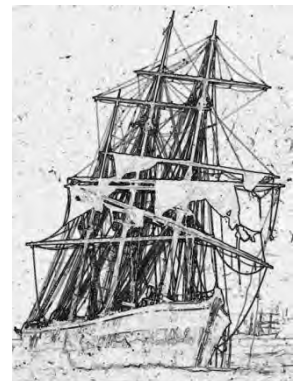


MARITIME HERITAGE FIELD SURVEY FOR DURBAN OIL IMPORT PIPELINE



MARITIME HERITAGE DESKTOP SURVEY FOR SAPREF'S DURBAN OIL IMPORT PIPELINE:**DURBAN, KWAZULU-NATAL****SOUTH AFRICA**

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Declaration:

I, Vanessa Maitland, declare that I have no financial or personal interest in the proposed development, nor its developers or any of their subsidiaries, apart from the provision of heritage assessment and management services.



Vanessa Maitland
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12-05-2019

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GLOSSARY OF ACRONYMS

AMAFA	Heritage KwaZulu Natal Provincial Authority
AMSOL	African Marine Solutions (Pty) Ltd
ASAPA	Association of Southern African Professional Archaeologists
EIA	Environmental Impact Assessment
HIA	Heritage Impact Assessment
MEC	Member of the Executive Council
MUCH	Maritime and Underwater Cultural Heritage (Includes underwater and land maritime heritage)
NHRA	National Heritage Resources Act (No. 25 of 1999)
PLEM	Pipe Line End Manifold
RIB	Rigid Inflatable Boat (Rubber Duck)
ROV	Remotely Operated Underwater Vehicle
SAHRA	South African Heritage Resources Agency
SBM	Single Buoy Mooring

1. INTRODUCTION

This report fulfils Section 38 of the National Heritage Resources Act (NHRA) (25 of 1999) which states that an assessment of potential heritage resources in the development area needs to be done. It is a field survey of the designated area, as delineated in Section 5. The desktop study and study of ROV footage was completed in 2017 – see Report #: 2017/DBN/002 (Appendix A). These processes identified potential MUCH sites. This field survey is a follow-on of that report.

2. TERMS OF REFERENCE

The aim of this field survey is to determine if there are any magnetic anomalies within the defined area.

The scope of work consisted of the following:

- A magnetometer survey of the oil import pipeline, situated between 30° 0.485'S 30° 58.353'E and 29° 59.366'S 30° 57.840'E to determine the possibility of cultural heritage resources occurring within the study area. The defined study area was to incorporate the Pipeline End Manifold (PLEM) and associated anchor legs, as well as the pipeline.

The objectives were to:

- Identify potential Maritime and Underwater Cultural Heritage (MUCH) sites within the defined area.

3. HERITAGE RESOURCES

3.1. THE LEGISLATION

According to Section 32 (1) of the NHRA (No. 25 of 1999), heritage objects consist of:

“An object or collection of objects, or a type of object or list of objects, whether specific or generic, that is part of the national estate and the export of which the South African Heritage Resources Agency (SAHRA) deems it necessary to control, may be declared a heritage object, including— (a) objects recovered from the soil or waters of South Africa, including archaeological and paleontological objects, meteorites and rare geological specimens.”

The Act further stipulates that the term “archaeological” includes:

“wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the Republic, as defined respectively in sections 3, 4 and 6 of the Maritime Zones Act, 1994 (Act No. 15 of 1994), and any cargo, debris or artefacts found or associated therewith, which is older than 60 years or which SAHRA considers to be worthy of conservation.”

Section 35 of the Act states:

“(1) Subject to the provisions of Section 8, the protection of archaeological and palaeontological sites and material and meteorites is the responsibility of a provincial heritage resources authority: Provided that the protection of any wreck in the territorial waters and the maritime cultural zone shall be the responsibility of SAHRA.

(2) Subject to the provisions of subsection (8)(a), all archaeological objects, palaeontological material and meteorites are the property of the State. The responsible heritage authority must, on behalf of the State, at its discretion ensure that such objects are lodged with a museum or other public institution that has a collection policy acceptable to the heritage resources authority and may in so doing establish such terms and conditions as it sees fit for the conservation of such objects.

(3) Any person who discovers archaeological or palaeontological objects or material or a meteorite in the course of development or agricultural activity must immediately report the find to the responsible heritage resources authority, or to the nearest local authority offices or museum, which must immediately notify such heritage resources authority.

(4) No person may, without a permit issued by the responsible heritage resources authority—

- (a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;

- (b) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;”
- (c) trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or
- (d) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.”

Furthermore Section 38 of the Act states:

“(1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as—

- (a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
- (b) the construction of a bridge or similar structure exceeding 50 m in length;
- (c) any development or other activity which will change the character of a site—
 - (i) exceeding 5 000 m² in extent; or
 - (ii) involving three or more existing erven or subdivisions thereof; or
 - (iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or
 - (iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
- (d) the re-zoning of a site exceeding 10 000 m² in extent; or
- (e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

(2) The responsible heritage resources authority must, within 14 days of receipt of a notification in terms of subsection (1)—

- (a) if there is reason to believe that heritage resources will be affected by such development, notify the person who intends to undertake the development to submit an impact assessment report. Such report must be compiled at the cost of the person proposing the development, by a person or persons approved by the responsible heritage resources authority with relevant qualifications and experience and professional standing in heritage resources management; or
- (b) notify the person concerned that this section does not apply.

(3) The responsible heritage resources authority must specify the information to be provided in a report required in terms of subsection (2)(a): provided that the following must be included:

- (a) The identification and mapping of all heritage resources in the area affected;
- (b) an assessment of the significance of such resources in terms of the heritage assessment criteria set out in section 6(2) or prescribed under Section 7;
- (c) an assessment of the impact of the development on such heritage resources;
- (d) an evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development;
- (e) the results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;
- (f) if heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and
- (g) plans for mitigation of any adverse effects during and after the completion of the proposed development.

(4) The report must be considered timeously by the responsible heritage resources authority which must, after consultation with the person proposing the development, decide—

- (a) whether or not the development may proceed;
- (b) any limitations or conditions to be applied to the development;
- (c) what general protections in terms of this Act apply, and what formal protections may be applied, to such heritage resources;

- (d) whether compensatory action is required in respect of any heritage resources damaged or destroyed as a result of the development; and
- (e) whether the appointment of specialists is required as a condition of approval of the proposal.
- (5) A provincial heritage resources authority shall not make any decision under subsection (4) with respect to any development which impacts on a heritage resource protected at national level unless it has consulted SAHRA.
- (6) The applicant may appeal against the decision of the provincial heritage resources authority to the MEC, who—
- (a) must consider the views of both parties; and
- (b) may at his or her discretion—
- (i) appoint a committee to undertake an independent review of the impact assessment report and the decision of the responsible heritage authority; and
- (ii) consult SAHRA; and
- (c) must uphold, amend or overturn such decision.
- (7) The provisions of this section do not apply to a development described in subsection (1) affecting any heritage resource formally protected by SAHRA unless the authority concerned decides otherwise.
- (8) The provisions of this section do not apply to a development as described in subsection (1) if an evaluation of the impact of such development on heritage resources is required in terms of the Environment Conservation Act, 1989 (Act No. 73 of 1989), or the integrated environmental management guidelines issued by the Department of Environment Affairs and Tourism, or the Minerals Act, 1991 (Act No. 50 of 1991), or any other legislation: Provided that the consenting authority must ensure that the evaluation fulfils the requirements of the relevant heritage resources authority in terms of subsection (3), and any comments and recommendations of the relevant heritage resources authority with regard to such development have been taken into account prior to the granting of the consent.
- (9) The provincial heritage resources authority, with the approval of the MEC, may, by notice in the *Provincial Gazette*, exempt from the requirements of this section any place specified in the notice.
- (10) Any person who has complied with the decision of a provincial heritage resources authority in subsection (4) or of the MEC in terms of subsection (6) or other requirements referred to in subsection (8), must be exempted from compliance with all other protections in terms of this Part, but any existing heritage agreements made in terms of section 42 must continue to apply.”

3.2. CONCLUSION – THE LEGISLATION IN TERMS OF THE PROJECT

There is extensive national legislation covering MUCH sites. Within the scope of this project, Section 38 of the NHRA (25 of 1999), states that an assessment of potential heritage resources in the development area needs to be done. The original pipeline was constructed prior to the enactment of the NHRA, the maintenance work that is needed on the pipeline and the PLEM exceeds the 300m stipulated in the NHRA. The desktop study and study of ROV footage was completed in 2017 – see Report #: 2017/DBN/002 (Appendix A). These processes identified potential MUCH sites. This field survey is a follow-on of that report. As this area falls below the low water mark, the responsible heritage resources authority is SAHRA. Despite this report, if a potential MUCH site is uncovered during the work, a maritime archaeologist needs to be contacted to assess the find. Thereafter, in conjunction with SAHRA, a decision will be made regarding the significance of the site. If it is deemed to be culturally significant, the contractor can apply to the Maritime Unit of SAHRA for a permit for removal, excavation or destruction in terms of Section 35 of the NHRA.

4. STUDY APPROACH AND METHODOLOGY

4.1. EXTENT OF THE ASSESSMENT

This field survey is concerned with MUCH and covers the area as described in Section 5.

4.2. METHODOLOGY

4.2.1. MAGNETOMETER SURVEY

A magnetometer survey was conducted along the length of the pipeline with approximately 400 m study area on either side of the pipeline and to some extent around the anchor legs. Survey in the immediate vicinity of the PLEM was not possible. When a vessel is attached to the PLEM, depending on the weather conditions, the chains are pulled taut. During the survey of Thursday 08-11-2018, the magnetometer snagged on one of the chains and had to be repaired in Cape Town before the survey could continue (see Section 6.1.1). During the surveys, there was always a vessel at the PLEM. The magnetic signature of the PLEM and vessel completely “drowned” out other anomalies. Therefore, it was decided to avoid the PLEM. The only way to survey the vicinity would be to find a suitable weather window for survey when no vessels were anchored at the PLEM. This was not feasible given the time constraints for the job.

The magnetic signature of objects varies according to a number of factors, including, but not limited to distance from the magnetometer sensor; depth of sand covering the object; local geologic magnetic strength; orientation to the earth’s magnetic field; etc. Below are some examples of what magnetic signatures could indicate at different depths (Geometrics 2019).

Table 1: Approximate anomaly sizes correlated to magnetic fields

Object	Size	Magnetic Reading	Distance from Sensor
Ship	1000 tons	0.5 – 1 nT	244 m
Anchor	20 tons	0.8 – 1.25 nT	30 m
Pipeline	12 inch	1 – 2 nT	60 m
Pipeline	6 inch	1 – 2 nT	30 m
Iron	100 kg	1 – 2 nT	15 m
Iron	45 kg	0.5 – 1 nT	9 m
Iron	4.5 kg	0.5 – 1 nT	6 m

Limitations

The magnetometer picks up magnetic anomalies in and below the seabed. All the hits may not be MUCH sites, in addition, searches may not find the cause. Their status may only be revealed during the development process. The process gives the developers an idea of where MUCH sites may be uncovered.

