

資料 8-2-9. 危険物(磁気)探査結果

北港周辺の危険物調査範囲図を図 A.8.2.9-1 に示す。陸上部および水深 1.5m 以浅の海域は調査員が金属探知器を用いて金属の有無を探査した。水深 1.5m 以深の海域はダイバーが金属探知器を持って移動し、異常の確認は船上のモニターにより行った。一方、航路部における危険物探査の測線図を図 A.8.2.9-2 に示す。測線間隔は約 10m であり、ダイバーが船に曳航されながら目視にて地形の変化を確認し、異常が認められた場合は金属探知器で再探査した。次頁以下(資-67～資-87)に再委託先の BACTEC 社による調査結果を貼付する。



図 A.8.2.9-1 危険物調査範囲(北港周辺)

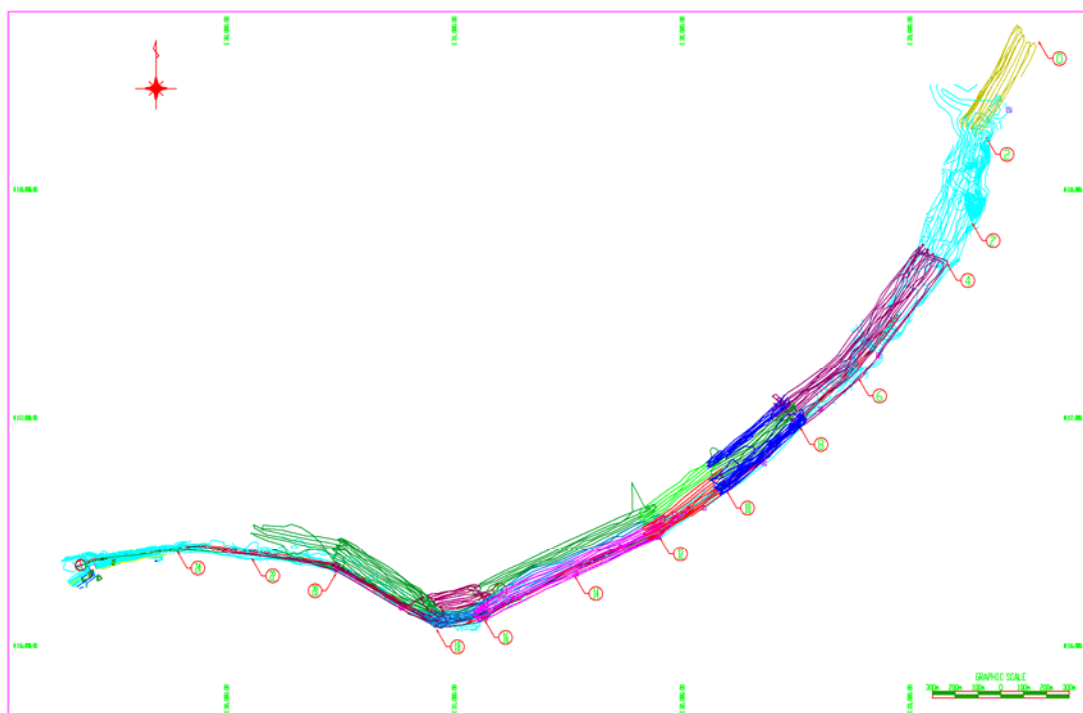


図 A.8.2.9-2 危険物調査の測線図(航路部)

1. INTRODUCTION

BACTEC SE Asia Pty. Ltd. (BACTEC) was engaged by ECOH Corporation, Japan, to conduct an Unexploded Ordnance (UXO) Survey of three sites required for the construction of a wharf and channel improvement. The project site was a battlefield during WWII and as such the possibility of UXO's being in the area was high. A magnetic survey and visual search was deemed to be the most effective way to locate any unexploded ordnance within the sites. It should be noted that marine growth over the last 60 years helped to mask the location of UXO's, without the use of a magnetometer.

2. AUTHORITY

The authorisation to proceed was formalised with the exchange of contracts at the commencement of the Peleliu Project on the 9 August 2005. The contract exchange took place between Mr Muraoka, ECOH Corporation and Mr Mark Latimer of BACTEC.

3. SCOPE

The scope of the survey was divided into three tasks.

- Task 1 - Magnetic land survey for UXO's at proposed Wharf Site. Area size 1,000 sq. metres
- Task 2 - Magnetic marine survey for UXO's of proposed Turning Basin Area. Total area size 5,600 sq. metres.
- Task 3 - Magnetic and visual search for UXO's in the Access Channel to the Turning Basin area. Total area size of 60 hectares.

