

ANNEXURE 5: HISTORIC IMAGERY

5.1. CONTEXT

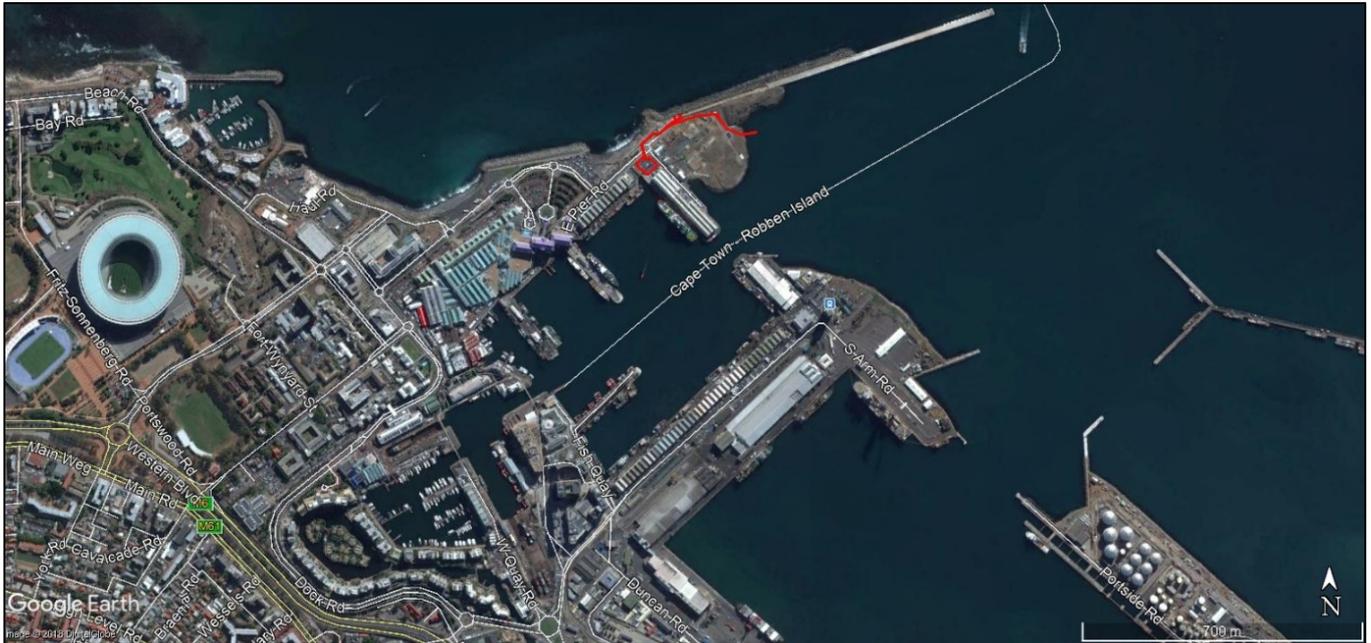


Figure 5.1.1: Proposed desalination plant and associated infrastructure (red lines) in context, 2017 (Source: Google Earth 2017-05-19 dataset).

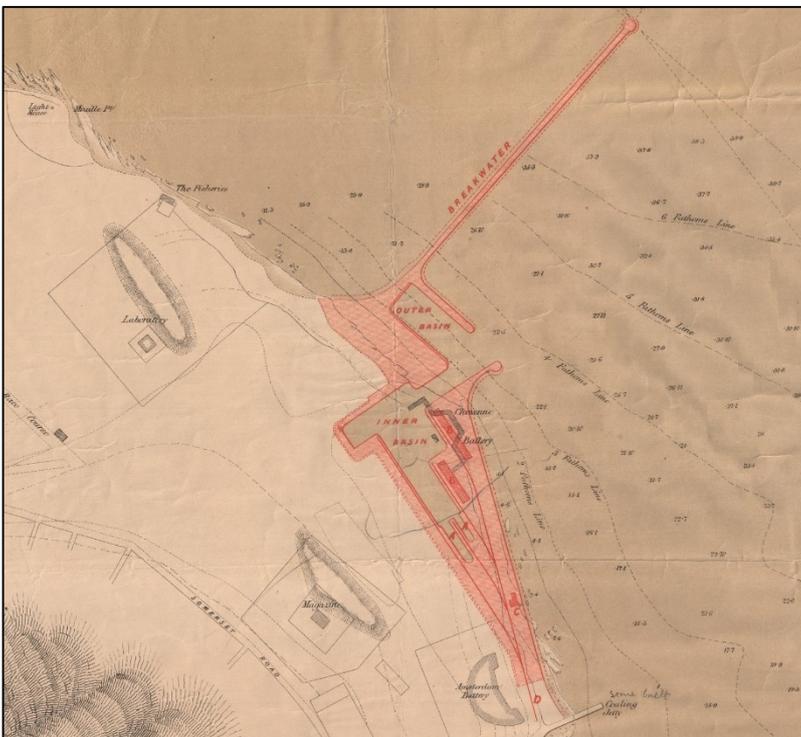


Figure 5.1.2: Original breakwater and two initial basins indicated on portion of 1859 plan of the proposed new harbour works for Cape Town Harbour (pink shaded area). Work was begun in September 1860 after Prince Alfred ceremoniously tipped the first load of stones. The Alfred Basin was completed in 1870. The proposed desalination plant site and infrastructure would have been located further offshore than the area covered in the illustration above (Source: UCT Islandora 19784).

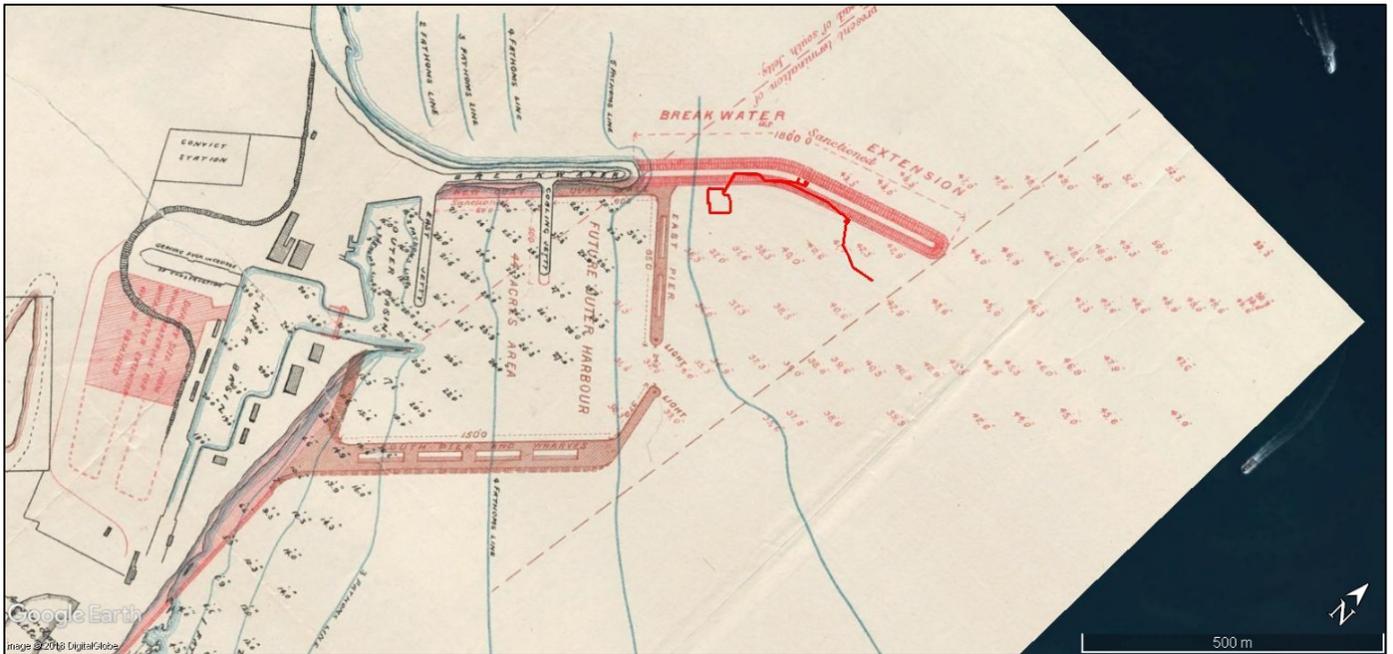


Figure 5.1.3: Proposed desalination plant infrastructure (red lines) superimposed onto 1880 map indicating the proposed extension of the breakwater and the envisaged outer harbour (future Victoria Basin) (pink shaded linear areas). The then existing breakwater, harbour basins and two jetties are also indicated. As evident, by 1880 the area affected by the proposed desalination infrastructure was still located offshore (Source: UCT Islandora 25102).

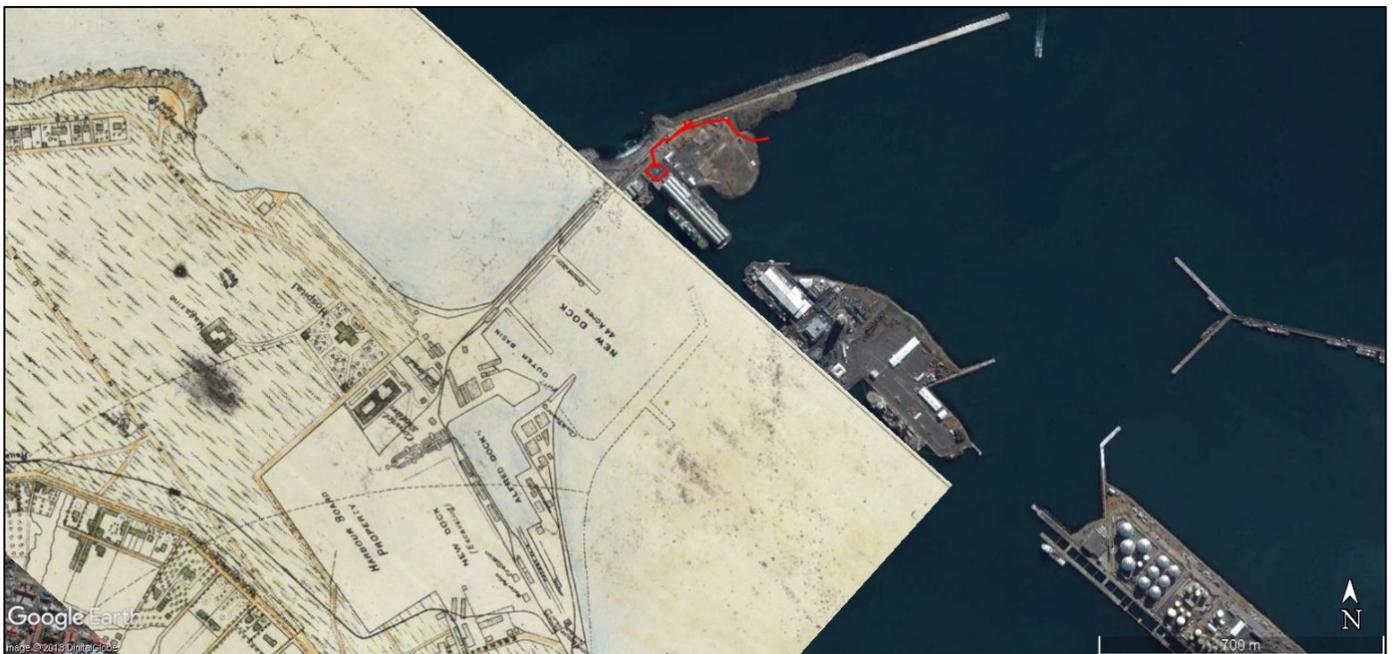


Figure 5.1.4: Proposed desalination plant infrastructure (red lines) superimposed onto portion of Richards & Sons 1891 revised Map of Cape Town. As evident, the harbour extension works proposed in 1880 were still in the offering. The area affected by the proposed desalination infrastructure is still located offshore, outside the boundaries of the map.