The physical pipeline and PLEM anchor blocks and chains have substantial magnetic signatures. Therefore, there may be small MUCH resources that are “hiding” within the magnetic signature of the pipeline. The magnetometer survey should therefore still be able to discern a shipwreck lying in the vicinity.

5. DESCRIPTION OF THE AFFECTED ENVIRONMENT

5.1. SITE LOCATION AND DESCRIPTION

SAPREF’s Oil Import Pipeline off Isipingo, is 2.6 km long from the inshore buoy to the offshore PLEM. The area under investigation is the pipeline which begins at about 11 m and shelves to about 45m depth.

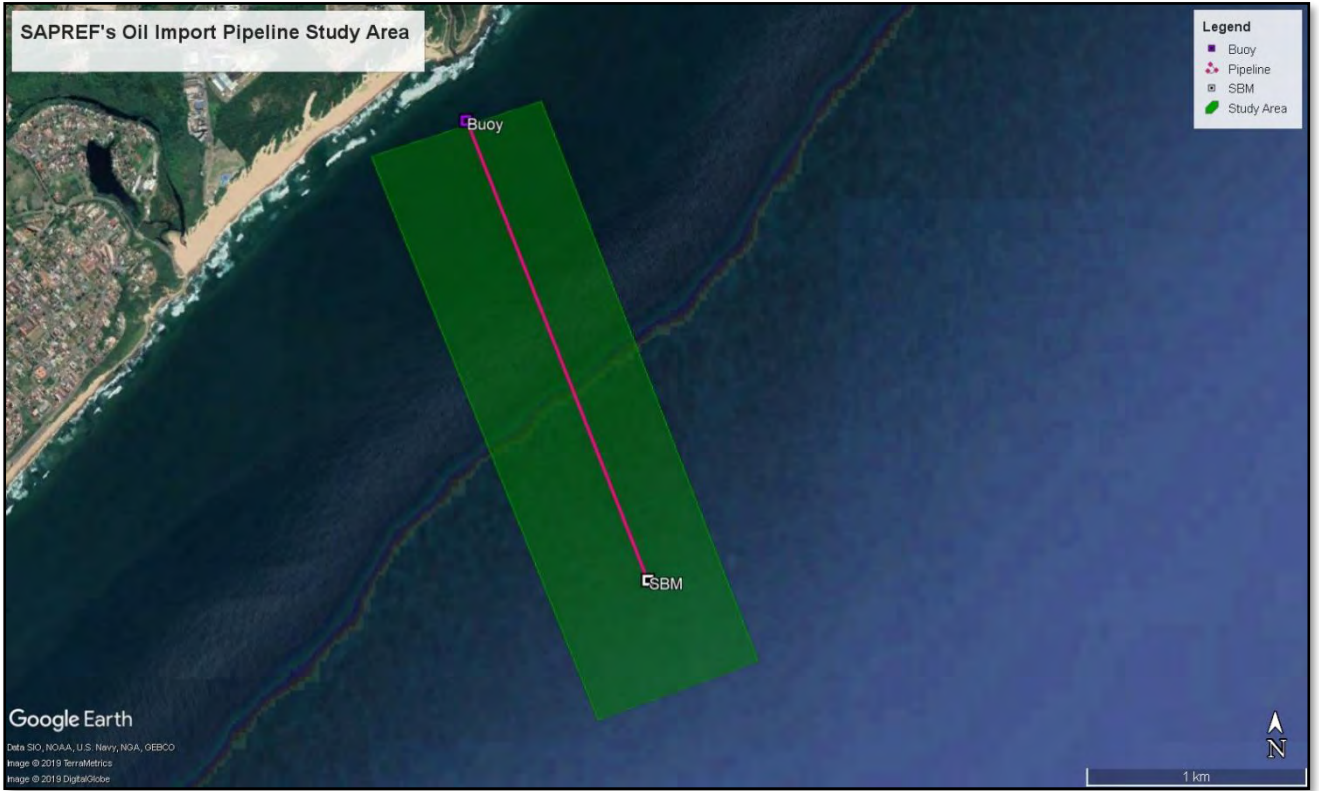


Figure 1: SAPREF's Oil Import Pipeline Study Area (Google Earth 2019)

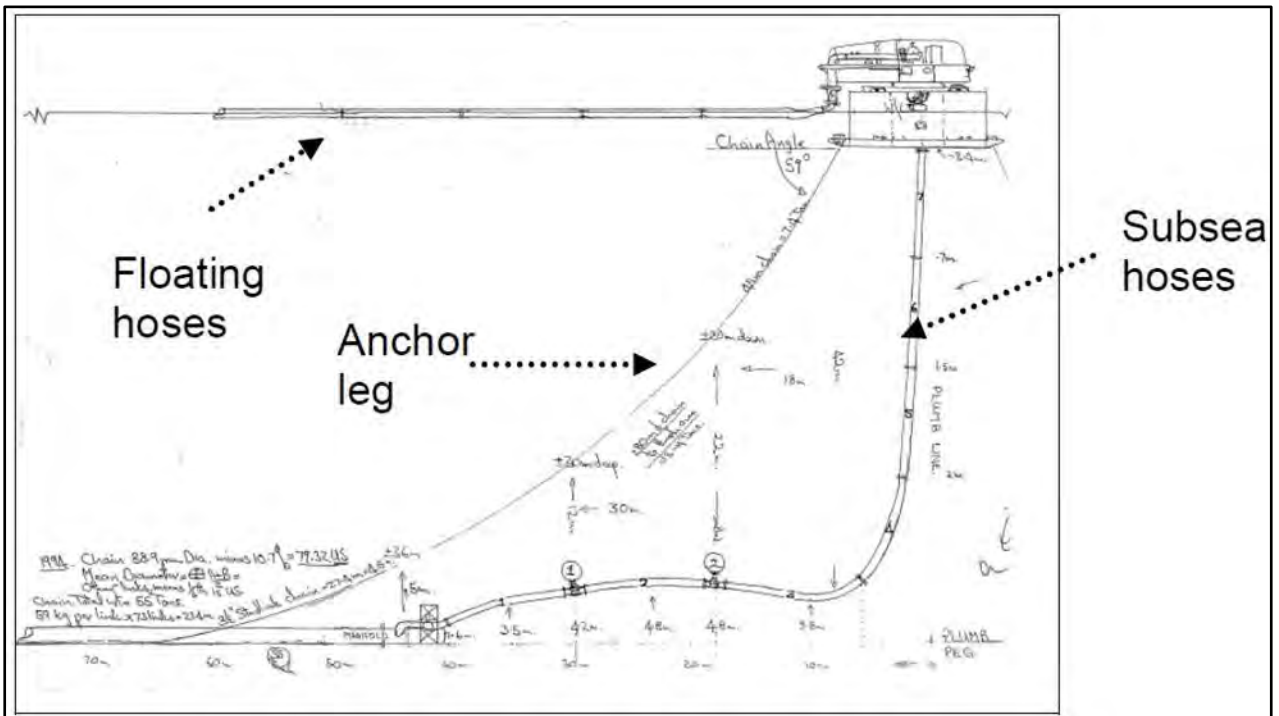


Figure 2: PLEM and Anchor Leg General Arrangement (SAPREF 2019)

6. MAGNETOMETER SURVEY

6.1. STUDY AREA – SURVEY RESULTS

6.1.1. ANALYSIS

The magnetometer data collected by MagLog software was analysed twice. The first or field analysis is performed as the magnetometer is towed. This analysis observes real time spikes within the magnetic field. Possible sites are tabulated and analysed according to the environmental conditions in the field. These conditions include:

- Shipping
- Weather / Sea conditions
- Channel marker buoys and markers
- Other metal objects in the vicinity

The post-field analysis was interpreted with Surfer geophysical software, ignoring the environmental conditions. A second analysis was performed while looking at the data stream and taking cognizance of the environmental conditions at the time of the survey (Figures 3-7).

Table 2: Magnetometer Survey Schedule of Events

Date	Vessel	Outcome
Tuesday 30-10-2018	Mobilized from Cape Town	
Wednesday 31-10-2018	Sibanye	Loaded the survey gear and underwent the induction. The captain stated that the wind and surge were too high for the tug to operate
Thursday 01-11-2018	Sibanye	The <i>Sibanye</i> went to the SBM – The magnetometer was launched, and as expected the propwash and thrust of the tug was too much for the equipment. Conferred with Kregan Reddy (AMSOL) and he organised for an Amsol Rigid Inflatable Boat (RIB) for the survey.
Friday 02-11-2018	Amsol Workboat	Loaded the gear onto one of the workboats and left the harbour. However, on leaving the harbour, the surge and wind was higher than predicted. If the surge is too high and the wind across the surge, it creates choppy conditions, this causes interference with the sensors and can create false positives. On discussion with Amsol and SAPREF representatives; and with consulting the weather forecast, it was decided that I would return to Cape Town and mobilize again when there was a weather window.
Wednesday 07-11-2018	Mobilized from Cape Town	
Thursday 08-11-2018	Amsol Workboat	Launched at 5:30 from the slipway and were on site by 7:00, the survey was started at 07:53, unfortunately on the second line, the skipper went too close to the SBM and snagged the magnetometer on the anchor chain. After retrieving the mag, she was relaunched. Thereafter we managed 8 lines and at approximately 10:35 the batteries went flat (they were left on the workshop floor and discharged). We returned to the harbour to charge the 2 x 12V batteries.
Friday 09-11-2018	Amsol Workboat	Launched at 06:00 and on exiting the harbour noticed a strange noise from the engine. On stopping, it was discovered that the rope guard on one of the engines was severely damaged and

		had in turn damaged the prop. As per safety rules, we returned to the harbour. Amsol launched another workboat. However the engine would not start. Numerous engineers attempted to remedy the situation and managed to get the engine working at about 11:30. We then proceeded to the SBM. On arrival, we launched the mag and she seemed to be working. However, I noticed signal problems on the way to the lines that needed to be run. We retrieved the mag and the damage on the cable from 08-11-2018 had worsened. I knew that the cable needed to be repaired before we could continue with the survey. Returned to Cape Town.
Sunday 07-04-2019	Mobilized from Cape Town	
Monday 08-04-2019	Amsol Workboat	Launched at 06:00, were on site and surveying by 7:51. We completed just over 60% of the survey lines by 13:37.
Tuesday 09-04-2019	Amsol Workboat	Launched at 06:00, were on site and surveying by 07:41 and completed the survey by 10:17.

