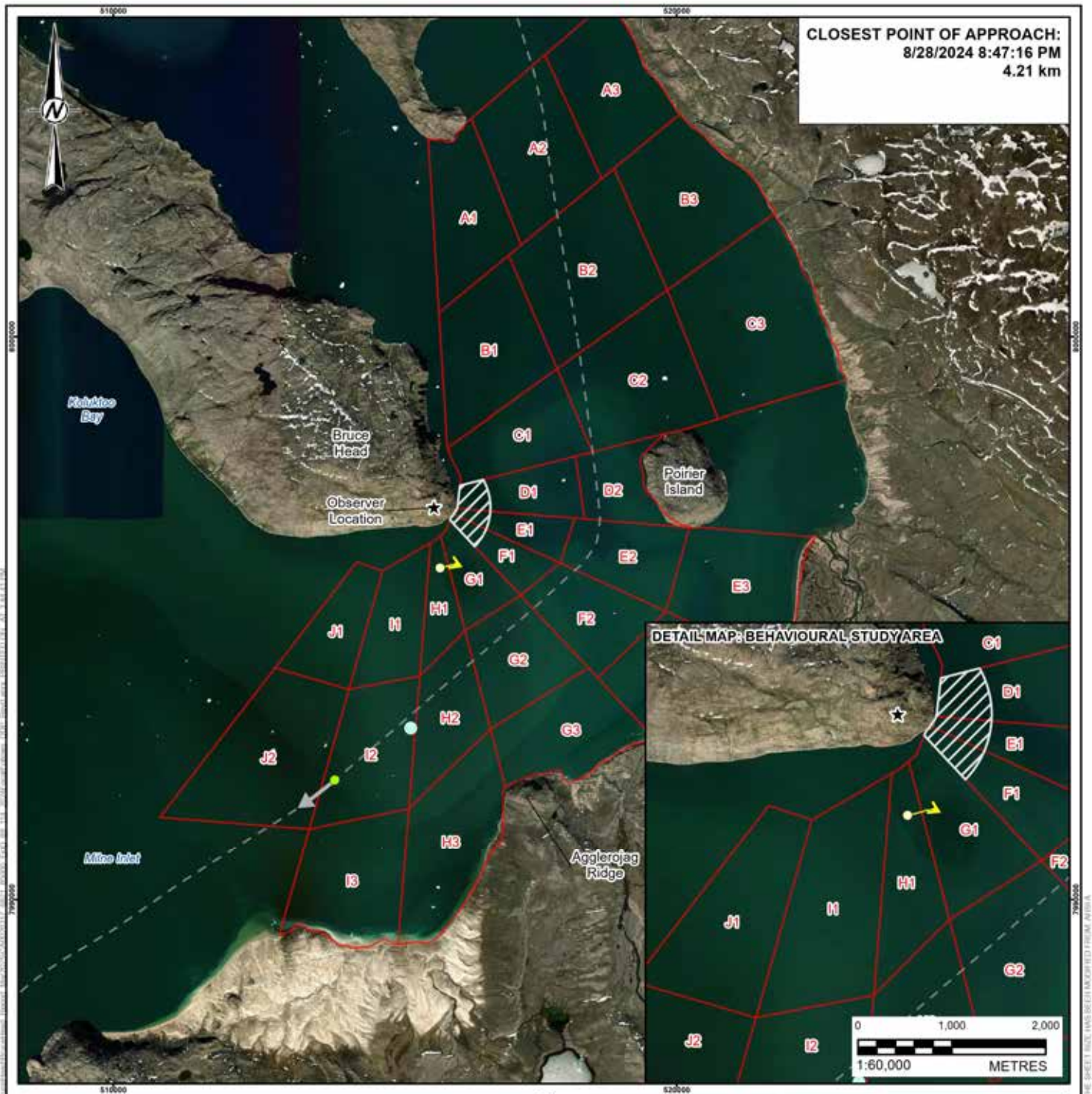
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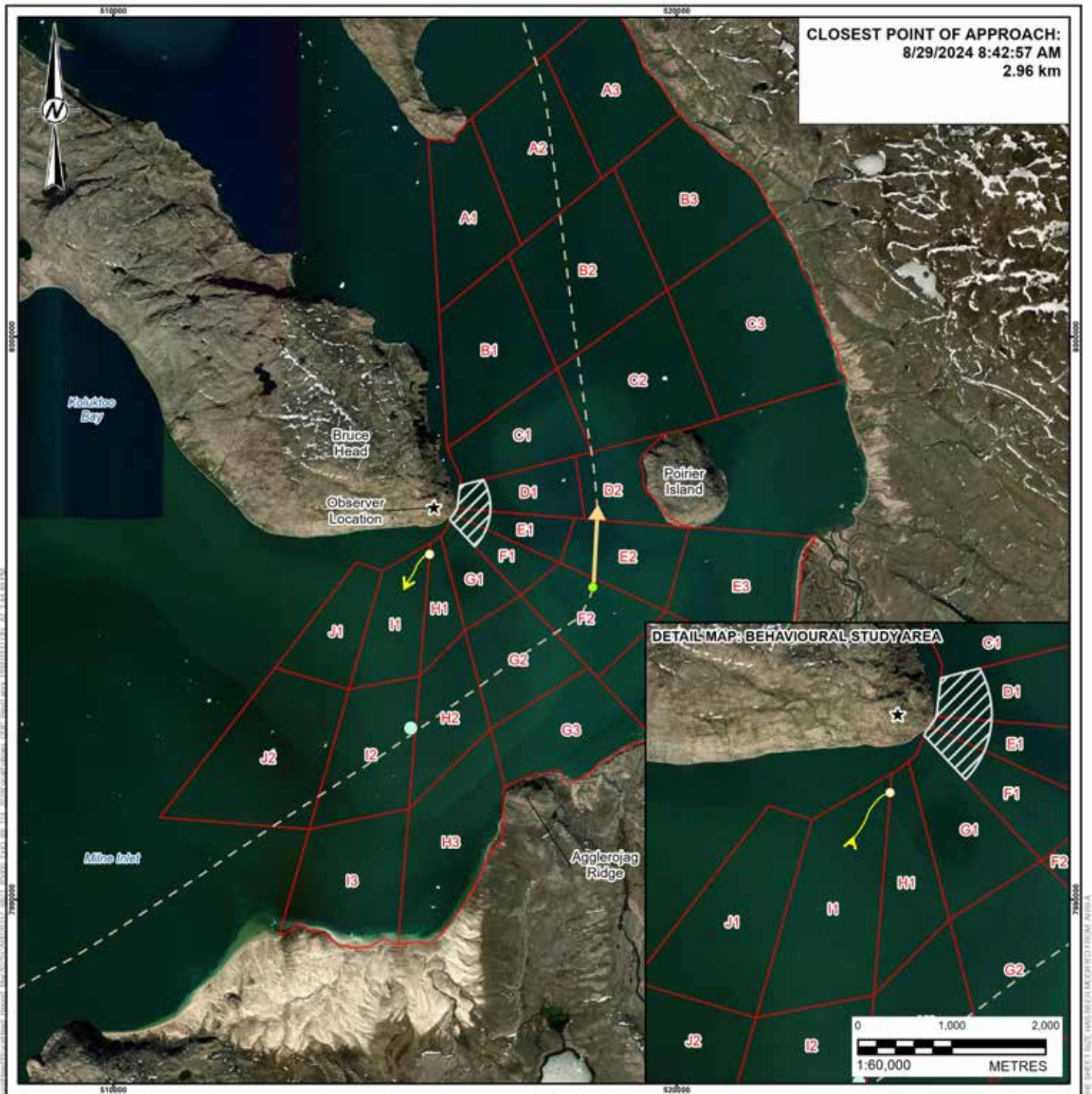
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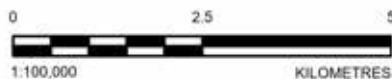
FIGURE
D-110





