



**DEPARTMENT OF
ENVIRONMENT**
CAYMAN ISLANDS GOVERNMENT

Coastal Works Review

Adventures in Taste Ltd.

Barkers Peninsula – Seagrass Removal and Dock Construction

Block 8A Parcels 19 and 20

Ref: DOE/CWK/350

PREPARED FOR: MINISTRY OF HEALTH, ENVIRONMENT, CULTURE AND HOUSING

December 17, 2018

Authored by: Technical Review Committee - Department of Environment, on behalf of the Director,
Department of Environment

Coastal Works Review

Executive Summary

The applicant – Adventures in Taste Ltd. – is seeking permission for the removal of seagrass and construction of a dock to facilitate a new tourism amenity area on the Barkers Peninsula as an alternative to his current facility on Seven Mile Beach. The site is located 1,250 feet east of the termination of Conch Point Road, West Bay.

Under delegated authority of the National Conservation Council (section 3 (13) of the National Conservation Law, 2013), the Department of Environment recommends **refusal** of the application because:

- The site is located within the Barkers Replenishment Zone, established in 1986 and carried forward as a protected area under the National Conservation Law (2013).
- Seagrass represents an important marine habitat that supports considerable biodiversity and essential ecological and physiological services.
- Removal of approximately 4 acres of seagrass will adversely affect essential habitat for the culturally important species such as conch and lobster which are both protected under the National Conservation Law Schedule 1 Part 2.
- The proposal will also destroy live coral currently existing within the site which is protected under the National Conservation Law Schedule 1 Part 1.
- Experience has shown that removal of seagrass leads to beach erosion.
- The construction of a dock of this size is considerably out of character for the Barkers Peninsula and will adversely affect the ability of the public to traverse the beach and to use the unregistered beach access paths through Block 8A Parcel 20.
- Prevailing wind and wave climate, and difficult shallow water access, will limit the utility of a dock in this area.
- There may be adverse effects on terrestrial and marine resources within the proposed Barkers National Park due to the consequences of construction of a commercial dock and creation of a high-volume tourist amenity adjacent to these areas.
- Importantly, carrying out the proposed works will not achieve the applicant's stated goal of recreating a Seven Mile Beach-type experience in the Barkers area. The prevailing north-east winds which dominate November to April mean that the area will be subject to a direct onshore wind for much of the year. A direct onshore wind means that the water quality will be poor and dead seagrass and regular Sargassum beaching events will continually fill the excavated area. The site will be least suitable during the height of the tourism season, when north-east winds are most common and when an alternative to Seven Mile beach would be needed most.

Additionally, the Department of Environment believes, that the project has not been properly thought out, because:

- The applicant has only applied to remove seagrass and not the rubble or calcareous algae found in large areas of the site with thin seagrass; both of these are undesirable to a tourist who was expecting a Seven Mile Beach experience.
- The seagrass beds and root mass overlay an immediate layer of bedrock that will not likely support an attractive sand layer or permit suitable depths for swimming and wading in the nearshore.
- The applicant has applied for a very irregular shape of dredging that has been based on 2013 aerial imagery. Recent drone imagery shows that the seagrass beds have changed since then, and it will be extremely difficult for the applicant to follow the proposed dredging plan.
- The applicant has proposed to remove seagrass by hand or appropriate mechanical means. A site visit confirmed that, as is typical, the seagrass in this location has roots and rhizomes that can be up to 2 feet deep and very dense. It will therefore be difficult to remove by hand and heavy machinery will need to be used for most of the work. Roughly estimated, 350 – 500 fully laden 20 yard dump trucks will be required to remove the material.

There are still many unknowns with respect to the land-side development associated with these works and this will likely serve as a ‘gateway’ project to further development in Barkers. As the proposed works will cause significant adverse impacts on the environment and will not succeed in creating the intended Seven Mile Beach experience, the Department of Environment does not believe that the proposals are justified nor that they will live up to the expectations of the developer or create the predicted economic benefits.

Project Proposal

The applicant – Adventures in Taste Ltd. – is seeking permission for the removal of seagrass and construction of a dock to facilitate a new tourism amenity area in Barkers Peninsula as an alternative to the Seven Mile Beach facility which he currently utilises (**Figure 1**). The site is located 1,250 feet east of the termination of Conch Point Road, West Bay.

The purpose of the proposed dock is to provide drop off and collection of guests by watercraft and temporary mooring of recreational watercraft. The application states that boats using the dock will have drafts of less than 30 inches.

The dock is proposed to be constructed of 16 inch diameter tip American Wood Preservers Institute (AWPI) poles treated to Standard C3 for marine exposure. 20 inch diameter holes will be pre-drilled to 10 feet deep and the poles will be installed. The cavity will be filled fully with 5000 psi hydraulic grout when the post is lined and plumbed. The top of the deck will be 4 feet above sea level and there is proposed to be a slope down onto the shore. There is proposed to be piles approximately every 12 feet along the dock. The decking proposed will be 2 by 6 inch decking with ½ inch gaps. There is proposed to be cross-bracing between the piles where the seabed elevation is more than 2 ft below mean sea level.

The application form indicates that silt screens will be deployed to contain turbidity. A description of the installation and maintenance of the silt screen has been provided on a drawing.

