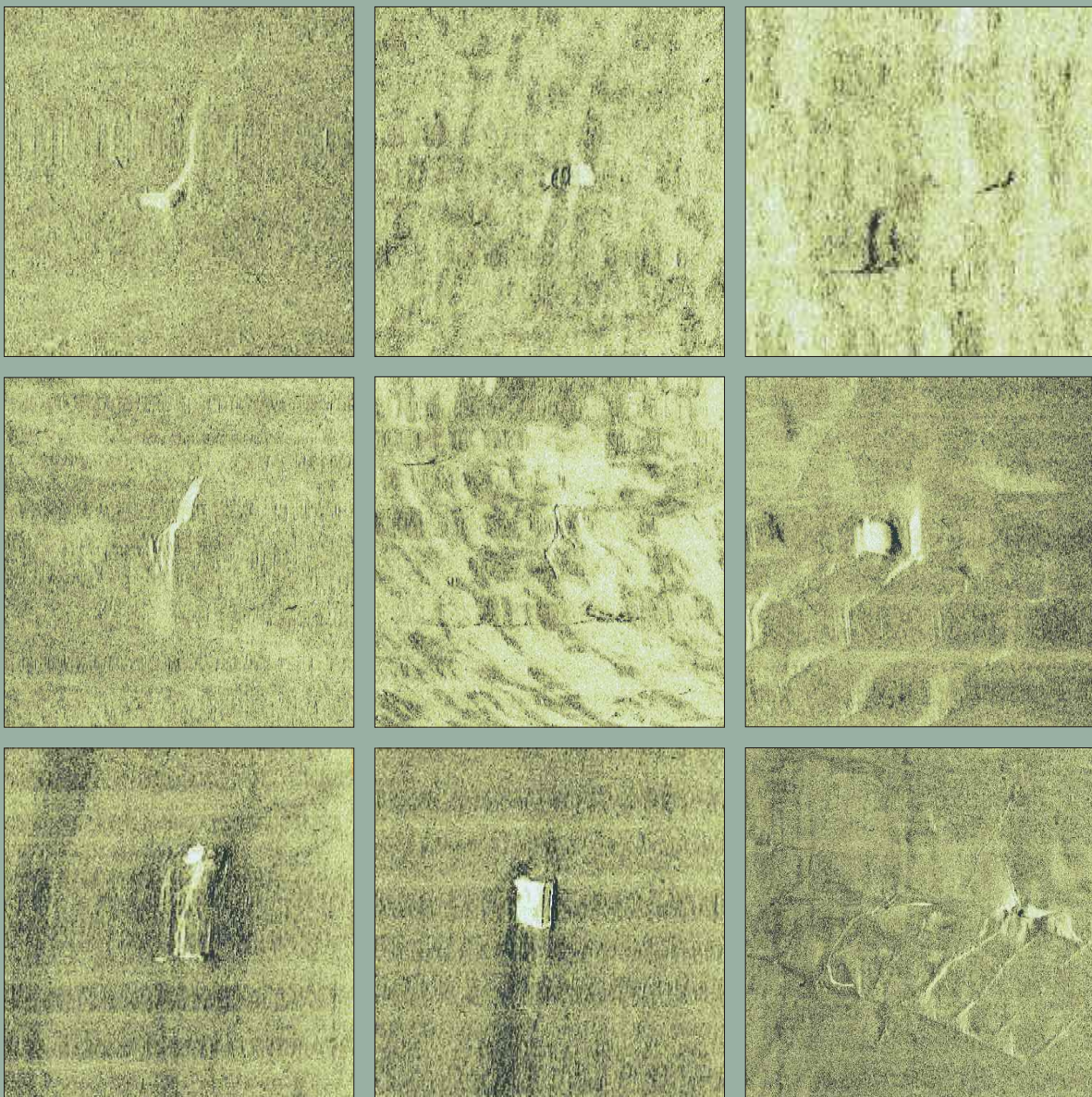




Blessing of Burntisland, Firth of Forth, Scotland

Designated Site Geophysical Survey:

Full Report



**ARCHAEOLOGICAL SERVICES IN RELATION TO THE PROTECTION OF WRECKS
ACT (1973)**

BURNTISLAND, FIRTH OF FORTH, SCOTLAND

DESIGNATED SITE ASSESSMENT: FULL REPORT

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Ref: 53111.03o

BURNTISLAND, FIRTH OF FORTH, SCOTLAND

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Summary

Wessex Archaeology was commissioned by Historic Scotland to undertake a geophysical survey of the Designated Site of the *Blessing of Burntisland*: a designated wreck site located within the Firth of Forth, Scotland. The work was undertaken as part of the contract for Archaeological Services in Relation to the Protection of Wrecks Act (1973).

The *Blessing of Burntisland* was a ferry that operated between Burntisland on the northern side of the Firth of Forth and Leith on the southern side. In July 1633, during King Charles I's tour of Scotland, she was crossing the Forth in a storm whilst carrying a number of the King's domestic servants, household items and an amount of treasure with an estimated value of up to 100,000 pounds in the 16th century. At the time this was possibly equivalent to one-sixth of the entire Scottish exchequer.

In 1999 the site was designated under the Protection of Wrecks Act, and Ian Archibald was granted a Survey Licence. The presence of the wreck within the designated area has never been confirmed either by ground truthing by divers or by standard geophysical techniques.

Wessex Archaeology survey operations took place between 2nd and 6th August 2004. A Written Scheme of Investigation produced by Wessex Archaeology recommended survey of the wreck to Level 1b.

Within the designated area the main feature identified during the sidescan sonar survey was the diver survey grid established by the Burntisland Heritage Trust. A number of small anomalies were recorded outside the designated area but none of these appear to indicate the presence of a wreck site.

The sub-bottom profile survey over the site showed a geological layer within the designated area that was covered by one to two metres of soft sediment. This supports observations made during diver surveys by the ADU.

BURNTISLAND, FIRTH OF FORTH, SCOTLAND

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Acknowledgements

This investigation was commissioned by Historic Scotland as part of the contract for Archaeological Services in Relation to the Protection of Wrecks Act (1973). The assistance provided by Gordon Barclay, Deirdre Cameron and Andrew Burke of Historic Scotland is gratefully acknowledged.