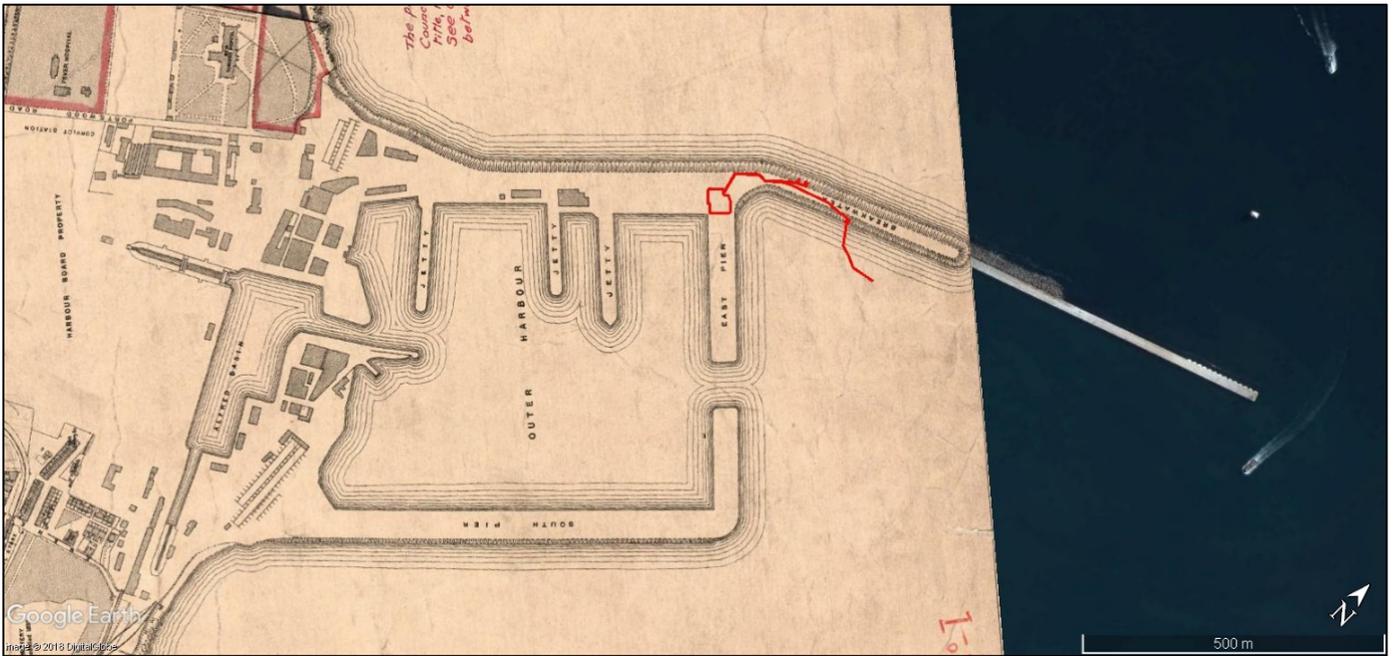


Figure 5.1.5: Proposed desalination plant infrastructure (red lines) superimposed onto portion of ca 1900 compilation map of Walter Thom survey of the Cape Town Municipality which was undertaken during the 1890s. The breakwater has been extended, and a jetty and two piers have been added. The desalination plant site and most of the associated infrastructure are now located on dry land for the first time. East Pier has been named, but the Victoria Basin is still indicated as ‘Outer Harbour’ (Source: City of Cape Town L221_20).



Figure 5.1.6: Proposed desalination plant infrastructure (red lines) superimposed onto portion of 1911 South African Railways map of Cape Town Harbour. Railway lines and buildings are now evident on the new harbour structures, and Victoria Basin has been named. Compared to 1900, harbour lights have been affixed at the ends of the breakwater and two piers, and the breakwater has been slightly extended inshore at its terminus. The terminus of the harbour rail line is indicated just to the north of the plant site, with two branch lines terminating at the end of East Pier, the easternmost of which traversing the plant site (Source: UCT Islandora 19899).

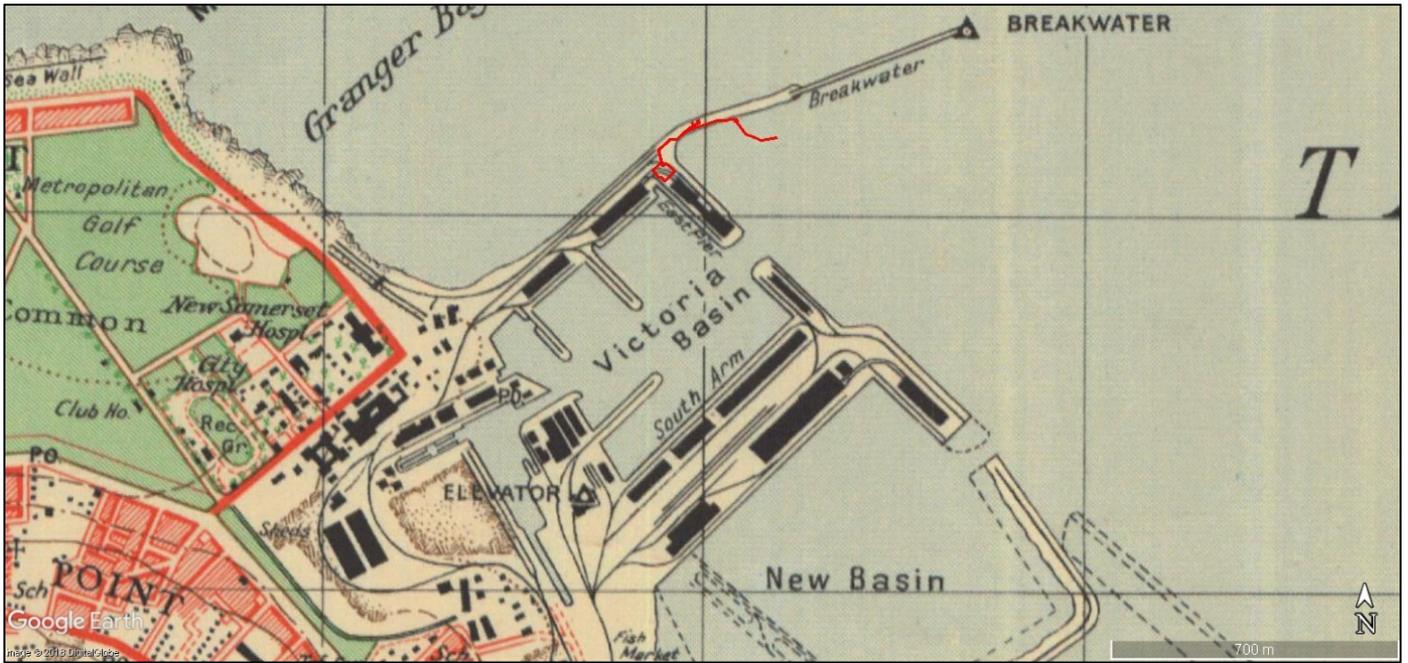


Figure 5.1.7: Proposed desalination plant infrastructure (red lines) superimposed onto portion of 1939 revised edition of 1934 Cape Peninsula 1: 25 000, Sheet 1. The breakwater has been extended in length (the triangle at its terminus indicates a trig station), and a new basin is indicated as under construction to the south-east of South Pier (Source: Chief Directorate National Geo-spatial Information).

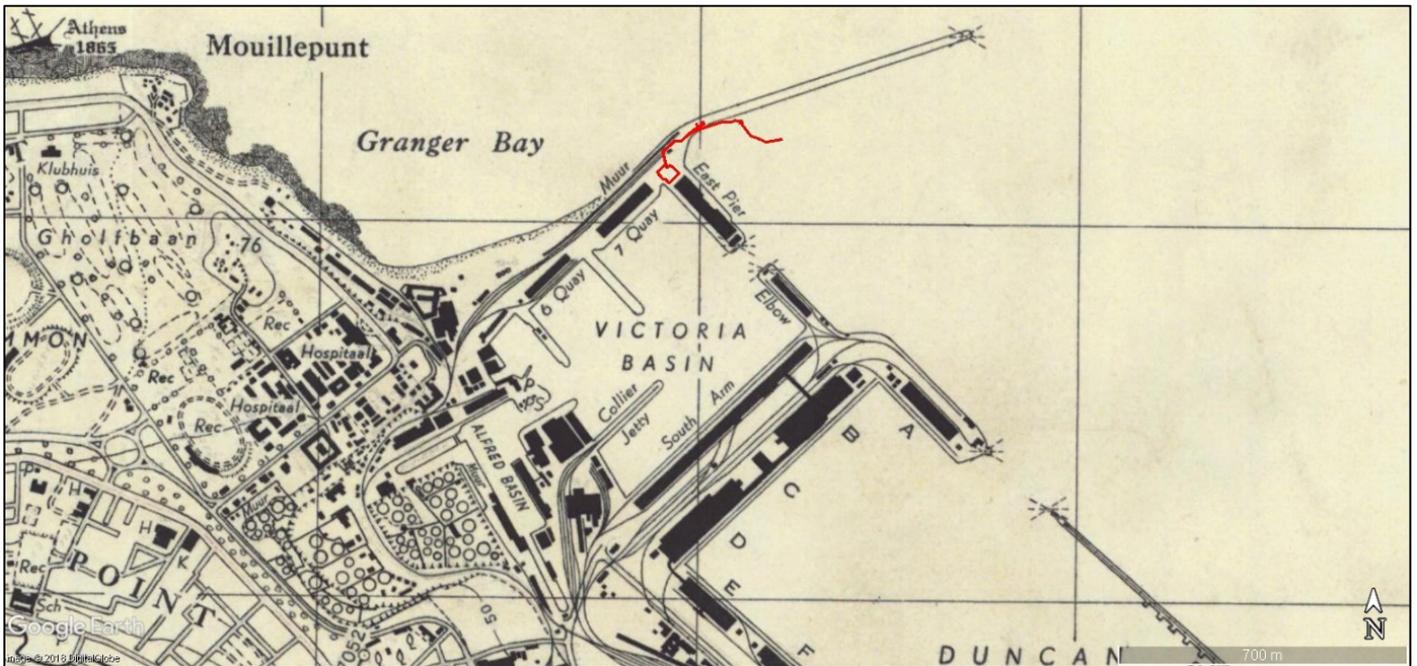


Figure 5.1.8: Proposed desalination plant infrastructure (red lines) superimposed onto portion of 1958 edition of 3318-2777 TOPO 1: 18 000 map. The Duncan Dock has been completed, and the area to the south-east of Alfred Dock has been developed into two vast oil storage sites on either side of Dock Road during and after World War Two. The original seawall to the north of the proposed plant site is clearly marked ('Muur'), as is Quay 7 to the west of East Pier. The rail line configuration has changed somewhat, and no branch lines are any longer indicated on East Pier itself (Source: Chief Directorate National Geo-spatial Information).