Seagrass in the nearshore area of Block 8A Parcels 19 and 20 is proposed to be removed by hand and appropriate mechanical means (with perforated buckets, screens, etc.). The application indicates that any sand inadvertently removed will be replaced. The amount of seagrass proposed to be removed within the application is 179,775 feet, which is based on the outline of dense seagrass from the 2013 aerial imagery by the Lands and Survey Department.

A contractor has not yet been appointed and there is very little detail on construction methodology. The applicant did not respond to the Department of Environment's request for further information.

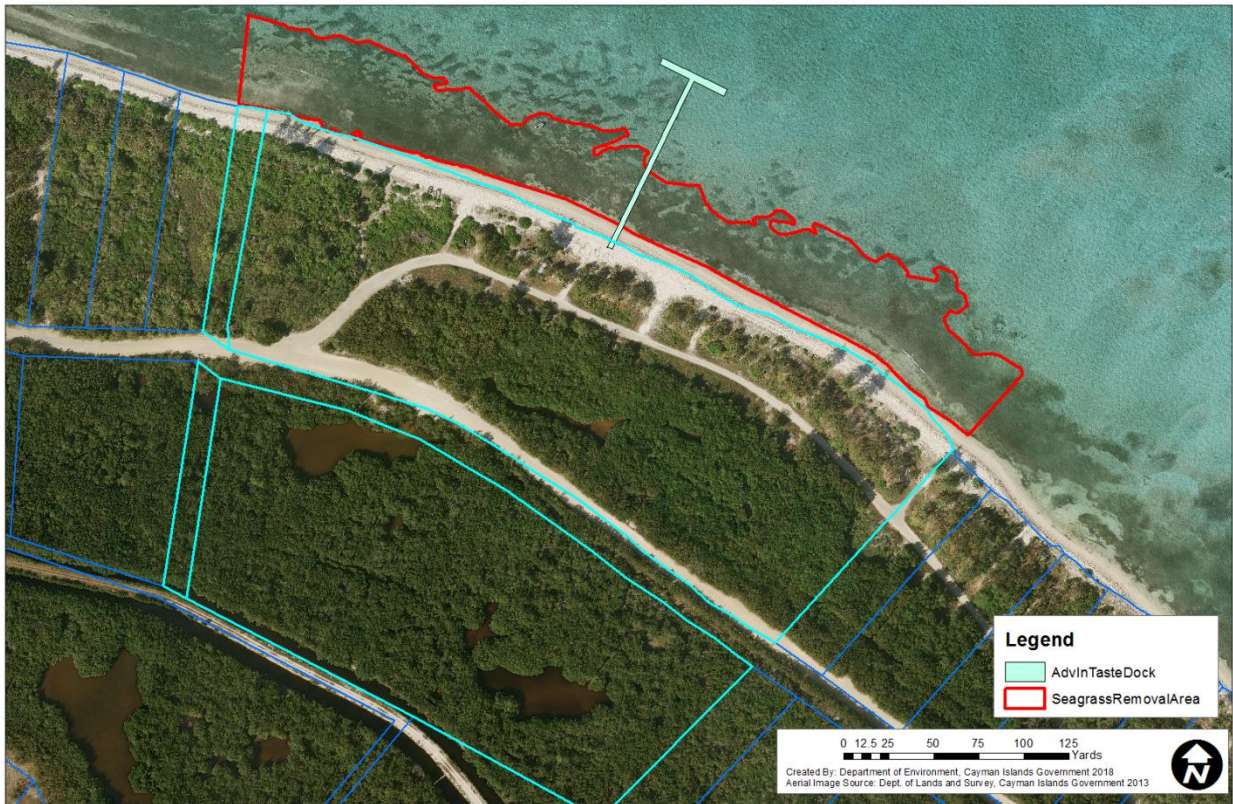


FIGURE 1: SITE PLAN SHOWING THE PROPOSED SEAGRASS REMOVAL AREA AND THE DOCK (SOURCE: LIS, 2013)

Background

The site is located within a Replenishment Zone, a Marine Protected Area since 1986, under the National Conservation Law (2013), as shown in **Figure 2**. It is located approximately 800 feet to the west of the proposed Barkers National Park boundary. The site is owned by Dart Realty Ltd. who submitted a letter confirming that they have no objections to the coastal works application submitted by Adventures in Taste Ltd and who have been engaged in promoting the proposed seagrass removal and dock. The site is located on a turtle nesting beach.