Wessex Archaeology would also like to thank the following people:

- Licensee Ian Archibald and site archaeologist Philip Robertson for their invaluable assistance during this survey.

The fieldwork was carried out by Dr Paul Baggaley and Dr Richard Bates. The data was processed and interpreted by Paul Baggaley who also compiled this report, and Kitty Brandon prepared the illustrations. The project was managed for Wessex Archaeology by Steve Webster.

Data Licences

The material derived from the UKHO is subject to licence 820/020220/11 and the conditions on End-Users and Third Parties contained therein. The following charts and wreck requests have been added to Schedule 1 Annex A:

- Digital use of Chart 733

A copy of the report will be sent to UKHO.

BURNTISLAND, FIRTH OF FORTH, SCOTLAND**DESIGNATED SITE ASSESSMENT: FULL REPORT**

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1. INTRODUCTION

- 1.1.1. This document constitutes a Designated Site Assessment: Full Report for a programme of archaeological work undertaken as part of the contract for Archaeological Services in Relation to the Protection of Wrecks Act (1973). The document has been prepared by Wessex Archaeology (WA) for Historic Scotland (HS). It comprises a geophysical survey of the *Blessing of Burntisland*, a designated wreck site located within the Firth of Forth (**Figure 1**).
- 1.1.2. The work was conducted in accordance with a Written Scheme of Investigation (WSI) prepared by WA. Surveying commenced on 2nd August and finished on 5th August 2004. All surveying took place off the survey vessel owned and operated by St Andrews University. The field team personnel were WA marine geophysicist Dr Paul Baggaley, the vessel skipper and geophysicist Dr Richard Bates of St Andrews University.

2. OBJECTIVES

- 2.1.1. The overall objective for the site as defined in the WSI was for recording to Level 1b.
- 2.1.2. This was further defined in the WSI, specifying the following tasks:
- produce a single geo-referenced sidescan sonar image of the designated wreck site and its surroundings;
 - provide co-ordinates and database entries for all sidescan sonar targets detected over the survey area;
 - attempt to identify a methodology whereby the licensee can expand upon this survey in a way that will produce structured archaeological data;
 - attempt to establish the shallow geological conditions underlying the site.

3. EXISTING SITE DATA

- 3.1.1. The position of the designated area as given in the brief was as follows:

Lat.	56° 02.407' N
Long.	03° 14.856' W
OSGB 36	

3.1.2. The Statutory Instrument number is 186, and from the centre point (defined above) the designated area covers a radius of 100 metres. The current Licensee is Mr Ian Archibald and the nominated archaeologist is Mr Philip Robertson.

3.1.3. Other information available prior to and during the assessment comprised:

- the UK Hydrographic Office record for the site;
- the National Monument Record entry for the site;
- ADU Reports for years 1999, 2000 and 2001;
- various books and web sites (see bibliography).

4. METHODOLOGY

4.1.1. The survey methods used over the *Blessing of Burntisland* were sidescan sonar and sub-bottom profiling. This methodology was discussed with the Licensee prior to the commencement of survey operations to assess practicality and possible amendments and suggestions.

4.2. SIDESCAN SONAR SURVEY

4.2.1. A sidescan sonar system produces a qualitative image of the seabed using acoustic energy. The system has transducers on either side of the towfish which emit high frequency pulses of acoustic energy in a direction perpendicular to travel. These acoustic pulses are reflected from the sea floor back to the transducers where they are detected and recorded via a workstation onboard the survey vessel. The strength of the reflections is mainly dependent upon the properties of the seafloor materials with the result that different sediment types will produce different signal strengths. Any objects on the seafloor which have any topography, such as a wreck, sandwaves or a rock, will produce a shadow due to the low angle of incidence of the acoustic pulse from the towfish.

4.2.2. A Klein 3000 digital sidescan sonar system was used for the project. This sidescan sonar system collects data at both 100 kHz and 500 kHz simultaneously. For archaeological purposes the highest possible resolution was required and therefore the 500 kHz data was processed to enable the identification of anomalies. The sidescan towfish was towed at a depth to maximise anomaly detection but that avoided possible loss of the sonar fish due to contact with the seafloor or upstanding anomalies.

4.2.3. Survey lines were run at 45-metre spacing throughout the survey area with a range setting of 50 metres. This ensured greater than 200% data coverage.

4.2.4. The data was collected digitally on a workstation using Klein SonarPro software, which stored the data in a suitable format for post-processing.

4.3. SUB-BOTTOM PROFILE SURVEY

4.3.1. A Geoacoustics pinger source was used for the sub-bottom profile. This system consists of a source and a receiver transducer housed within a single unit. The source transducer generates an acoustic pulse downwards into the water column. The broad

band frequency of this acoustic pulse is approximately centred on the 5 kHz frequency.

- 4.3.2. The acoustic energy propagates out from the source until it reaches an interface between two media with different acoustic impedance (the acoustic impedance of a material is the product of its density and seismic velocity). At each interface a portion of the energy is reflected back to the receiver transducer, which converts the acoustic energy it detects into an electrical signal for digital recording onboard the vessel.
- 4.3.3. The remaining energy continues to propagate further into the seabed and is partially reflected from different acoustic interfaces until it becomes too weak through attenuation to produce coherent return signal. The depth to which the acoustic signal can penetrate and still produce measurable reflections depends on the acoustic properties of the geology and the frequency content of the acoustic signal being emitted by the source.
- 4.3.4. Two orthogonal lines of sub-bottom data were collected over the site with the aim of characterising the sub-surface geological setting of the wreck site.

4.4. BATHYMETRIC SURVEY

- 4.4.1. A single beam echosounder was operating throughout both the sidescan sonar and sub-bottom profile surveys. The single beam echosounder survey records the depth of the seabed. The data was recorded digitally in Trimble HydroPro navigation software.