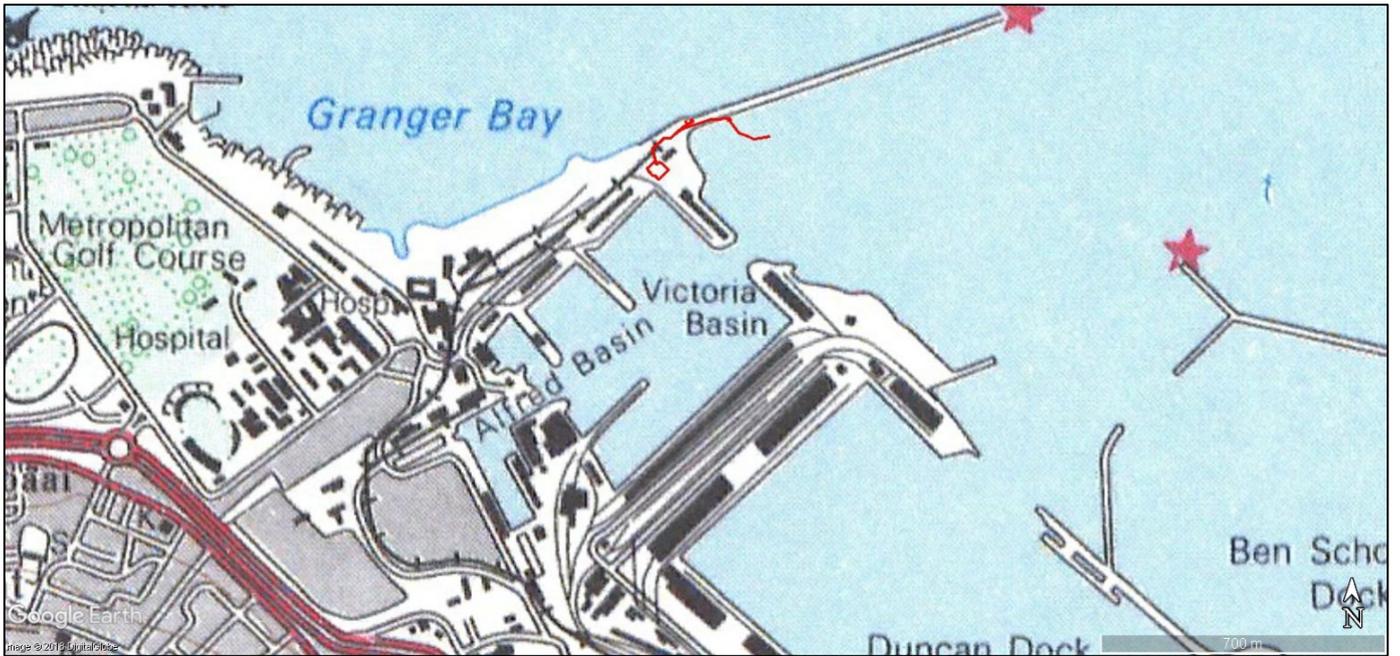


Figure 5.1.9: Proposed desalination plant infrastructure (red lines) superimposed onto portion of 1988 edition of Cape Town 3318CD 1: 50 000 topo-cadastral map. Also the Ben Schoeman Dock has now been constructed (early 1970s). A second seawall has been constructed from the bottom of Granger Bay to the foot of the breakwater (already visible on 1980 map edition). The area at the base of the breakwater directly to the east of the proposed plant site has been extended inshore slightly, the built footprint on East Pier has diminished, and a branch line is once again indicated on East Pier, but this time located to the west of the site (Source: Chief Directorate National Geo-spatial Information).



Figure 5.1.10: Proposed desalination plant infrastructure (red lines) superimposed onto portion of 1993 edition of Cape Town 3318CD 1: 50 000 topo-cadastral map. Compared to 1988, the (V&A) Waterfront has emerged, the railway lines have given way to roads, the oil sites have disappeared, and dolosse now protect the new seawall indicated on the 1988 map (Source: Chief Directorate National Geo-spatial Information).



Figure 5.1.11: Proposed desalination plant infrastructure (red lines) indicated on 2000 Google Earth satellite imagery. The built footprint has increased significantly since 1993, and the Waterfront precinct now accommodates a number of hotels. The reclaimed area at the base of the breakwater to the east and north-east of the desalination plant site has been extended to its current extent, and all portions of the proposed desalination infrastructure located on land, are now located on land for the first time (Source: Chief Directorate National Geo-spatial Information).

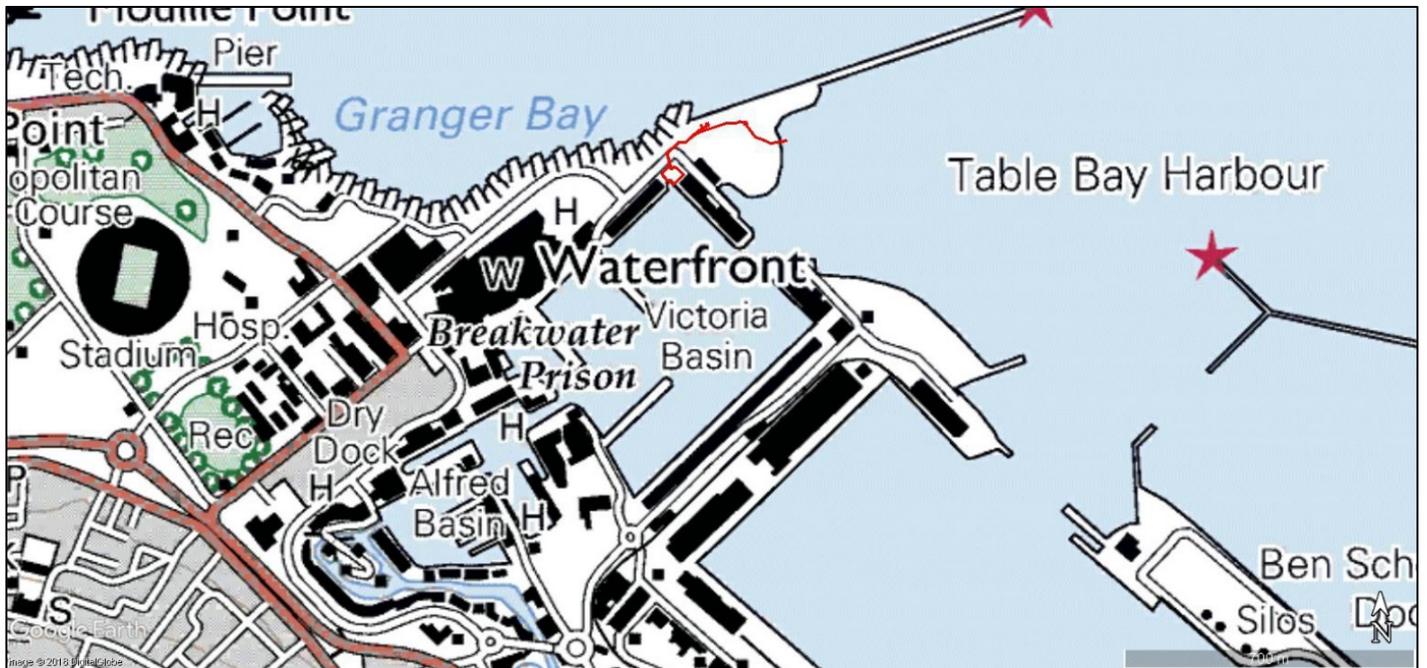


Figure 5.1.12: Proposed desalination plant infrastructure (red lines) superimposed onto portion of 2010 edition of Cape Town 3318CD 1: 50 000 topo-cadastral map. The Waterfront and associated built footprint have expanded even more. The old Breakwater Prison/ oil sites area has been redeveloped. The area around the proposed desalination plant site has become more built up, but otherwise the situation is unchanged from 2000 (Source: Chief Directorate National Geo-spatial Information).

5.2. OVERVIEW OF SITE AND INFRASTRUCTURE

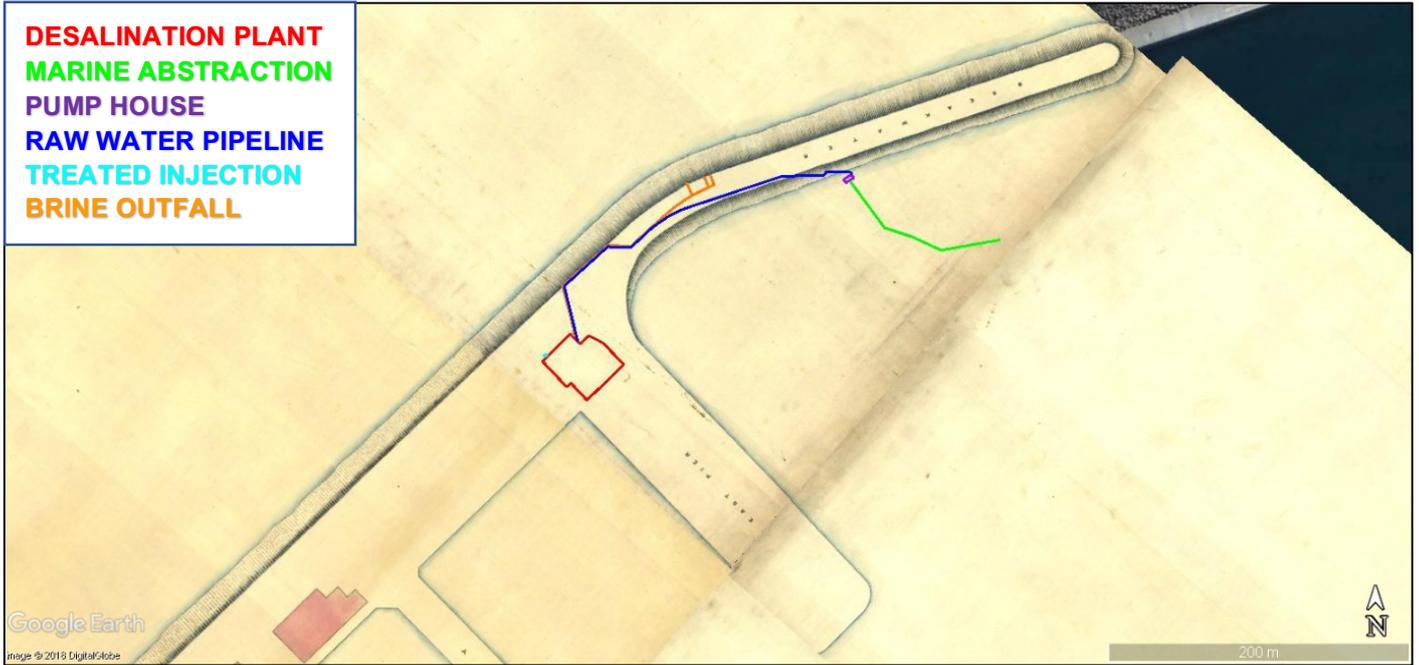


Figure 5.2.1: Proposed desalination plant infrastructure indicated on Walter Thom’s 1892-1900 survey of the Cape Town Municipality, Sheets 130-134. No buildings or other infrastructure were located on the portions of East Pier and the breakwater occupied by the proposed desalination plant infrastructure. The nearest building (shaded pink) is indicated at the foot of what was later known as Jetty 3. The alignment of the offshore-facing edge of the breakwater coincides with the location of the existing initial seawall, but the seawall is not explicitly indicated (and one may reasonably assume that the otherwise meticulous Thom would not have missed such a detail).

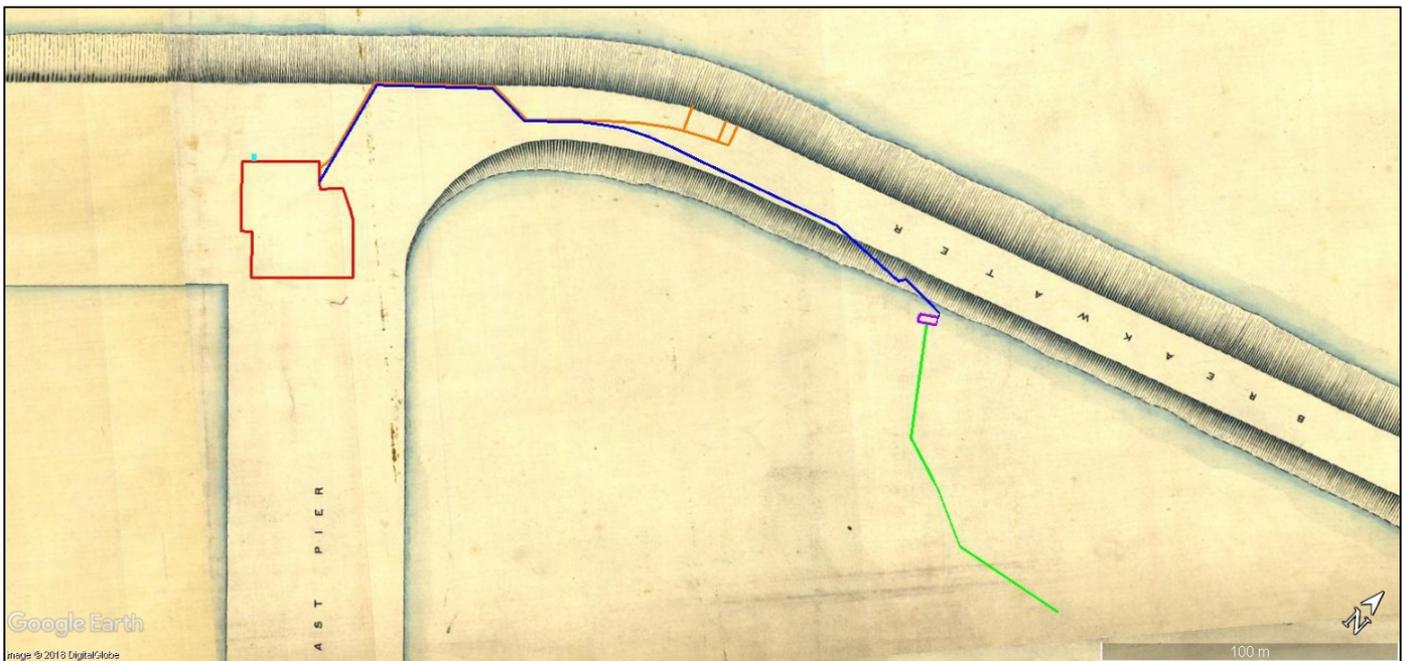


Figure 5.2.1: Detail of 1892-1900 Thom survey.