LEGEND

- ACOUSTIC RECORDER (AMAR) LOCATION
- CLOSEST POINT OF APPROACH (VESSEL)
- CLOSEST POINT OF APPROACH (FOCAL FOLLOW)
- ★ OBSERVER LOCATION
- FOCAL FOLLOW TRACK 95 (2024)
- ACTIVE VESSEL TRANSIT (REX OLDENDORFF)
- NON-ACTIVE VESSEL TRANSIT (REX OLDENDORFF)
- BEHAVIOURAL STUDY AREA (BSA)
- STRATIFIED STUDY AREA (SSA) SUBSTRATA



REFERENCE(S)

SUBSTRATA AND OBSERVER LOCATION DIGITIZED FROM LGL SHORE-BASED MONITORING OF NARWHALS AND VESSELS AT BRUCE HEAD, MILNE INLET, 2016 REPORT. SHIPPING ROUTE DATA BY CLIENT, JULY 14, 2020. HYDROGRAPHY, POPULATED PLACE, AND PROVINCIAL BOUNDARY DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA, ALL RIGHTS RESERVED. IMAGERY COPYRIGHT ©20240729 AND 20230728 ESRI AND ITS LICENSORS. SOURCE: MAXAR, USED UNDER LICENSE, ALL RIGHTS RESERVED. PROJECTED COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N

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PROJECT

MARY RIVER PROJECT

TITLE

FOCAL FOLLOW 95 (2024) AND ACTIVE VESSEL TRANSIT

CONSULTANT



YYYY-MM-DD 2025-04-24

DESIGNED SU

PREPARED AA

REVIEWED PA

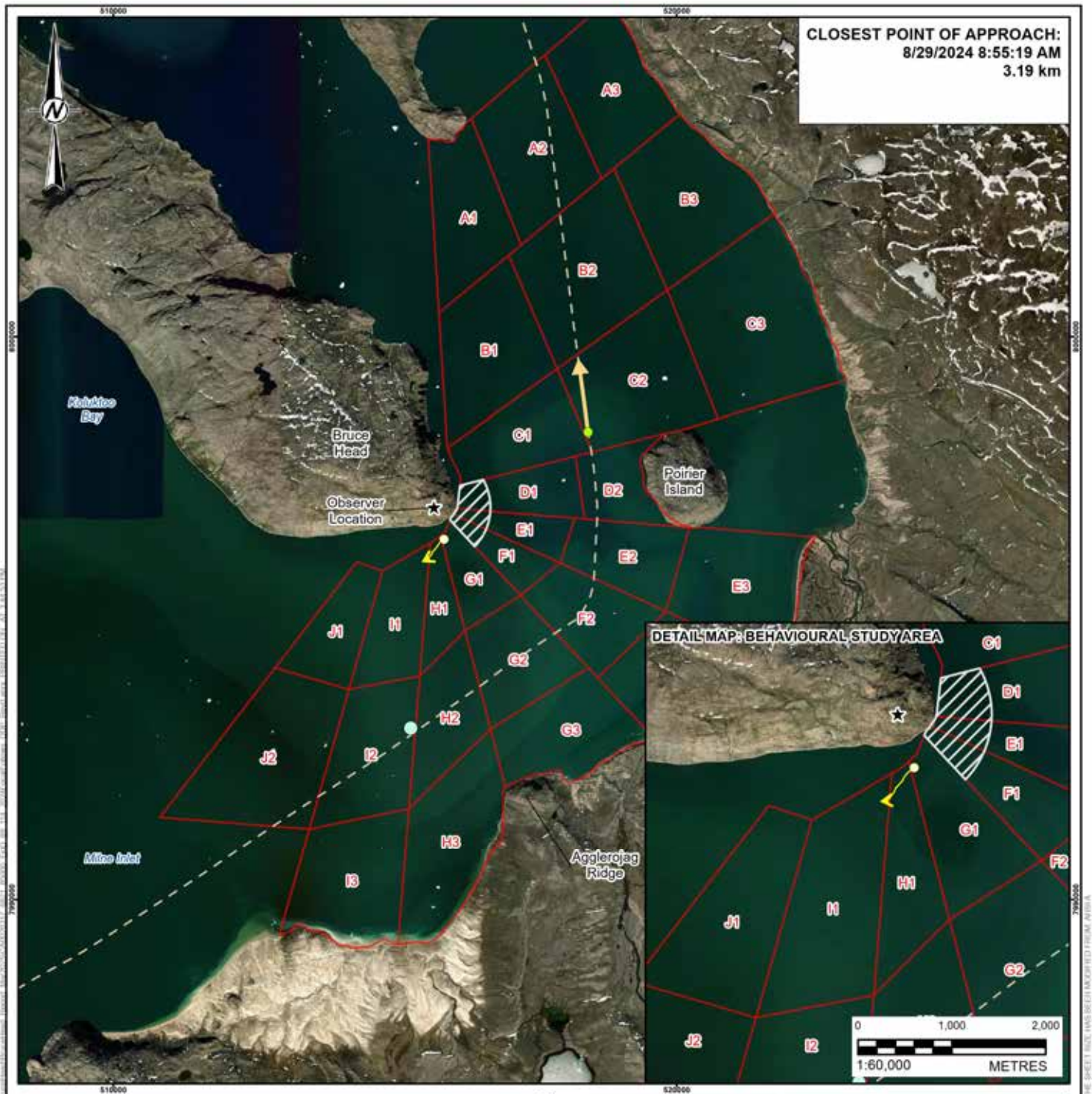
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PROJECT NO.
CA0026317.6821

CONTROL
85000

REV.
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FIGURE
D-113



LEGEND

- ACOUSTIC RECORDER (AMAR) LOCATION
- CLOSEST POINT OF APPROACH (VESSEL)
- CLOSEST POINT OF APPROACH (FOCAL FOLLOW)
- OBSERVER LOCATION
- FOCAL FOLLOW TRACK 96 (2024)
- ACTIVE VESSEL TRANSIT (REX OLDENDORFF)
- NON-ACTIVE VESSEL TRANSIT (REX OLDENDORFF)
- BEHAVIOURAL STUDY AREA (BSA)
- STRATIFIED STUDY AREA (SSA) SUBSTRATA

REFERENCE(S)

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CLIENT

BAFFINLAND IRON MINES CORPORATION

PROJECT

MARY RIVER PROJECT

TITLE

FOCAL FOLLOW 96 (2024) AND ACTIVE VESSEL TRANSIT

CONSULTANT



YYYY-MM-DD 2025-04-24

DESIGNED SU

PREPARED AA

REVIEWED PA

APPROVED PA

PROJECT NO.
CA0026317.6821

CONTROL
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FIGURE
D-114

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM ANTI-A

APPENDIX E

**Focal Follow Survey Descriptions in
the Presence of Vessels**

Table E-1: Summary of narwhal focal follow surveys conducted within 5 km of vessels in 2020

