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S.S. *Dicky* Archaeological Management Planning Documentation



Conservation Management Plan

S.S. *Dicky*

26° 41' 51.37", 153° 08' 21.65" (WGS 84)

Dicky Beach

Caloundra

QLD

May 2015

S.S. Dicky Archaeological Management Planning Documentation Conservation Management Plan

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Cover Image: S.S. Dicky during a site inspection. (Cosmos Archaeology 26th September, 2014)

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Abbreviations

CMP	Conservation Management Plan
DEHP	Department of Environment and Heritage Protection (QLD)
EPA	Environmental Protection Agency (QLD)
HIA	Heritage Impact Assessment
SCC	Sunshine Coast Council
S.S.	Screw Steamer
QLD	Queensland
UNESCO	United Nations Educational, Scientific and Cultural Organisation
WIP	Wreck Interpretation Plan

EXECUTIVE SUMMARY

The Sunshine Coast Council (SCC) is proposing to preserve key heritage elements of the S.S. (Screw Steamer) *Dicky* wreck as well as reduce safety risks posed by the remains by removing hazardous elements. The wreck is located in the intertidal zone on Dicky Beach, Caloundra. A permit is required from the Queensland Department of Environment and Heritage Protection (DEHP) under Section 91 of the *Queensland Heritage Act 1992* to disturb the site. The awarding of a permit would be conditional, in part, on acceptable archaeological mitigation being implemented before, during and after the Main Works proposed for the wreck. This Conservation Management Plan (CMP) is accompanied by a Heritage Impact Assessment (HIA) and Wreck Interpretation Plan (WIP) which together are to be considered by the DEHP for a permit to undertake the proposed works.

The proposed 'Cut and No Cover' approach to the project seeks to minimise disturbance to the wreck of the S.S. *Dicky* while reducing the risks posed by the wreck to public safety on the beach. It includes the removal of upper portions of the wreck for conservation, storage and an outdoor display while the majority of the wreck remains buried *in situ* beneath natural beach sand deposits. This CMP addresses the 'Cut and No Cover' approach with archaeological, conservation and interpretation mitigation measures for an acceptable impact to the wreck.

Mitigation measures for this project include archaeological recording before, during and after the proposed Main Works, controlled cutting of hazardous elements and detailed recording of the artefacts removed. It also includes provisions for the conservation of removed elements. Interpretation aspects are detailed in the accompanying WIP report.

The following CMP summary points are of key consideration:

- Archaeological management is essential for controlled and minimised impact upon the cultural heritage significance of a site and for creating a thorough record of how the impact occurred;
- The proposed Pre-Main Works, Main Works, Post-Main Works and Ongoing Site Management for the S.S. *Dicky* shipwreck may be undertaken at any time, as long as all the tasks are undertaken appropriately and in the established sequence;
- Sand level on site is the most important factor when determining the best time for the Main Works as lower sand levels facilitate the cutting away of the lower portions of the wreck down to the floor frames;
- The use of underwater cutting equipment will also facilitate the cutting away of the lower portions of the wreck down to the floor frames;
- An induction should take place before the Main Works and each episode of Ongoing Site Management begins so that the objectives of the cutting process are clear and all participants are aware of what is expected;
- Cutting should only be undertaken on features that have been previously recorded and labelled by an archaeologist;
- Cutting locations shall be determined *ad hoc* once exposed but will not extend deeper than the floor frames of the wreck;
- Cutting has been tested successfully with a thermal lance and circular saw. The circular saw must have a diamond blade of a minimum 10 inches. Other potential cutting equipment include a large capacity air powered right angle grinder, power hacksaw and oxy-acetylene torch;
- Once the Main Works are completed, a conservator will inspect the artefacts recovered, those already in the depot and the propeller and assess the potential for conservation as well as implement any required conservation measures;
- Burial is one method of conserving the artefacts that will not be used in the WIP or conserved for display, however, burial must be carefully recorded and monitored by archaeologists to be effective;

- Guides will be produced for Ongoing Site Management including removal of loose and recorded intact wreckage by SCC, as well as monitoring protocols if the wreck is exposed in the future;
- Some of the tasks of Ongoing Site Management may be completed without an archaeologist if it is not feasible to have one present, as long as the tasks are performed correctly;
- Should an archaeologist not be present during Ongoing Site Management, protocols and guidelines will be provided so that recording is undertaken to the required standard;
- All elements (artefacts) that are removed from the wreck during Ongoing Site Management must be accompanied by the original feature label, whether this is the original tag or an improvised tag with the label number obtained from the catalogue of features;
- After an episode of Ongoing Site Management, all data is to be reviewed by an archaeologist and the relevant databases and records updated. Advice may be given concerning initial conservation of artefacts; and,
- Artefacts removed during Ongoing Site Management are to be properly recorded by archaeologists at the SCC Depot after cutting. This may happen as soon as possible after an episode of Ongoing Site Management or after a period of time, as deemed appropriate by the archaeologists. All artefacts already stored in the depot will also be recorded.

1 INTRODUCTION

1.1 Background

The Sunshine Coast Council (SCC) is proposing to preserve key heritage elements of the S.S. (Screw Steamer) *Dicky* wreck as well as reduce safety risks posed by the remains by removing hazardous elements. The wreck is located in the intertidal zone on Dicky Beach, Caloundra. A permit is required from the Queensland Department of Environment and Heritage Protection (DEHP) under Section 91 of the *Queensland Heritage Act 1992* to disturb the site. The awarding of a permit would be conditional, in part, on acceptable archaeological mitigation being implemented before, during and after interfering with the wreck.

DEHP require a Heritage Impact Assessment (HIA) of the proposed project for a permit to be awarded. Cosmos Archaeology have prepared a HIA, including the assessment of a wide variety of options which led to the selection of one combined approach called 'Cut and No Cover'.¹ The HIA is to be accompanied by a Conservation Management Plan (CMP) and Wreck Interpretation Plan (WIP) which expand in detail the 'Cut and No Cover' approach to the project. If all three documents are accepted by the DEHP, a permit will be issued under Section 91 of the *Queensland Heritage Act 1992* on condition that the measures proposed are implemented.

1.2 Study Objective

The objective of this report is to:

- *Submit a CMP for the 'Cut and No Cover' approach to the project that accords with the Burra Charter principles and satisfies the requirements of the DEHP.*

This report is one part of the S.S. *Dicky* Archaeological Management Planning Documentation, accompanied by a HIA and the WIP, and must be read in conjunction with these documents.²

1.3 Study Methodology

This report first provides an introduction to the proposed project in **Section 2**, including a summary of the heritage impact assessment and key mitigation measures from the HIA. **Section 3** is the conservation policy for the S.S. *Dicky* wreck including consequences of the proposed project. **Section 4** provides a detailed implementation strategy for all mitigation measures including Pre-Main Works, Main Works, Post-Main Works and Ongoing Site Management. **Section 5** contains the conclusion and recommendations.

1.4 Authorship

This report was written by Dani Wilkinson (Archaeologist). Dani collated information for the project plan, impact assessment and mitigation measures as well as preparing the conservation policy and implementation strategy. Cos Coroneos (Director) oversaw production of the report, providing advice where required, and reviewed the final product.

Section 4 was written with the advice of Geoff Hewitt (Principal, Geoff Hewitt Archaeologist), Jon Carpenter (Maritime Archaeological Conservator, Western Australian Museum, Shipwreck Galleries), Vicki Richards (Conservation Scientist, Western Australian Museum, Shipwreck Galleries) and Peter Tonkin (3-D Projects).

¹ **Cosmos Archaeology, 2015a**, *S.S. Dicky Archaeological Management Planning Documentation: Heritage Impact Assessment (Final Draft)*, report prepared for Sunshine Coast Regional Council.

² *Op. Cit.* **Cosmos Archaeology, 2015a**; **3-D Projects, 2015**, *Draft Wreck Interpretation Plan S.S. Dicky Caloundra*, report prepared for Sunshine Coast Regional Council.

2 PROPOSED PROJECT

2.1 Project

2.1.1 Methodology

The 'Cut and No Cover' approach to the project seeks to minimise disturbance to the wreck of the S.S. *Dicky* while reducing the risks posed by the wreck to public safety on the beach. It includes the removal of upper portions of the wreck for conservation, storage and an outdoor display while the majority of the wreck remains buried *in situ* beneath natural beach sand deposits. This approach also includes the provision for Ongoing Site Management which entails removal of loose wreckage and/or cutting recorded frames as they become exposed in the future. It also includes the assessment of future options to replace the visible stanchion with another wreck marker if the stanchion were to become insufficient for this purpose.

A test excavation was conducted by Cosmos Archaeology and SCC on the 17th April, 2015, which was used to inform and refine a draft version of this CMP.³ In some cases, the findings have altered some of the minor original objectives of the 'Cut and No Cover' approach to the project. Of note is the intent to reinforce the bow stanchion so that it may remain as a wreck marker *in situ*. This is now considered no longer necessary as investigation of the stanchion did not reveal the source of its instability and, despite observations of movement under pressure, the stanchion appeared to be steady without additional reinforcement.

The test excavation also demonstrated that the level of sand cover over the wreck greatly influenced how much of the wreck could be exposed, recorded, cut and removed during low tides. Rather than wait for the time when the wreck is completely exposed – an unpredictable event with a narrow window of time before it is re-covered – SCC has opted to undertake some of the Ongoing Site Management tasks at the most favourable spring tide. It is therefore likely that on occasion, when the sand cover is much reduced on the site, wreck intact frames will appear. While it would be ideal that an archaeologist be present when such frames are cut and removed, it may not be possible at short notice, especially as frame(s) may be covered again within hours. The methodology presented will anticipate circumstances where an archaeologist may not be present when frames are cut after being temporarily exposed due to storm events. The methodology will provide measures, which will ensure that the risk of impacting the site without suitable archaeological recording having taken place is minimised. This will include the provision that only intact wreck elements that have been previously recorded by an archaeologist can be removed.