4. TIMING

The task was conducted from the 6 August 2005 to 19 August 2005, inclusive. A summary of relevant dates and events, which occurred during the undertaking of this survey, is attached at Summary of Events, Appendix 1 of this report.

5. STAFF

The task was carried out by Mark Latimer, Manager, Explosive Ordnance Services for BACTEC, and assisted by David Humphreys, Project Manager, BACTEC. Both Mr Latimer and Mr Humphreys are ex-navy Clearance Divers trained in all forms of underwater explosive tasks and have conducted underwater UXO clearance operations worldwide.

6. EQUIPMENT

The Foerster Ferex 4.021 Analogue Gradiometer Magnetometer was used to conduct the magnetic survey at all sites. The Ferex is a search instrument designed to detect ferrous objects beneath the ground up to a depth of 6 metres. The depth capability is dependant on the size of the object, the magnetic signature and the aspect of the target. The 4.021 will detect a 25 lb. projectile at 2 metres. A 30 metre underwater cable was used during the survey of the basin area and the channel. Photographs of the equipment are attached at Appendix 6 of this report.

7. METHODOLOGY

(Note – All co-ordinates in this report are obtained using a Garmin GPS Map76 Set on WGS 84)

7.1. Task 1

The land area was changed from the original document supplied on the 8th June 2005 and was divided into two sites. The land survey area was marked out into two sites from map details provided by ECOH Corporation at a meeting held on the 8 August, at Koror, Palau. A map of the search area is attached at Appendix 2 of this report. Both sites were investigated using the Foerster Magnetometer, using half metre line spacing.

All contacts were uncovered and positively identified and the investigation hole covered in on completion.

The tables below list the boundary co-ordinates of the two Task 1 sites.

Site 1 (East of existing wharf) Total area approximately 525 sq. metres

LOCATION	NORTH	EAST
N/W Corner	07 02' 56.6"	134 16' 00.4"
N/E Corner	07 02' 56.9"	134 16' 01.6"
S/W Corner	07 02' 56.1"	134 16' 00.5"
S/E Corner	07 02' 56.2"	134 16' 01.7"

Site 2 (Bliliou Fishing Cooperative) Total area approximately 620 sq. metres

LOCATION	NORTH	EAST
N/W Corner	07 02' 54.6"	134 15' 58.0"
Sea Wall Bend	07 02' 55.2"	134 15' 59.0"
N/E Corner	07 02' 55.5"	134 15' 59.2"
S/W Corner	07 02' 54.3"	134 15' 58.4"
S/E Corner	07 02' 55.1"	134 15' 59.4"

7.2. Task 2

The marine area was changed from the original document supplied on the 8 June 2005 and was now divided into two sites. Site 1 was the main channel east of the existing wharf and joining the land survey Site 1 area. Site 2 was the area from the high water mark west of the existing wharf and out to the turning basin with additional area to the west of the turning basin. A map of the search area is attached at Appendix 2 of this report.

Both sites were initially visually inspected to establish the amount and type of ferrous obstacles in the area. This search was followed by a Magnetometer survey to investigate items under the sea bed. A diver manoeuvred the magnetometer probe around the sites with direction from the surface. Once a contact was pin pointed, the diver would excavate the area until the item giving the reading was found. All contacts were investigated and positively identified.

The tables below list the boundary co-ordinates of the two Task 2 sites.

Site 1 (Main Channel east of existing wharf) Total area approximately 3,060sq/mt

LOCATION	NORTH	EAST
N/W Corner	07 02' 58.1"	134 02' 58.1"
N/E Corner	07 02' 58.6"	134 16' 01.7"
S/W Corner	07 02' 56.6"	134 16' 00.4"
S/E Corner	07 02' 57.0"	134 16' 02.3"

Site 2 (Area south and west of turning basin) Total area approximately 2,700sq/mt

NORTH	EAST
07 02' 54.3"	134 15' 57.5"
07 02' 54.6"	134 15' 58.0"
07 02' 55.2"	134 15' 59.0"
07 02' 55.5"	134 15' 59.2"
07 02' 55.8"	134 15' 59.6"
07 02' 56.5"	134 15' 59.4"
07 02' 56.1"	134 15' 57.7"
07 02' 56.6"	134 15' 57.3"
07 02' 55.8"	134 15' 56.6"

7.3. Task 3

The survey of the channel area was conducted by dividing the area into manageable sizes using the channel beacons. The survey methodology was dependant on depth and amount of ferrous debris. There were three methods employed to cover the channel area.