FFID #	Date / Time at CPA (EDT)	Total Time with Group	Vessel CPA (km)	Group Composition	Observations (Including reason for survey end)
10	9 August / 13:27	12 m 5 s	0.86	3x adults (tusked)	Group observed travelling NE as Golden Opportunity transited northbound through the southern portion of the SSA. Primarily parallel formation, mixed loose and tight spread throughout. Some scanning and horizontal rolling observed throughout survey. Shallow and deep dives throughout. Sudden change in orientation at approximately 1 m 0 s and again at 5 m 30 s into survey, all scanning and spaced tightly, then continued NE travel. Survey ended due to battery.
56	22 August / 9:11	1 m 59 s	2.27	3x adults (tusked) 1x adults (no tusk) 2x juveniles (tusked) 1x juvenile (no tusk)	Group observed travelling southward as Georg Oldendorff transited northbound through stratum C. Group primarily clustered and tightly spread. Tusked adult positioned at the front of the group observed scanning. Survey ended due to high winds.
57	22 August / 9:15	4 m 6 s	2.74	3x adults (tusked)	Group observed travelling southward/SE relatively slowly. Some milling behaviour observed momentarily. Group primarily in parallel formation and loosely spread. Individuals switch between shallow diving and travelling at surface. Georg Oldendorff transiting northbound through stratum B. Survey ended due to high winds.
62	29 August / 13:23	1 m 21 s	3.31	1x adult (no tusk) 1x calf	Mother and calf pair observed travelling NE, closely associated with one another and calf predominantly below mother. Tusked male observed trailing behind the pair but far away (i.e., >20 body lengths) and not considered part of the focal group. Nordic Olympic transiting southbound through stratum G. Survey ended due to pair diving deeply and not resurfacing.
63	29 August / 13:26	1 m 10 s	2.57	1x adult (no tusk)	Adult (no tusk) observed travelling NE and scanning. Nordic Olympic transiting southbound through stratum H. Survey ended due to individual diving deeply and not resurfacing.

FFID #	Date / Time at CPA (EDT)	Total Time with Group	Vessel CPA (km)	Group Composition	Observations (Including reason for survey end)
64	29 August / 13:29	1 m 30 s	2.39	1x adult (no tusk) 1x calf	Mother and calf pair observed milling and slowly travelling NE, closely associated with one another and calf predominantly below mother. Nordic Olympic transiting southbound through stratum H. Survey ended due to pair diving deeply and not resurfacing.
65	29 August / 13:41	3 m 55 s	2.84	1x adult (no tusk) 1x yearling	Adult (no tusk) observed resting while oriented NE/E at start of survey. Individual joined by a yearling at 3 m 0 s into survey, with yearling approaching from behind and then remaining closely associated with the underside of the adult (potentially its mother). Nordic Olympic transiting southbound through southern SSA. Survey ended due to pair diving deeply and not resurfacing.
66	29 August / 13:42	3 m 30 s	2.84	1x adult (no tusk)	Non-tusked adult observed resting and milling while oriented eastward. Individual then began travelling slowly eastward before diving out of sight. Nordic Olympic transiting southbound, beyond the southern portion of the SSA. Survey ended due to individual diving deeply and not resurfacing.
67	29 August / 13:44	3 m 30 s	3.55	1x juvenile (tusked)	Juvenile (tusked) observed travelling predominantly eastward while at the surface. Nordic Olympic transiting southbound, beyond the southern portion of the SSA. Survey ended due to individual diving deeply and not resurfacing.
68	29 August / 13:45	3 m 30 s	3.68	1x adult (no tusk)	Non-tusked adult observed travelling predominantly eastward and then resting and milling slowly at the surface. Individual rolls horizontally at end of video. Nordic Olympic transiting southbound, beyond the southern portion of the SSA. Survey ended due to battery.
83	30 August / 10:01	10 m 0 s	3.97	1x adult (no tusk) 1x calf Later joined by: 1x adult (no tusk)	Mother and calf pair observed oriented westward, with mother making deep dives at start of the survey while calf waits at surface, periodically attempting to dive down deeply. Orientation changes throughout but primarily moving N/NW. Mother resurfaces at 1 m 30 s and the pair observed resting in close association with one another, oriented N/NE, with the calf nursing from its mother. Pair begins slow travel while the mother is observed scanning at approximately 6 m onward. Joined by another adult (no tusk) at 7 m 30 s, at which point the mother dives

FFID #	Date / Time at CPA (EDT)	Total Time with Group	Vessel CPA (km)	Group Composition	Observations (Including reason for survey end)
					<p>down deeply and leaves her calf with the new individual.</p> <p>Calf begins travelling westward with the new adult, positioned above and to the side of the individual. New adult swimming closely with the calf but making erratic movements as if looking around and scanning.</p> <p>Bulk Destiny transiting southbound through stratum B.</p> <p>Survey ended due to pair diving deeply and not resurfacing.</p>
84	30 August / 10:13	4 m 45 s	2.62	<p>2x adults (no tusk)</p> <p>2x juveniles (tusked)</p> <p>1x juvenile (no tusk)</p> <p>1x calf</p>	<p>Group observed travelling westward, loosely associated with one another and in parallel formation.</p> <p>The mother and calf are in close association with one another throughout the survey, with the calf primarily underneath of its mother.</p> <p>The two juveniles (tusked) dive deeply at 30 s and then resurface, re-joining the group, at 2 m 30 s.</p> <p>At 3 m 0 s, the juvenile (no tusk) is observed swimming ahead of the group, at which point all abruptly change direction, now moving eastward and then milling while the tusked juveniles dive deeply and then resurface.</p> <p>Three of the immatures are then observed rolling vertically as they again change direction, now moving NE, and the tusked juvenile is observed briefly resting its tusk on the juvenile (no tusk) before the two are seen belly to belly.</p> <p>Bulk Destiny transiting southbound through stratum E.</p> <p>Survey ended due to the group diving deeply and not resurfacing.</p>
85	30 August / 10:32	12 m 49 s	1.87	<p>1x adult (no tusk)</p> <p>Later joins:</p> <p>2x adults (no tusk)</p> <p>1x calf</p>	<p>Single adult (no tusk) observed travelling westward, with momentary change in travel eastward at 30 s, before resuming westward travel.</p> <p>Individual observed just below the surface for much of the survey.</p> <p>Another abrupt change in travel direction observed at 5 m 30 s, with individual now travelling NE, SE, and then E, all while continually scanning and rolling horizontally.</p> <p>Toward the last minute of the survey, focal individual joins a group of two adults (no tusk) with calf. Formation of group changing every few seconds (linear to parallel to cluster).</p> <p>Bulk Destiny transiting southbound through stratum F → H.</p> <p>Survey ended due to battery.</p>

Table E-2: Summary of narwhal focal follow surveys conducted within 5 km of vessels in 2021

FFID #	Date / Time at CPA (EDT)	Total Time with Group	Vessel CPA (km)	Group Composition	Observations (Including reason for survey end)
33	7 August / 13:21	4 m 48 s	3.99	1x adult (tusked) Later joined by: 1x adult (no tusk)	Single adult (tusked) observed travelling eastward, later joined by another adult (no tusk). Adult with tusk dove deeply at 3m 26s, while adult (no tusk) travelled NE. Botnica transiting northbound through stratum J. Survey ended due to animal leaving frame.
34	7 August / 13:22	3 m 24 s	3.72	7x adults (tusked)	Group of tusked adults observed travelling NE in a loose parallel formation. Two individuals separately observed defecating. Group diverges and then dive below the surface at approximately 3 m 24s. Botnica transiting northbound through strata I/J. Survey ended due to the group diving deeply and not resurfacing.
35	7 August / 13:24	51 s	3.47	2x adults (tusked)	Two tusked adults observed travelling eastward in loose linear formation. One individual observed defecating. Botnica transiting northbound through stratum I. Survey ended due to the pair diving deeply and not resurfacing.
36	7 August / 13:35	13 m 0 s	2.11	1x adult (tusked)	Single adult (tusked) observed travelling eastward. Switched direction to westward travel at 4m 30s, then again changed travel direction to orient northward at 7m 30s. Observed milling and frequently changing travel direction for remainder of survey. Hunting vessel observed travelling southbound through stratum B at 13:33. Botnica transiting northbound through strata I/H/G. Survey ended due to battery.
37	7 August / 13:36	4 m 0 s	2.31	2x adults (tusked)	Single adult (tusked) observed milling at surface, joined by another adult with tusk 30s into follow. Pair observed milling and circling one another during first part of survey and then began travelling in northward direction in loose parallel formation. Hunting vessel observed travelling southbound through stratum B at 13:33. Botnica transiting northbound through strata H/G. Survey ended due to the pair diving deeply and not resurfacing.