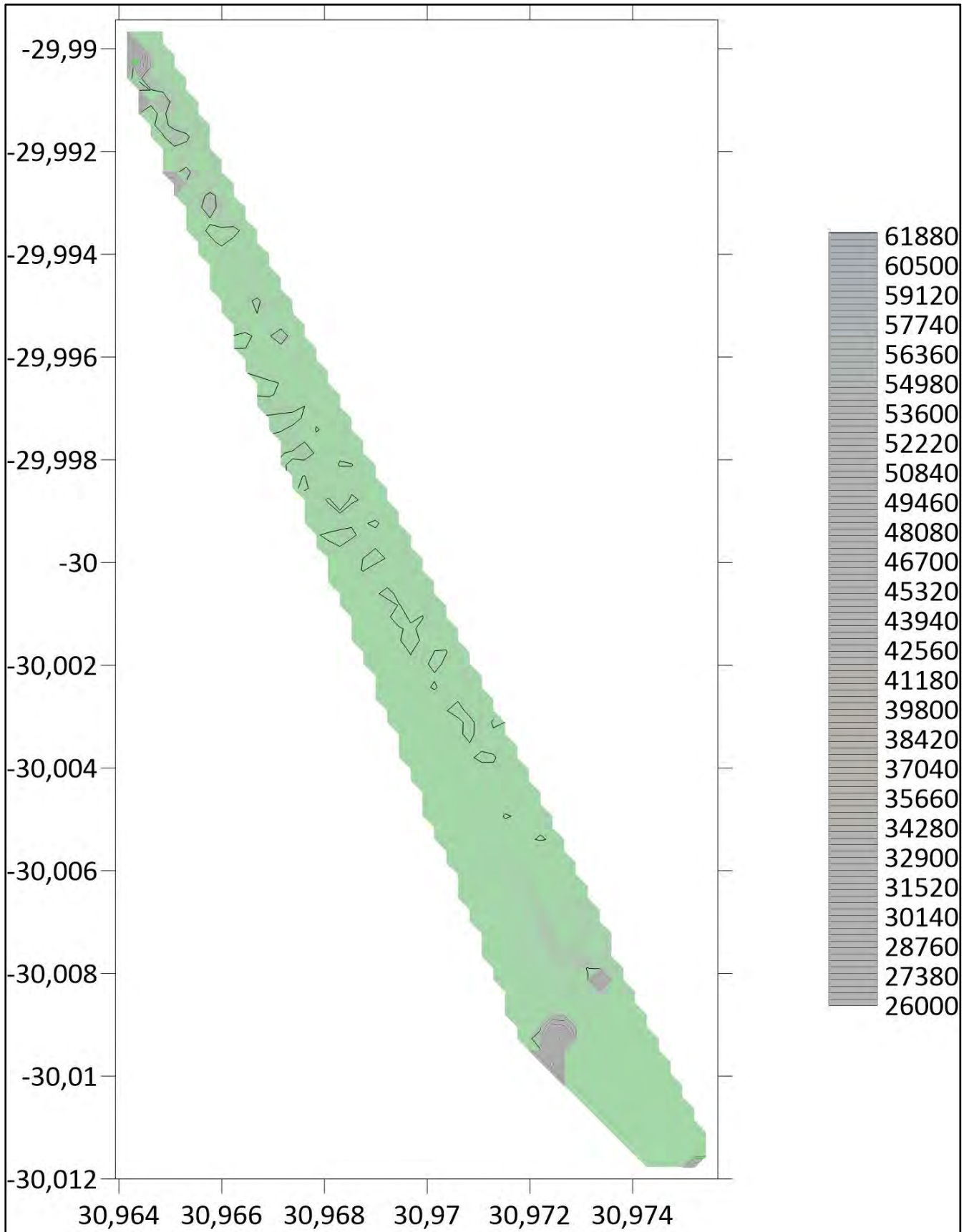


Figure 3: Magnetometer Survey Plotted at 15 nT Contour Intervals – Thursday 08-11-2018

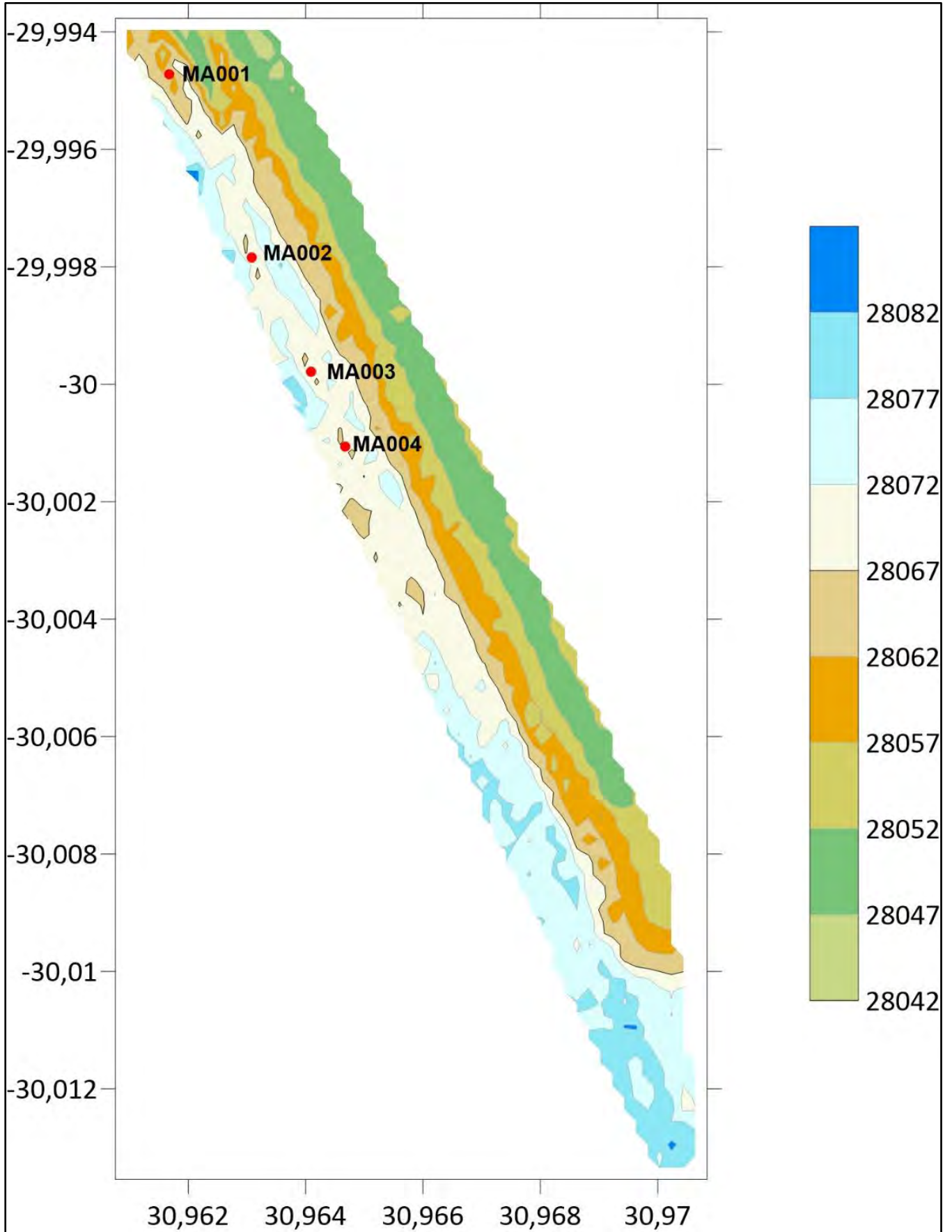


Figure 4: Magnetometer Survey Plotted at 5 nT Contour Intervals – Monday 08-04-2019

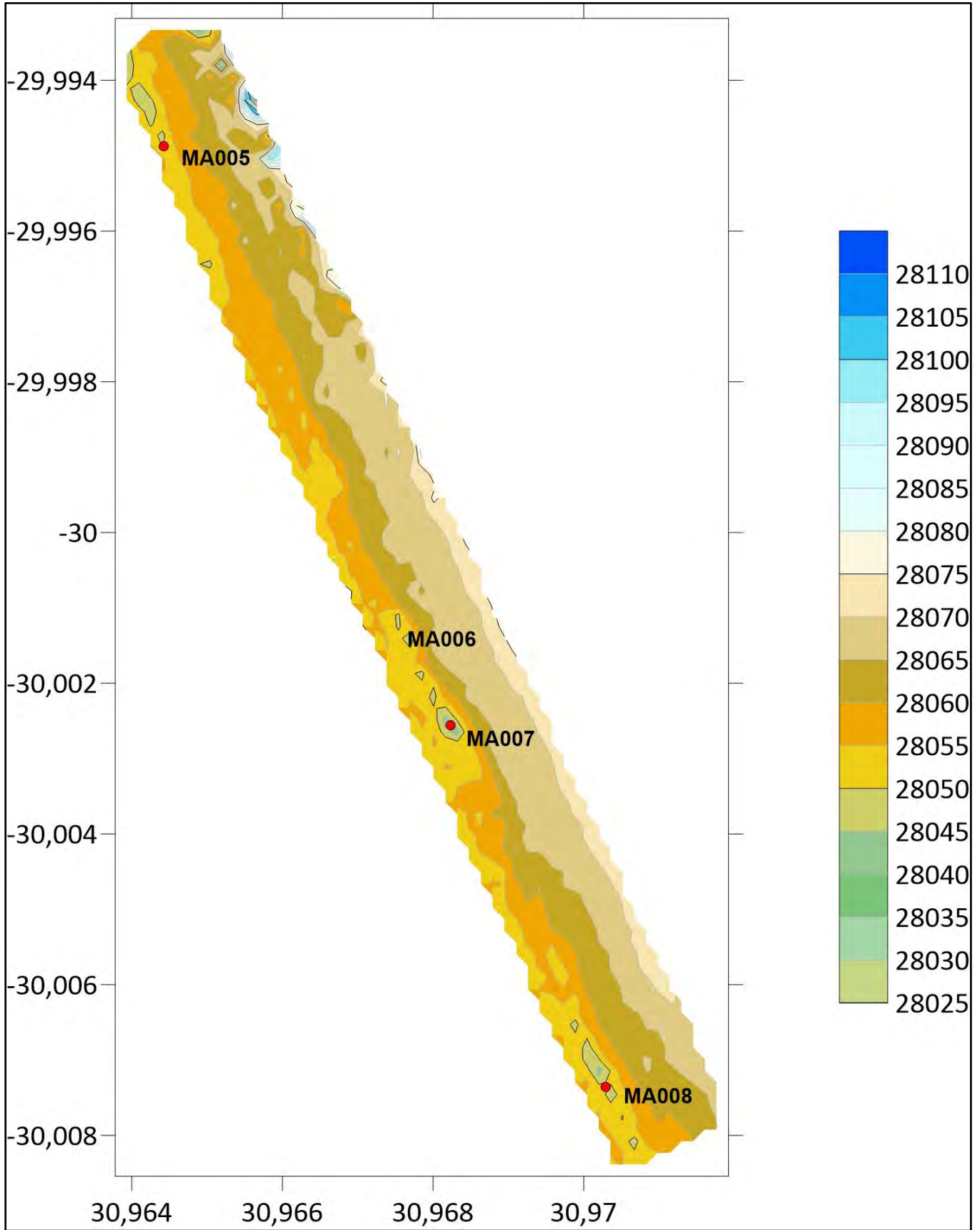


Figure 5: Magnetometer Survey Plotted at 5 nT Contour Intervals – Monday 08-04-2019