1. Visual search by divers using snorkels or scuba.
2. Magnetometer search with diver guiding the magnetometer head under direction from the surface.
3. Towed magnetometer.

Divers had to snorkel or scuba dive to survey the Conservation area near the boat channel as any boat activity in this area would have caused problems, and access was restricted due to the depth. The navigation of the lanes for the magnetometer survey was plotted using DGS Tracking, to ensure total coverage of the areas. Once a contact was detected during the towed magnetometer survey, a marker buoy was put over the side. After completion of the towed magnetometer survey of that area, a diver was then used to pin point the contact. The diver would then excavate the area until the item giving the reading was found. All contacts were investigated and positively identified.

Listed below is a table showing the boundaries of the Task 3 Survey. The channel beacons were used as a guide, and the width of the survey area (150 metres) was measured from the beacons to the north/west. The survey was initially started from the boat channel and then Beacon 24.

POSITION	NORTH	EAST
Channel start (Barge)	07 02'57.0"	134 16'02.3"
Channel start boundary	07 03'00.9"	134 16'01.0"
Channel Marker 24	07 02'58.5"	134 16'12.1"
Channel Marker 24 Boundary	07 03'03.7"	134 16'11.7"
Channel Marker 22	07 02'57.5"	134 16'22.5"
Channel Marker 22 Boundary	07 03'02.7"	134 16'23.2"
Channel Marker 20	07 02'55.4"	134 16'34.6"
Channel Marker 20 Boundary	07 03'00.6"	134 16'35.8"
Channel Marker 18	07 02'47.6"	134 16'49.2"
Channel Marker 18 Boundary	07 02'52.3"	134 16'47.8"
Channel Marker 16	07 02'49.2"	134 16'55.9"
Channel Marker 16 Boundary	07 02'53.8"	134 16'54.1"
Channel Marker 14	07 02'55.1"	134 17'08.9"
Channel Marker 14 Boundary	07 02'59.6"	134 17'06.8"
Channel Marker 12	07 03'00.6"	134 17'21.1"
Channel Marker 12 Boundary	07 03'05.1"	134 17'18.9"
Channel Marker 10	07 03'07.3"	134 17'30.7"
Channel Marker 10 Boundary	07 03'11.4"	134 17'27.9"
Channel Marker 8	07 03'16.3"	134 17'41.1"
Channel Marker 8 Boundary	07 03'19.8"	134 17'37.4"
Channel Marker 6	07 03'23.2"	134 17'49.5"
Channel Marker 6 Boundary	07 03'26.5"	134 17'45.7"
Channel Marker 4	07 03'39.6"	134 18'01.9"
Channel Marker 4 Boundary	07 03'42.0"	134 17'57.6"
Channel Marker 2	07 03'57.5"	134 18'08.0"
Channel Marker 2 Boundary	07 04'00.2"	134 18'03.7"
Channel Marker 0 (42)	07 04'10.7"	134 18'15.4"
Channel Marker 0 Boundary	07 04'14.2"	134 18'11.8"

8. SURVEY RESULTS

8.1. Task 1

The first site was located east of the existing wharf and out from the high water mark. Total area covered was 15 x 35 metres (525 sq. metres). The site was soft-to-medium packed coral sand, with heavy kelp coverage in the sheltered area of the wharf. This site contained metal fragments in varying states of corrosion. The main items uncovered were reinforcement bar and scrap iron. 6 x 0.50 calibre machine gun rounds were located in this site. No other items of significance were located.

The second site was located in the fenced area of the Bliliou Fishing Cooperative. This area contained several out buildings, an incinerator and underground services. Total area covered was 620 sq. metres, less 20 sq. metres for the area of the sheds and incinerator. Photographs of these areas are attached at Appendix 6 of this report. The area had reclamation work carried out in 1980 to stop the erosion of the beach. Gabions made from wire mesh were used to construct the sea wall. An existing tree dating back to approximately the end of the war indicated that most of the beach that would have existed at the end of the war had eroded and the

possibility of UXO existing in this area would be close to non-existent. Items uncovered included a fire extinguisher one metre below the surface, vehicle parts and scrap metal. No other items of significance were located. A UXO Survey Certificate for these two sites is attached at Appendix 3 to this report.

8.2. Task 2

The first site was east of the existing wharf and extended across the main channel to a conservation zone. Total area searched was approximately 3060 square metres. The area close to the foreshore was littered with tyres and debris discarded from boats. The area near the conservation zone was relatively free from any ferrous contacts. Bottom conditions in this area were medium firm sand. No items of significance were located in this site.