FFID #	Date / Time at CPA (EDT)	Total Time with Group	Vessel CPA (km)	Group Composition	Observations (Including reason for survey end)
38	7 August / 13:36	4 m 31 s	2.30	1x adult (tusked)	Single adult (tusked) observed travelling SW. Individual changed direction of travel to orient northward after 30s, then again changed direction of travel to orient SW at approximately 3m 30s. Hunting vessel observed travelling southbound through stratum B at 13:33. Botnica transiting northbound through stratum G. Survey ended due to the individual diving deeply and not resurfacing.
39	7 August / 13:47	5 m 24 s	3.70	2x adults (tusked)	Two adults (tusked) observed travelling southbound in loose parallel formation. One adult dove at 2:30 and the remaining adult switched to resting behaviour while oriented eastward, until commencing travel again at 5m 0s. Botnica transiting northbound through stratum E. Survey ended due to the individual diving deeply and not resurfacing.
40	7 August / 13:43	1 m 54 s	3.44	1x adult (tusked)	Single adult (tusked) observed milling throughout the duration of the survey. Botnica transiting northbound through stratum F. Survey ended due to battery.
41	7 August / 13:53	10 m 53 s	4.12	3x adults (tusked)	Group of three adults (tusked) observed tightly associated and socializing at depth for the first four minutes of the survey, rolling, rubbing, and engaged in sexual behaviour (genitals of two individuals obvious). Rolling and rubbing behaviour continues throughout the survey as group travels SE in tight cluster formation. Botnica transiting northbound through stratum C. Survey ended due to the group diving deeply and not resurfacing.
47	8 August / 12:58	8m 55s	3.49	1x adult (no tusk) Temporarily joined by: 1x adult (tusked)	Single adult (no tusk) observed alternating between resting, milling, and travel toward the NE. Temporarily joined by another adult (tusked) at 1m 30s which dove shortly after joining. Bulk carrier Golden Ruby transiting southbound through strata D/E. Survey ended due to the individual diving deeply and not resurfacing.
48	8 August / 13:01	2m 32s	3.18	1x adult (tusked)	Single adult (tusked) observed milling at surface for duration of survey. Bulk carrier Golden Ruby transiting southbound through strata E/F. Survey ended due to the group diving deeply and not resurfacing.

FFID #	Date / Time at CPA (EDT)	Total Time with Group	Vessel CPA (km)	Group Composition	Observations (Including reason for survey end)
49	8 August / 13:11	2m 43s	2.03	1x adult (no tusk)	Single adult (no tusk) observed travelling generally northward, milling temporarily, then resuming northward travel. Bulk carrier Golden Ruby transiting southbound through stratum H. Survey ended due to the individual diving deeply and not resurfacing.
85	16 August / 17:37	6m 35s	2.29	1x adult (no tusk)	Single adult (no tusk) observed travelling westward throughout the survey and periodically rolling horizontally. Observed milling temporarily at 3m 0s then resumed westward travel. Botnica transiting northbound through strata H/G. Survey ended due to the individual diving deeply and not resurfacing.
86	16 August / 17:41	1m 17s	2.61	1x adult (no tusk) 1x calf	Mother and calf pair observed travelling SW/W while tightly associated. Calf predominantly underneath its mother but no nursing discernible. Botnica transiting northbound through stratum G. Survey ended due to the pair diving deeply and not resurfacing.
87	16 August / 17:42	10m 23s	2.82	1x adult (no tusk) 1x juvenile (no tusk) 1x calf	Group of three narwhal observed milling in loose cluster formation with calf tight to mother. "S scar" observed on mother's dorsal side (individual resighted during multiple surveys). Group dove deeply at 2m 0s and only calf resurfaced at 4m 30 s, commencing SE/SW travel on its own for duration of survey. Botnica transiting northbound through strata F/E. Survey ended due to battery.
114	19 August / 06:32	1m 53s	4.70	1x adult (tusked) Later joined by: 1x juvenile (tusked)	Single adult (tusked) observed travelling southward. Individual joined by juvenile (tusked) at 0m 30s and the pair continued to travel together in loose linear formation. Golden Frost transiting southbound through stratum B. Survey ended due to the pair diving deeply and not resurfacing.
115	19 August / 06:41	4m 39s	3.59	1x adult (tusked) Later: 1x adult (tusked) 1x adult (no tusk)	Single adult (tusked) observed milling non-directionally. Individual commenced travel westward at 1m 30s, then joined by non tusked adult at 2m, and another tusked adult at 2m 30s. Group then alternated milling and travelling in various directions, occasionally rolling horizontally. Golden Frost transiting southbound through stratum C. Survey ended due to the group diving deeply and not resurfacing.

FFID #	Date / Time at CPA (EDT)	Total Time with Group	Vessel CPA (km)	Group Composition	Observations (Including reason for survey end)
116	19 August / 06:46	3m 2s	3.15	1x adult (tusked)	Single adult (tusked) observed travelling southward throughout survey. Golden Frost transiting southbound through stratum D. Survey ended due to the individual diving deeply and not resurfacing.
117	19 August / 06:56	2m 41s	0.43	1x adult (tusked)	Single adult (tusked) observed travelling NE throughout survey. Golden Frost transiting southbound through strata F/G. Survey ended due to the individual diving deeply and not resurfacing.
118	19 August / 07:00	7m 8s	0.66	1x adult (no tusk) 1x yearling	Mother and yearling pair observed travelling northward, with yearling below its mother and tightly associated. Ore carrier is visible within the field of view. The pair is observed to split up and dive below the surface at 1m 30s, with only the yearling resurfacing and resuming travel initially oriented SW, then westward. Yearling is then observed milling temporarily, making short dives below 5 metres depth, and frequently changing direction. The individual is also observed rolling horizontally throughout survey. Golden Frost transiting southbound through strata G/H. Survey ended due to battery.
119	19 August / 07:07	54s	1.79	1x adult (tusked)	Single adult (tusked) observed travelling NW. Golden Frost transiting southbound through stratum I. Survey ended due to the individual diving deeply and not resurfacing.
120	19 August / 07:07	52s	1.79	3x adults (tusked)	Group of three adults (tusked) observed travelling westward in loose cluster. Golden Frost transiting southbound through stratum I. Survey ended due to the group diving deeply and not resurfacing.
121	19 August / 07:20	4m 42s	3.25	1x juvenile (tusked) Later joined by: 1x adult (tusked)	Single juvenile (tusked) observed milling at surface, then joined by adult (tusked). The pair milled together at the surface and rubbed against one another. The pair then travelled northward, followed by westward, with more rubbing observed. Golden Frost transiting southbound through stratum J. Survey ended due to the pair diving deeply and not resurfacing.