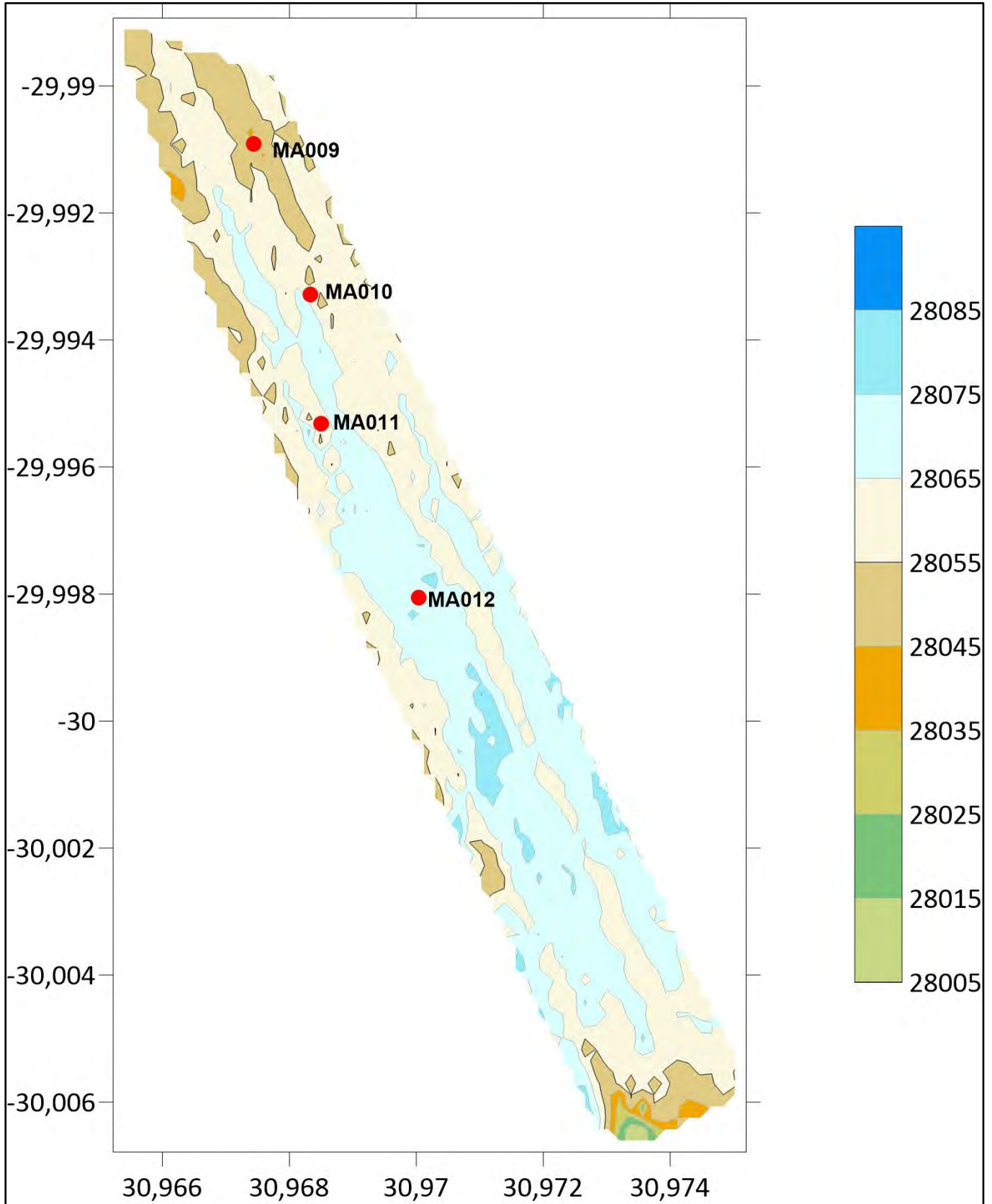


Figure 6: Magnetometer Survey Plotted at 10 nT Contour Intervals – Tuesday 09-04-2019