The second site had different bottom conditions with soft sand and kelp. Thick kelp was in the corner of the wharf. The site was relatively free from ferrous contacts but it was noted that a large winch and ship debris was just outside the search area to the west.

No items of any significance were located. A UXO Survey Certificate for these two sites is attached at Appendix 4 to this report.

8.3. Task 3

Most contacts in the main channel area were located along the edges of the channel. Discarded channel markers, metal pipes and sinkers were the main items found. The bottom conditions were mainly soft to medium coral sand with heavy build up of kelp from Beacon 6 to the boat harbour. A submarine cable was located and plotted at three different locations. The cable is similar to that used in New Guinea for communications by the Japanese military.

The three locations are listed to assist in future dredge plans, as the cable is 10 metres in the main channel and would pose a problem for dredges.

NORTH	EAST
07 03'03.4"	134 17'23.6"
07 02'49.3"	134 16'56.3"
07 02'48.5"	134 16'53.8"

The cable was again relocated at 3 positions between Beacon 18 and 22 and once again was 10 metres in from the beacons. The cable had 4 rubberised cores and was protected by steel cable. A photograph of the cable is attached at Appendix 6 of this report.

No items of any significance were located. A UXO Survey Certificate for this site is attached at Appendix 5 to this report.

9. QUALITY CONTROL

Quality Assurance and Control was a vital part in ensuring the task was completed competently and with confidence that the sites searched were surveyed to the required specifications. All detection equipment was calibrated daily over a prepared test pit. The test

pit was established near the sites. The test pit had 3 targets, representative of the targets to be located during the task, buried at different depths.

During the magnetometer survey the Forester Magnetometer was tested every hour for both battery level and function.

Details of all equipment calibrated and the results were recorded in the Equipment Calibration Logs. BACTEC search instruments are calibrated at the commencement of work each day. Any instrument failing the test would be withdrawn from the task until the problem was rectified; results were recorded in the Equipment Calibration Log and the Daily Log.

At the completion of the task, all items were removed from the test holes, which were then filled in to avoid injury, and all rubbish and items used for the task were removed from the sites.

10. CONCLUSION / RECOMMENDATIONS

Most contacts during the channel survey were located on the edge of the channel which suggests that items that were previously in the channel were removed either during the post war clean-up or during the previous channel dredging operations.

The submarine cable located during the main channel survey should be noted if dredging operations are to take place. Local sources have said that there is a telecom cable somewhere in the main channel, but as this cable would have a copper core in rubberised wrapping, it was impossible to locate with the magnetometer. After discussions at the local government offices, it was confirmed that a telecom cable was laid in the left hand side of the channel coming from Koror in 1994.

It should be noted that the depth and size of the channel would restrict the size of vessels and shipping using the channel and therefore would limit it as a target during the war, therefore this would explain the lack of evidence of bombing or UXO in the area.

The land and marine survey areas contained ferrous contamination that limited the full assessment for UXO. Vessel debris, moorings, truck tyres and other large objects were unable to be removed from the survey site. Although no indication of UXO was found during the survey of these two areas, it should be noted that due care should be taken if dredging is to take place in these areas, as these objects may have concealed possible UXO's underneath.

This task was a survey only and not a complete clearance that would have involved the removal of all ferrous items from the site. Contacts from the marine survey and the main channel survey were uncovered, identified and left in place. The results of the survey for UXO has found no evidence of UXO or any other explosive related items in the tendered sites and as such we recommend that no further UXO investigation is necessary for future development within the described boundaries. If the marine area, such as the wharf, is to be extended, then the source of any back fill for the site, which comes from within the island, must come from a UXO certified free area or imported from a clean site.

11. LIMITATIONS OF REPORT

This report has been prepared for the use of ECOH Corporation, Japan, in accordance with general accepted Consulting practice. No other warranty, expressed or implied, is made as to the professional advice included in this report. This report has not been prepared for the use

by parties other than the client, the owner and their respective consulting advisors. It may not contain sufficient information for purposes of other parties or for other uses.

This report was prepared on completion of the fieldwork and is based on conditions encountered and reviewed at the time of preparation. BACTEC disclaims responsibility for any changes that might have occurred after this time. The interpreted locations and depths noted in this report should be taken as an indication only and no decision should be based solely on these results.

This report should be read in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties. This report does not purport to give legal advice. Legal advice can only be given by qualified legal practitioners.