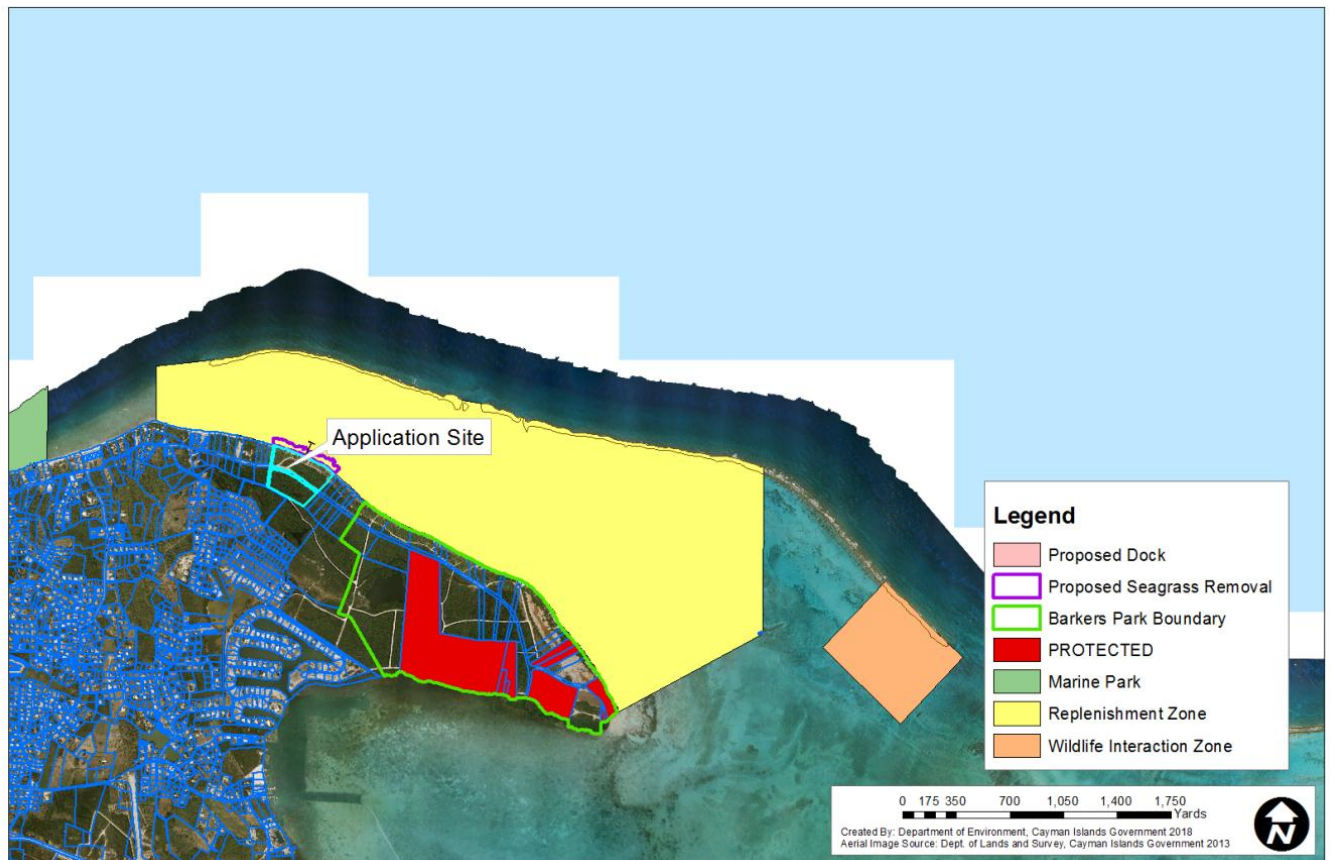


FIGURE 2: SITE LOCATION PLAN SHOWING THE SITE, THE PROTECTED AREAS, BARKERS PARK BOUNDARY AND THE MARINE PARKS (SOURCE: LIS, 2013)

The beach of Block 8A Parcel 20 is zoned Public Open Space and the inland area of Block 8A Parcel 19 and 20 is zoned Hotel – Tourism (**Figure 3**). Therefore, the proposed seagrass removal and dock will impact a beach area zoned for Public Open Space, which is particularly relevant given concerns regarding beach erosion, public access and the objections received from members of the public regarding the cultural significance of the Barkers Peninsula.