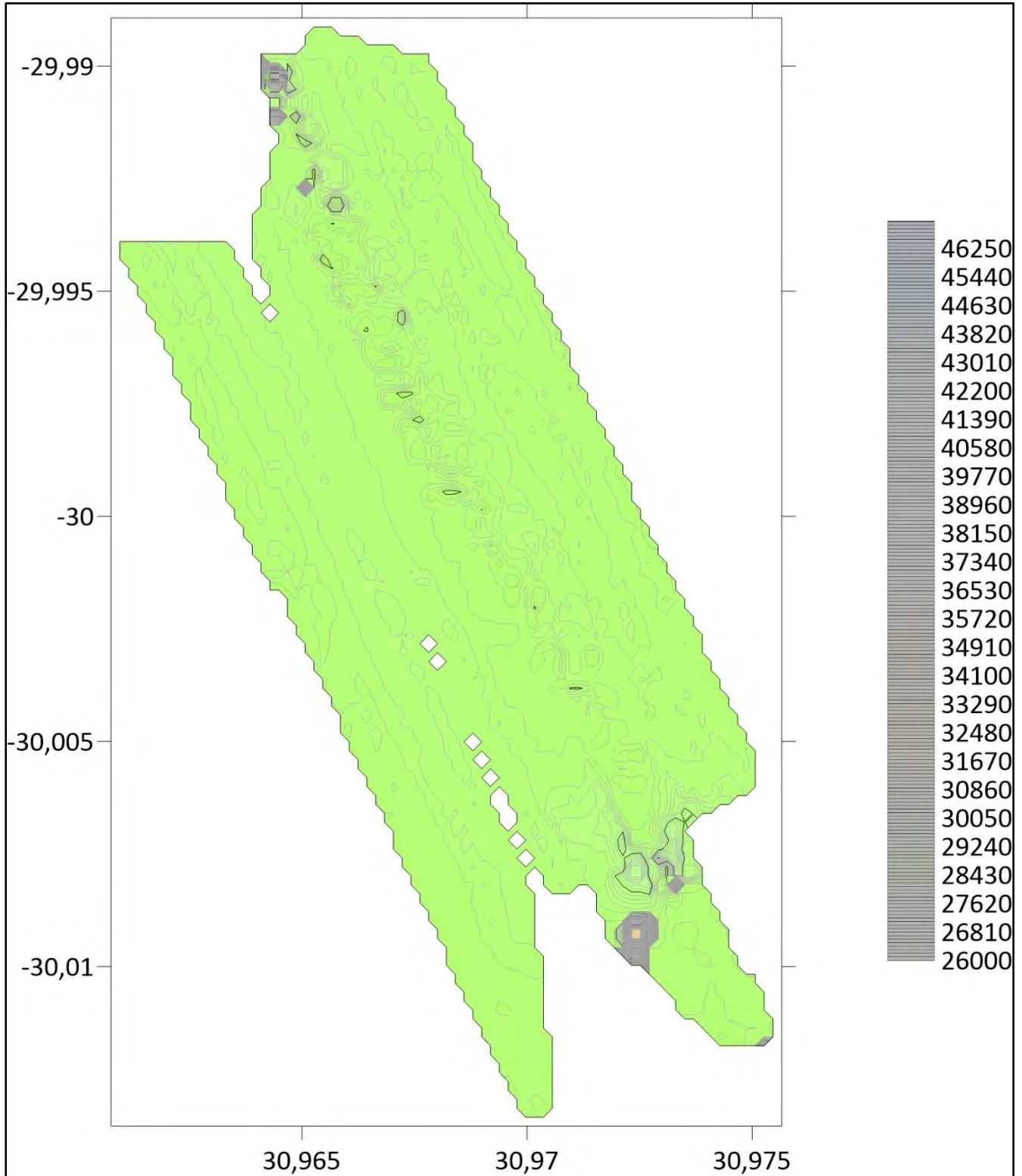


Figure 7: Magnetic Anomaly Survey Plot 10 nT Contour Interval– Mosaic of Survey

6.1.2. RESULTS



Figure 8: Magnetometer Survey Mosaic with Pipeline marked

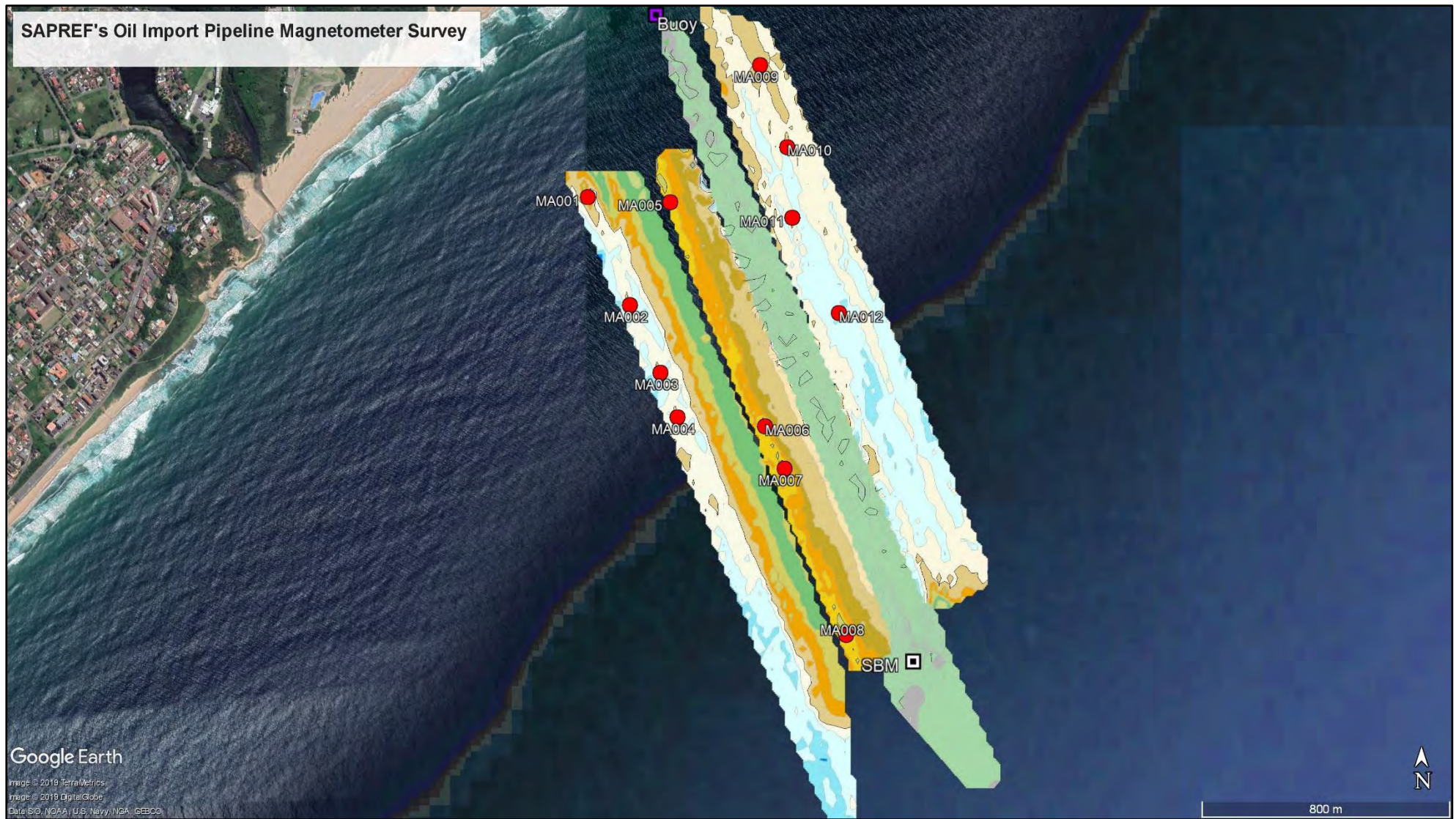


Figure 9: Magnetometer Survey overlaid on Study Area (Google Earth 2018)

The red polygon demarcates the magnetic signature of the pipeline and the PLEM (Figure 8).

Table 3: Magnetic Anomaly Analyses

Figure	Name	Latitude	Longitude	Size	Approximate Depth from sensor	Approximate Size	Distance from PLEM (meters)	Distance from Pipeline (meters)
5	MA001	29° 59.683'S	30° 57.701'E	15 nT	10 m	700 kg		430
	MA002	29° 59.870'S	30° 57.785'E	5 nT	22 m	500 kg		410
	MA003	29° 59.987'S	30° 57.846'E	5 nT	24 m	500 kg		410
	MA004	30° 0.064'S	30° 57.880'E	5 nT	27 m	500 kg		410
6	MA005	29° 59.692'S	30° 57.866'E	5 nT	15 m	250 kg		180
	MA006	30° 0.080'S	30° 58.055'E	6 nT	29 m	600kg		160
	MA007	30° 0.153'S	30° 58.094'E	12 nT	30 m	200 tons		160
	MA008	30° 0.441'S	30° 58.217'E	10 nT	35 m	120 tons	240	150
7	MA009	29° 59.455'S	30° 58.046'E	8 nT	12 m	400 kg		240
	MA010	29° 59.597'S	30° 58.100'E	10 nT	20 m	1 ton		220
	MA011	29° 59.719'S	30° 58.110'E	7 nT	23 m	700 kg		160
	MA012	29° 59.884'S	30° 58.203'E	8 nT	27 m	160 tons		180

Explanation of Table 2:

Analysis of the magnetometer survey (Figure 10) displays a number of anomalies in the Study Area (marked with red dots). The above anomalies seem to be large. However, according to Table 1, pipelines can emit a similar magnetic signature. Therefore, some of these anomalies may well be left over from the construction of the pipeline. In a normal survey, these anomalies would be subject to a visual survey in order to ascertain their origins. As that is not possible, I would suggest cognisance of the possibility of MUCH resources being found during maintenance of the pipeline, and contacting an archaeologist should possible heritage items be found. An assessment could be done remotely on images, either still photographs or ROV footage.

The largest anomaly is MA001 at 15 nT, it is near the coastline and therefore may be shipwreck material. However, it is c. 430 m from the pipeline and should not be impacted by future maintenance work.

The only anomaly near the PLEM is MA008. However, it is 240 m from the PLEM and 150 m from the pipeline. As can be seen in Figure 2, the anchor legs are buried approximately 70 m from the PLEM and thus this anomaly cannot be the attached anchor leg.

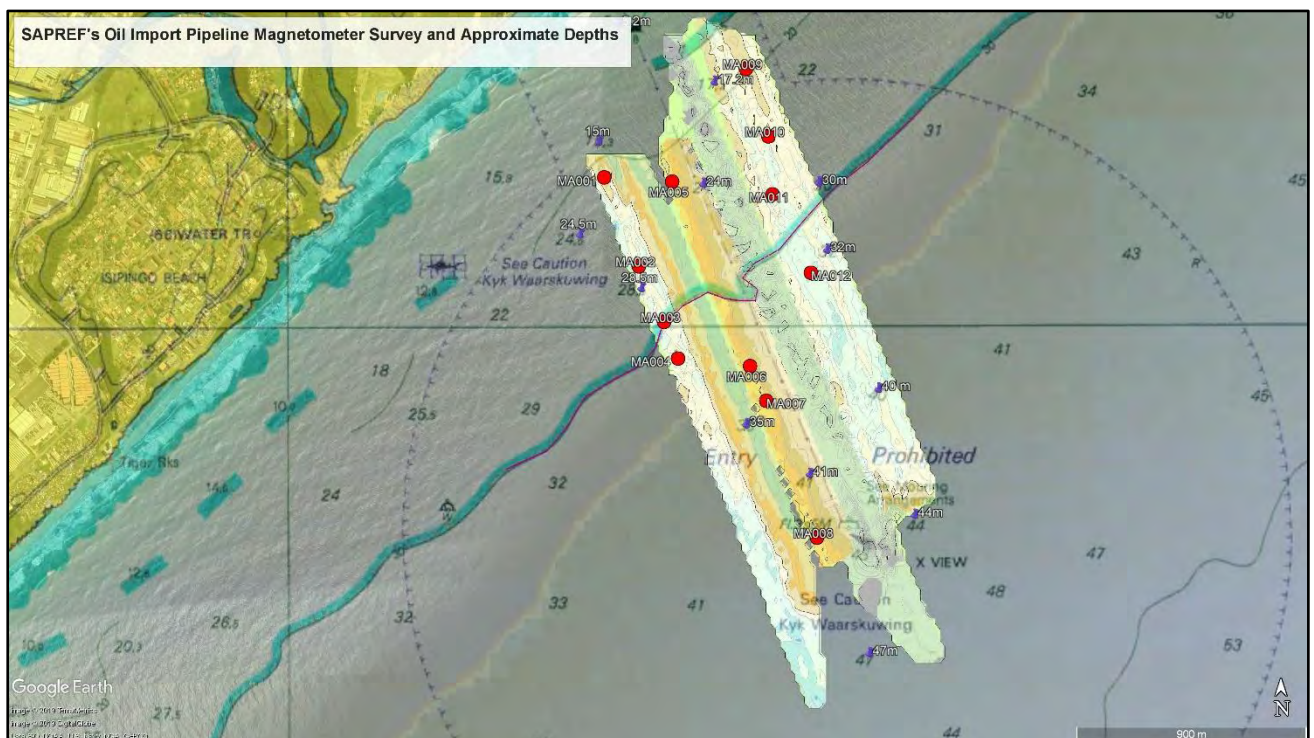


Figure 10: Magnetometer Survey with the Marine Chart Overlay (Google Earth 2019; SAN 1029 1971)

Shipwrecks and the associated debris field generally has much larger, more complex magnetic signatures (Figure 11). Even wooden ships had a fair amount of ferrous material on them, such as cannon, anchors and metal fasteners.

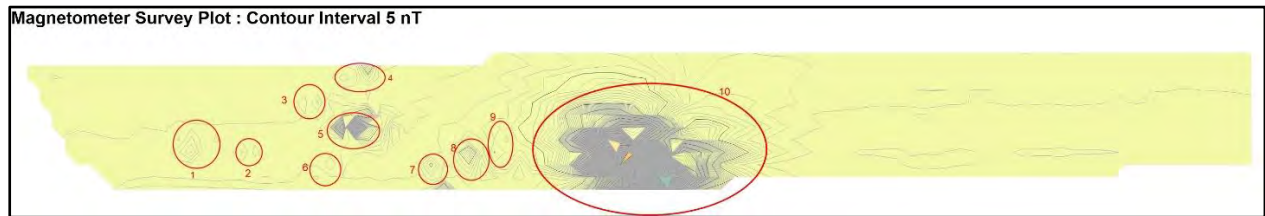


Figure 11: Magnetometer survey from a different site with a large iron wreck and scattered wreckage from a wooden vessel – For comparison purposes.

6.1.3. SURVEY CONCLUSION

- The magnetometer survey revealed some magnetic anomalies. However, there is a strong likelihood that these are debris from the construction and/or maintenance of the pipeline.
- In addition, all of the anomalies are at least 150 m away from the pipeline. The chance of these being MUCH resources is low. Additionally, the chance on any impact on them during pipeline maintenance is also low.
- The only anomaly close to the PLEM is 240 m away and 150 m from the pipeline.
- No diver searches were undertaken due to the diving restrictions in this area. Therefore this report is analyses of the magnetometer survey and an assessment of the probability of the identified anomalies being MUCH resources.
- The only anomaly that may cause concern is MA001. Hit is 340 m from the pipeline. If, in future, any work is to be undertaken in this area, the possibility of it being a shipwreck, must be kept in mind.
- During work on the pipeline, the possibility of uncovering MUCH resources (specifically shipwreck material) must be borne in mind and an archaeologist contacted if in doubt.

7. OVERALL RECOMMENDED MANAGEMENT MEASURES

Heritage sites are fixed features in the environment, occurring within specific spatial confines. Any impact upon them is permanent and non-reversible. Those resources that cannot be avoided and that are directly impacted by the proposed development can be excavated / recorded and a management plan can be developed for future action. Those sites that are not impacted on can be written into the management plan, whence they can be avoided or cared for in the future. With regards to this project, MA001 should be written in as a potential shipwreck site and if SAPREF divers get a chance to investigate the site, they should take video and this can be looked at by an archaeologist. If it is a shipwreck, it should be a no-go site, until its significance can be ascertained.

7.1. Objectives

- Protection of heritage sites within the project boundary against vandalism, destruction and theft.
- The preservation and appropriate management of new discoveries in accordance with the NHRA, should these be discovered during development activities.