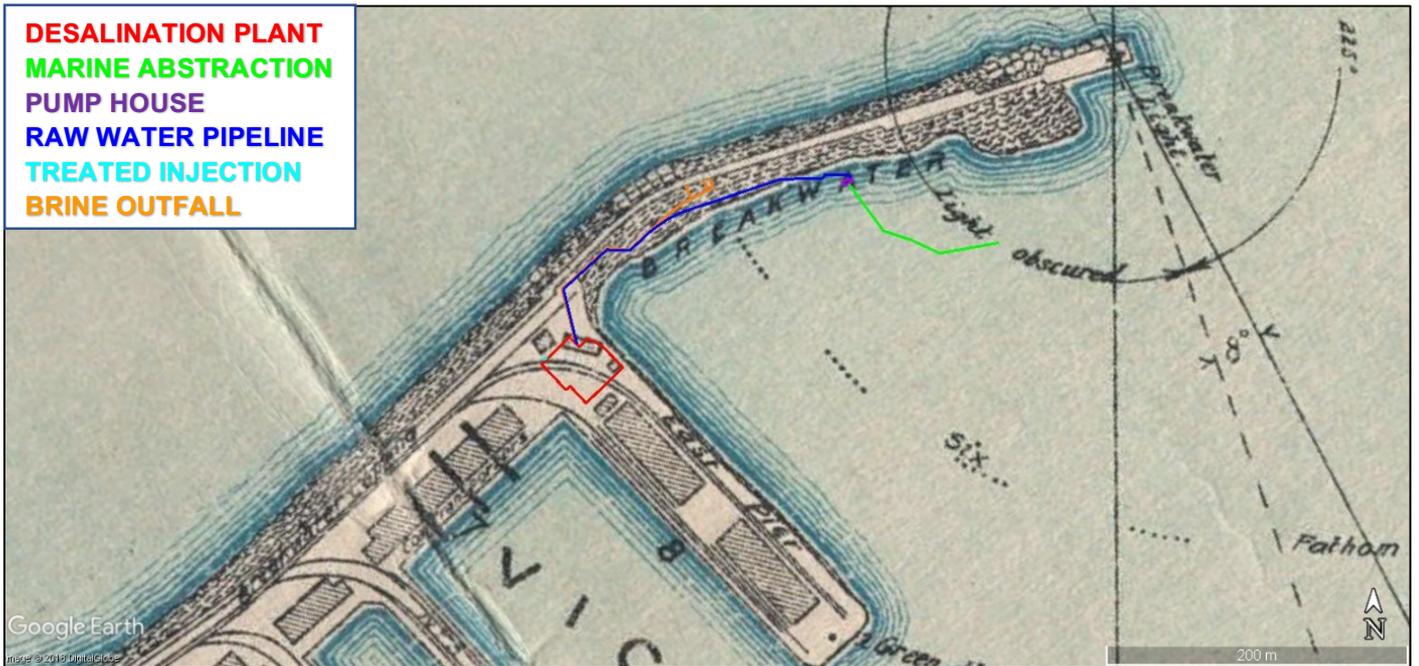


Figure 5.2.3: Proposed desalination plant infrastructure indicated on 1911 South African Railways map of Cape Town Harbour. Two large buildings on East Pier and number of smaller structures are now visible at the foot of East Pier, two of which are located within the proposed plant site. The site is traversed by a branch rail line to the end of East Pier. The seawall structure located to the north of the site is inscribed 'Breakwater capping', and the buildings to the south-west of the site 'Coal transporters' (Source: UCT Islandora 19899).



Figure 5.2.4: Detail of 1911 South African Railways map of Cape Town Harbour.

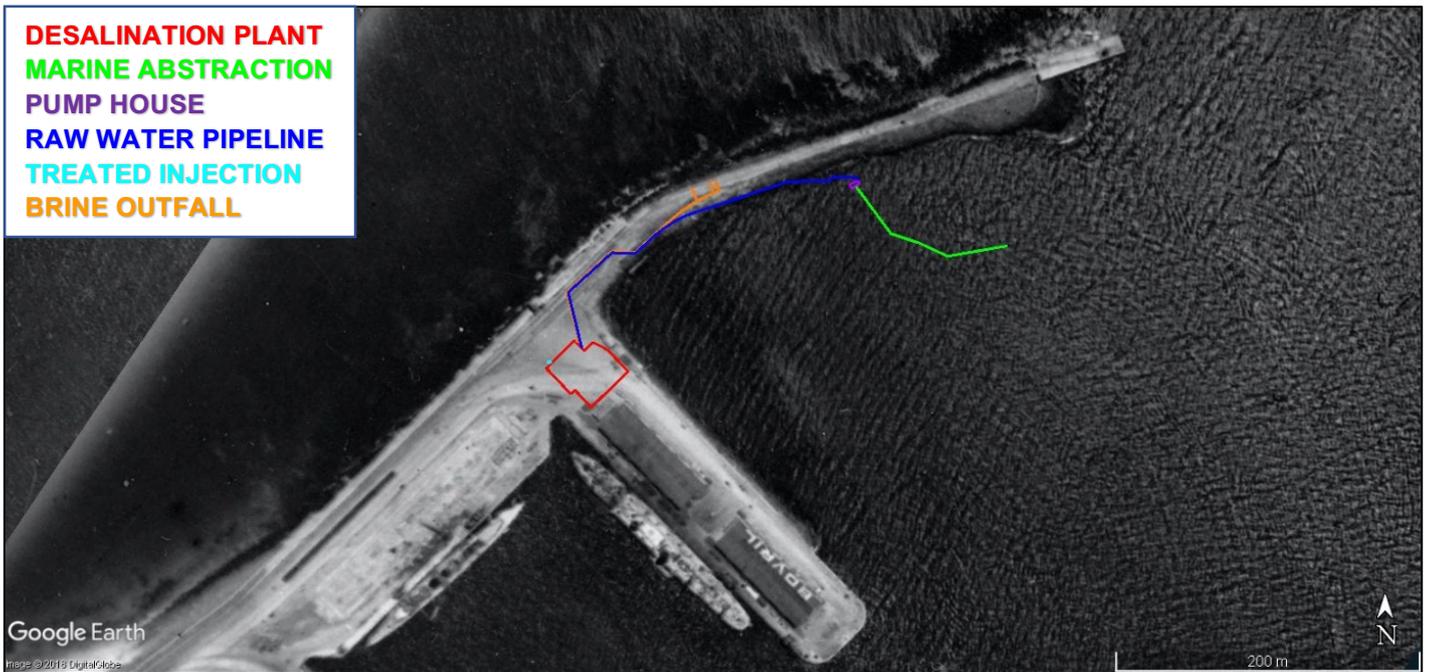


Figure 5.2.5: Proposed desalination plant infrastructure indicated on 1926 aerial photography. Jetty 3 to the south-west of the 'Coal transporters' buildings has disappeared, along with some of some of the adjacent buildings. The configuration of small buildings near the plant site has changed relative to 1911. The rail branch line across the site is clearly visible (Source: Chief Directorate National Geo-spatial Information 1926_05_0855; _0859).

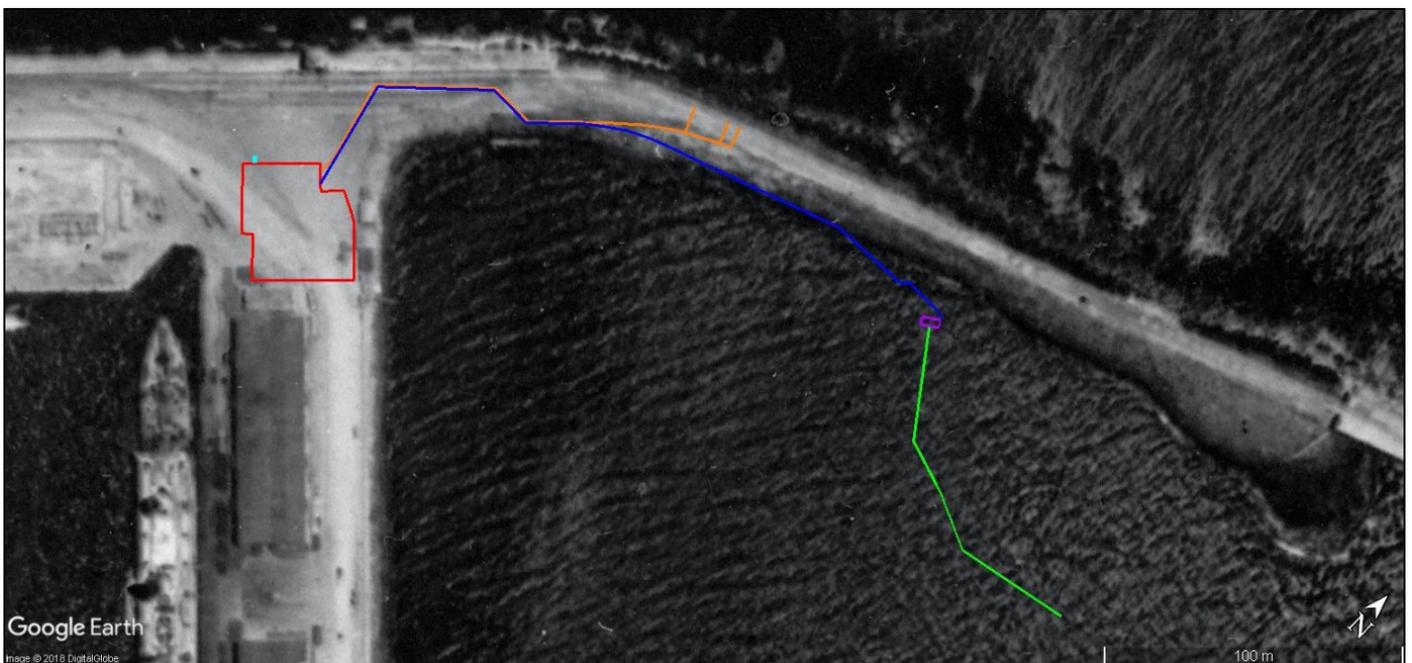


Figure 5.2.6: Detail of 1926 aerial photography.