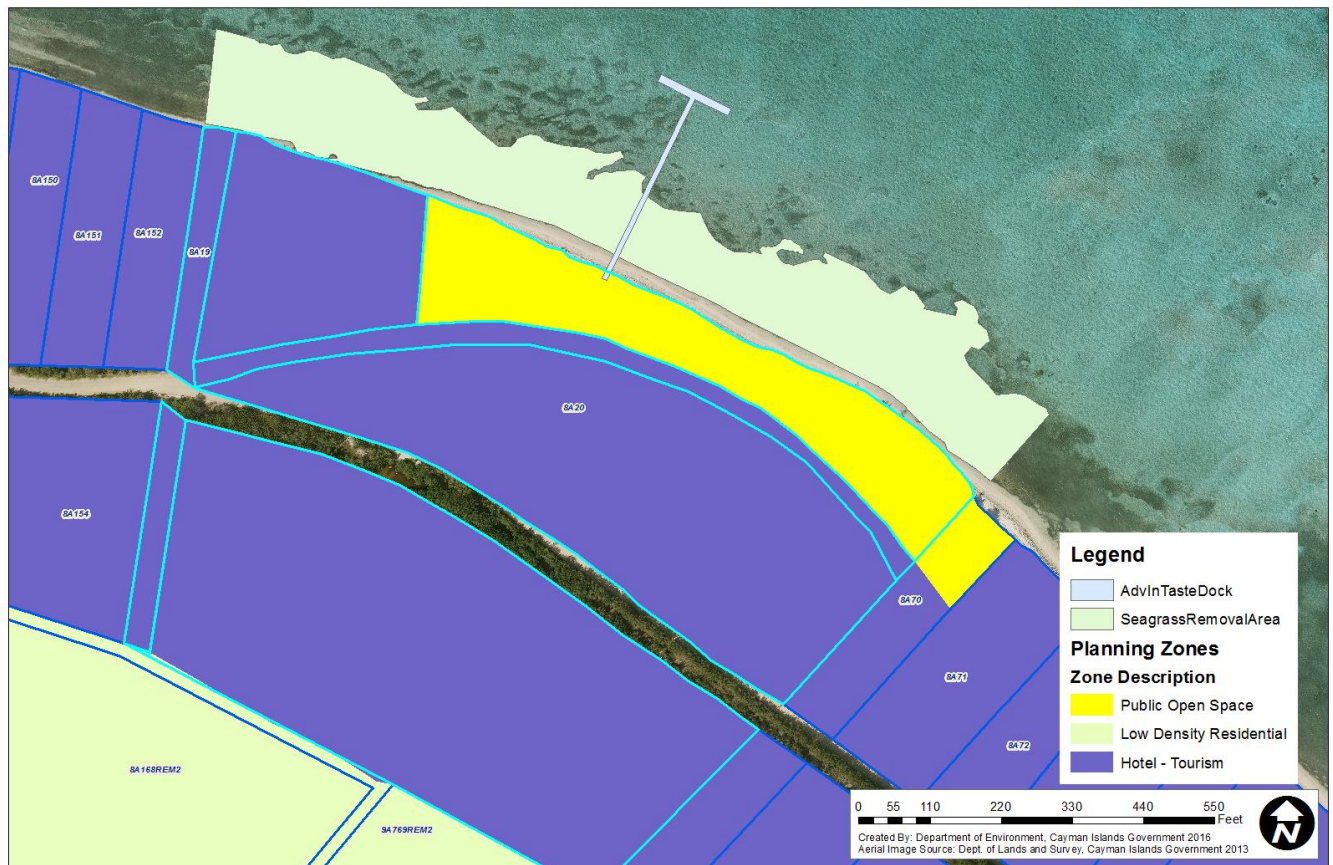


FIGURE 3: PLANNING ZONES AT THE SITE, SHOWING THAT THE BEACH IS ZONED PUBLIC OPEN SPACE (SOURCE: LIS, 2013)

Environmental Impacts of the Seagrass Removal

Impact to Culturally Important Species and Protected Areas

The site is located entirely within a Replenishment Zone. The Replenishment Zone has been protected since 1986 when the Marine Conservation (Marine Parks) Regulations were enacted and has been carried forward over as a protected area under the National Conservation Law (2013). The Replenishment Zones were implemented primarily to ensure the protection of habitats – including breeding and nursery areas – for queen conch (*Strombus gigas*) and spiny lobster (*Panulirus argus*). The site is a known lobster and conch habitat, as shown in **Figure 4**, although they spend much of their lifecycle here at larval stages hidden from sight.

Queen conch and spiny lobster are both protected species under Schedule 1 Part 2 of the National Conservation Law 2013. This is the list of species which may be hunted or collected in accordance with regulations or a conservation plan, however both conch and lobster are protected at all times and all seasons while in a Replenishment Zone.



FIGURE 4: SUB-ADULT LOBSTER FOUND WITHIN THE SITE DURING THE SITE VISIT (SOURCE: DOE, 27 Nov 2018)

The DoE undertakes annual surveys of the shallow water conch populations in an effort to gauge the effectiveness of Marine Protected Areas and understand the status of the population. Based on work in other countries the density of conch in an overfished area can fall to a level below which reproduction stops (known as the depensation effect). Grand Cayman's Replenishment Zones within the heavily exploited sounds such as the North Sound are absolutely critical to maintaining the overall conch populations at a density where reproduction can successfully occur and so maintain these culturally important fisheries for future generations of Caymanians.

Shallow seagrass beds, such as those that are proposed to be removed, are important habitat for a considerable array of species, in particular juvenile lobster and conch. While only a few inches long or smaller, juvenile lobster settle from the ocean to the safety of the seagrass meadows to hide from predators and hunt for prey. Juvenile conch also settle from their free floating life stages to spend most of their early life buried among the seagrass roots hiding from predators, emerging occasionally to eat algae off of the turtle grass and other substrate. The loss of turtle grass within this area equates to a potential loss of innumerable conch and lobster and will hinder the objective of maintaining populations to support continued harvest by future generations of Caymanians.

While the area of seagrass removal within the site is small compared to the total area of the Replenishment Zone, it represents a large proportion of the total seagrass within the zone because the dense seagrass beds are located close to shore in a thin band. Seagrass habitats retain a close synergy with other adjacent shallow coastal lagoon habitats within the Replenishment Zone and consequently represents an important transitional habitat in the lifecycle of many marine species, including the locally important conch and lobster.

The removal of the seagrass within this area, despite regulations enacted since 1986 and the National Conservation Law, will cause significant adverse effects to the integrity of the protected area and to a number of protected species, including the culturally important conch and lobster.

Impact to Protected Areas under the National Conservation Law

The National Conservation Law provides definitions of “adverse effect”, which means, in this case, an effect that may result in the physical destruction or detrimental alteration of a protected area or an area of critical habitat. There are 12 general types of adverse effects and the proposed removal of seagrass will cause at least 10 of them. These effects are discussed below.