The following shall apply:

- The Environmental Control Officer should be given a short induction, by the heritage practitioners, on archaeological site and artefact recognition.
- The contractors and workers should be notified that archaeological sites might be exposed during the construction activities.
- Should any heritage artefacts be exposed during excavation, work on the area where the artefacts were discovered, shall cease immediately and the Environmental Control Officer shall be notified as soon as possible;

- All discoveries shall be reported immediately to a heritage practitioner so that an investigation and evaluation of the finds can be made. Acting upon advice from these specialists, the Environmental Control Officer will advise the necessary actions to be taken;
- Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site; and
- Contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the NHRA (Act No. 25 of 1999), Section 51. (1).

7.2. Control

In order to achieve the above, the following should be in place:

- SAPREF should appoint an Environmental Control Officer, who should be tasked to take responsibility for any heritage sites that may be uncovered and should be held accountable for any damage. This person must take responsibility to contact the heritage practitioner to assess any sites uncovered during the project.

REFERENCES

Legal Sources:

National Environmental Management Act, 1998 (Act No. 107 of 1998)

National Heritage Resources Act, 1999 (Act No. 25 of 1999)

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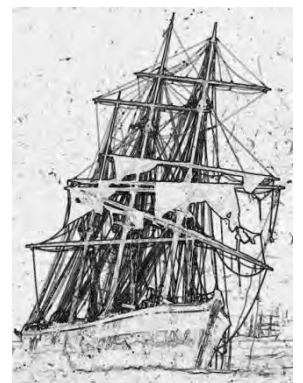
Map Sources:

Google Earth. Accessed 2018/9

SAN 1029. 1971.

APPENDIX A:

Maritime Heritage Desktop Survey for Durban Oil Import Pipeline Lowering



MARITIME HERITAGE DESKTOP SURVEY FOR SAPREF'S DURBAN OIL IMPORT PIPELINE LOWERING PROJECT:**DURBAN, KWAZULU-NATAL****SOUTH AFRICA**

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Declaration:

I, Vanessa Maitland, declare that I have no financial or personal interest in the proposed development, nor its developers or any of their subsidiaries, apart from the provision of heritage assessment and management services.



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GLOSSARY OF ACRONYMS

ASAPA	Association of Southern African Professional Archaeologists
EIA	Environmental Impact Assessment
HIA	Heritage Impact Assessment
MUCH	Maritime and Underwater Cultural Heritage (Includes underwater and land maritime heritage)
NHRA	National Heritage Resources Act (No. 25 of 1999)
PLEM	Pipe Line End Manifold
ROV	Remotely Operated Underwater Vehicle

1. INTRODUCTION

This report fulfils Section 38 of the NHRA (25 of 1999) which states that an assessment of potential heritage resources in the development area needs to be done. It is a desktop survey of existing shipwreck databases in the areas, as delineated in Section 5. It includes a review of the ROV footage of the affected area and an assessment of the visible objects. It concludes with recommended management measures for the area, in terms of cultural heritage resources.

2. TERMS OF REFERENCE

The aim of this desktop survey is to determine if there are any known shipwrecks within the defined areas.

The scope of work consisted of the following:

- Desktop study, consisting of a database of known and suspected wrecks in the area ascertained through study of available written and oral resources
- Review of ROV footage to assess the visibility of cultural heritage objects

The objectives were to:

- Identify potential MUCH sites within the designated area

3. HERITAGE RESOURCES

3.1. The Legislation

According to Section 32 (1) of the NHRA (No. 25 of 1999), heritage objects consist of:

“An object or collection of objects, or a type of object or list of objects, whether specific or generic, that is part of the national estate and the export of which SAHRA deems it necessary to control, may be declared a heritage object, including— (a) objects recovered from the soil or waters of South Africa, including archaeological and paleontological objects, meteorites and rare geological specimens.”

The Act further stipulates that the term “archaeological” includes:

“wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the Republic, as defined respectively in sections 3, 4 and 6 of the Maritime Zones Act, 1994 (Act No. 15 of 1994), and any cargo, debris or artefacts found or associated therewith, which is older than 60 years or which SAHRA considers to be worthy of conservation.”

Section 35 of the Act states:

“(1) Subject to the provisions of section 8, the protection of archaeological and palaeontological sites and material and meteorites is the responsibility of a provincial heritage resources authority: Provided that the protection of any wreck in the territorial waters and the maritime cultural zone shall be the responsibility of SAHRA.

(2) Subject to the provisions of subsection (8)(a), all archaeological objects, palaeontological material and meteorites are the property of the State. The responsible heritage authority must, on behalf of the State, at its discretion ensure that such objects are lodged with a museum or other public institution that has a collection policy acceptable to the heritage resources authority and may in so doing establish such terms and conditions as it sees fit for the conservation of such objects.

(3) Any person who discovers archaeological or palaeontological objects or material or a meteorite in the course of development or agricultural activity must immediately report the find to the responsible heritage resources authority, or to the nearest local authority offices or museum, which must immediately notify such heritage resources authority.

(4) No person may, without a permit issued by the responsible heritage resources authority—

(a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;

(b) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;”

(c) trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or

(d) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.”

Furthermore Section 38 of the Act states:

“(1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as—

- (a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
- (b) the construction of a bridge or similar structure exceeding 50 m in length;
- (c) any development or other activity which will change the character of a site—
 - (i) exceeding 5 000 m² in extent; or
 - (ii) involving three or more existing erven or subdivisions thereof; or
 - (iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or
 - (iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
- (d) the re-zoning of a site exceeding 10 000 m² in extent; or
- (e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

(2) The responsible heritage resources authority must, within 14 days of receipt of a notification in terms of subsection (1)—

- (a) if there is reason to believe that heritage resources will be affected by such development, notify the person who intends to undertake the development to submit an impact assessment report. Such report must be compiled at the cost of the person proposing the development, by a person or persons approved by the responsible heritage resources authority with relevant qualifications and experience and professional standing in heritage resources management; or
- (b) notify the person concerned that this section does not apply.

(3) The responsible heritage resources authority must specify the information to be provided in a report required in terms of subsection (2)(a): provided that the following must be included:

- (a) The identification and mapping of all heritage resources in the area affected;
- (b) an assessment of the significance of such resources in terms of the heritage assessment criteria set out in section 6(2) or prescribed under section 7;
- (c) an assessment of the impact of the development on such heritage resources;
- (d) an evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development;
- (e) the results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;
- (f) if heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and
- (g) plans for mitigation of any adverse effects during and after the completion of the proposed development.

(4) The report must be considered timeously by the responsible heritage resources authority which must, after consultation with the person proposing the development, decide—

- (a) whether or not the development may proceed;
- (b) any limitations or conditions to be applied to the development;
- (c) what general protections in terms of this Act apply, and what formal protections may be applied, to such heritage resources;
- (d) whether compensatory action is required in respect of any heritage resources damaged or destroyed as a result of the development; and
- (e) whether the appointment of specialists is required as a condition of approval of the proposal.

(5) A provincial heritage resources authority shall not make any decision under subsection (4) with respect to any development which impacts on a heritage resource protected at national level unless it has consulted SAHRA.

- (6) The applicant may appeal against the decision of the provincial heritage resources authority to the MEC, who—
- (a) must consider the views of both parties; and
 - (b) may at his or her discretion—
 - (i) appoint a committee to undertake an independent review of the impact assessment report and the decision of the responsible heritage authority; and
 - (ii) consult SAHRA; and
 - (c) must uphold, amend or overturn such decision.
- (7) The provisions of this section do not apply to a development described in subsection (1) affecting any heritage resource formally protected by SAHRA unless the authority concerned decides otherwise.
- (8) The provisions of this section do not apply to a development as described in subsection (1) if an evaluation of the impact of such development on heritage resources is required in terms of the Environment Conservation Act, 1989 (Act No. 73 of 1989), or the integrated environmental management guidelines issued by the Department of Environment Affairs and Tourism, or the Minerals Act, 1991 (Act No. 50 of 1991), or any other legislation: Provided that the consenting authority must ensure that the evaluation fulfils the requirements of the relevant heritage resources authority in terms of subsection (3), and any comments and recommendations of the relevant heritage resources authority with regard to such development have been taken into account prior to the granting of the consent.
- (9) The provincial heritage resources authority, with the approval of the MEC, may, by notice in the *Provincial Gazette*, exempt from the requirements of this section any place specified in the notice.
- (10) Any person who has complied with the decision of a provincial heritage resources authority in subsection (4) or of the MEC in terms of subsection (6) or other requirements referred to in subsection (8), must be exempted from compliance with all other protections in terms of this Part, but any existing heritage agreements made in terms of section 42 must continue to apply.”

3.2. Conclusion – The legislation in terms of the project

There is extensive national legislation covering MUCH sites. Within the scope of this project, Section 38 of the NHRA (25 of 1999), states that an assessment of potential heritage resources in the development area needs to be done. This is the purpose of the desktop study. These processes identify potential MUCH sites. If a potential MUCH site is uncovered during the work, a maritime archaeologist needs to be contacted to assess the find. Thereafter, in conjunction with SAHRA, a decision will be made regarding the significance of the site. If it is deemed to be culturally significant, the contractor can apply to the Maritime Unit of SAHRA for a permit for removal, excavation or destruction in terms of Section 35 of the NHRA.

4. STUDY APPROACH AND METHODOLOGY

4.1. Extent of the Assessment

This desktop survey is concerned with MUCH and covers the area as described in Section 5.

4.2. Methodology

4.2.1. Desktop Survey

A shipwreck database was compiled from the available written and oral sources and is available in Section 6.

Limitations

- The database is a research tool that is constantly evolving as information is uncovered and added. In addition, the solitary nature of many wrecks means that information may be scarce and/or inaccurate. Therefore, without definitive information, shipwrecks are allocated to an area, based on limited information and certain assumptions regarding the dynamic nature of the environment.

4.2.2. Review of ROV footage

The ROV footage undertaken by SAPREF in 2016 was reviewed. Potential cultural heritage objects were identified and management measures recommended.

Limitations

- The ROV footage was, by necessity concentrating on the integrity of the pipeline. The images of potential heritage objects are unclear and no definitive significance can be assigned at this time.

5. DESCRIPTION OF THE AFFECTED ENVIRONMENT

Site Location and Description

SAPREF's Oil Import Pipeline off Isipingo, is 2.6 km long from the inshore buoy to the offshore SBM. The area under investigation is the exposed pipeline which begins at about 11 m and shelves to about 38m depth.



Figure 1: SAPREF's Oil Import Pipeline Area (Google Earth 2017)

6. SHIPWRECK DATABASE

The nature of the environment, poor historical reporting and the length of time since the wrecks occurred means that underwater cultural heritage sites may literally be anywhere and are thus hard to pinpoint with any accuracy beforehand. It is important to have a database because if MUCH sites are uncovered during the project, it will be easier to identify the wreck and thus assess its cultural and historical significance.