4.5. DATA PROCESSING AND ANOMALY CHARACTERISATION

- 4.5.1. The raw bathymetric data were processed by Dr Richard Bates to correct for tides and then interpreted using IVS Fledermaus software by WA. This allowed the single beam echosounder data to be converted into a surface representing the bathymetry of the survey area (**Figure 2**). This data set provided a vertical reference for the geophysical data.
- 4.5.2. The sidescan sonar data were processed and interpreted by WA using Coda Geosurvey software. This allowed the data to be replayed with various gain settings in order to optimise the quality of the images. The data were then interpreted for any objects of possible anthropogenic origin; the position and dimensions of any such objects were recorded in a gazetteer (**Appendix II**). The sidescan sonar data were then joined together to form a mosaic, giving a single georeferenced sidescan sonar image for the entire survey area. This image was then draped over the bathymetric data using IVS Fledermaus software in order to allow it to be viewed in conjunction with the Admiralty chart and other data sets.
- 4.5.3. The raw sub-bottom profile data were processed and interpreted by WA using Coda Geosurvey software. The sub-bottom data were interpreted (**Figure 4**) by delineating any strong boundaries between different geological layers.
- 4.5.4. All three data sets, sidescan sonar sub-bottom and bathymetry data, were incorporated into a single 3D scene using IVS Fledermaus software, which allowed all the data sets to be viewed in conjunction with the background charts and mapping.

- 4.5.5. It should be emphasised that the identification of a feature on the basis of a sidescan sonar or sub-bottom profile survey does not imply that the feature is necessarily of archaeological interest. Many of the features so identified may prove to be of modern origin, geological exposures, features attributable to sediment movement, or scars from anchoring or dredging.
- 4.5.6. The form, size and/or extent of anomalies need not enable easy discrimination; a single small but prominent anomaly may comprise all that is present, or it may be part of a much more extensive feature that is largely buried. Similarly, a scatter of minor anomalies may define the edges of a buried but intact feature, or it may be all that remains as a result of past impacts from, for example, dredging or fishing. The application of a ratings system is therefore only a means of prioritising sites in order to inform any subsequent investigations; it does not constitute a definitive interpretation.

5. RESULTS

5.1. SITE POSITION 2004

Lat.	56° 02.403' N
Long.	003° 14.941' W
WGS84	

- 5.1.1. The above position is not marked on the seafloor except for the presence of a survey grid established by divers from the Burntisland Heritage Trust. The reading was converted from geographical co-ordinates (OSGB36) to geographical co-ordinates (WGS84) using Geodetic Calculator v2.4.1.

5.2. BATHYMETRY AND GEOLOGY

- 5.2.1. The bathymetry of the seabed shoals from approximately 23m over the designated area to 17m to the north and 21m to the south.
- 5.2.2. The seabed around the wreck site consisted of a mainly flat muddy bottom with areas of gravelly sand.
- 5.2.3. The sub-bottom profile data shows that the sub-surface geology of the area is composed of undifferentiated layers with no observable features overlying a hard reflector, possibly bedrock. This bedrock layer is covered by 1-2m of soft sediment in the survey area which is in agreement with observations made by the Burntisland Heritage Trust dive team, who describe hitting a hard layer beneath the site with survey poles.
- 5.2.4. This bedrock layer appears to be horizontal within the designated area and to the south but to the north of the designated area, where the seafloor shoals to 17m, the bedrock layer dips downwards and is covered by up to 15m of soft sediment.

5.3. ARCHAEOLOGICAL FEATURES

Anomalies within the designated area

- 5.3.1. The designated area for the *Blessing of Burntisland* is based upon documentary evidence rather than the observed position of the wreck, which is presumed to be covered by soft sediment. Over this point the divers from the Burntisland Heritage Trust have established a survey grid (**WA3024**) which is approximately 37m by 33m and split into six sections.
- 5.3.2. Within the area covered by the survey grid is a large object (**WA3014**) some 5m by 1m by 0.7m. The nature of this object is unclear from the sidescan sonar image but it is thought to be related to the diver survey rather being a part of the *Blessing of Burntisland* wreck itself.
- 5.3.3. The only other three sidescan sonar anomalies within the designated area are two lengths of rope (**WA3015**, **WA3018** and **WA3019**) which may also have been left on the seafloor by divers from the Burntisland Heritage Trust.

Anomalies outside the designated area

- 5.3.4. To the south of the designated area there were seven sidescan sonar anomalies identified. Of these the only feature which was upstanding from the seafloor was an apparently circular object (**WA3025**) which is probably of modern anthropogenic origin.
- 5.3.5. Two of the objects (**WA3017** and **WA3023**) show no signs of structure and may well be geological. The final object south of the designated area was observed twice (**WA3020** and **WA3027**) as being an object with a large scour mark to the south-west, however the nature of this object is also unclear.
- 5.3.6. There are also two linear objects within this part of the survey area. The first of these (**WA3021**) on the south-west corner of the survey area is approximately four metres long and from its shape it may be a section of a tree or other piece of debris. The other linear feature (**WA3022**) is a section of rope or cable some eight metres in length.
- 5.3.7. To the north of the designated area, on the slope above the site being investigated by the Burntisland Heritage Trust, there were fourteen sidescan sonar anomalies identified with two at the northern edge of the survey area having prominent scour marks. These two objects (**WA3009** and **WA3010**) are approximately 350m from the designated point and appear to be of anthropogenic origin with **WA3010** showing definite structure.
- 5.3.8. Two of the anomalies north of the designated area are patches of debris or exposed rock (**WA3001** and **WA3012**) both of which are approximately ten metres across.
- 5.3.9. There are three small (less than two metres) objects (**WA3002**, **WA3013** and **WA3016**) which are all of apparent anthropogenic origin but which cannot be positively identified.

- 5.3.10. **WA3011** was a small mound to the north-east of the designated site which stood some 0.3m from the seafloor. This anomaly shows no clear structure and may be of geological origin.
- 5.3.11. The six remaining sidescan sonar anomalies (**WA3003**, **WA3004**, **WA3005**, **WA3006**, **WA3007** and **WA3008**) were all small objects thought to be of anthropogenic origin and exhibited some type of structure with the exception of **WA3007** which was an area of dark reflectors and may be geological.