2.1.2 Works

The proposed project is divided into four components. This includes:

- Pre-Main Works;
- Main Works;
- Post-Main Works; and,
- Ongoing Site Management.

Pre-Main Works includes non-invasive recording of the site before interference with the wreck commences. Main Works is the main component of interference and includes extensive recording plus the cutting and removal of large wreck features above sand level. Post Main Works is the component of processing data from the Main Works including producing reports and databases as well as undertaking conservation and interpretation measures. Ongoing Site Management is largely undertaken by SCC, following protocols and procedures established by the archaeologists, and includes opportunistic removal of loose wreckage as well as cutting and removal of wreck features that have been previously recorded.

³ **Cosmos Archaeology, 2015b**, *Test Excavation of S.S. Dicky – 17th April 2015*, report prepared for Sunshine Coast Council.

2.2 Heritage Impact Assessment

2.2.1 Significance

A full significance assessment for the S.S. *Dicky* wreck was presented in the accompanying HIA report. The statement of significance for the wreck is replicated below along with the significance assessment for each criteria (Table 1).

Statement of Significance: *The significance of the S.S. Dicky lies in its excellent ability to convey the story and meaning of shipwreck through its present form and context as well as provide some illumination on iron shipbuilding technology and life aboard a late 19th century cargo vessel. It is a much loved and perhaps even revered cultural landmark of the Sunshine Coast.*

Table 1. Significance assessments for the S.S. Dicky wreck against each significance criteria.

Significance Criteria	Significance Assessment
Aesthetic	Moderate
Archaeological	Moderate
Architectural	Low
Historical	Moderate
Interpretive	High
Scientific	Moderate
Social	High
Technical	Moderate

2.2.2 Impact Assessment

A full impact assessment for the proposed 'Cut and No Cover' approach to the project upon the S.S. *Dicky* wreck was presented in the accompanying HIA report. The proposed impact is as follows:

- Removal of loose wreck debris from around the wreck;
- Removal of frames and hull sections above the turn of the bilge and/or where the floor frames end;
- Removal of the remnant stern assembly;
- On-going removal of loose wreckage as it becomes exposed.

A summary of the impact assessment to the wreck is provided in Table 2.

Table 2. Impact assessment of the wreck as a whole.

Significance Criteria	Impact	Assessment
Aesthetic	Removal of stern assembly and extant section of hull on starboard side.	This will have a substantial impact as the bulk of the wreck will be buried and only infrequently exposed
Archaeological	Removal and recovery of structural elements	Removal of elements will have a minor impact as a considerable amount of material will remain and the removed/recovered elements are likely of low to moderate (stern assembly) archaeological potential.
Architectural	No impact.	
Historical	Establishment of an outdoor interpretive display.	This will enhance the historical significance of the wreck by providing an informative display.
Interpretive	Establishment of an outdoor interpretive display.	This will enhance the interpretive significance of the wreck by providing an informative display.

Significance Criteria	Impact	Assessment
Scientific	Examination, conservation and select burial of wreck components.	The proposed project will enhance the scientific significance of the wreck by increasing our understanding of wreck deterioration processes.
Social	Outdoor display and attention to wreck due to works	Proposed project recognises social significance of the wreck
Technical	Removal and recovery of structural elements	Minor impact as the bulk of material will remain and the removed/recovered elements are likely have low technical potential

2.2.3 Archaeological Mitigation

Mitigation of the impact to archaeological and technical significance of the *S.S. Dicky* wreck includes the recording of all objects recovered from the wreck and surrounding the wreck, as well as the retention of select items for future study and teaching.

Key measures for the proposed archaeological mitigation are as follows:

- Recording by an archaeologist of intact frames/hull plates and stern assembly prior to removal;
- Recording in this context means photography, tagging of object with unique identification, recording its position and orientation onto a site plan, photogrammetry – where possible – and detailed description of the object after it has been removed;
- An archaeologist to locate and record any loose wreck material to be recovered in conjunction with works carried out to remove intact frames/hull and stern assembly;
- Recording in this context means photography, tagging of object with unique identification, recording its position and orientation and detailed description of the object after it has been removed;
- Establishment of archaeological management protocols for when the wreck becomes exposed after storm events. This includes the cutting and removal of intact frames, with and without an archaeologist present, and the removal of loose wreckage, and;
- Preparation of an artefact collection policy which would provide guidance on what should be conserved, buried or discarded.

2.2.4 Conservation Mitigation

Impacts to the scientific significance of the wreck will be mitigated by examination, conservation and select burial of wreck components. This will increase understanding of the wreck deterioration process, along with development of techniques to manage and sustain the wreck and associated artefacts.

Key measures for the proposed conservation mitigation are as follows:

- Treatment of the recovered objects for outdoor display – this may include de-concretion, grinding, re-shaping and/or stabilisation;
- Treatment of the vessel's propeller currently covered in fibreglass and on display in a car park nearby;
- Treatment of recovered objects for above ground storage as part of a type collection, and;
- Appropriate methods of burial or discard for artefacts.

2.2.5 Interpretation Mitigation

An outdoor display within line of sight of the wreck is the main mitigation measure for impacts to the aesthetic and social significance of the wreck. The outdoor display would be a high profile / above ground replacement of the iconic image of the wreck, referencing the striking

visual features and characteristics of it, rather than attempting to create a duplicate. This is further explored in the Wreck Interpretation Plan.⁴

2.3 Legislative Compliance and Other Requirements

The HIA report appraised the proposed project and mitigation measures against relevant heritage guidelines and found that they are in line with all of the following guidelines:

- The Burra Charter 1999;
- UNESCO Convention for the Protection of the Underwater Cultural Heritage 2001;
- Guidelines for the Management of Australia's Shipwrecks 1994; and
- Requirements of DEHP.

It also found that the following compliances are considered to be required for the proposed project:

- *Queensland Heritage and Other Legislation Amendment Bill 2007* – the wreck is automatically protected under this Act and consent from the Queensland EPA is required to damage, destroy, disturb, expose or remove the wreck.

⁴ *Op. Cit. 3-D Projects, 2015*

3 CONSERVATION POLICY

3.1 *Statement of Conservation Policy*

The objective of this conservation policy is to maintain the heritage significant values of S.S. *Dicky* while reducing the safety risks posed by the remains.

3.2 *Reasons for Policy*

A conservation policy is required to manage the compromise between removing hazardous elements and impacting the heritage significance of the wreck. The measures presented in this policy have been chosen within the limitations of resources available to SCC.

Although more extensive actions were considered, any further works would have impacted greatly on the significance of S.S. *Dicky* without equally extensive and appropriate mitigation.

3.3 *Consequences of Conservation Policy*

Consequences of this conservation policy can be listed as follows:

- The risk to public safety on the beach posed by the wreck remains is considerably reduced although not completely eliminated;
- The bulk of the wreck will remain in place at Dicky beach;
- *In situ* remains of S.S. *Dicky* will be less visible, with the majority buried beneath beach sand and only intermittently exposed in storm events;
- The archaeological potential of the buried portions of the wreck should remain unaffected. The proposed project will not interfere with the slow and inevitable deterioration of the buried archaeological remains, nor will they be acting to preserve this potential;
- A stanchion will be the only remaining element of S.S. *Dicky* that is permanently exposed, until it's condition deteriorates to such a level that it must be removed to conserve and maintain its heritage significance;
- Once the stanchion has been removed, a new wreck marker should be installed to mark the position of the buried wreck remains;
- An outdoor display will be created in line of sight to the wreck site at Dicky Beach, possibly containing removed elements of the wreck as an interpretive and high profile replacement of the wreck site. This will reference the features and characteristics of the wreck but not attempt to duplicate it;
- A type collection of objects will be retained and conserved, with the selection of artefacts guided by an Artefact Retention Policy;
- Artefacts may be conserved by burial, creating a protected underground repository of objects;
- Objects that are not to be retained will be discarded as appropriate;
- A cutting protocol will be established in the event that the *in situ* wreck remains are exposed to a degree to facilitate cutting of elements that have already been recorded;
- A monitoring protocol will be established in the event that the *in situ* wreck remains are exposed after cutting; and
- Any loose pieces of wreckage identified in the future can be recorded and collected by SCC;
- Archaeological recording and monitoring during all conservation measures will be reported with a database of all artefact records that can be added to by SCC with the ongoing recovery of loose pieces and monitoring of the wreck.

4 STRATEGY FOR IMPLEMENTATION

4.1 Pre-Main Works

The strategy for minimising loss of significance prior to the Main Works of the S.S. Dicky project is based on detailed recording of the site. This has been divided into three tasks, detailed in Table 3 below, which includes:

- Task 1 – Recording
- Task 2 – Metal detector survey
- Task 3 – Processing photogrammetric model

Table 3: Measures for minimising loss of significance during the Pre-Main Works.