Figure 2: Site Map with approximate wreck locations and relevant landmarks (Google Earth 2017)

#	Name	Events	Home Port	Date	History
1	<i>John Bull</i>	Wrecked	Durban	02-12-1948	This 15-ton fishing boat, registered at Durban sank off Isipingo when she was struck by a 10-meter wave. Four people died (Levine 1986)
2	<i>Lady Aubrey</i>	Wrecked	Durban	29-03-1979	This 15-ton motor fishing vessel, owned by Dr J.M. Hulett drove aground high on the rocks, just off the Isipingo Golf Course.
Wrecked "Off Port Natal"					
3	<i>Colombo</i>	Wrecked	Dutch	24-09-1822	Bound from Batavia for Holland. Wrecked off Port Natal.
4	<i>Buckbay Packet</i>	Wrecked	British	June 1823/24	In February 1828 the government schooner called at Port Natal on her way to Delagoa Bay. Shortly after leaving, she was driven ashore during a gale. Her captain died of 'fever' on the coast.
5	<i>Koh-I-Nor</i>	Abandoned		01-01-1867	This 701-ton British ship under Captain H. Rutter, was on a voyage from Calcutta to Boston with a general cargo. She was abandoned at 30° 22' S 29° 30' E (Please note these cannot be compared to modern day co-ords, they need to be converted). This is somewhere near the Natal coast. The crew were taken aboard the Russian ship, <i>Tahli</i> and were landed at Cape Town a week later.
6	<i>Cotehele</i>	Wrecked	British	18-11-1894	Built in 1892 by Sir R. Dixon & Co. in Middlesbrough. 299.5 x 40.1 x 20.5 feet. 200 hp engine. This 1715-ton steamer sailed from Durban for Delagoa Bay. She struck Tenedos Shoal and returned to Durban for repairs. However, she was wrecked two weeks later on the coast of Natal.

#	Name	Events	Home Port	Date	History
7	<i>Octopus</i>	Wrecked	Durban	14-10-1906	Built in 1895 by W. Simon & Co (Ltd) in Renfrew, this 969-ton steel twin-crew dredger was en route to Australia from Durban on 13 October when she encountered a gale. By the following morning, she had shipped a lot of water and her crew abandoned her in two boats. The boat with Capt. Ogilvie aboard capsized while trying to beach two-and-a-half kilometres north of the Umhlanga River. The captain's wife and two children were drowned. The second boat beached at Umhlanga Rocks and the crew landed. The dredger eventually drifted ashore on the "Natal North Coast" and disintegrated.
Disappeared en route to or from Port Natal/Durban					
8	<i>São Thomé</i>	Abandoned	Portugal	March 1589	This carrack sailed from the Indian port of Cochin in January 1589 under the command of Estevao da Veiga. Although she was one of the richest vessels to sail from India, she was in poor condition, due to rampant corruption. During a south-east gale, one of the seams in her bow opened and although the leak was repaired, allowing her to continue, it wasn't long before a more serious leak developed in her stern. The vessel was approximately 480 kilometres of the southern African coast and her pepper-clogged pumps were unable to clear the water from her hold. The <i>São Thomé</i> was disabled and adrift, her lower decks under water. At dusk, on 16 March, land was sighted. The next morning 109 officers, crew, rich passengers, clergy and a few slaves took the only longboat and abandoned ship, leaving the balance aboard to their fate. However, the long boat was too crowded and eleven people were thrown overboard. Two days later the boat reached shore and only a few managed to walk to Mozambique. While there are different ideas as to where the longboat came ashore, from St Lucia to Lake Sibayi, no one knows where the <i>São Thomé</i> ended up. She may have drifted ashore anywhere on the KwaZulu Natal coast or she may have sunk offshore. For this reason, I have included the vessel in the database as there is a possibility that she may be in the impact zones.
9	<i>Penelope</i>	Disappeared	British	1591	East Coast
10	<i>Zeelt</i>	Disappeared	VOC	1672	After departing Table Bay
11	<i>Kers</i>	Disappeared	VOC	1697	Between. Batavia and Table Bay
12	Unknown	Wrecked		1730's	Anecdotal evidence, from a number of sources, that an English vessel went ashore somewhere south of Durban.
13	<i>Skelton Castle</i>	Disappeared	British	1806	Between Table Bay and Bengal
14	<i>Calcutta</i>	Disappeared	British	1809	Between Mauritius and Britain
15	<i>Jane Duchess of Gordon</i>	Disappeared	British	1809	Between Mauritius and Britain
16	<i>Lady Jane Dundas</i>	Disappeared	British	1809	Between Mauritius and Britain
17	<i>Sir William Bently</i>	Disappeared	British	1809	Between Mauritius and Britain
18	<i>Julia</i>	Disappeared/ Wrecked		December 1824	This 25-ton sloop or brig left Durban for Algoa Bay and disappeared. On her were 11 settlers and 12-days provisions. She was expected to return with supplies for the budding Natal settlement. The Cape Town Gazette (1825) states, "A quantity of staves were picked up near Middle Point Natal by some of Farewell's people, which were recognised to have come from the <i>Julia</i> and leads them to conclude that she was lost near that place.". It was believed that she caught fire and sank.
19	<i>Alma</i>	Disappeared/ Wrecked		May 1864	This schooner under Captain Duzdale was travelling from Cape Town to Natal and disappeared.
20	<i>Tien Esser</i>	Abandoned / Wrecked	German	05-01-1875	This schooner was bound for Natal with a cargo of wheat and flour. She foundered at sea and the survivors were rescued by the Dutch barque <i>Galilie</i> . One life was lost.

#	Name	Events	Home Port	Date	History
21	<i>Emin</i>	Disappeared	German	19-12-1893	Owned by the Deutsche Ost-Afrika Linie, built in 1891 by Blohm & Voss in Hamburg, she measured 172 x 25 x 14.2 feet. 90 hp engine. Home port, Danzig. This 373-ton steamer sailed from Durban for Mozambique with a coal cargo. She disappeared but some scattered wreckage was found later on the Zululand coast.
22	<i>Lindo</i>	Disappeared	Norway	August 1913	Built in 1891 by Workman Clark & Co. in Belfast and measuring 256.2 x 37.9 x 21.9, this 1475-ton vessel (ex- <i>Marian Woodside</i>) under Capt. Jensen was bound from Taltal with a nitrate cargo. She sailed from Durban on 26 August 1913 and disappeared.

7. ROV FOOTAGE

There were a number of objects visible in the footage. They fall into three categories;

- Construction debris, these are artefacts of the construction process or parts of the pipeline
- Sea debris, this includes plastic items, especially bags; saris; pipes and cable
- Possible cultural heritage objects

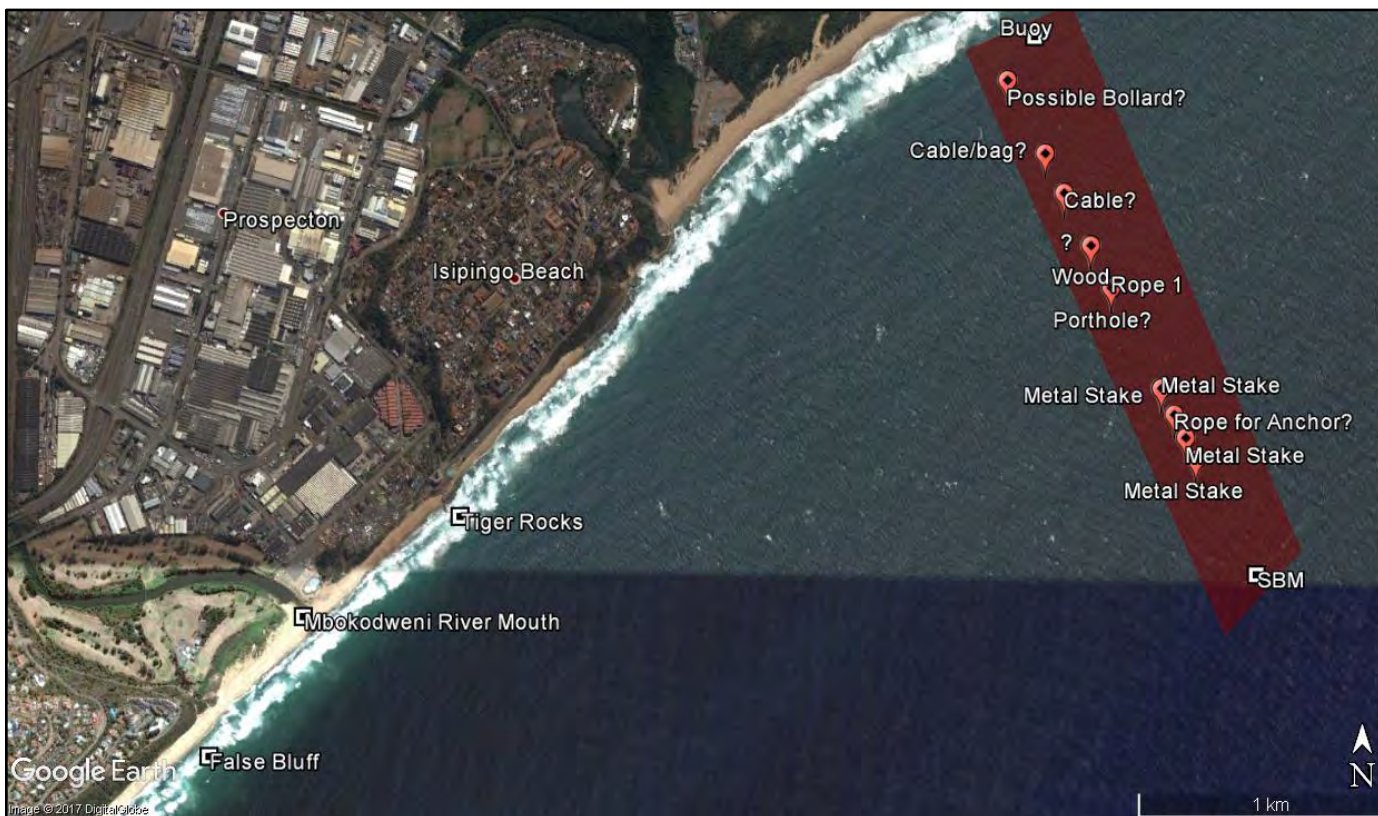


Figure 3: Map of visible cultural objects (Google Earth 2017)

7.1. Construction Debris

There are a number of rounded metal stakes/straps along the pipeline. According to SAPREF engineers (Pers Comm: 2017) these straps are residues of the construction process and are at regular intervals along the pipe.

This pipeline is outside a major metropolitan area and a major port, a certain amount of detritus washes up around the pipe, such as cabling and pipes.