FFID #	Date / Time at CPA (EDT)	Total Time with Group	Vessel CPA (km)	Group Composition	Observations (Including reason for survey end)
122	19 August / 07:27	3m 14s	4.57	1x adult (no tusk) 1x calf	Mother and calf pair observed travelling northward with the calf tightly associated and to the right of its mother. The pair changed orientation to SW at 1m 30 and began resting, with the calf observed nursing from its mother. Travel then resumed at 2m 30s. Golden Frost transiting southbound through the southern portion of stratum J. Survey ended due to the pair diving deeply and not resurfacing.
139	20 August / 07:05	8m 12s	3.72	1x adult (tusked) 1x adult (no tusk) Later joined by: 1x adult (tusked)	Two adults (one tusked, one not tusked) observed travelling SE, initially in tight parallel formation. Pair became more loosely associated during early part of survey, periodically rolling horizontally. Another adult (tusked) joined group at 1m 30s and more rolling was observed. Group began milling and resting at 6m 0s, and the adult (no tusk) departed the group at 6m 30s. Golden Rose transiting southbound through strata C/D. Survey ended due to the group diving deeply and not resurfacing.
140	20 August / 07:09	5m 21s	3.56	3x adults (tusked)	Three adults (tusked) observed converging into group and socializing. Rubbing and horizontal rolling observed. Group travels SW with intermittent milling. Golden Rose transiting southbound through stratum E. Survey ended due to battery.
141	20 August / 07:19	18m 59s	3.29	1x adult (tusked) 2x adults (no tusk) 2x yearlings	Adult (tusked) with two mother and yearling pairs observed travelling westward in loose parallel formation, with yearlings tightly associated with their mothers. Group maintained course with the tusked adult periodically diving deeply and resurfacing. Rolling observed by all group members, with one instance where all individuals rolled at the same time. No nursing observed throughout the survey. Golden Rose transiting southbound through strata D/E/F. Survey ended due to battery.

FFID #	Date / Time at CPA (EDT)	Total Time with Group	Vessel CPA (km)	Group Composition	Observations (Including reason for survey end)
142	20 August / 07:28	8m 4s	1.51	4x adults (no tusk) 1x calf	Four adults (no tusk) with single calf observed travelling westward in loose parallel and loose cluster formation. Calf maintains tight associated with its mother throughout the survey. Group observed travelling at and below surface, with one of the adults periodically rolling horizontally throughout the survey. Golden Rose transiting southbound through strata H/I. Survey ended due to battery.
143	20 August / 07:30	3m 6s	3.20	1x adult (tusked)	Single adult (tusked) observed travelling NW. Golden Rose transiting southbound through strata H/I. Survey ended due to weather.
144	20 August / 07:53	8m 22s	4.55	4x adults (no tusk) 1x calf	Resighting of group in survey #142. Four adults (no tusk) with single calf observed travelling westward in loose parallel formation. Calf maintains tight associated with its mother throughout the survey. Group observed travelling at the surface and at depth (>5m), with one of the adults continuing to roll horizontally throughout the survey. Golden Rose transiting southbound, beyond the southern portion of stratum J. Survey ended due to battery.

Table E-3: Summary of narwhal focal follow surveys conducted within 5 km of vessels in 2022

FFID #	Date / Time at CPA (EDT)	Total Time with Group	Vessel CPA (km)	Group Composition	Observations (Including reason for survey end)
16	01 August / 09:38	5m 24s	2.31	8x Adults (tusk)	Three adults observed stationary with some milling before travelling west. Group loosely associated and in cluster/parallel formation. Joined by five tusked adults at 21:36. Nordic Olympic transiting northbound from substratum I2 to G2. Survey ended due to animals diving and not resurfacing.
17	01 August / 09:39	3m 45s	2.42	1x Adult (tusk) 1x Juvenile (no tusk)	Single adult observed travelling west, met with juvenile and began milling. Juvenile dove and adult travelled west before diving. Group loosely associated without consistent formation. Nordic Olympic transiting northbound through substratum G2. Survey ended due to animals diving and not resurfacing.
18	01 August / 09:41	1m 11s	2.48	5 x Adults (tusks)	Five adults observed travelling west in loose cluster formation. Nordic Olympic transiting Northbound from substratum G2 to F2. Survey ended due to animals diving and not resurfacing.
19	01 August / 09:41	8m 20s	2.71	5 x Adults (no tusks) 1 x Calf	Mother-calf pair plus three adults (no tusks) observed travelling west in loose cluster formation. Later joined by single adult (no tusk). Calf shifted position between under, side, and above its presumed mother, remaining tightly associated. Nursing observed. When mother went to depth, calf associated with another female in group. Mother and calf reunited towards end of survey. Nordic Olympic transiting northbound from substratum G2 to E2. Survey ended due to battery
25	03 August / 17:39	3m 18s	2.91	1 x Adult (no tusk) 1x Yearling	Mother-yearling pair observed travelling northwest. Yearling circled its presumed mother loosely before resuming tight position underneath mother. Nordic Odin transiting northbound from substratum J2 to I2. Survey ended due to animals diving and not resurfacing.
26	03 August / 18:04	5m 45s	4.70	2 x Adult (no tusks) 1 x Calf 1 x yearling	Mother and calf observed travelling northeast in tight parallel formation. Calf remained tightly under its mother. Nursing observed. Nordic Odin transiting northbound from substratum J2 to I2. Survey ended due to animals diving and not resurfacing.

FFID #	Date / Time at CPA (EDT)	Total Time with Group	Vessel CPA (km)	Group Composition	Observations (Including reason for survey end)
30	04 August / 11:13	12:56m	4.09	2 x Adult (tusks) 2 x Adult (no tusks) 1 x Calf	Group observed travelling southeast in tight cluster formation, stopping to mill and socialize at depth in non-directional manner. Calf tightly associated with mother throughout survey. Nursing observed. When mother departed group, calf associated with tusked adult before splitting off and diving. Golden Ice transiting southbound through substratum C2. Survey ended due to animals diving and not resurfacing.
31	04 August / 11:22	3m 13s	2.70	3 x Adult (tusks) 1 x Juvenile (tusk) 1 x Calf	Group observed travelling north in loose parallel formation. Calf's presumed mother not apparent in group. Calf split off and dove in first minute of survey. Golden Ice transiting southbound from substrata D2 to E2. Survey ended due to battery.
32	04 August / 11:28	2m 09s	2.32	1 x Adult (no tusk) 1 x Yearling 1 x Calf	Mother-yearling pair and lone calf observed travelling north in loose linear formation. Group spent most of the time at depth with calf swimming ahead of mother-yearling pair. Yearling tightly associated with mother. Golden Ice transiting southbound from substratum E2 to F2. Survey ended due to animals diving and not resurfacing.
33	04 August / 11:36	2m 11s	1.87	1 x Adult (tusk) 1 x Juvenile (tusk)	Group observed milling non-directionally, shifting between loose parallel formation and no formation. Golden Ice transiting southbound through G2. Survey ended due to animals diving and not resurfacing.
34	04 August / 11:39	2m 35s	2.13	1 x Adult (tusk)	Single adult observed travelling north. Golden Ice transiting southbound from substratum G2 to H2. Survey ended due to animal diving and not resurfacing.
35	04 August / 11:40	51s	1.77	1 x Adult (tusk) 1 x Adult (no tusk) 1 x Juvenile (tusk)	Group observed milling in general northwest direction. Golden Ice transiting southbound from substratum G2 to H2. Survey ended due to animals diving and not resurfacing.