Task	Est. Time (hours)	Action	Personnel	Equipment
Task 1 – Recording <i>At low tide with maximum exposure of wreck. Photogrammetry must be done on overcast day with even lighting or early morning / late afternoon.</i>	4	Manually recording the dimensions and features all exposed elements of the wreck	Archaeologist	Tapes, photos of elements to notate
		Photographing all exposed elements of the wreck. This must include photographs onto which measurements of the features can be noted for the report	Archaeologist	Cameras, scales
		Photogrammetric recording of all exposed elements of wreck	Archaeologist x 2	Camera and scales
Task 2 – Metal detector survey	4	Metal detector survey around the site to identify possible buried loose remains. Include any locations where locals suggest wreckage is buried. GPS possible targets for later inspection.	Archaeologist x 2	Underwater metal detector, tapes for transects, compass, transect recording sheets, flags, GPS, wet gear
Task 3 – Processing photogrammetric model	TBA	All images taken as part of the photogrammetric recording will be sent to a specialist with adequate software to process and form a 3D digital model which will be supplied to Council and / or DEHP. <i>If required, additional visits to repeat the photogrammetric photography can be made.</i>	Photogrammetry specialist	<i>Office</i>

These tasks aim to record the wreck in its present state in detail so that information relating to its form will be preserved after cutting the wreck. The 3D digital model will also provide an interactive resource for interpretation or educational purposes in the future, as well as being an accurate representation of the wreck if any further archaeological or technical information is sought.

4.2 Main Works

The strategy for minimising loss of significance during the proposed Main Works as part of the S.S. Dicky project is usually presented in the form of an archaeological research design. The following tasks have been identified in line with that approach.

It is intended that the Main Works will be undertaken from July 2015 onwards. See Section 4.2.1 for additional information relating to timing.

The measures to be undertaken during the Main Works have been divided into eight tasks of roughly chronological order, detailed in Table 4. The tasks include:

- Task 1 – Upon arrival
- Task 2 – Exposure and recording
- Task 3 – Cutting process
- Task 4 – *In situ* material recording
- Task 5 – Infill
- Task 6 – Remove identified loose wreckage
- Task 7 – Artefact recording and storage
- Task 8 – Processing data and artefacts

The measures presented for minimising loss of significance during the Main Works are aimed towards detailed archaeological recording of the remains before, during and after cutting, as well as archaeological monitoring of the process.

Archaeological management is essential for controlled impact upon a site and for creating a thorough record of how the impact occurred. Recording during this component is also essential for creating a site plan of the hull remains left *in situ*, in order to inform future developments and for ongoing monitoring.

Table 4: Measures for minimising loss of significance during the Main Works.

Task	Est. Time (hours)	Action	Personnel	Equipment
Task 1 – Upon arrival	0.25	General photography of site.	Archaeologist	Camera, scales
Task 2 – Exposure and recording	Up to 12	Archaeologist to consult with excavators and begin excavating the wreck. Archaeologist will stand nearby and call a halt if any features are exposed. If required, specific directions will be given to the excavator for exposing the elements without causing damage. The directing archaeologist will indicate when mechanical excavation will stop and manual excavation commences.	Archaeologist, excavation crew	Excavator with smallest flat edged bucket available
		Manual excavation of the features to full exposure required for cutting.	Archaeologist x 2	Shovels, spades, trowels, brushes, buckets, PPE
		General photography of mechanical and manual excavation.	Archaeologist	Camera, scales, PPE
		Numbering system for frames and features put in place with labelling for each. Zip ties, tags and other assorted materials will be used to identify each frame and feature as having been recorded and prepared for cutting. See Section 4.2.2 .	Archaeologist	Zip ties (large and small), cattle tags, permanent marker, coloured electrical tape, cloth tape, flagging tape, recording sheets, log, PPE
		Photography of the prepared frames and features with labels.	Archaeologist	Camera, scales, PPE
		A progressive site plan will be recorded as the wreck is exposed. This will be done onto a prepared 'master site plan'	Archaeologist	Site plan
		DGPS positioning of remains as exposed including all frames and features. To use same frame and feature numbering system as above. Directed by an archaeologist who will also note the points taken and labels used. Alternatively, see Section 4.2.3.	DGPS team, archaeologist	DGPS equipment supplied, PPE, recording sheets, log
Task 3 – Cutting process	Up to 12	Cutting to be done with archaeologist supervision. Only frames that have been previously recorded and labelled can be cut. The position of the cut will be to the discretion of the excavation and cutting team. See Section 4.2.4.	Archaeologist, excavation crew, qualified cutter operator(s)	PPE, cutting equipment, excavator, crane and straps to support removed piece (if large)
		General photography of the cutting procedure.	Archaeologist	Camera, PPE
		No features can be cut and removed that have not been recorded and numbered. However, if a recorded frame comes apart in multiple pieces and some of those pieces do not have the original tag and number attached, they must be physically attached or grouped with the tagged artefact with zip ties, cord, rope, or bagged together.	Archaeologist	Zip ties, cord, rope, bags, flagging tape or selection thereof.
		Artefacts to be removed from site. If they can be manually lifted, artefacts are to be placed in tubs of suitable size and transferred to SCC Depot to await recording. If they are heavy, artefacts must be lifted by crane onto pallets and transferred to SCC Depot for recording.	Craning crew if required, transport vehicle such as truck or ute	Tubs, crane, lifting straps, pallets, any required padding to support artefacts on pallets, PPE

Task	Est. Time (hours)	Action	Personnel	Equipment
Task 4 – <i>In situ</i> material recording	0.6	DGPS of the remains left in the ground, of exposed ends of frames and edge of hull. The numbering system of these points must include the frame / features numbers attached to the frames before cutting.	DGPS team	DGPS equipment
		Photograph the wreck remains to be left in the ground once artefacts have been removed.	Archaeologist	Camera, scales, PPE
Task 5 – Infill	Up to 1	Excavator can infill over the top of exposed remains using sand recently removed.	Excavating crew	Excavator, PPE
		General photography of the infill process	Archaeologist	Camera, scales, PPE
Task 6 – Remove identified loose wreckage <i>Concurrent with Tasks 2 to 5 when equipment and personnel available</i>	2	Mechanical and manual excavation to expose the remains at saved GPS targets.	Archaeologist x 2/3, excavator team	Excavator with flat edged bucket, shovels, spades, trowels.
		Artefacts are to be given unique identifying numbers and tagged.	Archaeologist x 2	Flagging tape, permanent marker
		GPS of identified wreckage remains recorded, as well as orientation of the artefact and distance/direction from the wreck.	DGPS team, archaeologist	GPS, PPE, recording sheets, log
		If they can be manually lifted, artefacts are to be removed and carried to a clear area away from site to be recorded. They can be laid on tarps or in tubs of a suitable size while awaiting processing. If they are heavy, artefacts must be craned away from the site and onto prepared pallets for recording.	Archaeologist and craning crew if required	Tarps, tubs, crane, lifting straps, pallets, any required padding to support artefacts on pallets, PPE
		<i>Proceed with Task 5 and Task 7.</i>		
Task 7 – Artefact recording and storage	2	Artefacts are to be recorded by archaeologists at the SCC Depot. This will occur as soon as possible after cutting.	Archaeologist	See below.
		The initial stages of the Artefact Retention Policy will guide what items are to be considered artefacts and what items are too small or undiagnostic to be retained and will be discarded. See Section 4.2.5.	Archaeologist	Artefact Retention Policy
		Artefacts are to be given unique identifying numbers, tagged (if not already), added to an artefact registry, photographed and recorded onto proformas. See Section 4.2.6.	Archaeologist	Cameras, flagging tape, permanent markers, artefact registry, proformas, scales and tapes, tarps, foam mats for photo backgrounds.
		Once each artefact has been recorded, it is to be stored within a tub or on a pallet. Initial conservation measures will also be undertaken on a selection of artefacts by storing in fresh water.	Archaeologist	Tubs, pallets, fresh water
		While in storage, occasionally inspect previous artefacts for deteriorating condition. If any is noted, consult a conservator.	Archaeologist	None.

Task	Est. Time (hours)	Action	Personnel	Equipment
		Although unlikely, any timber remains must be kept wet in fresh water and stored in a dark sealed container.	Archaeologist	Rags, fresh water, tubs with lids, buckets.
Task 8 – Processing data and artefacts	40	A digital database (FileMaker Pro or Excel) will be created to contain all the information from artefact records.	Archaeologist x 2/3	Office
		All photographs will be labelled using a predetermined labelling system and a photo log will be created.	Archaeologist	Office
		All artefacts already stored in the depot will also be recorded, following the process of Task 4, and added to the database.	Archaeologist	Cameras, flagging tape, permanent markers, artefact registry, pro formas, scales and tapes, tarps, foam mats for photo backgrounds.
		The interpretation specialist may inspect the collected artefacts and determine what pieces will be used in the interpretive display and what treatment they require. Treatment will be determined in conjunction with the conservation specialist. See Section 4.3.	Interpretation specialist, conservation specialist.	None
		All remaining artefacts will come under assessment following the Artefact Retention Policy. Artefacts will be designated for retaining or discard. See Section 4.2.5.	Archaeologist	Artefact Retention Policy
		Artefacts to be retained will be given a more permanent artefact label.	Archaeologist	Cattle tags, zip ties, engraver
		Appropriate conservation measures will be determined for each of the retained artefacts, including but not limited to treatment, burial and discard. See Section 4.3.	Conservator	None

4.2.1 Timings

It is likely that Tasks 1 to 8 will be completed within one day for the exposed starboard frames and stern section. Following this, Steps 1 and 2 (recording) will be undertaken along the port side of the hull, within one day. Steps 3 to 6 (cutting) to be conducted later as part of the Ongoing Site Management component of works when conditions result in limited sand level cover and maximum access.

It would be preferable for Main Works at the stern area of the wreck to be conducted at the lowest tide possible, while the bow area can be completed in higher tides. The lowest tides for June and July 2015 are presented in Table 5. Tides for the whole of June and July are available in Annex A. Sand levels are more prohibitive of access than water level and are harder to predict, so undertaking the Main Works during low spring tide would make this task more efficient.