Figure 4: Remains of metal strap (SAPREF 2016)



Figure 5: Remains of metal strap (SAPREF 2016)



Figure 6: Remains of metal strap (SAPREF 2016)



Figure 7: Remains of metal strap (SAPREF 2016)

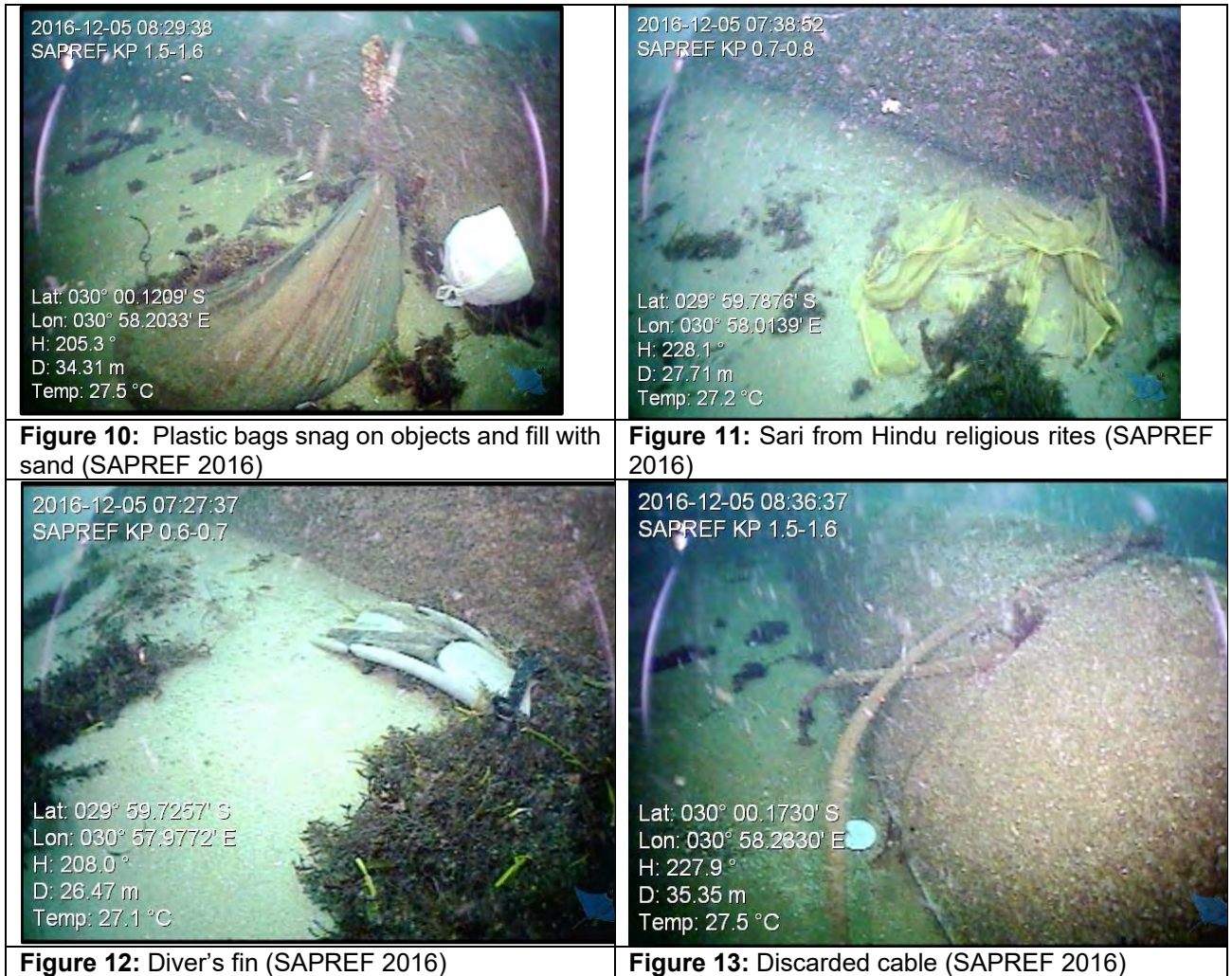


Figure 8: Concrete pipe (SAPREF 2016)



Figure 9: Steel cable with plastic attached (SAPREF 2016)

7.2. Sea Debris:



7.3. Possible Cultural Heritage Objects

There are two known wrecks in the Isipingo area that fall within the NHRA's 60-year boundary. In addition, there are at least five wrecks that are recorded as being wrecked "off Port Natal". It is sometimes hard, in this modern time of instant communication and satellites to envision how isolated the Isipingo area was in historic times. It would have been at least 14 kilometres of walking through dense bush. It should also be kept in mind that Durban was only "settled" after 1824. Shipwrecks survivors prior to this time had to walk up to Maputo or down to Cape Town in order to be returned to their homes. Many survivors were taken in by local people and assimilated. Ergo for more than 300 years prior to the founding of Durban, there was no one to record the fate of ships that 'disappeared' in the Indian Ocean, some of these may well have ended their lives near Durban.

As the estuary at Port Natal was protected from the elements; had a plentiful supply of fish and fresh water; and large trees for ship repairs, it was a natural place of refuge for vessels in trouble. Thus, Durban Bay became a shipwreck trap, as is evidenced by the more than 140 recorded wrecks in the area.

The ROV footage is an excellent tool for locating cultural artefacts, however I cannot make a definitive statement regarding the age or significance of the following possible cultural heritage objects without eyes-on.



Figure 14: Possible porthole (SAPREF 2016)



Figure 15: Porthole from the *County of Pembroke* (1903) wreck for comparative purposes (Maitland 2005)



Figure 16: Possible bollard (SAPREF 2016)



Figure 17: Bollard from the *Karin* (1927) wreck for comparative purposes (Maitland 2010)



Figure 18: Rope 1 (SAPREF 2016)



Figure 19: Rope 2 (SAPREF 2016)

8. CONCLUSIONS

There are at least two possible wrecks area of the oil import pipeline. In addition, as can be seen in the database, there are at least five vessels that wrecked in the vicinity of “Port Natal”, This was the historical name for Durban and Durban Bay. There are at least fifteen vessels that disappeared en route to-or-from Durban and may be in the vicinity of the pipeline.

Regarding the possible MUCH objects in Section 7.3, without eyes-on, it is difficult to assign significance. The objects vary from 15 m to 30 m depth and are at least 800 m apart. This would require investigation of the areas. Additionally, the immediate vicinity of these objects needs to be investigated to see if they are actual shipwreck sites or part of a wider debris field.

The coastline here is very dynamic and can shift wreckage considerable distances. I am aware that this pipeline was installed in 1998, before the implementation of the NHRA in 1999. Although the sites may be disturbed, it is still possible to add to our MUCH knowledge base and understanding of the maritime landscape through a more thorough investigation.

8.1. Short-term management measures

It is my understanding that the current stabilisation of the “pipelined will be the 600m length of pipeline with a 100m run-in on each side. Ergo, this is 1 300 and 2 100m from the PLEM respectively, and therefore in the area where some of the possible MUCH objects are. However, the observed objects are just outside of the stabilisation area.

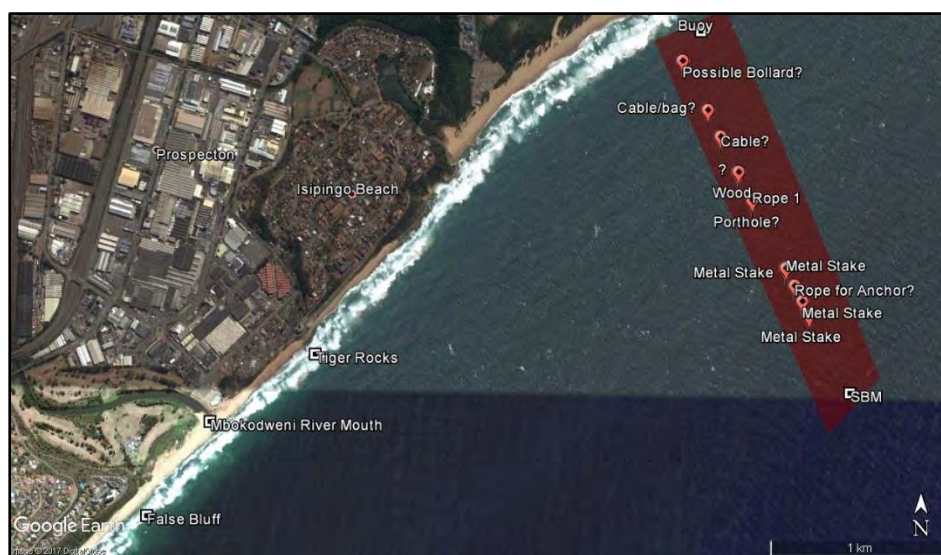


Figure 20: Stabilisation zone in relation to possible MUCH objects

Investigation into the possible MUCH sites should be undertaken during the annual maintenance dives, in the following manner:

- SAPREF divers could take detailed photographs of the possible porthole and bollard (with a scale), fanning away the sand in order to get detail;
- Additionally, the divers should perform a 30m circular search from the possible MUCH resources, taking video. This footage can be assessed in order to make a recommendation that will fulfil the requirements of the NHRA.

Thereafter a maritime archaeologist should assess their potential significance

When the stabilisation is performed and MUCH objects are uncovered, the management measures in Section 9 apply.

9. OVERALL RECOMMENDED MANAGEMENT MEASURES

Heritage sites are fixed features in the environment, occurring within specific spatial confines. Any impact upon them is permanent and non-reversible. Those resources that cannot be avoided and that are directly impacted by the proposed

development can be excavated / recorded and a management plan can be developed for future action. Those sites that are not impacted on can be written into the management plan, whence they can be avoided or cared for in the future.

9.1. Objectives

- Protection of heritage sites within the project boundary against vandalism, destruction and theft.
- The preservation and appropriate management of new discoveries in accordance with the NHRA, should these be discovered during development activities.

The following shall apply:

- The Environmental Control Officer should be given a short induction, by the heritage practitioners, on archaeological site and artefact recognition.
- The contractors and workers should be notified that archaeological sites might be exposed during the construction activities.
- Should any heritage artefacts be exposed during excavation, work on the area where the artefacts were discovered, shall cease immediately and the Environmental Control Officer shall be notified as soon as possible;
- All discoveries shall be reported immediately to a heritage practitioner so that an investigation and evaluation of the finds can be made. Acting upon advice from these specialists, the Environmental Control Officer will advise the necessary actions to be taken;
- Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site; and
- Contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the NHRA (Act No. 25 of 1999), Section 51. (1).

9.2. Control

In order to achieve the above, the following should be in place:

- A person or entity, e.g. the Environmental Control Officer, should be tasked to take responsibility for any heritage sites that may be uncovered and should be held accountable for any damage. This person must take responsibility to contact the heritage practitioner to assess any sites uncovered during the project.

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