6. CONCLUSIONS

- 6.1.1. The designated *Blessing of Burntisland* site appears not to contain the remains of the shipwreck based on the evidence available to date.
- 6.1.2. Although a number of sidescan sonar anomalies were identified within the survey area, none of them strongly indicates the presence of a shipwreck, or debris from a shipwreck, on the seafloor in this area.
- 6.1.3. If there is a shipwreck within this area then it must be completely buried by soft sediments. If this is the case then at the site of the diver survey grid there is only 1-2m of sediment cover available to conceal the wreck. Therefore if the wreck is in this area, any remaining structure must be less than 1m high for it to be completely covered. However, to the north of the diver survey grid there is a much larger accumulation of sediment, which the wreck could be within. If the wreck is covered by up to 15m of sediment then it would be extremely difficult to locate or to obtain physical evidence from it.

7. RECOMENDATIONS

- 7.1.1. Given the length of time since the *Blessing of Burntisland* was lost, and the geological conditions within this area of the Firth of Forth, it is likely that the wreck has been covered by soft sediment, provided that it has not already been completely destroyed by dredging or some other activity.
- 7.1.2. Therefore the two possible geophysical methods of locating buried material are a magnetic survey and further sub-bottom profiling surveys. However in this case there is a strong chance that neither of these methods will be successful.
- 7.1.3. For the wreck to be detected by sub-bottom profiling the survey line will have to pass directly over the wreck and a sufficient amount of material must be remaining for the wreck to act as a strong reflector. Given that any future survey will have a 10m line spacing at best, there would have to be a piece of wreckage of approximately that size in order to have a reasonable probability of it being detected.
- 7.1.4. A magnetic survey of the area would detect any ferrous material but given that the *Blessing of Burntisland* was a wooden vessel with no armaments it is unlikely to provide a large magnetic anomaly. Nor would the treasure provide a magnetic anomaly as precious metals are non-ferrous. Any magnetic signature associated with the wreck would be from small household items carried by King Charles I's domestic servants or from small fittings on the vessel. Therefore, it is possible that the wreck

would only produce a small magnetic anomaly which could be overlooked or obscured by the magnetic signature from more recent anthropogenic material.

8. REFERENCES

Larn, R., Larn, B., 1998, *Shipwreck Index of the British Isles: Volume 4, Scotland*, London.

Wessex Archaeology, 2003a, 'Archaeological Services in Relation to the Protection of Wrecks Act (1973): Written Scheme of Investigation', Unpublished Report Ref: 53111.01g.

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APPENDIX I: NOTE ON THE *BLESSING OF BURNTISLAND*

The *Blessing of Burntisland* was a ferry which operated between Burntisland on the northern side of the Firth of Forth and Leith on the southern side. In July 1633 during King Charles I's tour of Scotland she was crossing the Forth in a storm whilst carrying a number of the King's domestic servants, household items and an amount of treasure. The treasure an estimated value of up to 100,000 pounds, possibly equivalent to one-sixth of the entire Scottish exchequer at the time of the sinking.

This site has been investigated by a number of people including the Royal Navy and the ADU using a variety of remote sensing techniques and diver investigations, supplemented by the large amount of work conducted by the Burntisland Heritage Trust. So far this has not resulted in the finding of any physical evidence that there is a shipwreck within the designated area.