The Main Works are not likely to be completed on consecutive days allowing for the Main Works to take place when environmental conditions are ideal. It is preferable to undertake the Main Works in calm weather, as a westerly wind and strong wave action can increase the water level around the wreck as well as affect the stability of equipment.

Table 5. Lowest tides in June and July and the low tides surrounding those days. Note that days before and after those shown do not have a low tide below 0.30 m LAT / -0.69 m AHD. The estimated height of the keelson is 0.22 m LAT / -0.77 m AHD. As a comparison, the low tide experienced during the test excavation on 28th April 2014 was meant to be 0.18 m LAT / -0.81 m AHD, and this kept the entire site completely submerged.

Date	Low and High Tide Time	Tide Height (mLAT / mAHD)	Date	Low and High Tide Time	Tide Height (mLAT / mAHD)
12 June	0401	1.59 / +0.60	30 June	0050	0.53 / -0.46
	1030	0.29 / -0.70		0617	1.39 / -0.40
	1700	1.68 / +0.69		1223	0.24 / -0.75
	2311	0.55 / -0.44		1908	1.87 / +0.88
13 June	0459	1.55 / +0.56	01 July	0132	0.45 / -0.54
	1121	0.24 / -0.75		0703	1.42 / +0.43
	1752	1.84 / +0.85		1306	0.18 / -0.81
14 June	0011	0.50 / -0.49	02 July	1948	1.96 / +0.97
	0554	1.52 / +0.53		0214	0.38 / -0.61
	1208	0.19 / -0.80		0748	1.45 / +0.46
15 June	1841	1.94 / +0.95	03 July	1348	0.14 / -0.85
	0103	0.44 / -0.55		2031	2.01 / +1.02
	0644	1.50 / +0.51		0257	0.33 / -0.66
16 June	1252	0.17 / -0.82	04 July	0835	1.47 / +0.48
	1927	2.00 / +1.01		1433	0.13 / -0.86
	0151	0.41 / -0.58		2114	2.04 / +1.05
17 June	0732	1.46 / +0.47	05 July	0342	0.30 / -0.69
	1335	0.17 / -0.82		0922	1.47 / +0.48
	2010	2.02 / +1.03		1519	0.16 / -0.83
18 June	0236	0.41 / -0.58	05 July	2159	2.01 / +1.02
	0817	1.43 / +0.44		0429	0.29 / -0.70
	1415	0.21 / -0.78		1014	1.47 / +0.48
18 June	2051	2.00 / +1.01	05 July	1608	0.23 / -0.76
	0319	0.42 / -0.57		2245	1.95 / +0.96
	0859	1.39 / +0.40			
18 June	1455	0.26 / -0.73			
	2130	1.95 / +0.96			

4.2.2 Numbering and Labelling

A clear numbering and labelling system is required before the Main Works begin in order for the mass amounts of data to correspond. Labels for all artefact numbers, photographs,

notations and positions must match so that data can be successfully collated for each recorded feature.

Numbering of components will happen sequentially as the components are exposed. This is preferable as attempting to number components north to south, bow to stern or in any particular order can be easily disrupted if a component is later exposed after labelling or if the exposure of wreck over multiple tides cannot be done in sequential order. Numbering will continue in sequential order over days and site visits instead of re-setting at the beginning of the next visit.

Artefact labels are to be in the following format, with a guide provided in Table 6:

Frame and Feature Labels [XX][###]

A two letter abbreviation of the wreck component followed by a three digit consecutive number assigned to that individual component

Examples: FR003, HP042, UN002

Artefact Labels [XX][###]-[###]

The artefact number will begin with the frame or feature label that the artefact has been removed from, followed by a consecutive three digit number for that individual artefact.

Examples: FR003-001, HP042-002, UN002-005

Photographs and Videos SSDicky_[YMMDD]_[###]

A site identifier of “SSDicky” followed by the date and a consecutive number for that photo.

Examples: SSDicky_150603_001, SSDicky_150529_005, SSDicky_150605_006

Photographs – Artefacts SSDicky_[XX][###]-[###]_[YMMDD]_[###]

Follows the general photo labelling system other than the artefact label being inserted between the site identifier and date.

Examples: SSDicky_FR003-001_150529_003, SSDicky_HP042-002_150602_002, SSDicky_UN002-005_150603_001

DGPS Positions [XX][###]

The frame or feature label followed by any annotations indicating the position on that artefact.

Table 6. Preliminary labelling system guide.

Term	Label
1 – Wreck Component	
Bow	BW
Floor	FL
Frame	FR
General (only for photos)	GN
Hull Plating	HP
Keelson	KL
Stanchion	SN
Stern Post	SP
Stringer	SR
Timber Plank	TP
Unidentified	UN
2 – Component Number	
To be given sequentially as exposed with three digits	###
3 – Artefact Number (for artefacts only)	

To be given sequentially as exposed with three digits	###
4 – Date (for photographs only)	
To be given in reverse with two digits per number	YYMMDD
5 – Photograph number (for photographs only)	
Given sequentially for all photographs for which label items 1-5 are the same. Three digits.	###

4.2.3 Positioning Without DGPS

If DGPS is not available for every site visit, alternate positioning methods will have to be implemented although it is preferable that one positioning method be used consistently throughout the entire Main Works. Should DGPS positioning not be available, alternate positioning methods must be undertaken by an archaeologist. The replacement positioning method will be by baseline offset using a 30 m tape stretching from the stern post, past the stanchion and up the beach. From this tape the offset measurements can be made with another tape by swinging the offset tape in an arc over the baseline tape to find the shortest offset distance. The position of the stern end of the tape will be photographed in relation to the stern post and base elements of the stern and recorded by GPS in order to be replicated it for each visit. A bearing of the tape will be made from this point and photographs of the proximity of the tape to the stanchion.

4.2.4 Cutting

Location

It was initially intended to cut the hull down to the floor frames on both the port and starboard sides over a period of consecutive days. This was to provide a consistency over the entire wreck, remove any vertical pieces of hull that may become loose over time and reduce the top surface of the wreck down to a flat plane which, when it becomes exposed, will pose a greatly reduced risk to public safety than vertical frames.

The April 2015 test excavation made apparent that this level of cutting is deeper than first anticipated and that access is greatly restricted by sand level and water level. As the wreck is listing towards the port side, this means that the cutting on the port side is also considerably deeper than on the starboard. The test excavation also raised doubts as to whether this depth of cutting is required to remove hazardous elements of the wreck as it would only be very infrequently exposed.

As such, cutting locations shall now be determined *ad hoc* once exposed. Only elements of the wreck that are deemed hazardous and shallow enough to pose a safety threat will be recorded and cut. Cutting can only be done on frames that have been previously exposed and recorded, but once exposed for cutting (if cutting is conducted at a later time) the location of the cut can be left to the discretion of the cutting team. The floor frames will be considered the lowest limit of cutting, which is particularly relevant on the higher starboard side of the hull.

Cutting may also be limited to above the water level only, depending upon the availability of equipment and personnel. This would result in much less material being removed and the risk of not completing the original objectives of these works. Should cuts be made above water and then further exposed at a later date, repeat cutting *cannot* be undertaken without a repeat of recording. This is to ensure that an unrecorded frame is not inadvertently removed.

Stern Assembly

As part of the cutting of the hull, the stern assembly which is currently visible above sand will be cut and removed. This stern section includes the stern frame and rudder post which may still be attached to the centreline structure of the keel and keelson. It originally included the framing of the aperture housing for the single propeller, an aperture that was D-shaped, but part of the rudder post was cut away in 1963 when the propeller was removed for display

(Figure 1).⁵ The S.S. *Dicky* structure also included a bulkhead which was an important connection for a major side stringer that ran the full length of the hull on both port and starboard sides. The stern frame and aft bulkhead were structurally important where the hull tapers sharply to allow water to flow into the propeller blades with minimal turbulence. The narrowness and angularity of this part of the hull usually requires the use of a series of deep floors (see Figure 1). The structural strength of this type of framing is generally dependent to a great degree upon attachment of the frames to stringers and the presence of several plated deep floors and a stuffing box bulkhead penetrated by the forward end of the stern tube.

With the S.S. *Dicky* wreck, the remaining upper part of the rudder post became cantilevered after removal of the lower part but was restrained by the longitudinal stringers but these have now entirely corroded and the remaining stern frame assemblage now moves in response to wave action. Collapse of the tall and heavy remaining rudder post and stern frame assembly is inevitable. If uncontrolled collapse is permitted, it is probable that all structural integrity at the stern will be lost.