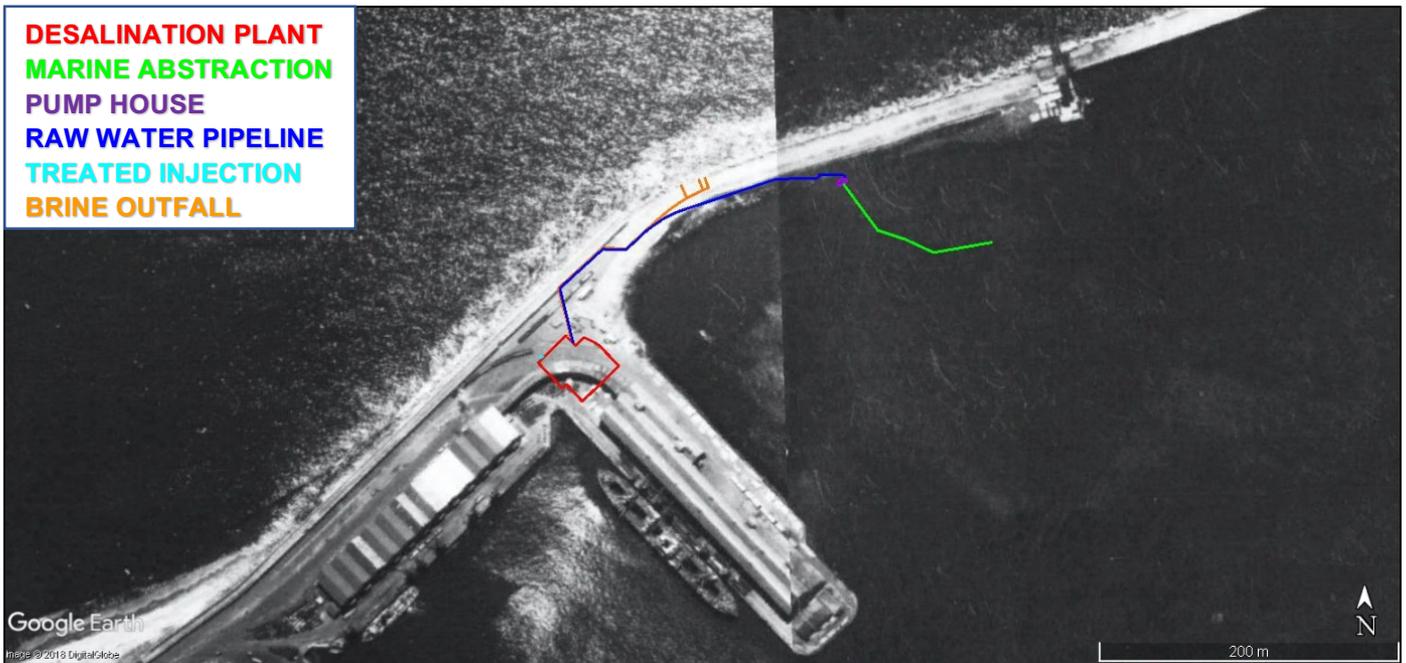


Figure 5.2.7: Proposed desalination plant infrastructure indicated on 1945 aerial photography. The seawall is clearly visible. The two large structures on East Pier have made way for one large structure covering most of the pier, and a small one at the tip of the pier. The 'Coal transporters' site now accommodates a row of large adjoining buildings. The nature of the crescent-shaped apparent structure (it may be stacked containers) occupying the central portion the proposed site is unclear. Rail cars are visible to the north of the site (Source: Chief Directorate National Geo-spatial Information 203A/45_4_618; _620).

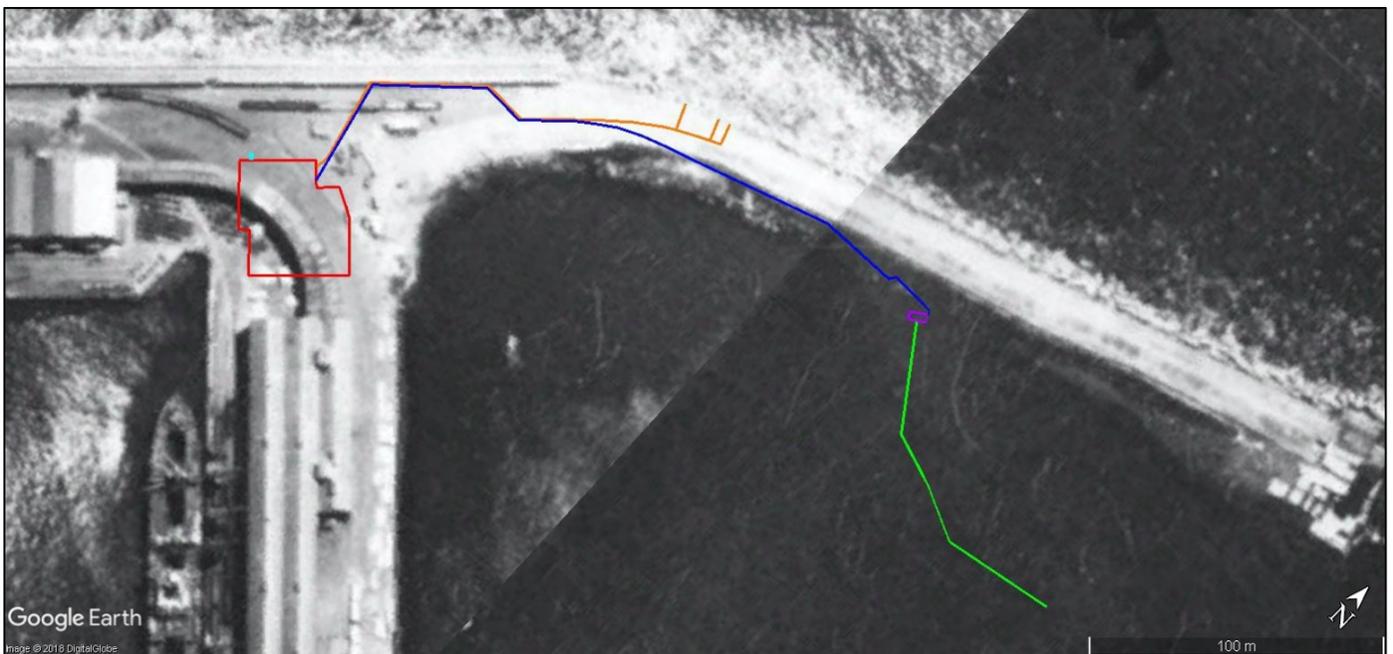


Figure 5.2.8: Detail of 1945 aerial photography.

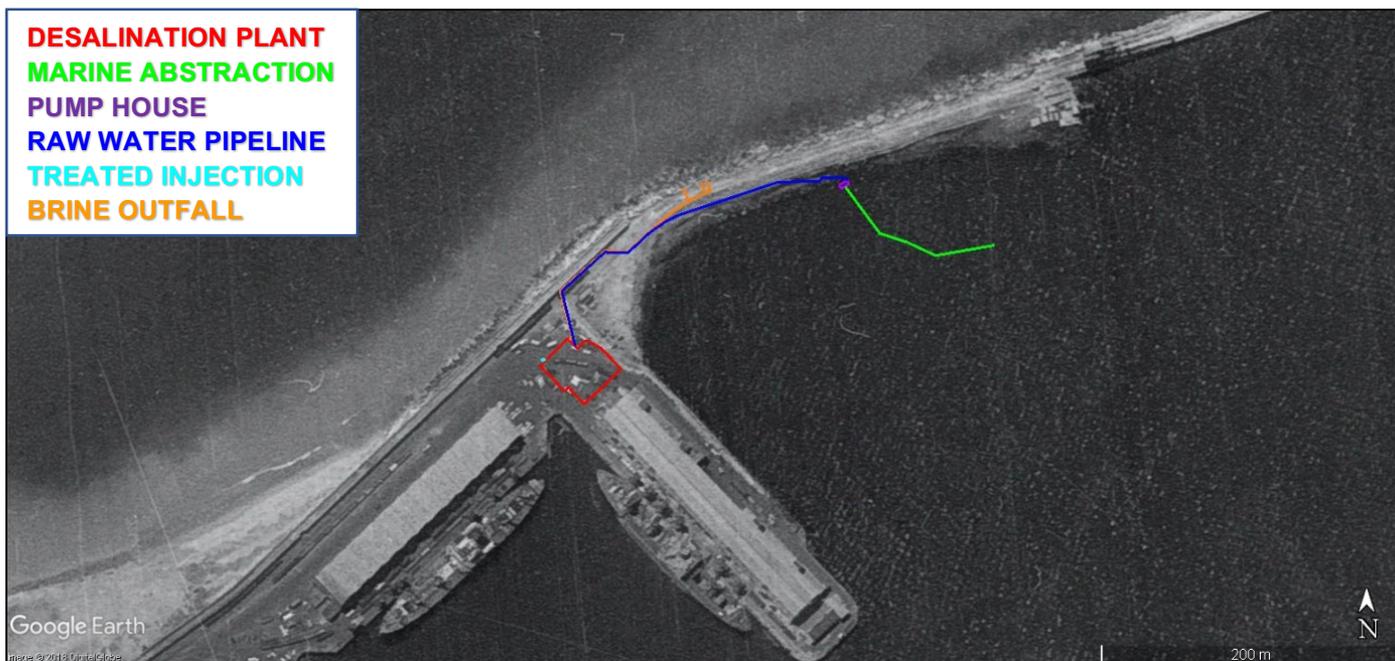


Figure 5.2.9: Proposed desalination plant infrastructure indicated on 1960 aerial photography. Apart from the disappearance of the crescent-shaped object, the built pattern has remained essentially unchanged from 1945. The objects occupying the proposed plant site appear to be a collection of rail cars and containers (Source: Chief Directorate National Geo-spatial Information 454/60_18_7625).

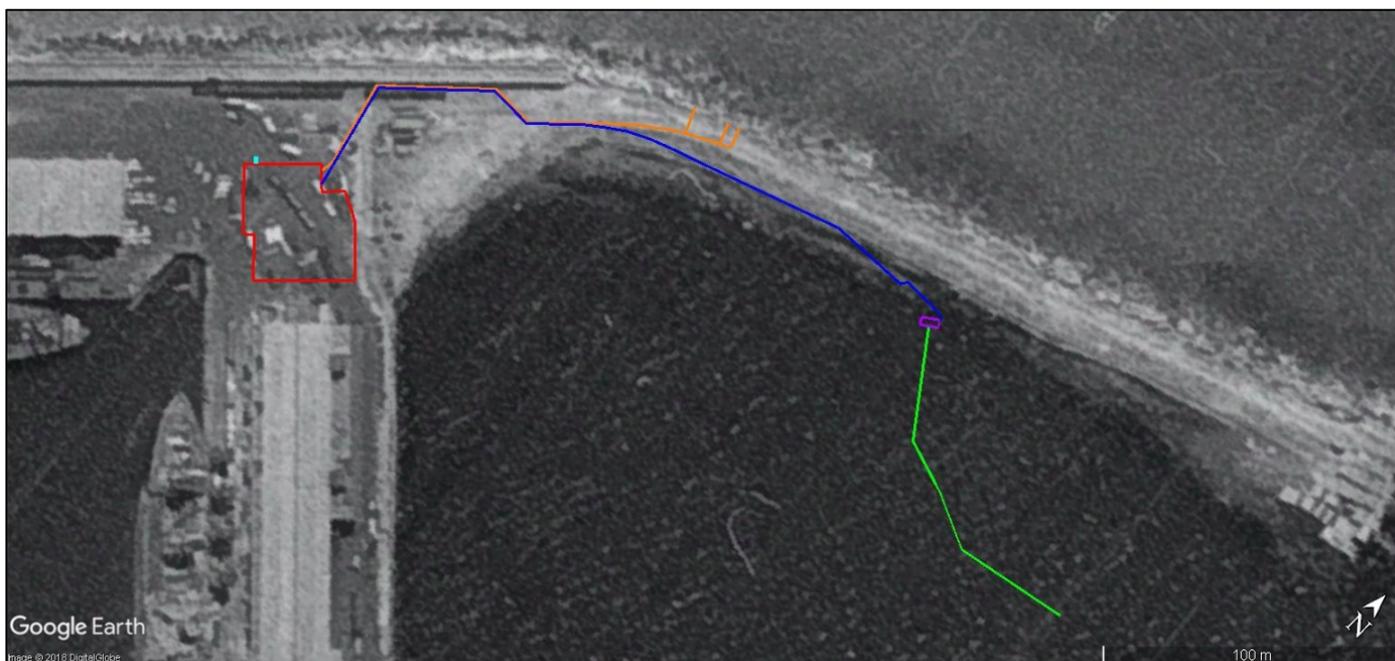


Figure 5.2.10: Detail of 1960 aerial photography.