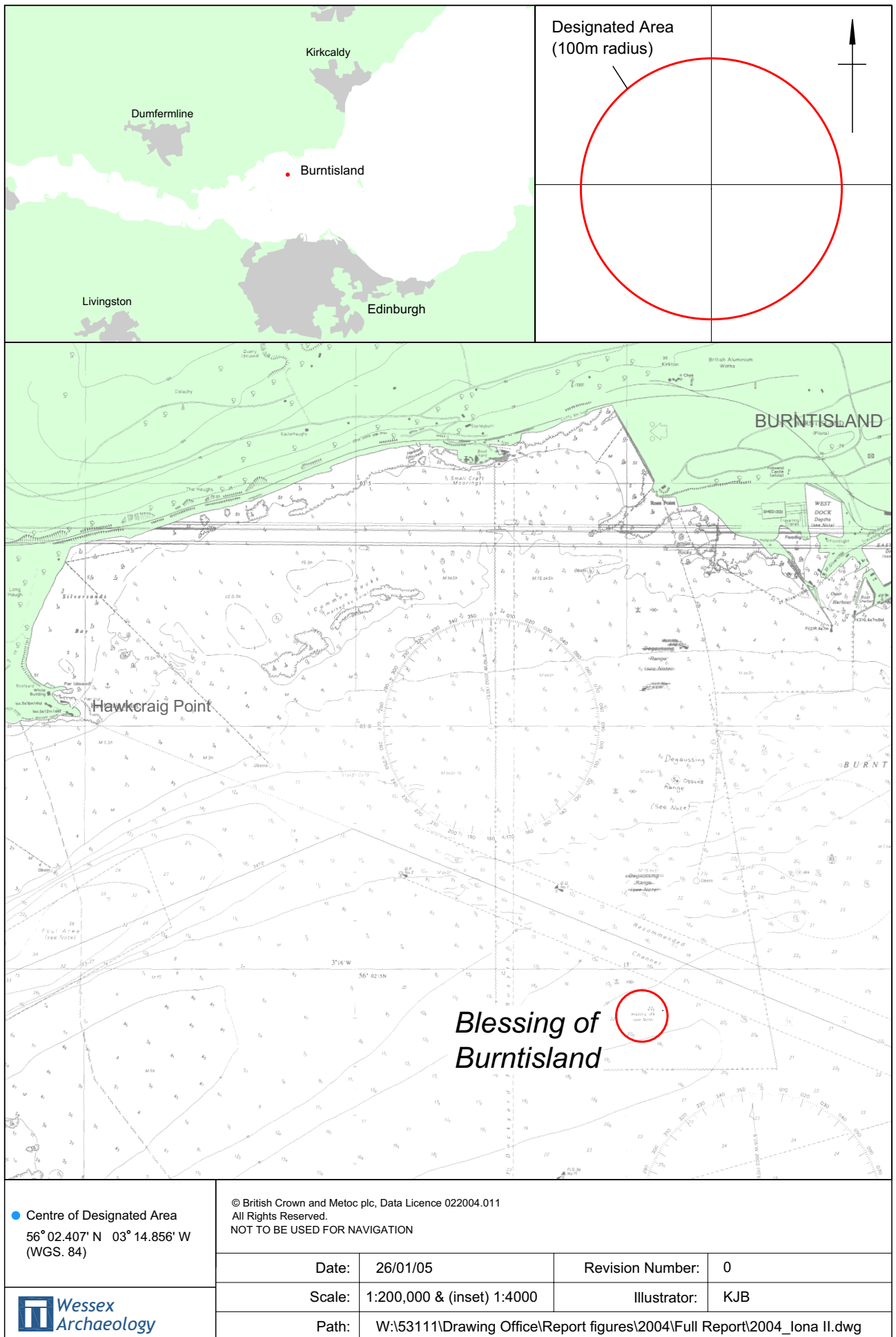
APPENDIX II: SIDESCAN SONAR ANOMALIES

WA ID	Anomaly Type	Easting (m)	Northing (m)	Latitude	Longitude	Length (m)	Height (m)	Width (m)	Description
3001	Object	484537.43	6210765.56	N 56.0418535	W 03.2481941	10.2	0	6.2	Patch of debris - probably rock
3002	Object	484512.88	6210732.76	N 56.0415580	W 03.2485862	0.8	0	1.2	Circular object - unclear
3003	Object	484087.64	6210623.33	N 56.0405608	W 03.2554052	1.5	0	1	Circular object
3004	Object	484091.22	6210641.71	N 56.0407261	W 03.2553489	1.2	0	0.4	Linear dark reflector - object
3005	Object	484223.59	6210649.02	N 56.0407961	W 03.2532247	4.1	0	1.7	Object - modern debris
3006	Object	484273.15	6210724.49	N 56.0414759	W 03.2524336	1.3	0	0.9	Small mound- may be sediment covered object
3007	Object	484147.29	6210634.00	N 56.0406587	W 03.2544485	3.9	0	0.9	Patch of dark reflectors
3008	Object	484063.50	6210665.49	N 56.0409388	W 03.2557952	8.4	0	2	Reflector possibly with attached object in water column
3009	Object	484513.50	6210915.73	N 56.0432019	W 03.2485868	6.2	0	2.8	Complex object with large scour mark
3010	Object with shadow	484535.07	6210928.89	N 56.0433209	W 03.2482414	2.3	0.7	0.8	Rectangular object with large scour mark
3011	Object with shadow	484689.53	6210807.67	N 56.0422367	W 03.2457551	1.8	0.3	0.9	Small mound with shadow
3012	Object	484594.26	6210712.64	N 56.0413798	W 03.2472788	9.3	0	10.7	Patch of rock
3013	Object	484580.38	6210647.01	N 56.0407897	W 03.2474978	1.4	0	1.5	Object - unclear
3014	Object with shadow	484481.24	6210574.13	N 56.0401317	W 03.2490849	4.4	0.7	0.7	Dark reflector with shadow
3015	Linear	484465.33	6210545.72	N 56.0398759	W 03.2493386	11.6	0	0	Rope
	Linear	484466.63	6210547.41	N 56.0398911	W 03.2493178	11.6	0	0	
	Linear	484468.58	6210549.24	N 56.0399076	W 03.2492866	11.6	0	0	
	Linear	484470.61	6210550.73	N 56.0399211	W 03.2492542	11.6	0	0	
	Linear	484473.35	6210551.81	N 56.0399309	W 03.2492102	11.6	0	0	
3016	Object	484562.88	6210646.52	N 56.0407847	W 03.2477787	2.2	0	1.2	Object - possibly isolated rock
3017	Object	484621.93	6210512.36	N 56.0395812	W 03.2468232	3.2	0	1	Object - possibly rock

WA ID	Anomaly Type	Easting (m)	Northing (m)	Latitude	Longitude	Length (m)	Height (m)	Width (m)	Description
3018	Linear	484529.24	6210556.80	N 56.0399775	W 03.2483135	34.6	0	0	Rope or cable
	Linear	484525.47	6210554.92	N 56.0399605	W 03.2483739	34.6	0	0	
	Linear	484519.57	6210554.06	N 56.0399526	W 03.2484685	34.6	0	0	
	Linear	484515.53	6210551.61	N 56.0399305	W 03.2485332	34.6	0	0	
	Linear	484510.62	6210550.60	N 56.0399212	W 03.2486120	34.6	0	0	
	Linear	484503.88	6210549.57	N 56.0399118	W 03.2487201	34.6	0	0	
	Linear	484500.22	6210549.71	N 56.0399129	W 03.2487788	34.6	0	0	
	Linear	484497.55	6210550.79	N 56.0399225	W 03.2488218	34.6	0	0	
3019	Linear	484481.75	6210522.95	N 56.0396719	W 03.2490737	20.2	0	0	Rope or cable
	Linear	484478.74	6210522.19	N 56.0396649	W 03.2491220	20.2	0	0	
	Linear	484475.17	6210520.55	N 56.0396501	W 03.2491792	20.2	0	0	
	Linear	484471.86	6210520.06	N 56.0396456	W 03.2492323	20.2	0	0	
	Linear	484470.50	6210519.70	N 56.0396423	W 03.2492541	20.2	0	0	
	Linear	484466.68	6210517.91	N 56.0396261	W 03.2493153	20.2	0	0	
	Linear	484462.53	6210518.08	N 56.0396275	W 03.2493819	20.2	0	0	
3020	Object	484244.71	6210409.85	N 56.0386479	W 03.2528716	1.8	0	2.2	Object - possibly rock
3021	Linear	484189.34	6210224.54	N 56.0369811	W 03.2537494	4.2	0	0	Rope or linear object
	Linear	484197.76	6210221.31	N 56.0369524	W 03.2536141	24.2	0	0	
	Linear	484189.90	6210227.61	N 56.0370088	W 03.2537406	24.2	0	0	
	Linear	484193.96	6210224.44	N 56.0369804	W 03.2536752	24.2	0	0	
3022	Linear	484565.58	6210406.12	N 56.0386249	W 03.2477215	8.1	0	0	Rope or cable
	Linear	484566.12	6210406.23	N 56.0386259	W 03.2477129	10.5	0	0	
	Linear	484566.33	6210407.05	N 56.0386333	W 03.2477095	10.5	0	0	
	Linear	484567.34	6210407.31	N 56.0386356	W 03.2476933	10.5	0	0	
	Linear	484567.97	6210408.16	N 56.0386433	W 03.2476833	10.5	0	0	
	Linear	484569.48	6210408.44	N 56.0386458	W 03.2476591	10.5	0	0	
	Linear	484570.12	6210409.78	N 56.0386579	W 03.2476489	10.5	0	0	
	Linear	484571.64	6210410.25	N 56.0386622	W 03.2476245	10.5	0	0	
	Linear	484573.15	6210410.81	N 56.0386673	W 03.2476003	10.5	0	0	
Linear	484573.73	6210411.32	N 56.0386719	W 03.2475910	10.5	0	0		
3023	Object	484629.16	6210429.02	N 56.0388327	W 03.2467024	1.5	0	1.5	Dark reflector - object possibly rock