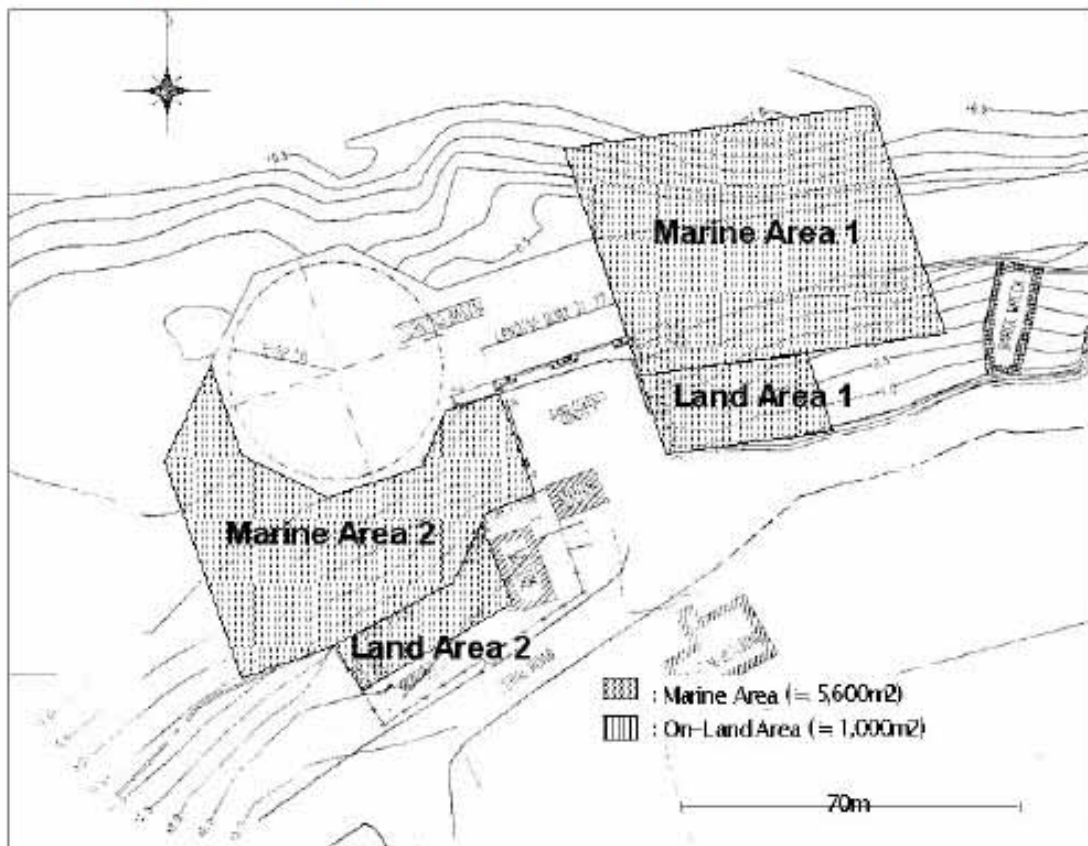
Whilst to the best of our knowledge, information contained in this report is accurate at the date of issue, conditions on the site (including the depositing and removal of contamination) can change in a limited time. This should be borne in mind if the report is used after a protracted delay.