- Changes to littoral (close to shore) or sediment transport processes that may alter the supply of sediment available for those processes or that may otherwise exacerbate erosion – **as discussed later, the removal of seagrass will cause beach erosion.**
- Alterations that may impair the capacity of the area to function as a habitat beneficial to wildlife – **the permanent sterilization of the area by removal (and prevention of regrowth) of seagrass will remove a habitat beneficial to wildlife.**
- Alterations that may increase losses of the area from a rise in the sea level with respect to the surface of the land, whether caused by an actual sea level rise or land surface subsidence – **when material is removed from the nearshore area, sand from the beach and beach ridge moves to fill it, so the removal of seagrass will cause beach erosion and land surface subsidence.** The existing beach ridges will be lowered resulting in the potential for increased storm wave inundation (overtopping) and seawater intrusion to the surrounding upland habitat.
- The discharge of pathogens, dissolved or suspended minerals or solids, waste materials or other substances at levels that may be harmful to wildlife or the ecological or aesthetic value of the area – **the process of removal of seagrass will generate turbidity that will harm the adjacent areas of the Replenishment Zone even with a silt screen and when complete, the proposals will harm the aesthetic value of the area due to poor water quality and the accumulation of dead seagrass.** Seagrass banks baffle and reduce wave energy and stabilize marine sediments. The loss of seagrass will increase wave energy and result in continued resuspension of finer sediments usually trapped in seagrass further reducing water quality and aesthetics.
- Alterations of hydrology, water flow, circulation patterns, water levels or surface drainage that may be harmful to wildlife or the ecological or aesthetic value of the area or that may exacerbate erosion – **the removal of seagrass will alter the water flow and circulation patterns, harming wildlife, the ecological and aesthetic value and will exacerbate erosion.**
- Alterations that may interfere with the public use and enjoyment of the area – **the dock and any landside development will interfere with the public use and enjoyment across the Crown-owned beach below the Mean High Water Mark and of the four unregistered beach accesses.**
- Alterations that may hinder or impede the movement or migration of wildlife – **the seagrass will be removed and so wildlife within it or that would move between the site and the nearby area will not be able to do so. Many marine species use ‘green belts’ as a sheltered or safe passage for migration or relocation. The interruption of nearly 1200 ft of seagrass could potentially introduce a significant obstacles for species that will not cross open sand plains as part of**

their migration routes. Commercially important snook, bonefish and permit are known to use nearshore seagrass beds as hunting and nursery areas, their migration routes and preferences are as yet unknown.

- Alterations that may impair the capacity of a beach ridge to function as a protective barrier and as a reserve of sand for beach nourishment during storms – **removal of the seagrass will cause beach erosion and depletion of the beach ridge. See above comment.**
- Alterations that may impair the capacity of the area to act as a sink or reservoir of greenhouse gases or enhance its potential as a source of greenhouse gases – **seagrass provides an important natural ‘carbon sink’ and prevents the erosion of carbon deposits and the subsequent release of carbon dioxide into the atmosphere.**
- Development that may increase the potential for damage to the area from floods, hurricanes or storms – **seagrass and the beach ridge provide protection against hurricane damage by reducing the risk of erosion and promoting shoreline stability.**

The removal of the seagrass will adversely affect a protected area as defined in the National Conservation Law.

Impact to Other Benthic Habitats by the Removal of Seagrass

The works will directly impact a substantial area of dense, healthy seagrass beds. The works will also result in negative impacts to other forms of seagrass communities and live coral within the site area.

Although no details of expected ongoing maintenance have been provided by the applicant, based on the purpose of the seagrass removal (to provide a tourism amenity) it is unlikely that the seagrass would be allowed to recover and therefore the removal will be permanent.

It is likely that considerable ongoing mechanical maintenance of the area will be required. Firstly it is unlikely that sand will remain in the excavated area without the stabilising and wave attenuating benefits of the seagrass. Consequently sand renourishment will be required on a regular basis. Additionally rubble, calcareous algae and other marine detritus are likely to collect in the cleared sand pocket areas that will ultimately detract from the visitor experience. Pioneering marine algae species will attempt to recolonise the area and will likely need frequent clearing. This ongoing disturbance, the permanent sterilisation of the marine environment in this area and the constant source of sedimentation will have significant impact on the surrounding marine habitats.

Live coral heads were observed during the in-water site visit. The proposed seagrass removal will also result in the destruction of live coral, as shown in **Figure 5**, either by direct removal or by indirect construction effects from the removal of the adjacent seagrass. It is extremely unlikely that the seagrass surrounding the coral heads could be removed without directly or indirectly affecting the coral.

Coral is protected under Schedule 1 Part 1 of the National Conservation Law.



FIGURE 5: LIVE CORAL HEADS WHICH FALL WITHIN THE SEAGRASS REMOVAL AREA (SOURCE: DOE 2018)

The removal of the seagrass will result in the destruction of live coral within the site, either directly by construction or indirectly by turbidity.

Impact to the Beach by the Removal of Seagrass

Removal of the seagrass will -result in significant beach erosion. Prior experience of removal of seagrass in Cayman has shown beach retreat following the removal of the seagrass. As shown in **Figure 6**, seagrass removal at Bodden Town Public Beach led to beach loss of up to 45 ft.



FIGURE 6: SEAGRASS REMOVAL AT BODDEN TOWN PUBLIC BEACH RESULTING IN LOSS OF BEACH OF UP TO 45 FT (SOURCE: LIS 1994 AND 2004)

Beach retreat and erosion occurred at a property in South Sound (Lawrence Thompson's house) where a large area of seagrass was removed. As a result of the significant erosion that was occurring at the property, boulders were placed along the high water mark in an effort to recreate the previous beach. While this prevented erosion for a time at the property, it worsened the effect of scouring at the neighbouring properties. Eventually the beach at the property eroded around the boulders and the boulders were removed. There is no indication that the desired sandy swim area was ever formed and erosion at this site remains a serious issue today.