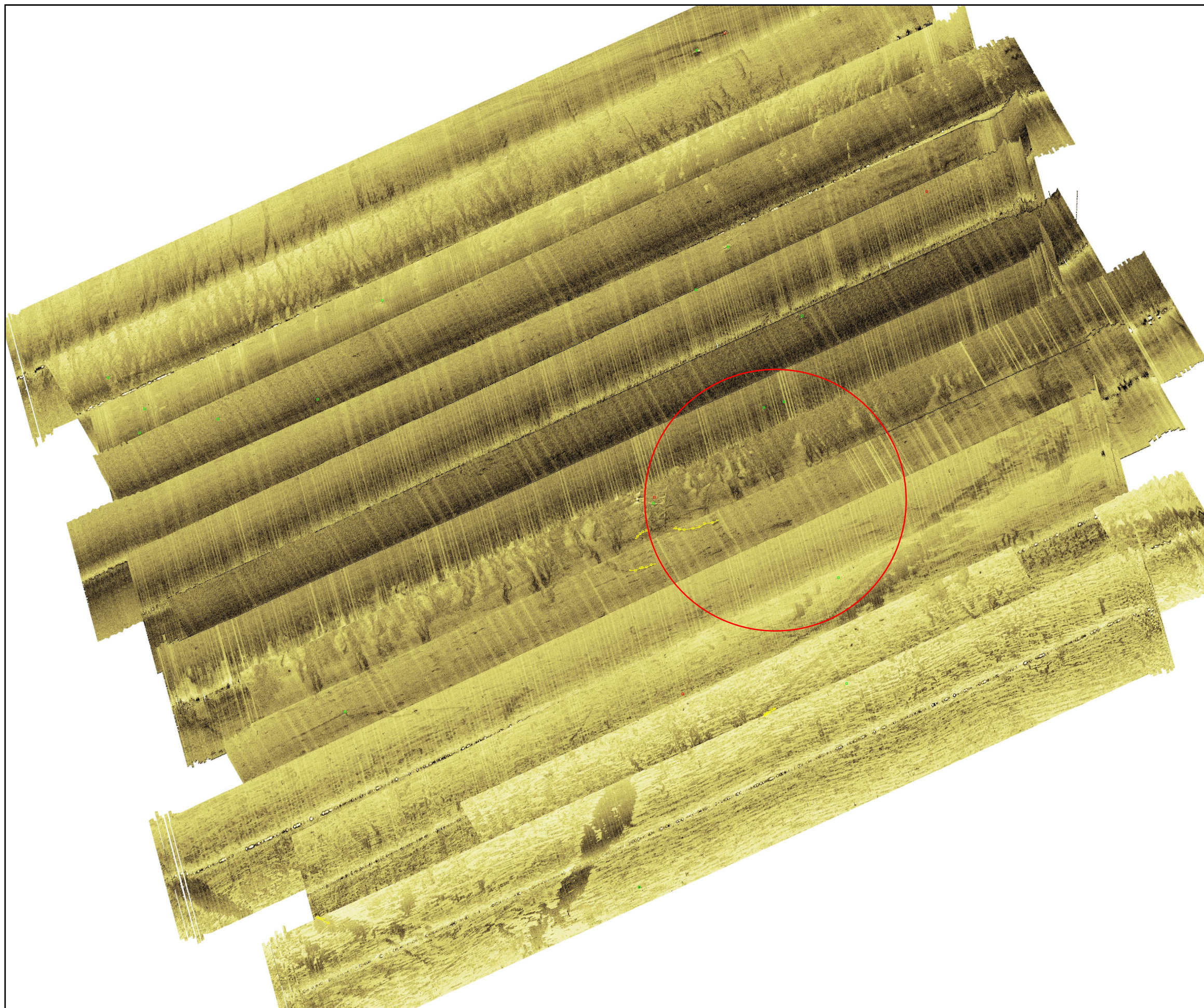
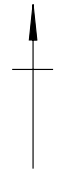
WA ID	Anomaly Type	Easting (m)	Northing (m)	Latitude	Longitude	Length (m)	Height (m)	Width (m)	Description
3024	Object	484480.46	6210569.71	N 56.0400920	W 03.2490972	36.9	0	32.7	Diving grid
3025	Object with shadow	484502.85	6210423.41	N 56.0387782	W 03.2487293	1.7	0.4	0.7	Circular object
3026	Object	484470.28	6210274.94	N 56.0374432	W 03.2492435	2.4	0	1.6	Patch of dark reflectors - object
3027	Object	484246.66	6210410.40	N 56.0386530	W 03.2528404	2.7	0	1.7	Small object with scour

1. Eastings and Northings are given in metres for UTM Zone 30 North, datum WGS84.
2. Latitude and Longitude are given in degrees and decimal minutes, datum WGS84.
3. The dimensions of the sidescan sonar anomalies are calculated by Coda Geosurvey software using the velocity of the survey vessel and the time between the two points of interest. Therefore these measurements are a guide only. Timing update rates and errors from the GPS signal or unrecorded changes in velocity will affect these dimensions