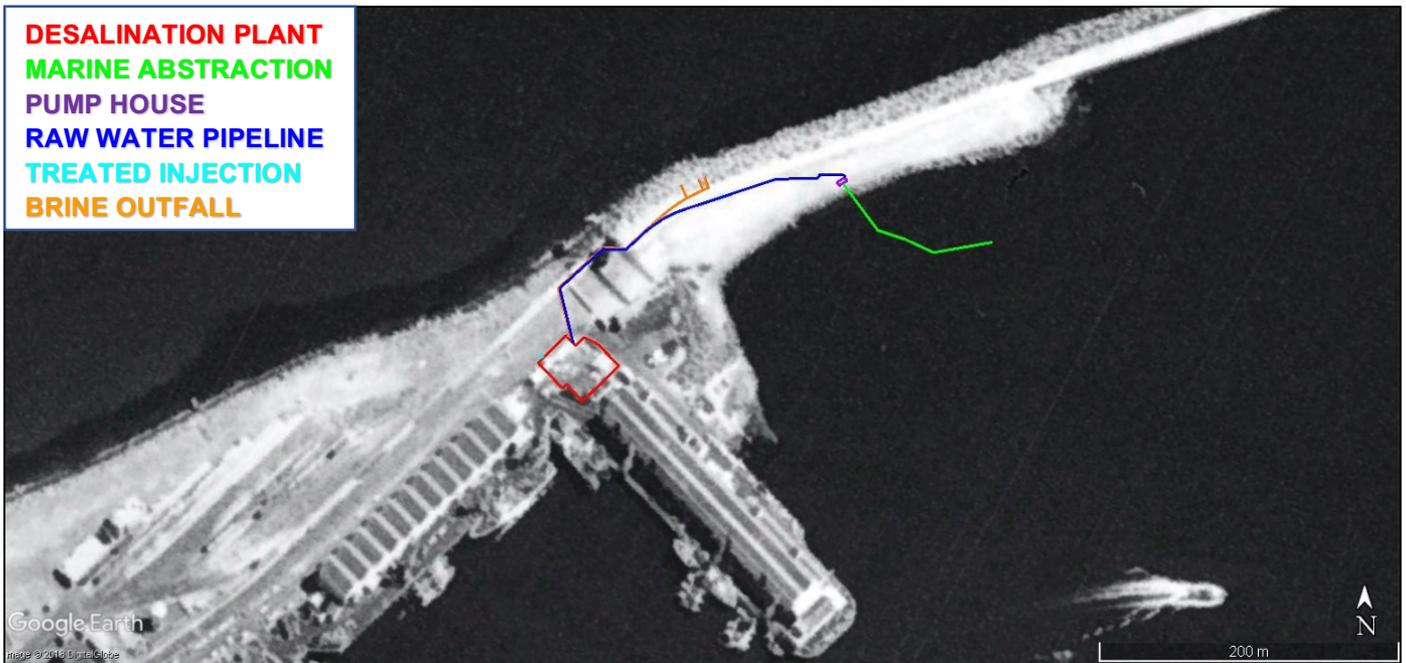


Figure 5.2.11: Proposed desalination plant infrastructure indicated on 1988 aerial photography. The second outer seawall is yet to be buffered with dolosse. Reclamation of the area at the foot of the breakwater to the east and north-east of the plant site had begun, and the proposed pump house site is now located on dry land for the first time (Source: Chief Directorate National Geo-spatial Information 919/88_19_9479).

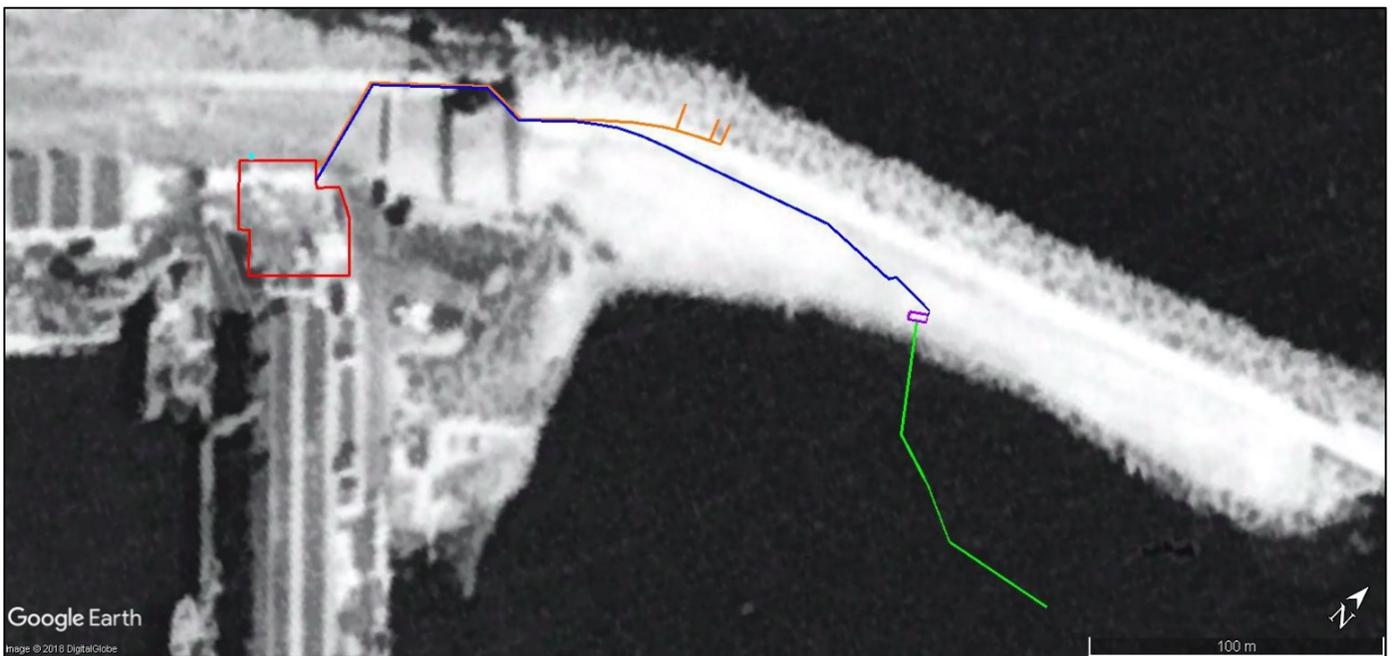


Figure 5.2.12: Detail of 1988 aerial photography.



Figure 5.2.13: Proposed desalination plant infrastructure indicated on 1996 aerial photography. Dolosse now protect the breakwater and sea wall, and the reclamation of the area to the east and north-east of the plant site is progressing. Approximately half of the portion of marine abstraction pipeline currently proposed on land is already located on land (Source: Chief Directorate National Geo-spatial Information 994/96_3_31).



Figure 5.2.14: Detail of 1996 aerial photography.



Figure 5.2.15: Proposed desalination plant infrastructure indicated on 2000 Google Earth satellite imagery. The proposed plant site has now become a parking area, and the rail lines have clearly made way for roads. The reclaimed area at the foot of the breakwater had reached its current extent, but the site is still in the process of establishment (Source: Google Earth 2000-02-07 imagery dataset).



Figure 5.2.16: Detail of 2000-02-07 satellite imagery.



Figure 5.2.17: Proposed desalination plant infrastructure indicated on 2009 Google Earth satellite imagery. The reclaimed area has been stabilised and is largely vegetated. A number of new helicopter landing pads are visible on the western fringes of the reclaimed area. No buildings are located on the reclaimed area yet (Source: Google Earth 2009-09-11 imagery dataset).



Figure 5.2.18: Detail of 2009-09-11 satellite imagery.



Figure 5.2.19: Proposed desalination plant infrastructure indicated on 2017 Google Earth satellite imagery. Yet more helicopter landing pads and associated structures have been constructed on the reclaimed area, one of which would be affected by the proposed pump house and associated portions of incoming and outgoing pipelines (Source: Google Earth 2017-05-19 imagery dataset).



Figure 5.2.20: Detail of 2017-05-19 satellite imagery.

5.3. DESALINATION PLANT



Figure 5.3.1: Proposed desalination plant site (red outline), raw water intake (dark blue line), treated water injection (dark blue line) and brine outfall (orange line) pipelines indicated on 1911 South African Railways map of Cape Town Harbour (Source UCT Islandora 19899).



Figure 5.3.2: Proposed desalination plant site (red outline), raw water intake (dark blue line), treated water injection (dark blue line) and brine outfall (orange line) pipelines indicated on 1926 aerial photography (Source: Chief Directorate National Geo-spatial Information 1926_05_0855; _0859).



Figure 5.3.3: Proposed desalination plant site (red outline), raw water intake (dark blue line), treated water injection (dark blue line) and brine outfall (orange line) pipelines indicated on 1945 aerial photography (Source: Chief Directorate National Geo-spatial Information 203A/45_4_618; _620).



Figure 5.3.4: Proposed desalination plant site (red outline), raw water intake (dark blue line), treated water injection (dark blue line) and brine outfall (orange line) pipelines indicated on 1960 aerial photography (Source: Chief Directorate National Geo-spatial Information 454/60_18_7625).

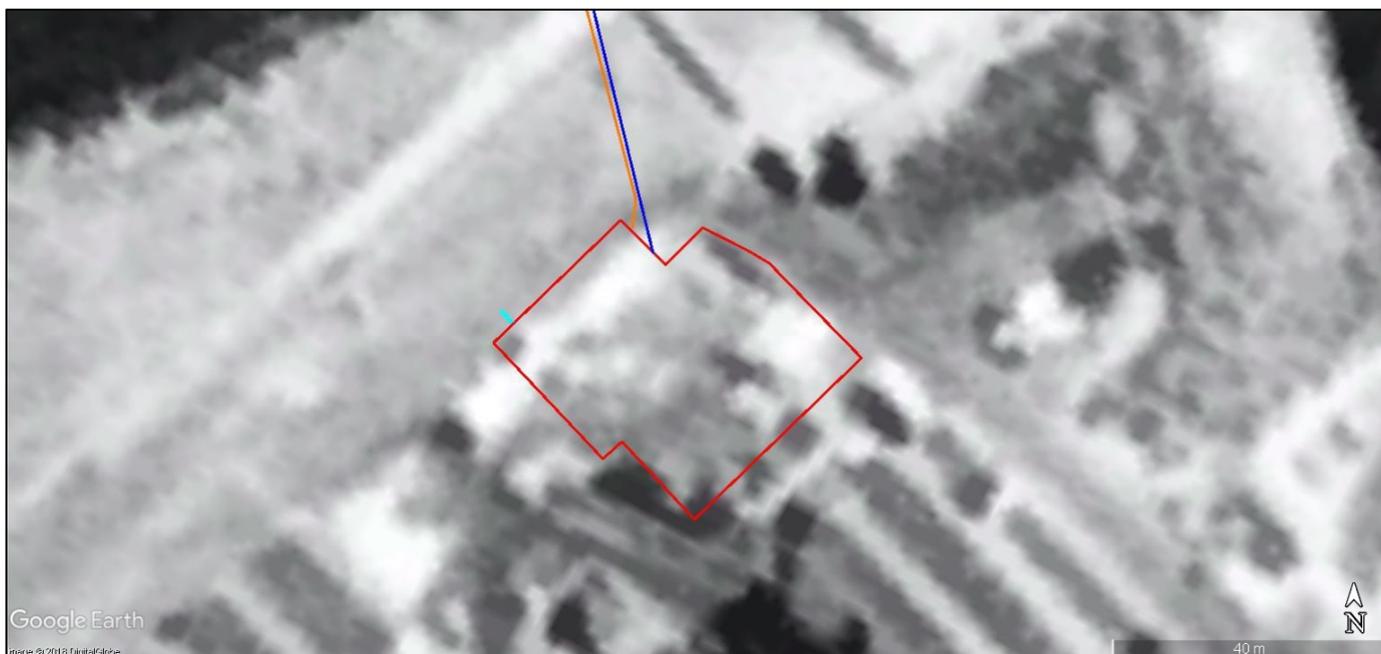


Figure 5.3.5: Proposed desalination plant site (red outline), raw water intake (dark blue line), treated water injection (dark blue line) and brine outfall (orange line) pipelines indicated on 1980 aerial photography (Source: Chief Directorate National Geo-spatial Information 919/88_19_9479).