An image from 2002 (**Figure 7**) shows the placement of boulders and the erosion of the adjacent properties of approximately 20 feet. **Figure 8** shows the aerial images of the property at South Sound over time.



FIGURE 7: AN IMAGE FROM 2002 OF A PROPERTY IN SOUTH SOUND WHERE THE PLACEMENT OF BOULDERS AND REMOVAL OF SEAGRASS RESULTED IN BEACH EROSION AT ADJACENT PROPERTIES, AS SHOWN BY THE SEVERE EROSION IN THE FOREGROUND.

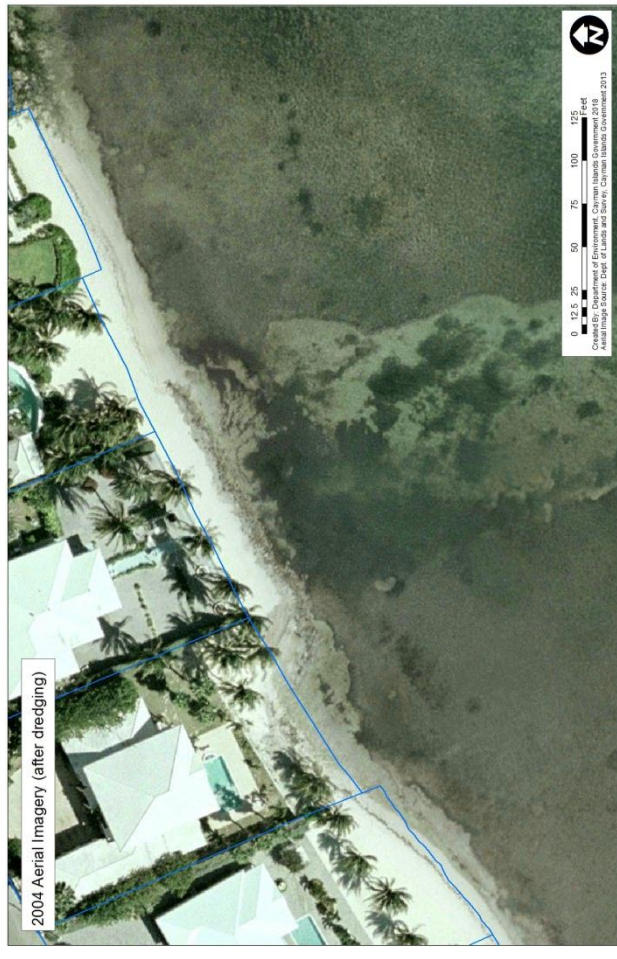
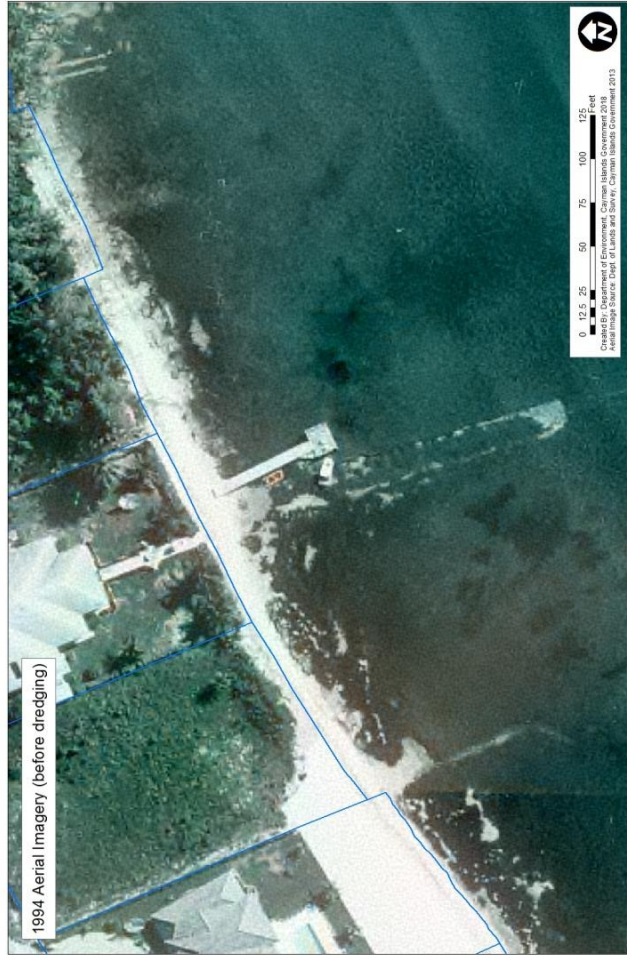


FIGURE 8: SEAGRASS REMOVAL AT SOUTH SOUND RESULTING IN EROSION AT PROPERTY AND SCOURING OF BEACH ON ADJACENT PROPERTIES

During the in-water site visit conducted on 27 November, it was observed that the areas without seagrass beds were significantly deeper than the seagrass beds. These ‘blow out’ areas (**Figure 9**) show that without the seagrass, the sand is likely to be eroded away until bedrock is exposed. In addition to erosion within the excavated area, the beach is likely to retreat as the dense seagrass beds close to shore are likely keeping the beach intact (**Figure 10**) by reducing wave energy. Following removal of the seagrass, beach sand will move to replace the removed material.