Burntisland site location

Figure 1



 Designated Area

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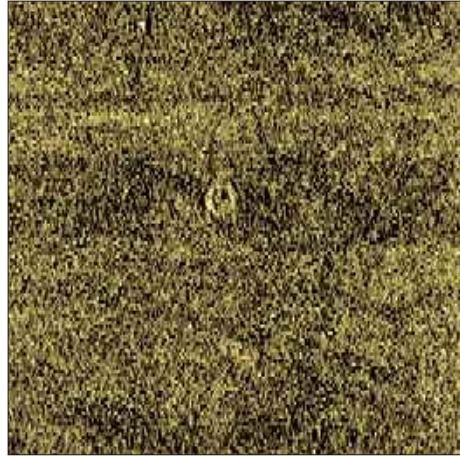
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Date:	14/06/05
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Sidescan sonar mosaic with anomaly positions marked

Figure 2



WA3001



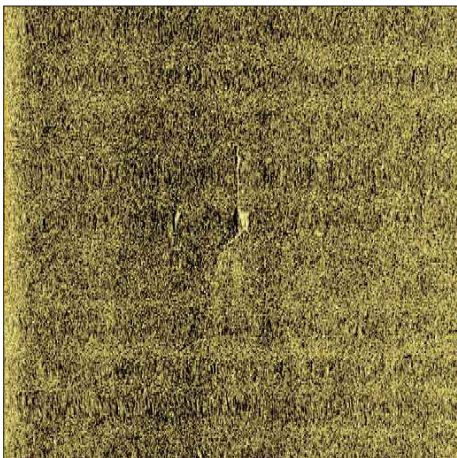
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WA3003



WA3004



WA3005



WA3006



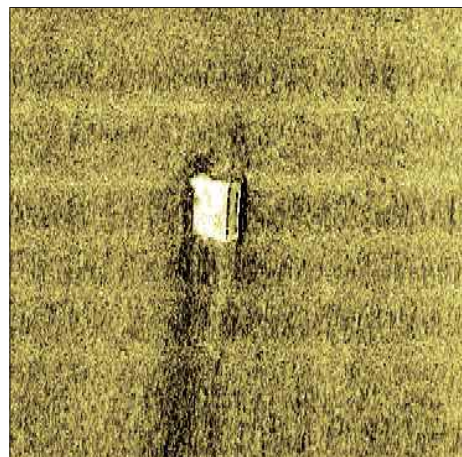
WA3007



WA3008



WA3009



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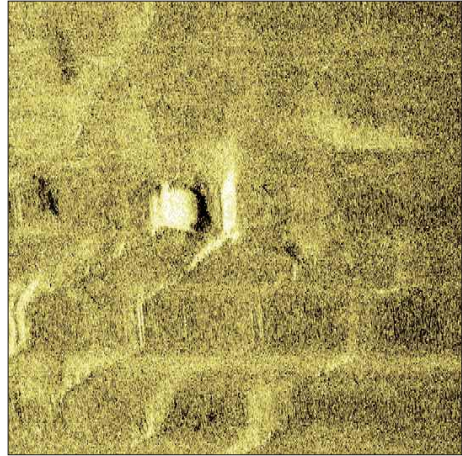
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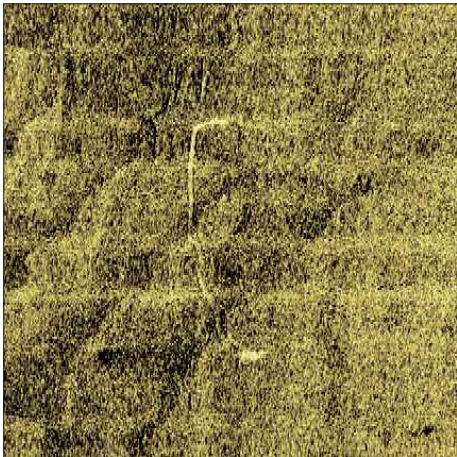
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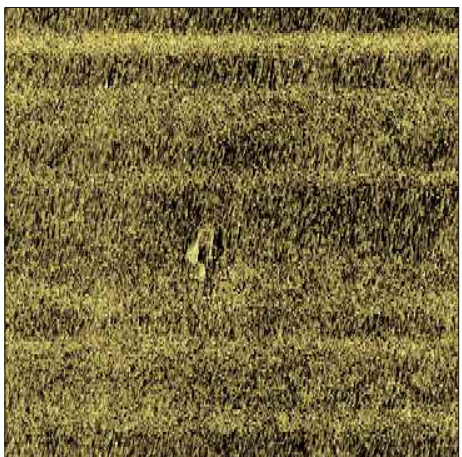
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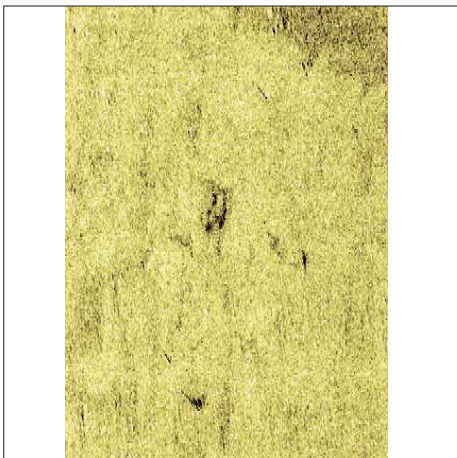
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WA3015