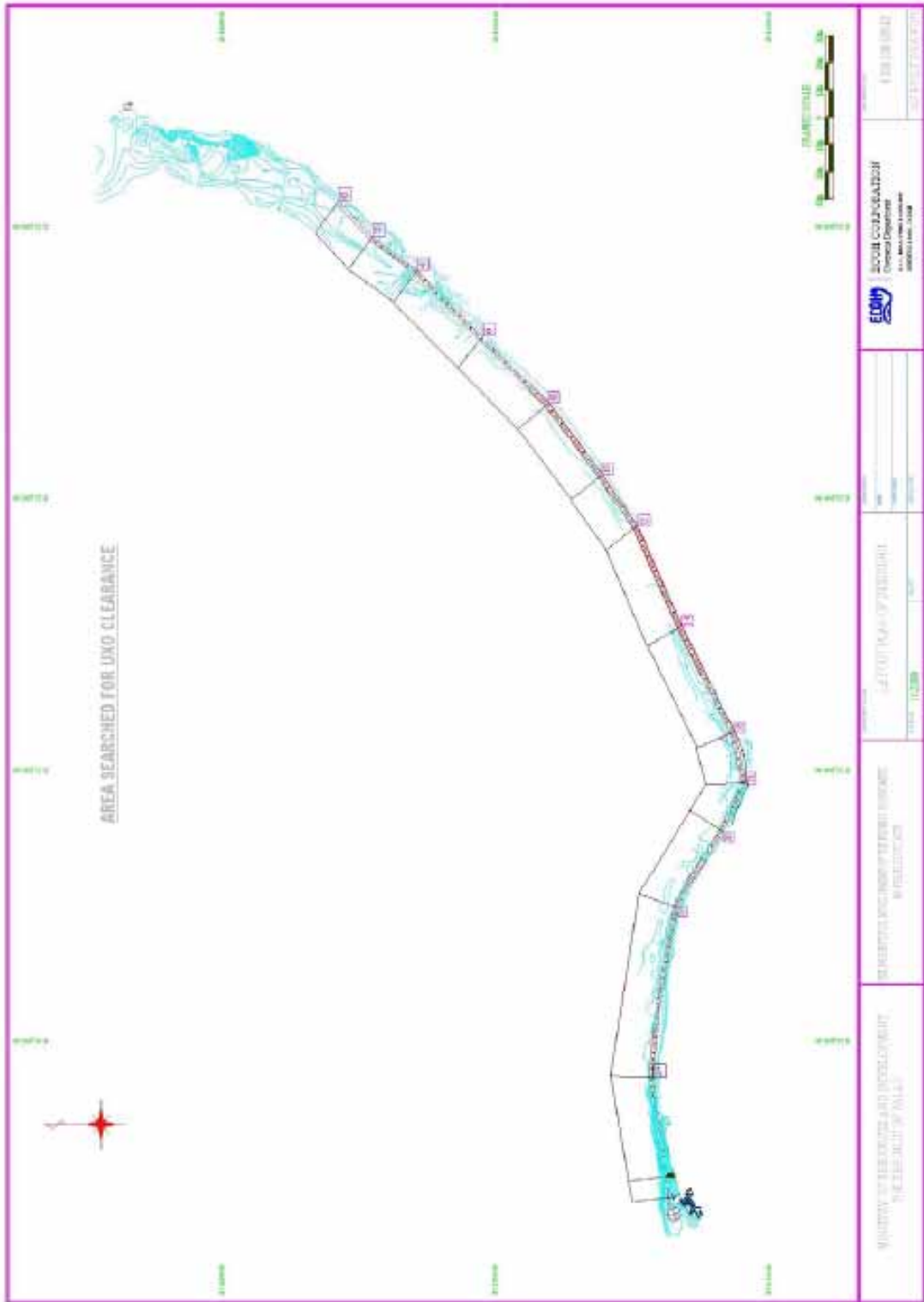
12. APPENDIX 1 – SUMMARY OF EVENTS

The following is a summary of relevant dates and events, which occurred during the undertaking of this survey:

Date	Activities	Comments
6 August 2005	Preparation of Equipment Mobilise to Palau	
8 August 2005	Exchanging of Contracts	Conducted at Koror
9 August 2005	Site inspection Start Dry Area Survey	Move to Peleliu Island
10 August 2005	Finish Dry Area Survey Commence Marine area survey	No significant finds
11 August 2005	Finish Marine Area survey Start Channel Survey	No significant finds
18 August 2005	Finish Survey task	No significant finds
19 August 2005	Demobilisation from Peleliu Island	Interim Report given to Mr Masakiyo Muraoka and Mr Shinji Okada
19 August 2005	Final Report	Draft Final Report submitted
26 August 2005	Final Report	Submit of Final Report in electronic and hardcopy.

13. APPENDIX 2 – SITE MAP





14. APPENDIX 3 – CERTIFICATE OF UXO SURVEY - TASK 1

DATE	21 st August, 2005	SITE	Peleliu Island Project	INO	0031
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This is to certify that the following location has been surveyed and deemed clear of all UXO and Explosive Ordnance related objects, down to a depth of two metres, under the supervision of a BACTEC EOD Site Manager. Any limitations are attached in 'Notes Section'.

Site 1 (East of existing wharf) Total area 525 sq. / metres


LOCATION	NORTH	EAST
N/W Corner	07 02'56.6"	134 16'00.4"
N/E Corner	07 02'56.9"	134 16'01.6"
S/W Corner	07 02'56.1"	134 16'00.5"
S/E Corner	07 02'56.2"	134 16'01.7"

Site 2 (Biliou Fishing Cooperative) Total area 620 sq. / metres

LOCATION	NORTH	EAST
N/W Corner	07 02'54.6"	134 15'58.0"
Sea Wall Bend	07 02'55.2"	134 15'59.0"
N/E Corner	07 02'55.5"	134 15'59.2"
S/W Corner	07 02'54.3"	134 15'58.4"
S/E Corner	07 02'55.1"	134 15'59.4"