Seagrass also helps to maintain good water quality by binding sediment together – this is particularly important in this area as the parts of the seabed at the site include a very soft and silty substrate which may stay suspended without the seagrass. Instead of creating a sandy bottom, the proposed seagrass removal is likely to cause sand erosion until bedrock is exposed as well as increasing wave energy that will keep fine sediments in suspension reducing water quality and the aesthetic experience. This phenomenon is clearly observed on any windy day in the Barkers area or any seagrass lagoon around the Cayman Islands when stronger than normal wave activity overcomes the natural capacity of the seagrass to bind sediments resulting in turbid nearshore conditions. On calmer days the seagrass is able to reduce sediment resuspension and the water appears appealing and clear.



FIGURE 9: BLOW-OUT AREAS SHOWING LOWER DEPTH AND ROCK PRESENT WITHOUT SEAGRASS



FIGURE 10: THE NEARSHORE AREA ON THE LEFT, WHERE THE SEAGRASS IS ACTING AS A BARRIER HOLDING SAND TOGETHER.

On natural beaches, the beach ridge acts as a reserve of sand (**Figure 11**). The beach ridge is typically formed by high wave action or during storms. The beach ridge can then nourish beaches as sand is eroded away by normal wave action. During storms or high wave action, that sand can be brought back up to the beach ridge. This 'give and take' from the beach ridge system stabilises shorelines, prevents beach erosion and helps provide storm defence. There are numerous cases along Seven Mile Beach where removal of the beach ridge has contributed to beach erosion and upland storm inundation.

Removal of the seagrass, which binds sand together, will result in an impaired ability of the beach ridge to function as a sand reserve and nourish the beaches. The void created by removal of the seagrass will create a high demand on sand from the beach ridge, and sand will move to fill the newly created space or migrate along shore due to increased on-shore wave activity. As sand will not stay within the nearshore area without seagrass to bind it together and reduce movement of water, there will be a net loss of sand on this part of beach.

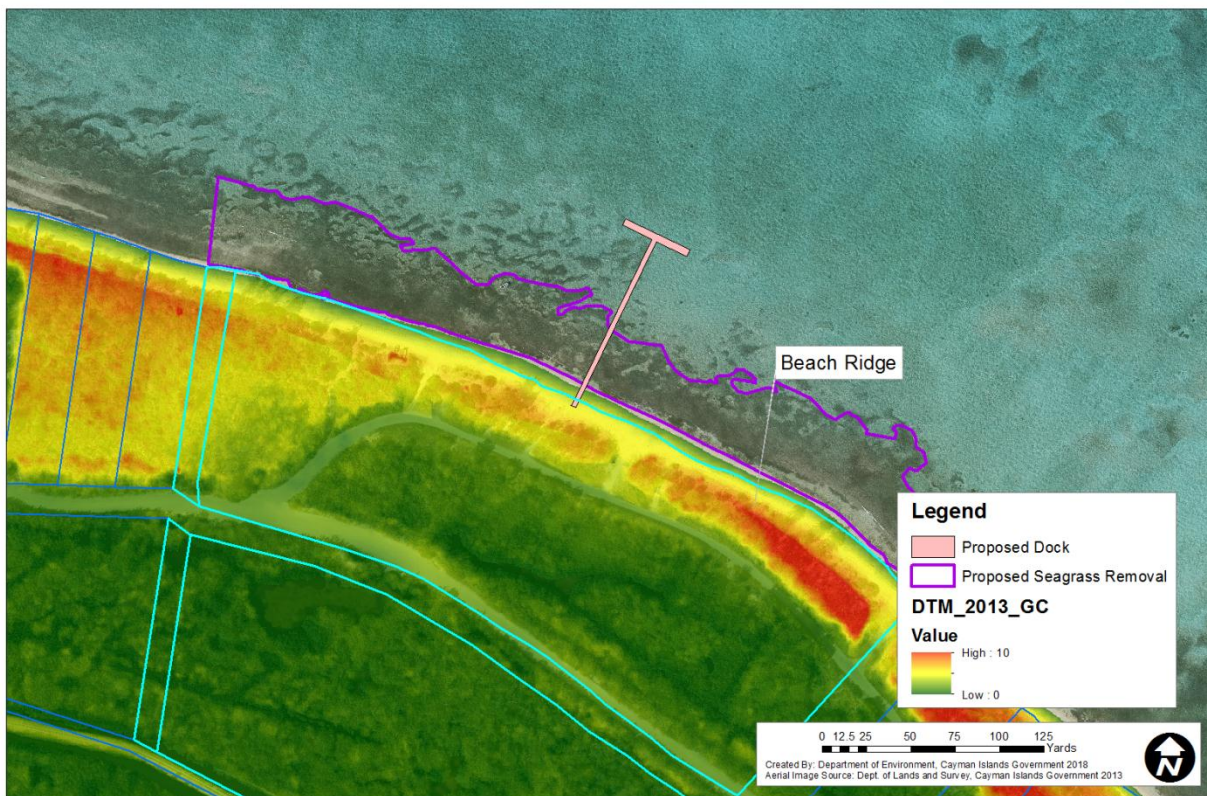


FIGURE 11: THE BEACH RIDGE PRESENT AT THE SITE (SOURCE: LIS, 2013)

The removal of seagrass will result in beach erosion, as evidenced in other locations in Cayman where the seagrass has been removed.