WA3016



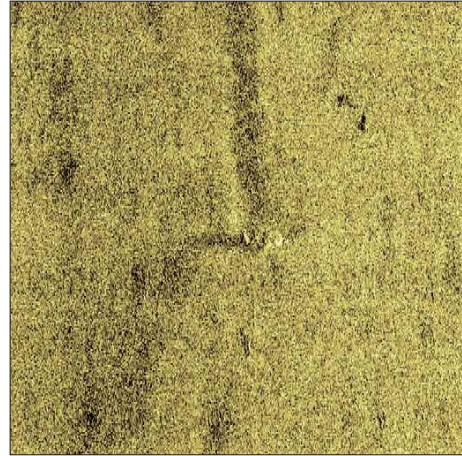
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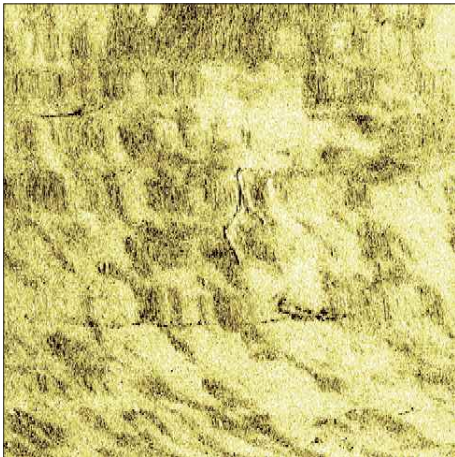
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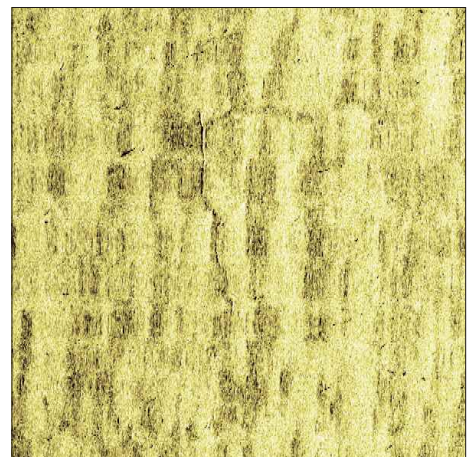
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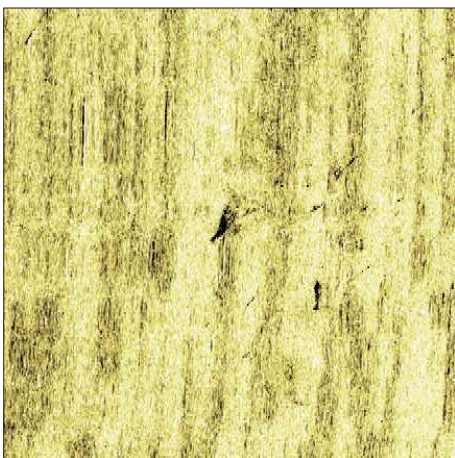
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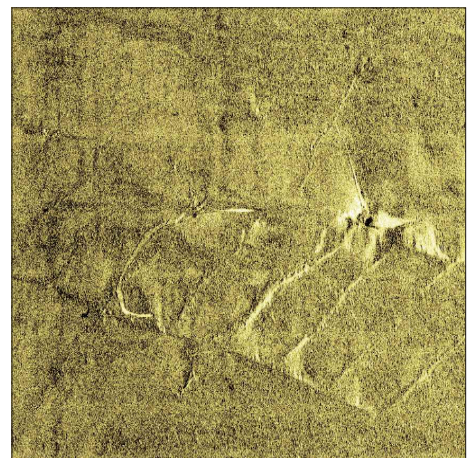
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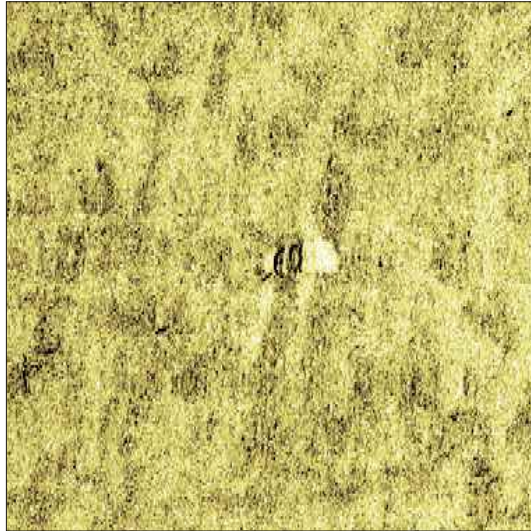
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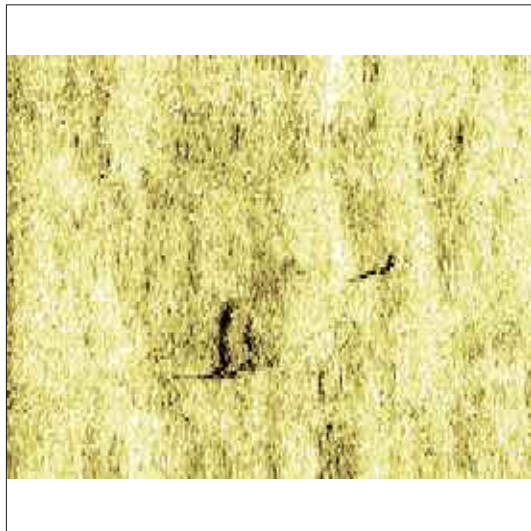
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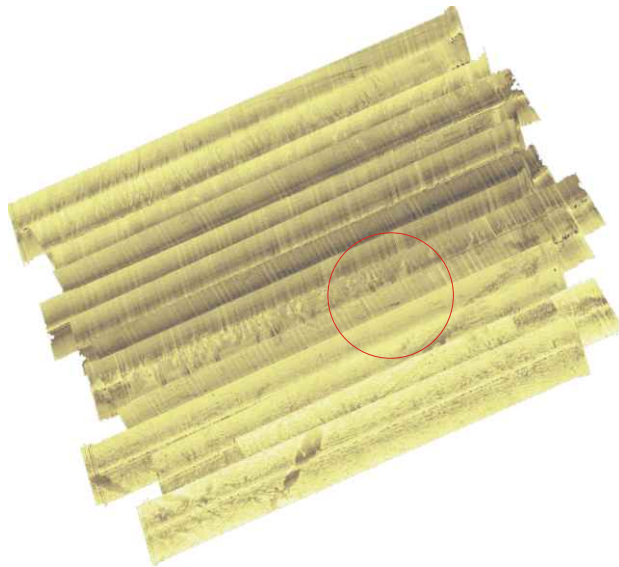
WA3024



WA3025



WA3026



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