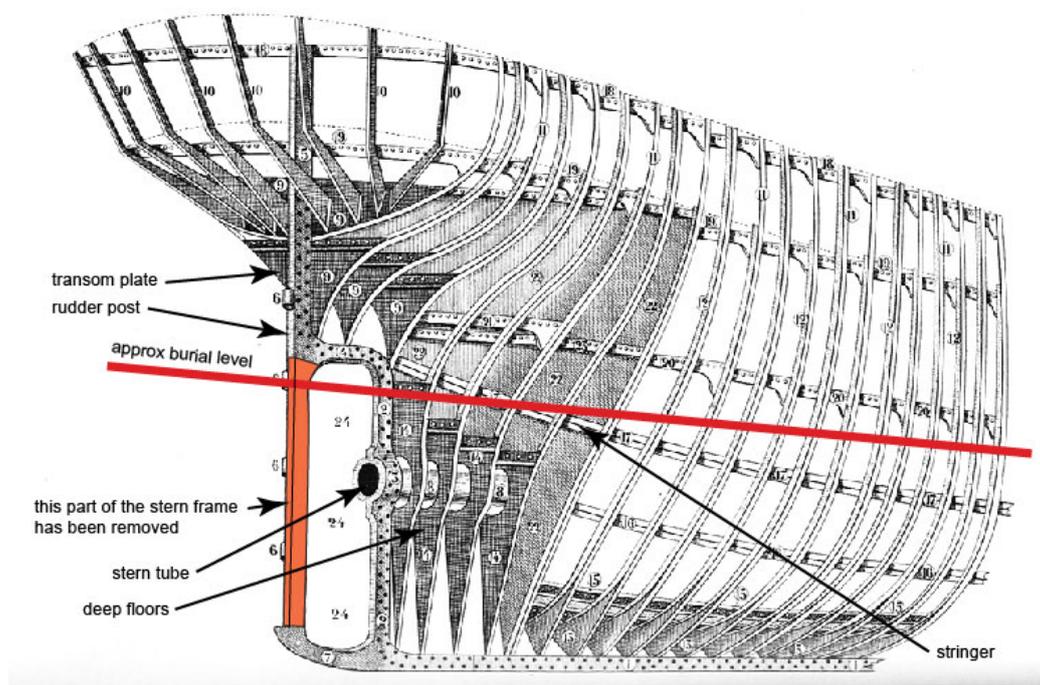


Figure 1. Possible arrangement of framing of the stern of S.S. *Dicky*. Note that this illustration depicts a three-deck ship whereas S.S. *Dicky* had two decks only. Also, S.S. *Dicky* probably had fewer transom plates and deep floors than this as it was a smaller vessel. Orange section indicates part that was removed in the 1960s. The red line indicates the usual sand level.⁶

The proposed cut line through the stern frame of S.S. *Dicky* indicated on Figure 2 corresponds with the present level of burial and intersects with the point of cantilever of the rudder post and transom plate/side shell assembly. The cutline nominated does not further compromise the integrity of the after peak and stern tube, which are considered to be important for maintaining the stern structure of the hull after the cut and cover process. The proposed cut line must be considered as contingent upon what the original structural details in this area were and particularly upon remaining structural integrity prior to cutting. These facts can only be determined by excavation and careful examination of the remaining structure.

⁵ Mann, C.H., 1985, *The Wreck of the Dicky*, Shire of Landsborough Historical Society Museum.

⁶ Paasch, H. 1890, *Illustrated Marine Encyclopedia*, Argus Books, Watford Hertfordshire, plate 22, annotated.

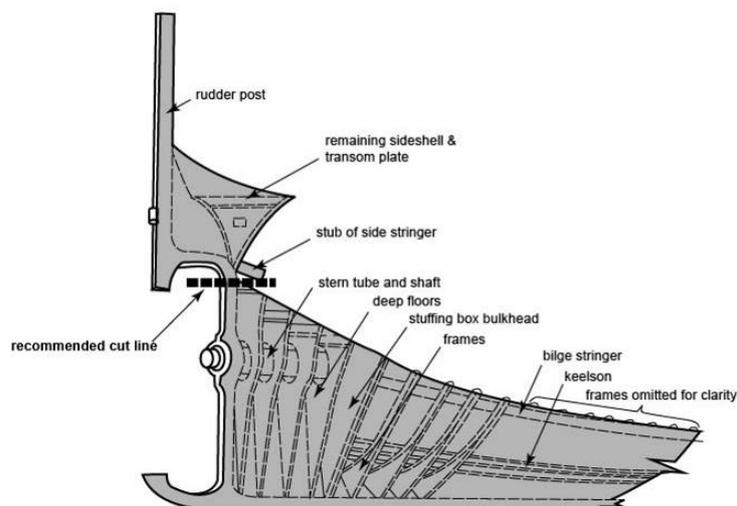


Figure 2. Schematic view of remaining stern structure of S.S. Dicky as inspected in late 2014. The proposed cut line at the stern frame is shown. This schematic assumes the presence of a bilge stringer.⁷

Cutting Equipment

Circular saws are the ideal method for cutting shipwreck remains. The saw should have a diamond blade with a circumference of at least 10 inches to effectively cut through the width of shipwreck material. Circular saws can be operated on a number of different machine types. The most common is hand-held circular saws which may be hydraulic, air-powered or electrical or petrol driven. Another option is to mount the circular saw on an excavator. The use of hand-held tools is dependent on calm and predictable sea conditions for the safety of the operator. Hydraulic and air-powered saws are effective underwater as well as above water. The difference is that hydraulic is a closed system while air-powered is not, meaning that the air-powered will cause bubbling underwater which would cause sediment disturbance and reduce visibility. Air-powered tools will also require a diesel-powered air compressor. Electrical and petrol driven saws can also be used but only above water.

An excavator-mounted hydraulic circular cut-off saw would be difficult to obtain but would be the safest and most effective cutting tool. The saw would be mounted onto the end of the excavator boom and would require pre-setting and adjusting of the blade angle for the required cut. The machine operator needs to be extremely proficient and cutting is to be done with the saw moving towards the operator. The reach of the excavator boom would allow operations into locations subject to incidental wave immersion. It may be convenient to have two excavators on site, one with a bucket for exposing the wreck and the other with the saw attachment for cutting. Saw safety would require the presence of some type of fixed safety guard or barrier such as rigid wire mesh to allow the supervisor to observe the path of the cut from an appropriate distance but providing protection against being inadvertently washed into the cut zone. The employment of a machine contractor experienced with the use of hydraulic saws and able to provide the necessary equipment is strongly recommended. There is a need to match the hydraulics of the machine to the characteristics of the saw and specific gear such as hydraulic flow dividers are necessary to protect the saw from overload. Hiring a saw separately and handing it over to a machine operator to use is not recommended. The result might be expensive.

As well as circular saws, a large capacity right angle grinder would also work for making cuts underwater if hydraulically or air powered, along with a reciprocating saw / power hacksaw. These hand held tools will also work for above water cutting, including electrically and petrol powered saws. An oxy-acetylene torch has proven successful for cutting above water, as observed by Cosmos Archaeology on the shipwreck P.S. *Leo* in 2007. A thermal lance has

⁷ *Op. Cit. Paasch, H. 1890*, plate 22, annotated.

also been tested underwater and worked effectively at cutting a frame off the S.S *Dicky* during the April 2015 test excavation, though it took a relatively long time and so is not considered cost-efficient.

For larger weighty elements being cut off the wreck, it will be necessary to have a mobile crane on hand. The size of pieces removed and the location of the saw cuts would be determined by the capacity of the crane to lift, traverse and relocate. The large parts of structure to be removed would be supported by the crane during cutting, using plate dogs or shackles and suitable slings under the control of a rigger. The intent of this is to prevent distortion of the remaining structure during the cut by controlling the tendency of the part being removed to twist, rotate or collapse. A crew of two (rigger and dogman) holding steadying lines pre-attached to the part being removed would need to be present during cutting to assist manually with this control.

4.2.5 Artefact Retention Policy

The Artefact Retention Policy has two steps. First is the initial determination during the cutting process of what loose remains are considered to be artefacts for recording and storing. What remains will be collected and discarded by bagging and placing in a bin for disposal. The policy for this step is presented in Table 7.

Table 7: Artefact Retention Policy for Step 1 – Cutting Process

Item	Outcome
Identifiable wreck component	Labelled, recorded and stored
Unidentifiable wreck component	Labelled, recorded and stored
Unidentifiable item that appears to be entirely concretion	Collected and discarded
Unidentifiable item that appears to be entirely corrosion product	Collected and discarded
Unidentifiable item of extremely poor condition, of which no diagnostic information will be discernable	Collected and discarded
Small items that have fragmented/flaked off the main wreck components and may contain diagnostic information	Labelled, recorded and stored
Small items that have fragmented/flaked off the main wreck components and do not contain diagnostic information	Collected and discarded

The second step of the Artefact Retention Policy takes place after the Main Works have been completed. This is when the remaining artefacts must be assessed and retained or discarded. Artefacts that are already stored in the SCC Depot will also be assessed in this step. The policy for this step is presented below.

Retain:

- A sample of each wreck component. If there are multiple artefacts, retain the best preserved examples;
- Examples where wreck components are joined;
- Any unique constructional pieces;
- A small selection of non-diagnostic artefacts that can be used for potential metallurgical testing in the future;
- Any well-preserved or visually interesting items for museum displays or teaching aids; and,
- Consider retaining multiples of similar components and conserve these in different ways to serve as a comparison of conservation techniques for archaeological research as well as for museum or teaching interests.

All artefacts to be retained will be inspected by a conservator and appropriate conservation measures will be determined. Points to keep in mind while implementing this Artefact Retention Policy is the quality of the remaining metal and general condition of the

components. Note that any overlapping areas or enclosed areas on an artefact can cause difficulties in conservation treatments as it harder to release entrapped salts and can lead to continuing corrosion after treatment. Artefacts that do not fit the criteria above and will not serve any other purpose should be discarded. Artefacts that are to be retained will be either stored in the SCC depot or shall be incorporated into the SCC Cultural Heritage Collection for loan and display.

4.2.6 Artefact Recording

Artefacts will be recorded onto pro formas which will be kept and updated during the entire course of this project, including details of the later conservation measures. Information recorded on to the pro formas will also be entered into a digital database created in FileMaker Pro or Excel. A draft of the pro forma is presented below (Figure 3).

All the artefacts will also be photographed in detail. This will be undertaken on a plain-coloured background, with a scale and the artefact label, and the artefact will be photographed from multiple angles. The digital database will contain fields for artefact photographs and a hard drive will be supplied with high resolution artefact photographs.