NOTES

1. In the case of an intrusive survey, excavations may now be carried out to a depth of two metres within the area bounded by the indicated positions.
2. In areas contaminated by metallic rubbish, such as truck wheels, moorings and vessel debris, which was unable to be removed for the survey, caution must be observed when dredging in these areas.
3. The area contained within the boundaries listed above is deemed to be free of any Unexploded or Explosive Ordnance, with the exceptions noted in Para 2 of this certificate. The site was UXO surveyed to the capability of the equipment employed for the task and to the criteria set in *BACTEC Proposal – UXO Survey, Peleliu, Republic of Palau. ML05021 Proposal S-1066*

<p>Compiled by:..... Mark Latimer MExpE. <i>Project Manager</i></p> <p>Date : 29 August 2005</p>	<p style="text-align: right;"></p> <p>Authorised by: Timothy Pippett B.App.Sc. Dip.Bus. RGeo., FAIG. <i>Managing Director</i></p> <p>Date : 29 August 2005</p>
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15. APPENDIX 4 – CERTIFICATE OF UXO SURVEY - TASK 2

DATE	21 st August, 2005	SITE	Peleliu Island Project	INO	0031
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This is to certify that the following location has been surveyed and deemed clear of all UXO and Explosive Ordnance related objects, down to a depth of two metres, under the supervision of a BACTEC EOD Site Manager. Any limitations are attached in 'Notes Section'.

Site 1 (Main Channel east of existing wharf)


LOCATION	NORTH	EAST
N/W Corner	07 02' 58.1"	134 02' 58.1"
N/E Corner	07 02' 58.6"	134 16' 01.7"
S/W Corner	07 02' 56.6"	134 16' 00.4"
S/E Corner	07 02' 57.0"	134 16' 02.3"

Site 2 (Area south and west of turning basin)

NORTH	EAST
07 02' 54.3"	134 15' 57.5"
07 02' 54.6"	134 15' 58.0"
07 02' 55.2"	134 15' 59.0"
07 02' 55.5"	134 15' 59.2"
07 02' 55.8"	134 15' 59.6"
07 02' 56.5"	134 15' 59.4"
07 02' 56.1"	134 15' 57.7"
07 02' 56.6"	134 15' 57.3"
07 02' 55.8"	134 15' 56.6"

NOTES

- 1 In the case of an intrusive survey, excavations may now be carried out to a depth of two metres within the area bounded by the indicated positions.
- 2 In areas contaminated by metallic rubbish, such as truck wheels and vessel debris, which was unable to be removed for the survey, caution must be observed when dredging in these areas.
- 3 The area contained within the boundaries listed above is deemed to be free of any Unexploded or Explosive Ordnance, with the exceptions noted in Para 2 of this certificate. The site was UXO surveyed to the capability of the equipment employed for the task and to the criteria set in *BACTEC Proposal – UXO Survey, Peleliu, Republic of Palau. ML05021 Proposal S-1066*

<p>Compiled by:..... Mark Latimer MExpE. <i>Project Manager</i></p> <p>Date : 29 August 2005</p>	<p style="text-align: right;"></p> <p>Authorised by: Timothy Pippett B.App.Sc. Dip.Bus. R.PGeo., FAIG. <i>Managing Director</i></p> <p>Date : 29 August 2005</p>
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16. APPENDIX 5 – CERTIFICATE OF UXO SURVEY - TASK 3

DATE	21 st August, 2005	SITE	Peleliu Island Project	INO	0031
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This is to certify that the area located within the listed boundaries has been surveyed and deemed clear of all UXO and Explosive Ordnance related objects, down to a depth of two metres, under the supervision of a BACTEC EOD Site Manager. Any limitations are attached in 'Notes Section'.

POSITION	NORTH	EAST
Channel start	07 02'57.0"	134 16'02.3"
Channel start boundary	07 03'00.9"	134 16'01.0"
Channel Marker 24	07 02'58.5"	134 16'12.1"
Channel Marker 24 Boundary	07 03'03.7"	134 16'11.7"
Channel Marker 22	07 02'57.5"	134 16'22.5"
Channel Marker 22 Boundary	07 03'02.7"	134 16'23.2"
Channel Marker 20	07 02'55.4"	134 16'34.6"
Channel Marker 20 Boundary	07 03'00.6"	134 16'35.8"
Channel Marker 18	07 02'47.6"	134 16'49.2"
Channel Marker 18 Boundary	07 02'52.3"	134 16'47.8"
Channel Marker 16	07 02'49.2"	134 16'55.9"
Channel Marker 16 Boundary	07 02'53.8"	134 16'54.1"
Channel Marker 14	07 02'55.1"	134 17'08.9"
Channel Marker 14 Boundary	07 02'59.6"	134 17'06.8"
Channel Marker 12	07 03'00.6"	134 17'21.1"
Channel Marker 12 Boundary	07 03'05.1"	134 17'18.9"
Channel Marker 10	07 03'07.3"	134 17'30.7"
Channel Marker 10 Boundary	07 03'11.4"	134 17'27.9"
Channel Marker 8	07 03'16.3"	134 17'41.1"
Channel Marker 8 Boundary	07 03'19.8"	134 17'37.4"
Channel Marker 6	07 03'23.2"	134 17'49.5"
Channel Marker 6 Boundary	07 03'26.5"	134 17'45.7"
Channel Marker 4	07 03'39.6"	134 18'01.9"
Channel Marker 4 Boundary	07 03'42.0"	134 17'57.6"
Channel Marker 2	07 03'57.5"	134 18'08.0"
Channel Marker 2 Boundary	07 04'00.2"	134 18'03.7"
Channel Marker 0 (42)	07 04'10.7"	134 18'15.4"
Channel Marker 0 Boundary	07 04'14.2"	134 18'11.8"