Figure 5.3.6: Proposed desalination plant site (red outline), raw water intake (dark blue line), treated water injection (dark blue line) and brine outfall (orange line) pipelines indicated on 2000 satellite imagery (Google Earth 2000-02-07 dataset).

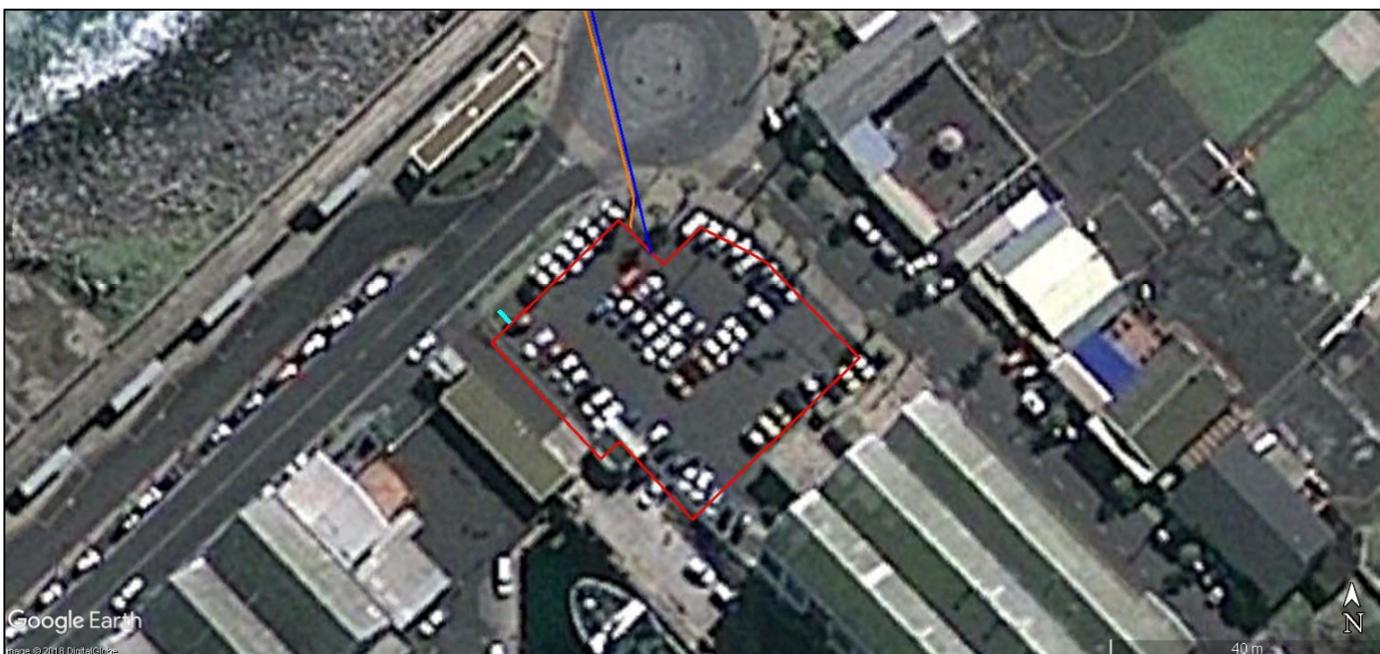


Figure 5.3.7: Proposed desalination plant site (red outline), raw water intake (dark blue line), treated water injection (dark blue line) and brine outfall (orange line) pipelines indicated on 2009 satellite imagery (Google Earth 2009-09-11 dataset).



Figure 5.3.8: Proposed desalination plant site (red outline), raw water intake (dark blue line), treated water injection (dark blue line) and brine outfall (orange line) pipelines indicated on 2017 satellite imagery (Google Earth 2017-05-19 dataset).

INTAKE AND DISCHARGE INFRASTRUCTURE

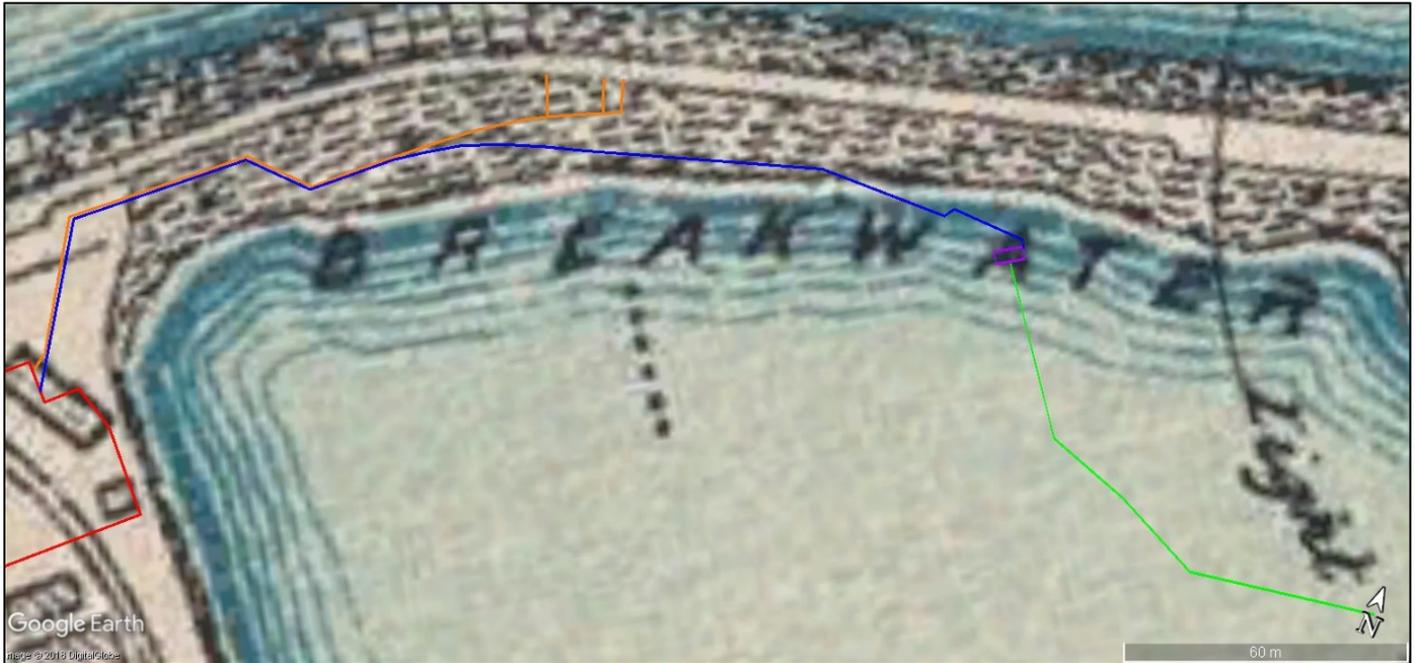


Figure 5.4.1: Proposed desalination plant site (red outline), marine abstraction structure (green line), pump house (purple rectangle) raw water intake pipeline (dark blue line) and brine outfall (orange line) indicated on 1911 South African Railways map of Cape Town Harbour (Source UCT Islandora 19899).

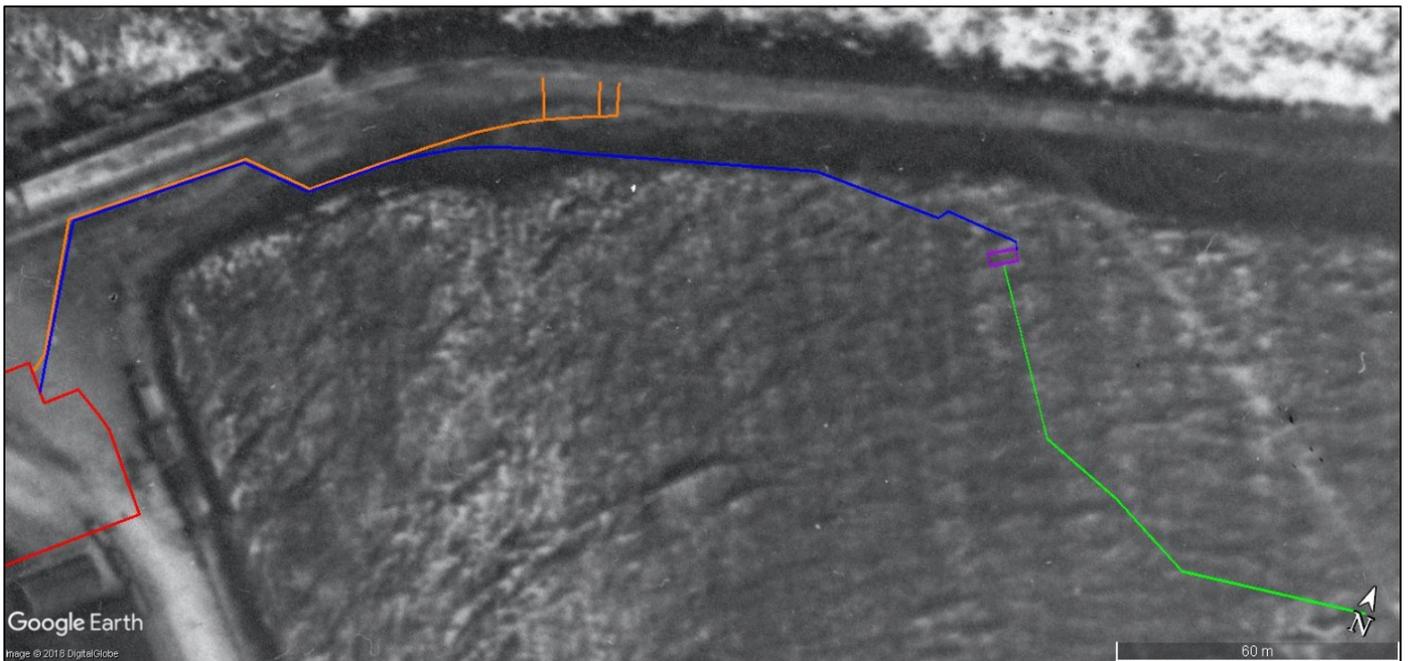


Figure 5.4.2: Proposed desalination plant site (red outline), marine abstraction structure (green line), pump house (purple rectangle) raw water intake pipeline (dark blue line) and brine outfall (orange line) indicated on 1926 aerial photography (Source: Chief Directorate National Geo-spatial Information 1926_05_0855; _0859).

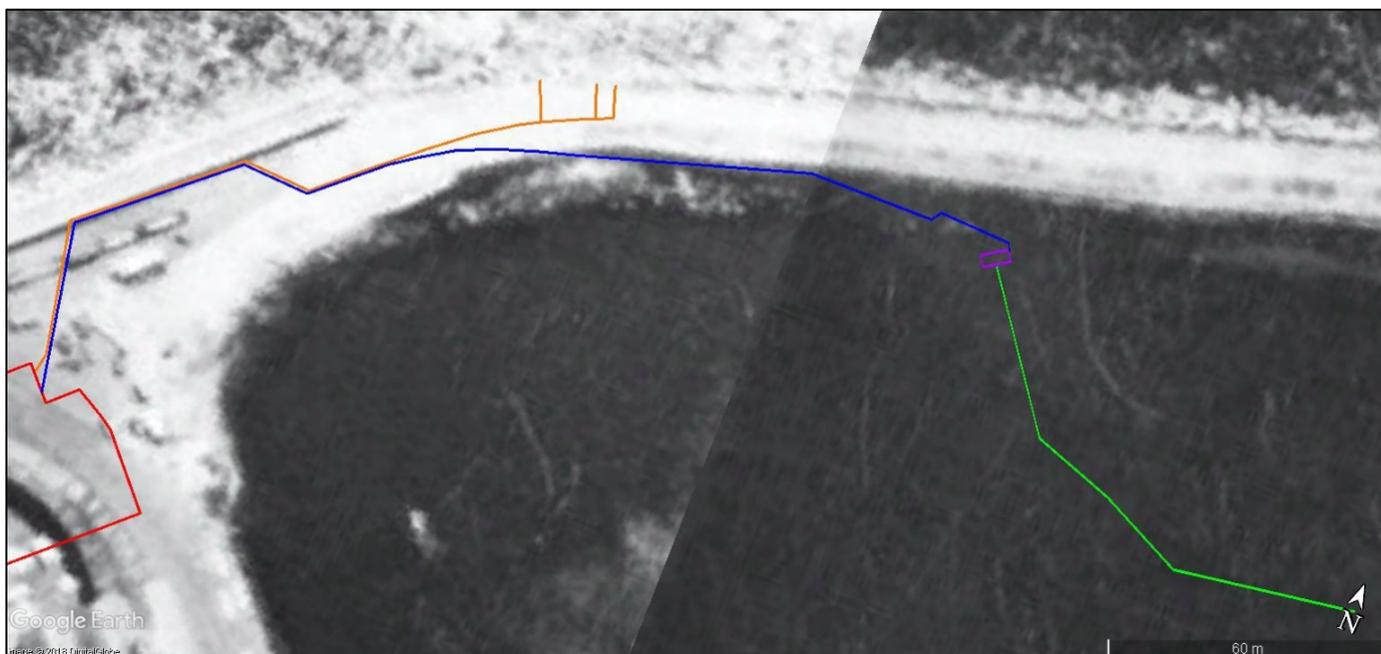


Figure 5.4.3: Proposed desalination plant site (red outline), marine abstraction structure (green line), pump house (purple rectangle) raw water intake pipeline (dark blue line) and brine outfall (orange line) indicated on 1945 aerial photography (Source: Chief Directorate National Geo-spatial Information 203A/45_4_618; _620).