It is anticipated that this documentation will be sufficiently detailed to allow those preparing the interpretative display in Dicky Beach Park to be able to select suitable objects without the need to exhume them from their underground repository.

S.S. Dicky – Caloundra, QLD – Artefact Recording Sheet

Artefact ID <input style="width: 90%;" type="text"/>	Date Removed <input style="width: 90%;" type="text"/>
Recorded by <input style="width: 100%;" type="text"/>	Date recorded <input style="width: 100%;" type="text"/>
	No. of objects <input style="width: 100%;" type="text"/>
Material <input style="width: 100%;" type="text"/>	Artefact type / short description <input style="width: 100%;" type="text"/>
Detailed description	
<div style="display: flex; justify-content: space-between;"> <div style="width: 80%; border: 1px solid black;"></div> <div style="width: 15%; padding-left: 10px;"> <p>Condition</p> <p>Very poor <input type="checkbox"/></p> <p>Poor <input type="checkbox"/></p> <p>Moderate <input type="checkbox"/></p> <p>Good <input type="checkbox"/></p> <p>Excellent <input type="checkbox"/></p> <p>Indeterminate <input type="checkbox"/></p> </div> </div>	
<p>OUTCOME</p> <p>Retain <input type="checkbox"/></p> <p>Discard <input type="checkbox"/></p>	
<p>CONSERVATION</p> <p>Purpose</p> <p>Display <input type="checkbox"/></p> <p>Storage <input type="checkbox"/></p> <p>Conservation</p> <p>Treatment <input type="checkbox"/></p> <p>Burial <input type="checkbox"/></p> <p>Conservation description</p> <div style="border: 1px solid black; height: 80px; width: 100%;"></div>	<p>Sketch</p> <div style="border: 1px solid black; height: 150px; width: 100%; background-image: linear-gradient(to right, lightgray 1px, transparent 1px), linear-gradient(to bottom, lightgray 1px, transparent 1px); background-size: 20px 20px;"></div>

Figure 3. Draft of the pro forma for recording artefacts.

4.3 Post-Main Works

The strategy for minimising loss of significance after the Main Works as part of the S.S. Dicky project is largely based on the Interpretation Plan which follows this report and conserving the remaining material. Conservation measures cannot be known in detail until all the removed pieces of the S.S. Dicky wreck can be assessed by a conservator. Measures for minimising loss of significance during Post-Main Works of the S.S. Dicky project has been divided into eight tasks and is detailed in

Table 8 below. The tasks include:

- Task 1 – Wreck Interpretation Plan
- Task 2 – Conservation of loose remains
- Task 3 – Conservation of propeller
- Task 4 – Reporting
- Task 5 – Wreck marker (if required)

Table 8. Measures for minimising loss of significance during the Post-Main Works.

Task	Est. Time (hours)	Action	Personnel	Equipment
Task 1 – Wreck Interpretation Plan		Implementation of the Interpretation Plan. See Section 4.3.1		
Task 2 – Conservation of loose remains	TBA	An assessment will be made of all the material recovered and already in the Depot and conservation measures will be determined and carried out as appropriate. This may include but is not limited to: <ul style="list-style-type: none"> • Storage without treatment in the SCC depot, • Manual deconcretion, • Treatment in alkaline solution. • Oxy-acetylene flame cleaning, • Abrasive blasting, • Burial. See Section 4.3.2. 	Conservator, archaeologist x 2/3, any assisting specialists, excavation crew	TBA Possibly cameras, scales, hammers, screw drivers, chisels, storage tanks, alkaline solution, oxy-acetylene flame equipment, high pressure sprayer, crane, lifting straps, excavator
Task 3 – Conservation of propeller	TBA	An assessment will be made of the propeller currently covered in fibreglass and on display in the park near Dicky Beach. Conservation measures will be determined and carried out as appropriate.	Conservator, archaeologist	<i>Will be determined after assessment</i>

Task	Est. Time (hours)	Action	Personnel	Equipment
Task 4 – Reporting	40	Monitoring reports will be produced by a maritime archaeologist with all the data obtained from recording throughout all the Tasks of this CMP. This reporting will include: <ul style="list-style-type: none"> • 3D digital imagery of the wreck prior to Main Works, • Monitoring of the Main Works, • Photographs and photo log, • DGPS data and a site plan of the site before and after the Main Works, • Digital artefact register and catalogue, including conservation measures, that can be added to by SCC, • Final guidelines for ongoing removal of loose and recorded intact wreckage. • Monitoring protocols if the wreck becomes exposed by storm events. See Section 4.5. 	Archaeologists	Office
Task 5 – Wreck marker	8	If the stanchion becomes inadequate as a wreck marker, the stanchion will be recovered following Tasks 1 to 6 of the measures during Main Works.	Archaeologist x 2/3, excavation crew, DGPS crew, engineer	Cameras, scales, excavator with flat edged bucket, shovels, spades, trowels, flagging tape, permanent marker, pro formas, photograph backgrounds, crane, lifting straps, pallet, ute/truck, forklift
<i>If required</i>		If appropriate, a replacement wreck marker will be installed.	Interpretation specialist, archaeologist. <i>To be assessed.</i>	<i>To be assessed</i>
		A conservation assessment of the stanchion will be made and appropriate conservation measures undertaken	Conservator, archaeologist. <i>To be assessed.</i>	<i>To be assessed.</i>

4.3.1 Interpretation Plan

An Interpretation Plan has been prepared by 3-D Projects alongside this report.⁸ This plan nominates important elements for the S.S. *Dicky* and provides two main options for on-site interpretation as well as an option for a beach installation. The on-site location is one previously nominated by Sunshine Coast Council as an appropriate area. It is the beachside park at Dicky Beach, a site that has a clear view across the beach to the existing wreck site. The interpretation plan recommends that SCC prepare a project brief and engage a design team to undertake the next stage of design development, design documentation and coordination of fabrication and installation of the chosen options.

The first park option nominated by 3-D Projects, 'Ghost in the Sea', involves a 1:1 scale footprint of the Dicky wreck containing concrete blocks of varying heights which represent ocean swells. The top faces of some of the blocks are impressed with key dates and text which interpret core aspects of the history of S.S. *Dicky*. Metal signage also displays historic photographs and a summary history. Selected artefacts from the wreck are suspended on

⁸ *Op. Cit. 3-D Projects, 2015*

concrete columns in the correct positions within the wreck footprint. This is the preferred SCC option.

It is recommended that the condition of hull and frames to be used in the display be flexible for the purposes of creating the best interpretive effect. For example the wreck elements could be left untreated and allowed to rust and stain the columns. Alternatively they could be sand blasted and buffed to produce a silver metallic surface. It is acknowledged that this approach may not be beneficial for the long term stability of the objects, however this approach has been recommended on the basis that there will be a relatively large number of objects recovered from the wreck, not including those already stored at the Council Depot. As all objects will be recorded in detail the loss of cultural significance due to either no conservation or aggressive presentation techniques will be minor. Furthermore the choice of similar objects – frames and hull – will allow the opportunity for the display to be periodically refreshed.

The second park option, ‘Ghost in the Forest’, comprises squared hardwood timber posts of variable lengths positioned vertically at 1 m spacing to create a hardwood forest effect. A 1:1 scale rendering of the S.S. *Dicky*’s original shape and volume will be represented by a durable paint finish to the timber poles which enables visitors to see the shape from a number of views. Key dates and texts related to the history of the vessel will be routed on some of the posts, as well as metal signage incorporated into the timber poles display.

The beach installation concept is a large column marker placed next to the location of the bow of the wreck (which will be removed). This will be clearly visible from the installation in the park, nominated above. The beach marker could be constructed of concrete or hardwood to match the park installation, with an artefact from the wreck suspended above.⁹ Text to be impressed or routed to the marker would be simple ‘grave’ text as follows:

*SS Dicky
Built Germany 1883
Wrecked by cyclone 1893
Buried Dicky Beach 2015*

4.3.2 Burial of Material

The re-burial of iron wreck material should be undertaken in an anaerobic environment, of minimum 1 m depth and at a site that can be revisited to expose the material if required. The SCC Depot has been identified as the site for burial. The material will not require any coverings or wrappings from a conservation perspective. Wrapping the items may be considered as a way for identifying the items and it could include burying the material with a small token of information or identification in case the site is accidentally exposed.

When undertaking the burial, a trench will need to be excavated and the position, depth and conditions of the trench recorded. Artefacts will only be placed horizontally along the trench and no artefacts will be piled upwards. The position and orientation of the trench is to be recorded by DGPS and the relative position of the artefacts mapped by offset measurements if a DGPS is not available when the artefacts are buried. The trench will then be back-filled. An archaeologist is required to be present for this process.

4.4 Ongoing Site Management

The strategy for minimising loss of significance during Ongoing Site Management as part of the S.S. *Dicky* project is to be undertaken by SCC with assistance from archaeologists.

- Task 1 – Monitoring
- Task 2 – Cutting when features become exposed
- Task 3 – Ongoing removal of loose wreckage

⁹ Refer to drawing, Dicky Beach Installation Perspective, **3-D Projects, 2015** p.25

- Task 4 – Additional artefact recording, storage and conservation

Table 9. Measures for minimising loss of significance during Post-Main Works.