FFID #	Date / Time at CPA (EDT)	Total Time with Group	Vessel CPA (km)	Group Composition	Observations (Including reason for survey end)
36	04 August / 11:41	47s	1.92	1 x Adult (tusk) 1 x Adult (no tusk) 1 x Juvenile (no tusk) 1 x Calf	Group observed milling in loose cluster formation, moving in general southwest direction. Calf positioned loosely in front and abreast of its presumed mother. Golden Ice transiting southbound through H2. Survey ended due to animals diving and not resurfacing.
37	04 August / 11:44	47s	2.03	1 x Adult (no tusk) 1 x Yearling	Mother-yearling pair observed milling in easterly direction. Yearling positioned tightly beneath its presumed mother. Golden Ice transiting southbound through H2. Survey ended due to animals diving.
54	05 August / 12:38	3m 29s	4.33	2 x Adult (tusks)	Two adults observed travelling west in loose linear formation. Arkadia transiting northbound towards substratum J2. Survey ended due to animals diving and not resurfacing.
55	05 August / 12:43	2m 47s	3.22	2 x Adult (no tusks) 1 x Juvenile (tusk) 1 x Yearling	Mother-yearling pair with adult observed travelling west in loose cluster formation. Joined by juvenile, continued travelling west. Arkadia transiting northbound towards substratum J2. Survey ended due to animals diving and not resurfacing.
63	06 August / 16:03	11m 50s	3.33	5 x Adult (tusks)	Two adults with tusks observed travelling south in loose parallel formation. Three additional adults joined group, stopping briefly to mill and socialize before resuming travel south in loose parallel formation. Nordic Qinnngua transiting southbound from substratum D2 to F2. Survey ended due to battery.
64	06 August / 16:18	1m 36s	1.69	1 x Adult (tusk) 1 x Juvenile (tusk)	Group observed travelling east in loose parallel formation. Group later moves to tight formation. Nordic Qinnngua transiting southbound through substratum I2. Survey ended due to animals diving and not resurfacing.

FFID #	Date / Time at CPA (EDT)	Total Time with Group	Vessel CPA (km)	Group Composition	Observations (Including reason for survey end)
65	06 August / 16:21	3m 15s	2.10	1 x Adult (tusk) 1 x Adult (no tusk) 1 x Calf	Mother-calf pair observed travelling east. Calf positioned tightly beneath presumed mother. Travel interrupted by adult male that appeared to chase mother and calf to depth. Adult male then travelled south. Mother-calf resurface and travelled northeast before diving. Nordic Qinnngua transiting southbound through substratum I2. Survey ended due to animals diving and not resurfacing.
70	07 August / 10:53	1m 47s	2.86	1 x Adult (no tusk) 1 x Calf	Mother-calf pair observed milling non-directionally, with calf tightly associated throughout the survey. M.V. Golden Brilliant transiting northbound through substratum I2. Survey ended due to animals diving and not resurfacing.
71	07 August / 10:53	7m 53s	0.96	2 x Adult (no tusk) 1 x Juvenile (tusk) 2 x Juvenile (no tusks) 1 x Yearling	Group (all excluding 1 adult) observed travelling northeast in tight cluster formation. Group loosened and milled temporarily, then travel resumed in westerly direction, shifting between cluster and parallel formations. Yearling positioned tightly above and below its presumed mother. M.V. Golden Brilliant transiting from substratum I2 to H2. Survey ended due to battery.
72	07 August / 11:11	36s	1.54	1 x Adult (no tusk) 1 x Calf	Mother-calf pair observed travelling north in tight parallel formation. Calf tightly associated throughout survey. M.V. Golden Brilliant transiting from substratum G2 to F2. Survey ended due to animals diving and not resurfacing.
74	07 August / 14:19	12m 29s	1.13	3 x Adult (tusks)	Three adults observed socializing and milling non-directionally and in no formation. Nordic Orion transiting southbound from substratum C2 to G2. Survey ended due to battery.
78	08 August / 10:21	7m 55s	2.64	6 x Adult (tusks) 1 x Adult (no tusk) 1 x Juvenile (tusk) 1 x Juvenile (no tusk)	Single juvenile (no tusk) observed travelling west. Later joined by other individuals and all travelled west in tight cluster formation. Group gradually split up and dove. Nordic Odyssey transiting northbound from substratum I2 to H2. Survey ended due to group diving and not resurfacing.

FFID #	Date / Time at CPA (EDT)	Total Time with Group	Vessel CPA (km)	Group Composition	Observations (Including reason for survey end)
79	08 August / 10:24	4m 32s	2.63	1 x Adult (tusk) 1 x Juvenile (tusk)	Pair observed travelling south in tight linear formation. Juvenile dove out of sight and adult continued travelling south. Adult (no tusk) joins toward end of survey. Nordic Odyssey transiting northbound through substratum G2. Survey ended due to battery.
98	11 August / 16:15	14m 47s	2.02	3 x Adult (no tusks) 1 x Juvenile (no tusk) 2 x Yearlings	Group observed travelling northeast in loose cluster formation. Group went to depth then resurfaced. Intermittent milling observed. First yearling associated tightly underneath its presumed mother, occasionally to the right or above. Second yearling loosely associated and to the left of presumed mother, later moving tightly below mother. Golden Suek transiting southbound from substratum F2 to H2. Survey ended due to battery.
99	11 August / 16:32	35s	3.49	1 x Adult (tusk)	Single adult observed travelling northeast. Golden Suek transiting southbound from substratum I2 to J2. Survey ended due to animal diving and not resurfacing.
100	11 August / 16:33	6m 29s	3.84	4 x Juvenile (tusks)	Group observed travelling east in tight cluster formation. Group began socializing at depth, though barely visible. Golden Suek transiting southbound through substratum J2. Survey ended due to animals diving and not resurfacing.
107	13 August / 16:11	13m 8s	4.89	3 x Adult (tusks) 3 x Adult (no tusk) 1 x Adult (unknown tusk) 1 x Calf	Group observed milling in westerly direction in loose cluster formation. Adult males appeared unusually interested in calf, as though they were trying to separate it from its presumed mother. The same individuals had been observed conducting this behaviour several hours prior to this survey, during which time no ships were present. Animals were consistently shifting formations, spread and direction throughout survey. Calf was intermittently without its mother but would join her several times to "escape" the other males. Males would eventually catch up and again attempt to separate calf from its mother. Nordic Nuluujak transiting northbound from substratum J2 to I2. Survey ended due to animals diving and not resurfacing.