NOTES

1. In the case of an intrusive survey, excavations may now be carried out to a depth of two metres within the area bounded by the indicated positions.
2. In areas contaminated by beacon rubbish and submarine cables, which was unable to be removed, caution must be observed when dredging in these areas.

- 3 The area contained within the boundaries listed above is deemed to be free of any Unexploded or Explosive Ordnance, with the exceptions noted in Para 2 of this certificate. The site was UXO surveyed to the capability of the equipment employed for the task and to the criteria set in *BACTEC Proposal – UXO Survey, Peleliu, Republic of Palau. ML05021 Proposal S-1066*

<p>Compiled by:..... Mark Latimer MIEExpE <i>Project Manager</i></p> <p>Date : 29 August 2005</p>	<p> Authorised by: Timothy Pippett B.App.Sc. Dip.Bus. RPhGeo., FAIG. <i>Managing Director</i></p> <p>Date : 29 August 2005</p>
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17. APPENDIX 6 – PHOTOGRAPH



0.50 Cal ammunition found in Land Survey Site 1



Fire extinguisher found 1metre down in Land Survey Site 2



Magnetometer search Land Survey Site 2



Furnace in Land Survey area Site 2



Gabion Sea wall in Land Survey Site 2



Gabion Sea wall in Land Survey Site 2



Shed in Land Survey Site 2



Land Survey Site 1



Underwater Magnetometer with 30 metres cable



Magnetometer Survey of shallow in Main Channel



Diver using Underwater Magnetometer



Submarine Cable pulled out of seabed, Main Channel.

18. APPENDIX 7 – BACTEC SE ASIA CURRICULUM VITAE

BACTEC South East Asia Pty. Limited (BACTEC), a subsidiary of BACTEC International Limited of the United Kingdom, founded in 1991, is an Explosive Ordnance Disposal (EOD) company with extensive experience in the survey, investigation and clearance of areas contaminated with ordnance and explosives, both on land and underwater. BACTEC provides high quality, independent, specialist services on all matters relating to explosive ordnance contamination.

BACTEC was established in 2003 to offer high sensitivity geophysical tools and expertise as an alternative to intrusive investigations in the following areas:

- **Ordnance Services** The location of buried unexploded ordnance (UXO), including site assessments and sample surveys to determine extent of pollution. BACTEC is a member of the Defence UXO Panel.

This includes the support for the Department of Defence on Defence land, the support to Civil Engineering and Construction companies on Former Defence Land.
- **Training** BACTEC provides training courses in all areas of the EOD / UXO operations and IED training for overseas government and non-government organisations.
- **Project Management** Project Management is an intricate part of all projects and BACTEC has expertise and experience in setting up, running and reporting on both major and minor projects worldwide.
- **Research and Development** BACTEC continues to develop state-of-the-art technologies, both hardware and software for the location and discrimination of ordnance items buried in the sub-surface.

BACTEC's technical staff are EOD trained ex-servicemen, including divers. All BACTEC Operations staff are Explosive Ordnance Disposal Operators who have attended formal training courses at the Defence EOD Schools, either in Australia, UK or USA. All operational members of staff are therefore familiar with addressing access issues on Defence Estates. BACTEC can also draw on additional qualified staff as required on a project-by-project basis.

One of the most important aspects of any EOD project is the standard of clearance, which is set at the start of the work. All EOD procedures are developed so that the highest standards of professional delivery and safety are met. BACTEC has ISO 9001 accreditation specifically for the range of EOD and associated services it provides. BACTEC is the only EOD / UXO Company in Australia to provide this accreditation.