Task	Est. Time (hours)	Action	Personnel	Equipment
Task 1 – Monitoring	TBA	A monitoring protocol will be established for events when the wreck is exposed. This will include a procedure of notification and assessment for Task 2 and Task 3. See Section 4.4.1.	N/A	N/A
Task 2 – Cutting when features become exposed	TBA	Guidelines and a protocol will be established for the cutting of previously recorded features when they become exposed, should an archaeologist not be available. See Section 4.4.2.	N/A	N/A
Task 3 – On-going removal of loose wreckage	TBA	Guidelines and a protocol will be established for the ongoing removal of loose wreckage identified around the wreck by SCC. See Section 4.4.3.	N/A	N/A
Task 4 – Additional artefact recording, storage and conservation	TBA	When deemed appropriate by the archaeologist, all cut and loose wreckage must be recorded by an archaeologist.		
		Artefacts are to be given unique identifying numbers, tagged (if not already), added to an artefact registry, photographed and recorded onto pro formas. See Section 4.2.7.	Archaeologist	Cameras, flagging tape, permanent markers, artefact registry, pro formas, scales and tapes, tarps, foam mats for photo backgrounds.
		Once each artefact has been recorded, it is to be stored within a tub or on a pallet. Conservation measures will be determined and undertaken, with advice from a conservator if required.	Archaeologist	Tubs, pallets, fresh water

4.4.1 Monitoring Procedure

A procedure will be established for monitoring and notification when the wreck is exposed. This will likely involve the Dicky Beach Surf Lifesavers as well as the general public who will notify SCC during exposure. SCC will then investigate and assess whether any features are exposed that may be cut or removed as described in Task 2 or Task 3. Should SCC consider performing Task 2 or Task 3 in the following days, they will notify an archaeologist and provide the opportunity for the archaeologist to participate.

4.4.2 Cutting Procedure When Features Become Exposed

Cutting of recorded features as they become exposed will occur opportunistically. It may not be possible to have an archaeologist present at short notice, so protocols and guidelines will be prepared for the SCC to follow in order to undertake the required on-site recording and to cut only those frames that have been previously recorded. An induction will also be prepared for all personnel who will be on site so that the objectives are clear. After each incident of cutting, the SCC will notify the archaeologist of events and send all recording data collected. Artefact recording for the removed sections will then be undertaken by an archaeologist as soon as practical.

It must be noted that if an archaeologist is on site then frames that have not been previously exposed may also be recorded allowing for additional features to be cut.

When the hull remains are exposed, either by mechanical/manual excavation or by natural erosion, only those frames that have been previously recorded may be cut. The recorded features will be indicated by an assortment of tagging, labelling and tape. The procedure in Table 10 must be followed, starting with arrival on site. The following procedure is a simplified task list based on the Tasks to minimise impact during the Main Works and is to be completed each day that cutting is undertaken.

Table 10. Task list for cutting procedure should an archaeologist not be available.

Task	Action	Personnel	Equipment
A <i>Upon arrival</i>	General photography of site.	SCC	Camera
B <i>Identify recorded frames</i>	Identify the features that have been previously recorded. They should have tagging, labelling and tape.	SCC	
	Compare the feature to photographs and descriptions in the catalogue of recorded frames. Note the frame / feature number and label if present. This will be noted in all records.	SCC	Catalogue of recorded frames
C <i>Photograph frames before cutting</i>	Photograph the recorded features to be cut with a scale, including a photograph of the label if present.	SCC	Camera, scale
D <i>Cut</i>	The position of the cut will be to the discretion of the excavation and cutting team. Cut as low as is required to remove the hazard, but no lower than the floor frames.	Qualified cutter operator(s)	PPE, cutting equipment
	General photography of the cutting procedure.	SCC	Camera, PPE
	Every removed piece MUST have a label. If a recorded feature comes apart in multiple pieces and some of those pieces do not have the original tag and number attached, they must be physically attached or grouped with the tagged artefact with zip ties, cord, rope, or bagged together. If the original tag is no longer present, then the number must be ascertained from the catalogue and added with flagging tape or other labelling equipment.	SCC	Zip ties, cord, rope, bags, flagging tape, permanent marker or selection thereof.
E <i>In situ material recording</i>	DGPS of the remains left in the ground, of exposed ends of frames and edge of hull. The numbering system of these points must include the frame / features numbers attached to the frames before cutting.	DGPS team	DGPS equipment
	Photograph the wreck remains to be left in the ground once artefacts have been removed, with scales.	SCC	Camera, scales
F <i>Transport</i>	Artefacts to be removed from site. Artefacts should be small enough to be manually lifted, placed in tubs of suitable size and transferred to SCC Depot to await recording.	Transport driver	Tubs, transport vehicle
G <i>Notification</i>	The archaeologist must be contacted as soon as possible with information regarding the cutting that took place. All photographs and DGPS data must be provided along with a list of the features that were cut.	SCC	
	The archaeologist will assess the information provided, update the relevant databases and records and visit the SCC depot to record the artefacts as soon as practical (see Task 6). The archaeologist may determine initial conservation measures to be started before recording the artefacts, which must be undertaken by SCC.	Archaeologist, SCC	

Should the archaeologist not be available, a catalogue will be supplied to SCC of all previously recorded features to aid in the identification of the features that can be cut. This will include photographs of the feature from multiple angles and including the tagging, labelling and taping that was added for identification. Photos will also show the location of

the feature in relation to the rest of the wreck. The catalogue will also include a site plan with all the recorded features labelled so that they can be located by position on site. The catalogue will be similar in format to that presented in

Table 11, however, features recorded in the future will be labelled and photographed in better detail than was required during the test excavation.

It may not be necessary for the archaeologist to record artefacts after every cutting event if the guidelines are followed correctly and the archaeologist assesses that the recording data collected by SCC is adequate. The archaeologist can determine initial conservation measures from photographs and hence the archaeological visit does not have to take place immediately after cutting. It is suggested, however, that archaeologists do visit as soon as possible after cutting for the first event. This will serve as a way of determining whether the guidelines are being followed and whether any improvements or changes are required. After that the visits may be limited to every three to six months as deemed appropriate by the archaeologist.

Table 11. Example of catalogue of features already exposed.

Feature ID	Date Exposed	Description	Labels Added	Photos
FR001	17/04/15 Test excavation	Port side Tested thermal lance cutting on one side.	None	 
FR002	17/04/15 Test excavation	Starboard side. Exposed. Test cut with saw.	None	
FR003	17/04/15 Test excavation	Port side. Near FR001.	None	
BW001	17/04/15 Test excavation	Bow hull plating.	None	

4.4.3 Guidelines for Ongoing Removal of Loose Wreckage

The following draft guide is for the ongoing removal of loose wreckage by SCC. This includes only pieces of structural wreckage identified around the S.S. Dicky site that are not attached to the wreck itself. The following steps must be followed in order to remove the wreckage without minimising loss of significance associated with the wreckage. These steps are designed to be followed without any prior training and can be undertaken by SCC, Dicky Surf

Life Saving, volunteers, school children or any other interested party, as long as the steps are followed to a satisfactory standard.

If the wreckage appears to be structural in nature and from the hull of the S.S. *Dicky* then the following steps should be followed:

- Record position found using GPS but preferably DGPS if available;
- Photograph wreckage *in situ* with a scale (examples of this procedure will be provided);
- Transport to depot in a controlled and secured manner;
- Record wreckage using scaled photographs and by filling out provided pro forma (examples will be provided);
- Send this information to Cosmos Archaeology who will consult with a conservator and provide advice on appropriate actions for the item which may include but is not limited to storage, conservation, burial or discard. An inspection by an archaeologist and/or the conservator may be required.
- Add item to digital database.

However, if the wreckage does not appear structural and may be potential a bilge deposit(s), artefact(s) or other shipwreck component(s) then the following steps should be followed:

- Record position found using GPS but preferably DGPS if available;
- Photograph wreckage *in situ* with a scale (examples of this procedure will be provided);
- Transport to depot in a controlled and secured manner;
- Contact an archaeologist to inspect and record the artefact as soon as practical. The archaeologist will then provide advice on appropriate actions for the item and add it to the digital database.

4.5 Unrelated Developments

The S.S. *Dicky* wreck has always been subject to environmental impacts including the physical forces of wind and waves and intermittent storm activity. However, the exposed elements of the wreck are the most vulnerable to these impacts and exhibit the most change as a result. Buried elements are protected by sand cover and, on the rare occasion that they are exposed, are only exposed for days at a time at most. Only major weather events are likely to have any impact to the buried remains of S.S. *Dicky* by exposing these elements and causing physical damage to the wreck.

To minimise loss of significance to the S.S. *Dicky* wreck as a result of these environmental impacts, a monitoring protocol will be established when the wreck is exposed. This will have the effect of tracking any changes to the wreck as well as possibly enabling a limited amount of recording of features that have not been previously exposed. Monitoring does not have to be conducted by an archaeologist as long as the monitoring protocol is followed and sufficient recording and reporting is undertaken. The monitoring procedure is designed to be followed without any prior training and can be undertaken by SCC, Dicky Surf Life Saving, volunteers, school children or any other interested party, as long as the steps are followed to a satisfactory standard. This has the benefit of enabling someone who has access to the wreck at highest exposure to undertake the inspection. The monitoring protocol will be finalised with reporting produced after the Main Works and will include:

- A brief on when the wreck should be inspected;
- A list of required gear to prepare for the inspection;
- An up-to-date site plan and photos to enable a comparison between the last observed condition of the wreck and the current condition;

- Instructions on how the wreck should be recorded and what observations to make;
- Recording may include comparative photographs taken from the same angle as previous photographs in order to directly compare;
- The inspection will include recording and observing the exposed stanchion post that is acting as a wreck marker, as well as making an assessment of its condition and the potential need for removing it and placing a new wreck marker;
- An up-to-date site plan on which to note what elements were exposed and details recorded;
- Any proformas that may be required and guides on how to use them;
- Examples where appropriate;
- Protocols for whom to send this information to with contact information. This may include the Heritage Division of the DEHP, and a maritime archaeologist.