FFID #	Date / Time at CPA (EDT)	Total Time with Group	Vessel CPA (km)	Group Composition	Observations (Including reason for survey end)
108	13 August / 16:20	39s	1.55km	1 x Adult (no tusk) 1 x Yearling 1 x Calf	Three narwhal observed travelling north in loose parallel formation. Calf observed tightly beneath its presumed mother. Yearling is not considered to have mother present. Nordic Nuluujak transiting northbound from substratum I2 to H2. Survey ended due to animals diving and not resurfacing.
109	13 August / 16:23	10m 7s	1.02	4 x Adult (tusks) 1 x Juvenile (tusk)	Group observed socializing at depth tightly without formation. Numerous instances of rubbing, tussling, and rolling. Animals consistently rotating around one another. Nordic Nuluujak transiting northbound from substratum H2 to F2. Survey ended due to battery.
110	13 August / 16:44	5m 50s	1.73	1 x Adult (tusk) 4 x Adult (no tusk) 1 x Juvenile (tusk) 4 x Yearling	Group observed travelling north in tight cluster formation. Group loosened throughout the survey, eventually diving out of sight. Nordic Nuluujak transiting northbound from substratum D2 to C2. Survey ended due to animals diving and not resurfacing.
111	13 August / 16:50	3m 15s	2.04	1 x Juvenile (tusk)	Single juvenile observed travelling southwest. Nordic Nuluujak transiting northbound from substratum C2 to B2. Survey ended due to animals diving and not resurfacing.
112	13 August / 17:45	9m 07s	2.17	3 x Adult (tusks) 1 x Adult (no tusk)	Group observed socializing tightly without formation. Temporarily travelled east, then resumed socializing. Group social behavior similar to FFID 109.
113	13 August / 19:41	31s	3.07	1 x Adult (tusk) 1 x Adult (no tusk)	Group observed travelling west in tight parallel formation. Botnica transiting northbound in H2, Golden strength transiting southbound through F2. Survey ended due to animals diving and not resurfacing.
114	13 August / 19:47	43s	2.71	2 x Adult (tusks) 1 x Juvenile (no tusk)	Group observed travelling west in tight parallel formation. Botnica transiting northbound in H2, Golden strength transiting southbound through F2. Survey ended due to animals diving and not resurfacing.
120	14 August / 11:40	10m 05s	2.55	7 x Adult (tusks)	Group observed travelling west in loose cluster formation. Golden Suck transiting northbound from substratum I3 to I2. Survey ended due to battery.

FFID #	Date / Time at CPA (EDT)	Total Time with Group	Vessel CPA (km)	Group Composition	Observations (Including reason for survey end)
121	14 August / 12:17	15m 41s	2.40	9 x Adult (tusks) 5 x Adult (no tusks) 2 x Juvenile (tusks) 3 x Yearling	Large group observed travelling south in tight cluster formation as part of herding event. Group includes three mother-yearling pairs. Golden Suek transiting northbound from substratum C1 to B2. Survey ended due to animals diving and not resurfacing.
124	14 August / 15:17	5m 36s	1.99	2 x Adult (tusks) 1 x Adult (no tusk) 1 x Juvenile (tusk)	Three adults observed travelling west in tight parallel formation, later in loose cluster formation. Sexual display observed by adult male. Sagar Samrat transiting southbound from substratum B1 to D1. Survey ended due to animals diving and not resurfacing.
125	14 August / 15:25	8m 7s	0.75	1 x Adult (tusk) 1 x Juvenile (tusk) 1 x Yearling	Adult and juvenile pair observed travelling north in parallel formation. Lone yearling joins group towards end of follow. Sagar Samrat transiting southbound from substratum F1 to H1. Survey ended due to animals diving and not resurfacing.
126	14 August / 15:39	3m 18s	2.01	8 x Adult (tusks) 6 x Adult (no tusks) 4 x Juvenile (tusks) 3 x Juvenile (no tusks) 1 x Yearling 1 x Calf	Group observed travelling east in cluster formation. Many individuals at depth. Yearling positioned tightly beneath its presumed mother. Calf positioned tightly to the right of its presumed mother. Sagar Samrat transiting southbound from substratum I1 to J2. Survey ended due to animals diving and not resurfacing.
127	15 August / 10:05	10m 8s	0.93	4 x Juvenile (Tusks)	Four juveniles observed socializing in tight parallel formation moving northwest. Golden Fast transiting northbound from substratum I2 to H2. Survey ended due to animals diving and not resurfacing.
128	15 August / 10:22	17m 30s	1.07	4 x Adult (tusks) 6 x Adult (no tusks) 2 x Yearling	Group observed milling loosely and non-directionally. Part of group went down to depth, the rest travelled southeast in loose cluster formation. Golden fast transiting northbound from substratum G1 to C2. Survey ended due to battery.
137	17 August / 10:29	1m 35s	4.84	1 x Adult (no tusk) 1 x Juvenile (tusk)	Pair observed travelling west in tight parallel formation. Elena Ve transiting southbound through substratum E2. Survey ended due to losing radial line of sight to group.

Table E-4: Summary of narwhal focal follow surveys conducted within 5 km of vessels in 2023

FFID #	Date / Time at CPA (EDT)	Total Time with Group	Vessel CPA (km)	Group Composition	Observations (Including reason for survey end)
1	11 August 2023 19:41	1m 17s	3.24	4 x Adult (no tusk) 5 Juvenile (no tusk) 2 x Yearling	Group of eleven observed travelling west in loose parallel formation. Two southbound ships in area; Golden Opal is closest with CPA of 3.24km and Nordic Odyssey with a CPA of 3.41km. Both yearlings were in tight left position relative to presumed mothers. Part of group including mother yearling pairs dove at 0:44, rest of group changed direction to N towards shoreline before diving. Survey ended due to animals diving and not resurfacing.

Table E-5: Summary of narwhal focal follow surveys conducted within 5 km of vessels in 2024

FFID #	Date / Time at CPA (EDT)	Total Time with Group	Vessel CPA (km)	Group Composition	Observations (Including reason for survey end)
2	9 August 2024 09:23:28	2m	2.64	4 x Adult (no tusk)	One ore carrier northbound in H2. Group consisting of four adults. Aborted flight due to battery levels.
3	9 August 2024 09:44:34	6m	4.98	1 x Adult (no tusk) 2 x Calf 1 x Juvenile	One ore carrier in F2. Group consisting of 1 mom/calf pair, 1 juvenile and 1 calf. All animals dove at start of recording. Juvenile and calf resurfaced. Mom/calf pair resurfaced. Appears mom has a potential gunshot wound on the cranium. Vessel was present within D2 at the end of the recording.
8	9 August 2024 11:31:14	6m	3.63	1 Adult (no tusk) 1 x Calf	Southbound vessel present within F2. 1 mom/calf pair displayed potential nursing behaviour. Little movement observed while pair is at surface (north facing). Both animals dove after which the drone raised altitude. Aborted survey because animals did not resurface before the drone had to return to the helipad due to battery levels.
9	9 August 2024 11:46:56	9m	1.97	1 x Adult (no tusk) 2 x Juvenile	Southbound vessel present within I3 at start of video recording. Group of 3 narwhal (1 adult female and 2 juveniles) located 2,900 m from the helipad. Group spread apart for a while and then back together in a tight formation (heading NE/E towards ship). The adult female dove after which the drone raised altitude to keep track of the group. Both juveniles continued to mill at the surface while the ship was within I3. Both juveniles dove and the flight was aborted. The ship was observed in I3 at end of the recording (and just about to exit the SSA).