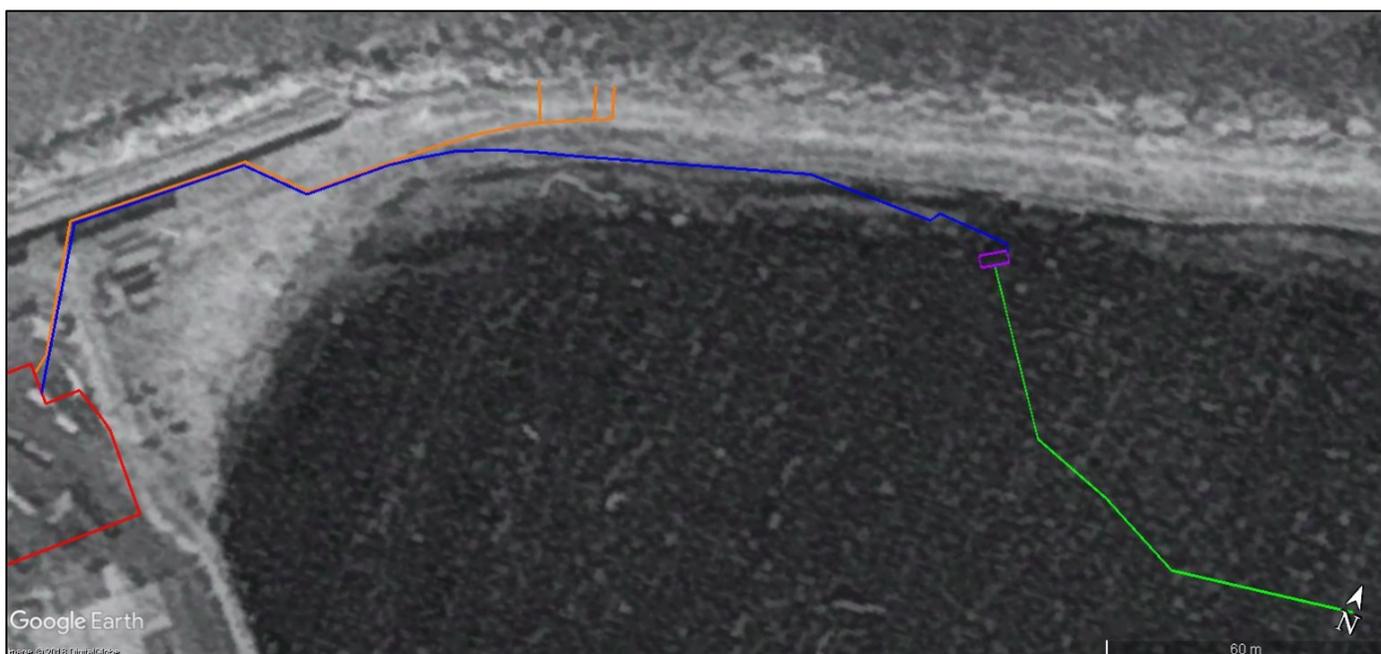


Figure 5.4.4: Proposed desalination plant site (red outline), marine abstraction structure (green line), pump house (purple rectangle) raw water intake pipeline (dark blue line) and brine outfall (orange line) indicated on 1960 aerial photography (Source: Chief Directorate National Geo-spatial Information 454/60_18_7625).

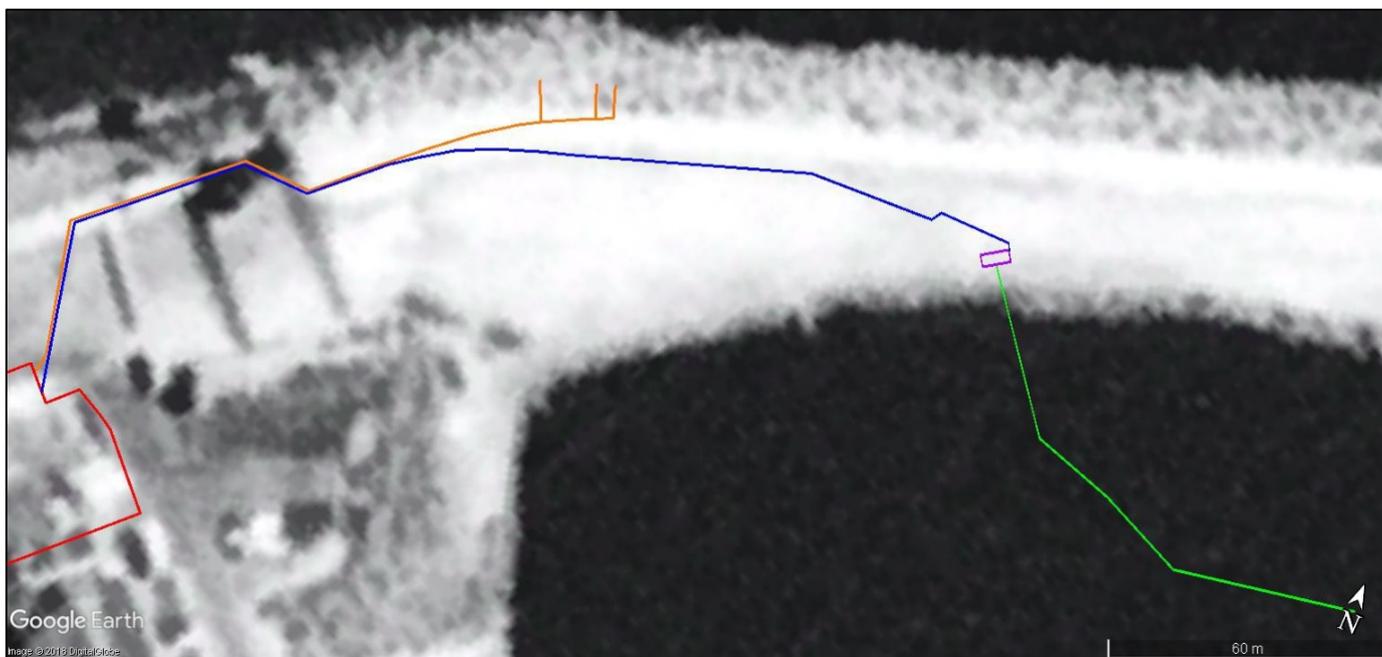


Figure 5.4.5: Proposed desalination plant site (red outline), marine abstraction structure (green line), pump house (purple rectangle) raw water intake pipeline (dark blue line) and brine outfall (orange line) indicated on 1980 aerial photography (Source: Chief Directorate National Geo-spatial Information 919/88_19_9479).



Figure 5.4.6: Proposed desalination plant site (red outline), marine abstraction structure (green line), pump house (purple rectangle) raw water intake pipeline (dark blue line) and brine outfall (orange line) indicated on 1996 aerial photography (Source: Chief Directorate National Geo-spatial Information 994/96_3_31).



Figure 5.4.7: Proposed desalination plant site (red outline), marine abstraction structure (green line), pump house (purple rectangle) raw water intake pipeline (dark blue line) and brine outfall (orange line) indicated on 2000 satellite imagery (Google Earth 2000-02-07 dataset).

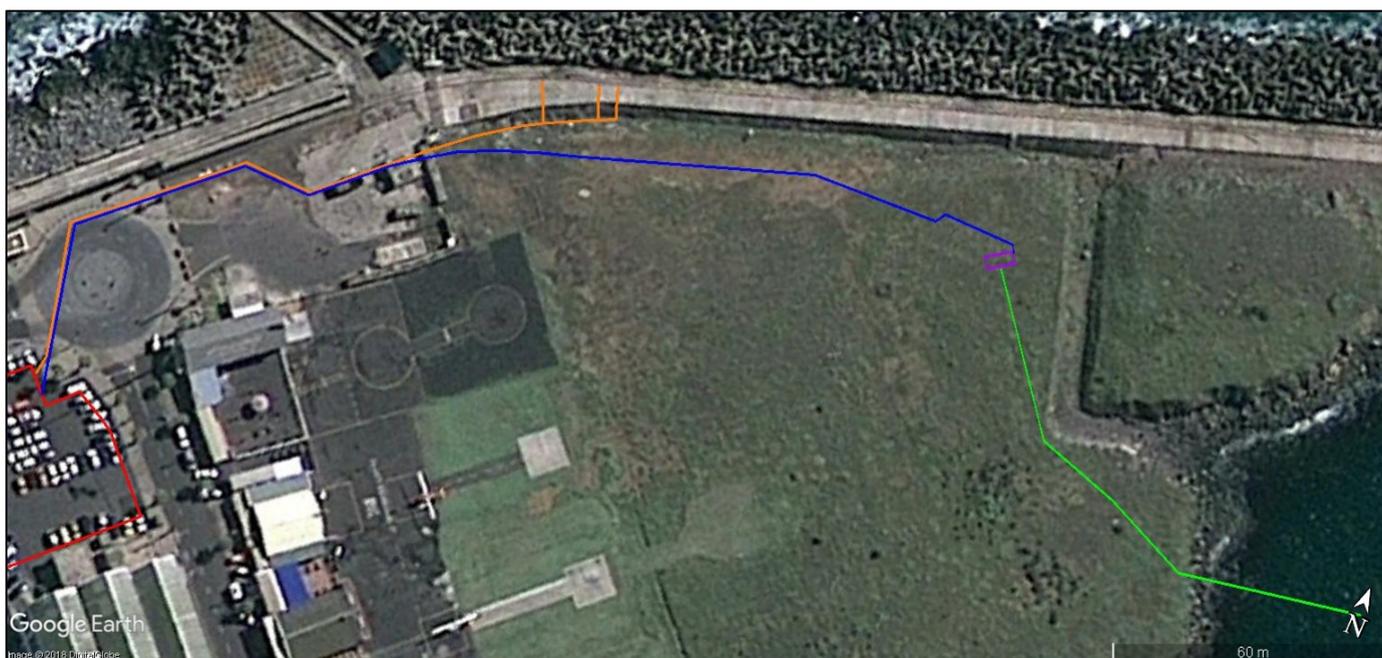


Figure 5.4.8: Proposed desalination plant site (red outline), marine abstraction structure (green line), pump house (purple rectangle) raw water intake pipeline (dark blue line) and brine outfall (orange line) indicated on (Google Earth 2009-09-11 dataset).



Figure 5.4.8: Proposed desalination plant site (red outline), marine abstraction structure (green line), pump house (purple rectangle) raw water intake pipeline (dark blue line) and brine outfall (orange line) indicated on 2017 satellite imagery (Google Earth 2017-05-19 dataset).