There are no foreseeable human impacts or developments that may impact the S.S. *Dicky* remains. The long term presence of the S.S. *Dicky* wreck at Dicky Beach is not likely to be forgotten, particularly with an interpretive display to remind and inform patrons of its presence. To avoid any invasive digging and exposure in the future, the current stanchion and potential future wreck marker will serve to indicate the presence of wreck material below the surface.

5 CONCLUSION

This report provides a methodology for acceptable mitigation to be implemented during Pre-Main Works, during Main Works, Post-Main Works and Ongoing Site Management as part of the S.S. *Dicky* project. It is accompanied by an HIA and WIP to be submitted to DEHP for a permit to undertake the proposed project.

Mitigation measures in this report include archaeological recording before, during and after the Main Works, controlled cutting of hazardous elements and detailed records of the artefacts removed. It also includes provisions for the conservation of removed elements. The following summary points are of key consideration:

- Archaeological management is essential for controlled and minimised impact upon the cultural heritage significance of a site and for creating a thorough record of how the impact occurred;
- The proposed Pre-Main Works, Main Works, Post-Main Works and Ongoing Site Management for the S.S. *Dicky* shipwreck may be undertaken at any time, as long as all the tasks are undertaken appropriately and in the established sequence;
- Sand level on site is the main factor to consider when determining the best time for the Main Works as lower sand levels facilitate the cutting away of the lower portions of the wreck down to the floor frames;
- The use of underwater cutting equipment will also facilitate the cutting away of the lower portions of the wreck down to the floor frames;
- An induction should take place before the Main Works and each episode of Ongoing Site Management begins so that the objectives of the cutting process are clear and all participants are aware of what is expected;
- Cutting should only be undertaken on features that have been previously recorded and labelled by an archaeologist;
- Cutting locations shall be determined *ad hoc* once exposed but will not extend deeper than the floor frames of the wreck;
- Cutting has been tested successfully with a thermal lance and circular saw. The circular saw must have a diamond blade of a minimum 10 inches. Other potential cutting equipment include a large capacity air powered right angle grinder, power hacksaw and oxy-acetylene torch;
- Once the Main Works are completed, a conservator will inspect the artefacts recovered, those already in the depot and the propeller and assess the potential for conservation as well as implement any required conservation measures;
- Burial is one method of preserving the artefacts that will not be used in the WIP or conserved for display, however, burial must be carefully recorded and monitored by archaeologists to be effective;
- A guide will be produced for the Ongoing Site Management of the site including removal of loose and recorded intact wreckage by SCC, as well as monitoring protocols if the wreck is exposed in the future;
- Some of the tasks of Ongoing Site Management may be completed without an archaeologist if it is not feasible to have one present, as long as the tasks are performed correctly;
- Should an archaeologist not be present during Ongoing Site Management, protocols and guidelines will be provided so that recording is undertaken to the required standard;
- All elements (artefacts) that are removed from the wreck during Ongoing Site Management must be accompanied by the original feature label, whether this is the original tag or an improvised tag with the label number obtained from the catalogue of features;

- After an episode of Ongoing Site Management, all data is to be reviewed by an archaeologist and the relevant databases and records updated. Advice may be given concerning initial conservation of artefacts; and,
- Artefacts removed during Ongoing Site Management are to be properly recorded by archaeologists at the SCC Depot after cutting. This may happen as soon as possible after an episode of Ongoing Site Management or after a period of time, as deemed appropriate by the archaeologists. All artefacts already stored in the depot will also be recorded.

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ANNEX A TIDES

The adjustment from Mooloolaba to Caloundra is -00:03 minutes.

AUSTRALIA, EAST COAST – MOOLOOLABA

LAT 26° 41' S LONG 153° 08' E
Times and Heights of High and Low Waters

2015

Time Zone -1000

MAY		JUNE		JULY		AUGUST		
Time	m	Time	m	Time	m	Time	m	
1	0020 0.57	16	0021 0.40	1	0135 0.45	16	0222 0.40	
FR	0613 1.59	SA	0617 1.71	WE	0706 1.42	TH	0803 1.39	
	1231 0.39	SA	1235 0.16	WE	1309 0.18	TH	1401 0.21	
	1853 1.67	SA	1858 1.96		1951 1.96	●	2033 1.92	
2	0058 0.52	17	0113 0.36	2	0217 0.38	17	0258 0.39	
SA	0649 1.59	SU	0706 1.67	TH	0751 1.45	FR	0842 1.39	
	1301 0.34	SU	1317 0.13	TH	1351 0.14	FR	1438 0.24	
	1926 1.75	SU	1944 2.03	○	2034 2.01		2109 1.88	
3	0135 0.48	18	0203 0.35	3	0300 0.33	18	0333 0.40	
SU	0723 1.58	MO	0752 1.61	FR	0838 1.47	SA	0920 1.38	
	1330 0.30	MO	1358 0.14	FR	1436 0.13	SA	1514 0.29	
	1959 1.81	●	2029 2.06		2117 2.04		2143 1.83	
4	0211 0.46	19	0252 0.37	4	0345 0.30	19	0407 0.41	
MO	0758 1.56	TU	0838 1.53	SA	0926 1.47	SU	0957 1.37	
	1401 0.28	TU	1439 0.19	SA	1522 0.16	SU	1550 0.36	
○	2033 1.86		2132 2.04		2202 2.01		2217 1.75	
5	0248 0.45	20	0340 0.41	5	0432 0.29	20	0442 0.43	
TU	0833 1.52	WE	0923 1.45	SU	1017 1.47	MO	1036 1.34	
	1434 0.28	WE	1519 0.26	SU	1611 0.23	MO	1627 0.45	
	2109 1.88		2156 1.98		2248 1.95		2251 1.67	
6	0328 0.46	21	0428 0.47	6	0522 0.31	21	0518 0.45	
WE	0910 1.48	TH	1007 1.37	MO	1111 1.46	TU	1117 1.32	
	1508 0.30	TH	1559 0.36	MO	1703 0.34	TU	1708 0.54	
	2147 1.88		2239 1.89		2336 1.85		2327 1.57	
7	0411 0.49	22	0517 0.54	7	0615 0.33	22	0557 0.48	
TH	0951 1.42	FR	1053 1.30	TU	1210 1.45	WE	1205 1.30	
	1546 0.34	FR	1641 0.47	TU	1802 0.45	WE	1755 0.64	
	2229 1.85		2322 1.78					
8	0458 0.53	23	0607 0.59	8	0630 1.72	23	0008 1.47	
FR	1037 1.36	SA	1143 1.24	WE	0711 0.34	TH	0642 0.49	
	1629 0.41	SA	1728 0.58	WE	1319 1.46	TH	1304 1.29	
	2316 1.81				1911 0.56		1854 0.73	
9	0555 0.56	24	0009 1.68	9	0129 1.59	24	0055 1.37	
SA	1130 1.31	SU	0701 0.63	TH	0810 0.35	FR	0732 0.50	
	1720 0.49	SU	1243 1.21	TH	1434 1.50	FR	1418 1.31	
			1824 0.67	●	2034 0.63	●	2011 0.78	
10	0011 1.76	25	0101 1.59	10	0235 1.48	25	0154 1.29	
SU	0701 0.57	MO	0757 0.63	FR	0908 0.34	SA	0828 0.49	
	1237 1.28	MO	1400 1.22	FR	1545 1.58	SA	1532 1.38	
	1823 0.56		1932 0.74		2158 0.64		2137 0.77	
11	0117 1.71	26	0200 1.52	11	0343 1.41	26	0302 1.25	
MO	0811 0.55	MO	0853 0.61	SA	1007 0.32	SU	0926 0.45	
	1358 1.30	TU	1514 1.27	SA	1649 1.69	SU	1631 1.48	
●	1939 0.60	●	2048 0.77		2311 0.60		2250 0.70	
12	0228 1.70	27	0301 1.49	12	0447 1.37	27	0408 1.25	
TU	0916 0.48	WE	0945 0.57	SU	1103 0.28	MO	1021 0.39	
	1515 1.39	WE	1615 1.36	SU	1744 1.79	MO	1720 1.61	
	2103 0.60		2200 0.75				2346 0.60	
13	0333 1.71	28	0357 1.47	13	0502 1.55	28	0506 1.28	
WE	1013 0.40	TH	1031 0.51	SA	1124 0.24	TU	1113 0.31	
	1621 1.53	TH	1704 1.47	SA	1755 1.84	TU	1805 1.74	
	2219 0.54		2301 0.71					
14	0432 1.73	29	0446 1.47	14	0014 0.50	29	0032 0.49	
TH	1104 0.30	FR	1112 0.45	SU	0557 1.52	WE	0534 1.37	
	1718 1.69	FR	1746 1.58	SU	1211 0.19	WE	1203 0.21	
	2324 0.47		2351 0.65		1844 1.94		1848 1.87	
15	0527 1.73	30	0529 1.47	15	0106 0.44	30	0115 0.38	
FR	1151 0.22	SA	1148 0.39	MO	0647 1.50	TH	0647 1.41	
	1809 1.84	SA	1823 1.68	MO	1255 0.17	TH	1251 0.12	
					1930 2.00		1931 1.97	
		31	0033 0.58			31	0156 0.28	
			0610 1.48				0735 1.48	
			SU	1222 0.33			FR	1337 0.06
			1859 1.78				○	2014 2.04

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Datum of Predictions is Lowest Astronomical Tide
Moon Symbols

Bureau of Meteorology

National Tidal Centre

● New Moon ◐ First Quarter ○ Full Moon ◑ Last Quarter