FFID #	Date / Time at CPA (EDT)	Total Time with Group	Vessel CPA (km)	Group Composition	Observations (Including reason for survey end)
20	10 August 2024 19:25:59	10m	3.27	1 x Adult (no tusk) 1 x Calf	Ore carrier Claude Desgagnes observed sailing northbound at 7 knots in E2. A mom/calf pair was oriented towards the northwest (1,841 m from helipad). A scar on mom's cranium was observed. The mom/calf pair dove at after which the drone raised altitude. The mom/calf pair resurfaced (now south facing), then dove. Aborted flight due to battery (ship at this point was within C2).
21	10 August 2024 19:27:03	12m	3.00	4 x Adult (no tusk) 1 x Calf	The ore carrier Claude Desgagnes was observed sailing northbound in B2. A hunting boat was travelling southbound towards F1. A group of 5 individuals (1 mom/calf pair and 3 adult females) were observed travelling southeast. Socializing behaviour was recorded at the surface. A scar was observed on one of the adult females. The group dove and the flight was aborted due to battery levels (52%) while ship was within A3 (northbound).
22	10 August 2024 19:33:47	10m	1.98	3 x Adult (no tusk) 2 x Calf 1 x Juvenile 1 x Yearling	Group observed consisting of 1 mom/calf pair and 1 calf (2 km from base). An adult female joined the group. Another adult female with one juvenile surfaced while the 2 mom/calf pairs dove. One of the mom/calf pairs resurfaced. Animals dove after which the drone raised altitude. Another adult female with a juvenile or yearling at was observed. A hunting boat was active in F1/E1, returning to BH camp. The drone flight was aborted due to battery levels and the group diving.
23	10 August 2024 19:49:52	6m	3.43	1 x Adult (no tusk) 1 x Calf	The first group of animals dove before they were identified. Focused on mom/calf pair that surfaced shortly thereafter. Animals dove again and aborted flight due to battery levels.
24	10 August 2024 19:54:38	12m	3.74	5 x Adult (tusk) 1 x Adult (no tusk)	Group identified consisting of 5 adult males and 1 adult female. Group dove, re-surfaced and dove again. Group re-surfaced and stopped recording due to battery levels (34%).
28	13 August 2024 06:40:00	6m	2.80	2 x Adult (no tusk) 1 x Calf	One mom/calf pair and an adult female. Group observed resting at surface and diving thereafter.
29	13 August 2024 06:43:54	3m	3.06	1 x Adult (no tusk) 1 x Calf 6 x Adult (unknown tusk)	Group of 8 animals observed. Flight aborted after group dove. Video only shows 2 animals as the rest of the group had already dove before the video recording was started.

FFID #	Date / Time at CPA (EDT)	Total Time with Group	Vessel CPA (km)	Group Composition	Observations (Including reason for survey end)
32	14 August 2024 22:19:00	1m	3.28	1 x Adult (no tusk) 1 x Calf	Mom/calf pair observed. Small hunting vessel present within D2, with a second boat arriving in D1. Group dove and did not resurface.
40	17 August 2024 06:15:02	5m	3.89	1 x Adult (tusk)	Adult male oriented northward. 7 hunting boats still present in area (I2/H3). The adult male is joined by another adult male. Flight aborted due to battery levels. Hunter boats now in I2, H3 and J2.
69	24 August 2024 19:03:43	4m	3.16	5 x Adult (tusk) 1 x Adult (no tusk) 1 x Calf	5 adult males and 1 mom/calf pair observed. Drone raised altitude before decreasing altitude again. All animals dove. Hunting boat present in I2, stationary. Ore carrier southbound in northern Assumption Bay, exiting the study area.
70	24 August 2024 19:13:50	5m	2.32	1 x Adult (no tusk) 1 x Calf 2 x Juvenile	Four narwhal (1 mom/calf pair and 2 juveniles) traveling east. One hunting boat in H3 traveling north. All animals dove, after which the drone increased altitude. The hunting boat travelled west towards Koluktoo Bay, from H3. Survey ended.
70	24 August 2024 19:16:50	5m	3.85	1 x Adult (no tusk) 1 x Calf 2 x Juvenile	Four narwhal (1 mom/calf pair and 2 juveniles) traveling east. One hunting boat in H3 traveling north. All animals dove, after which the drone increased altitude. The hunting boat travelled west towards Koluktoo Bay, from H3. Survey ended.
71	24 August 2024 19:24:30	4m	2.35	2 x Adult (tusk)	2 adult males observed logging at surface. Animals repositioned subsurface. One adult male observed at surface, logging. Drone raised altitude. One hunting vessel present in area.
71	24 August 2024 19:24:30	4m	2.66	2 x Adult (tusk)	2 adult males observed logging at surface. Animals repositioned subsurface. One adult male observed at surface, logging. Drone raised altitude. One hunting vessel present in area.
87	28 August 2024 20:09:28	7m	3.99	3 x Adult (no tusk)	Observed 3 adult females travelling southwest. Two of them were traveling subsurface while the third joined subsurface. A hunter's gunshot went off at Bruce Head point. Animals observed milling subsurface. Animals surfaced and then disappeared subsurface. Drone raised altitude. A new group was picked up (FF#88) by the drone. An ore carrier was present in F2, traveling north.

FFID #	Date / Time at CPA (EDT)	Total Time with Group	Vessel CPA (km)	Group Composition	Observations (Including reason for survey end)
88	28 August 2024 20:22:04	6m	2.43	9 x Adult (tusk) 2 x Adult (no tusk) 1 x Juvenile (tusk) 1 x Calf	9 adult males, 2 adult females and 1 juvenile male observed travelling fast in a south-westerly direction, within a tight group. Majority of the animals dove, with 1 adult male remaining at the surface. Drone raised altitude. One calf joined the adult male. The drone raised altitude and the survey was ended.
89	28 August 2024 20:26:46	6m	1.40	2 x Adult (no tusk) 1 x Calf	At least 2 moms and a calf. Animals dove. At least 2 remained subsurface. Drone raised altitude. A gunshot heard at Bruce Head point. 1 animal traveling subsurface then dove. Ore carrier in B2 northbound.
90	28 August 2024 20:31:02	2m	1.06	11 x Adult (unknown tusk)	At least 11 adults observed travelling fast southbound. All animals dove. Ore carrier northbound at north end of study area.
91	28 August 2024 20:32:07	4m	1.14	1 x Adult (no tusk) 1 x Calf	Possible mom/calf pair. Animals dove. Drone raising altitude. New large group observed at bottom right of frame. Animals dove. Ore carrier present within A2, northbound.
92	28 August 2024 20:41:03	7m	2.95	2 x Adult (tusk) 1 x Adult (no tusk) 3 x Juvenile (no tusk)	Group traveling southwest (2 adult males, 1 adult female and 3 juvenile females). Juveniles dove. Drone raising altitude. Animals travelling subsurface. Ore carrier was in A2 northbound, out of study area now. Drone raised altitude.
93	28 August 2024 20:47:16	7m	4.21	2 x Adult (no tusk) 1 x Juvenile (no tusk)	Adult female traveling northeast then dove. Drone increasing altitude. Narwhal observed surfacing. Another animal joined. 2-3 narwhal travelling subsurface. 1 female juvenile and 2 adult females traveling slow northeast. Juvenile and adult female observed at surface. The other adult female travelling subsurface. Drone raised altitude.
94	29 August 2024 08:36:45	4m	2.54	1 x Adult (no tusk) 1 x Calf	Mom/calf pair observed traveling slow northeast. Animals dove. Drone raised altitude. Survey ended due to battery levels 49%.
95	29 August 2024 08:42:36	15m	2.96	3 x Adult (no tusk) 1 x Calf	3 adult females and 1 calf traveling southeast. All dove, calf lagging behind. Drone raised altitude. Calf returned to surface, then dove again. Drone raising altitude. Calf returned subsurface, then travelling at surface, northeast. Drone raised altitude.
96	29 August 2024 08:55:17	4m	3.19	3 x Adult (no tusk) 1 x Adult (tusk)	2 adult females and a calf traveling southeast. Observed another adult female and an adult male. Drone raised altitude and survey ended due to technical issue.



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