Impact to Benthic Habitats Outside of Site

Silt screens have been proposed, but no construction details have been provided to outline how such a large area will have a silt screen correctly deployed. Very little construction methodology was provided and the applicant has not responded to requests for further information.

Whilst the use of silt screens can help to minimise the impacts of sedimentation from excavation activities, they do not result in zero impact from turbidity. Most recently, silt screen failure was evidenced at the dredging site in North Sound to the north of the Holiday Inn (Heritage Holdings coastal works application). The screens were deployed correctly and the permittee even used a double layer of silt screens to try to contain turbidity, however as can be seen from **Figure 12**, significant turbidity escaped into the North Sound.

It will also be important to ensure that the skirt on the screens is of an appropriate depth i.e. not too long that it comes into contact with the seabed, is not left in place too long and will be removed if there is inclement weather, in order to minimise further impacts on the benthic environment

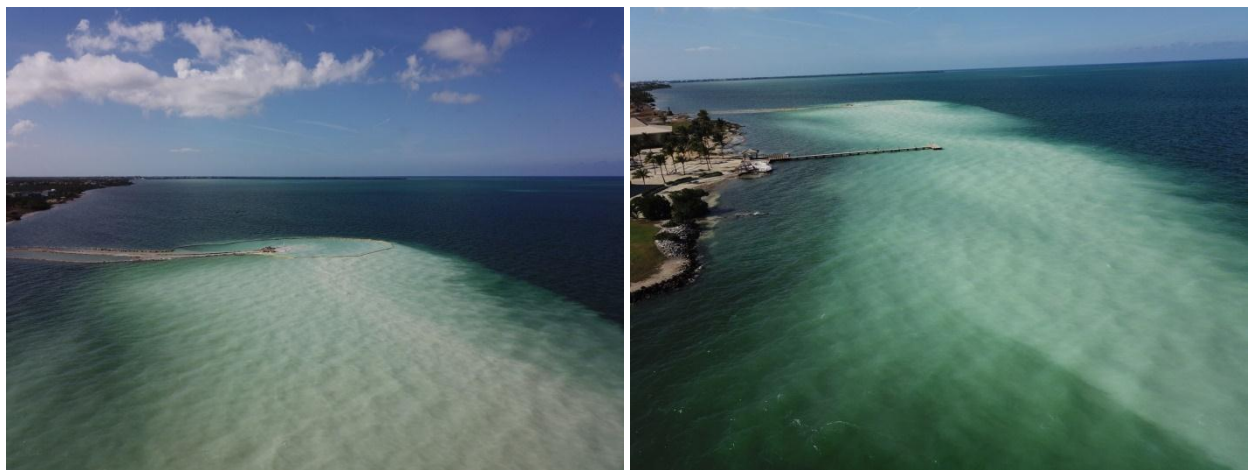


FIGURE 12: TURBIDITY ESCAPING FROM CORRECTLY DEPLOYED SILT SCREENS (SOURCE: SITE VISIT ON 10 APRIL 2018)

There are likely to be adverse effects from turbidity even with correctly deployed silt screens, although the silt screens do help to mitigate the effect.

Environmental Impacts of the Dock

Impact to Benthic Habitats from Dock Construction and Operation

The dock extends beyond the area where seagrass removal is proposed by 180 ft. The footprint of the dock is still within the Replenishment Zone. The works will directly impact an additional 2,875 sq ft beyond the area of seagrass removal during both construction and operation and the installation of the pilings will generate plumes of suspended sediment.

The use of the dock by motorised water craft will have on-going impacts to benthic habitats in the area; such effects can be seen in aerial photography around other docks in similar environments elsewhere on the island. In addition, prevailing wind and wave climate, and difficult shallow water access, will limit the utility of a dock in this area.

In terms of the principle of a dock in this location, it would be the first of its type in this area, with the closest dock being the Villas Papagallo dock located 2,140 ft to the west of the site. A dock without the seagrass removal is preferred to any seagrass removal, however the purpose of the dock is still not compatible with the vision for Barkers National Park.

Barkers is not suitable for mass tourism and the dock is of a commercial scale, suggesting high volume activity. No planning application has been submitted for Block 8A Parcels 19 and 20. It has previously been the policy of both the DoE and the Planning Department that permission should only be granted for coastal works structures on development properties for which they can provide a service to a land-based development.

Therefore, we would recommend that any application for a dock alone be submitted concurrently with a planning application for the development of Block 8A Parcel 19 and 20, so that development in this part of Barkers can be considered holistically rather than on a piecemeal basis.

Impact to Public Access from Dock

The dock will impede public access across the beach especially public land below the Mean High Water Mark. The dock has a sloping section of 23.62 feet and the top of the beach will be 4 feet above mean sea level (**Figure 13**). The applicant's drawing CWL-01 shows the dock extending beyond the Mean High Water Mark onto shore, and that the sloping section begins at the Mean High Water Mark. Horseback riders and people walking along the beach will come across a dock extended 4 feet above sea level in their path. There will be adverse effects on public access as they will be required to change their path to continue along the beach. Additionally, kite surfing is a popular activity in this area and a dock of these dimensions represents a significant obstacle and potential hazard.

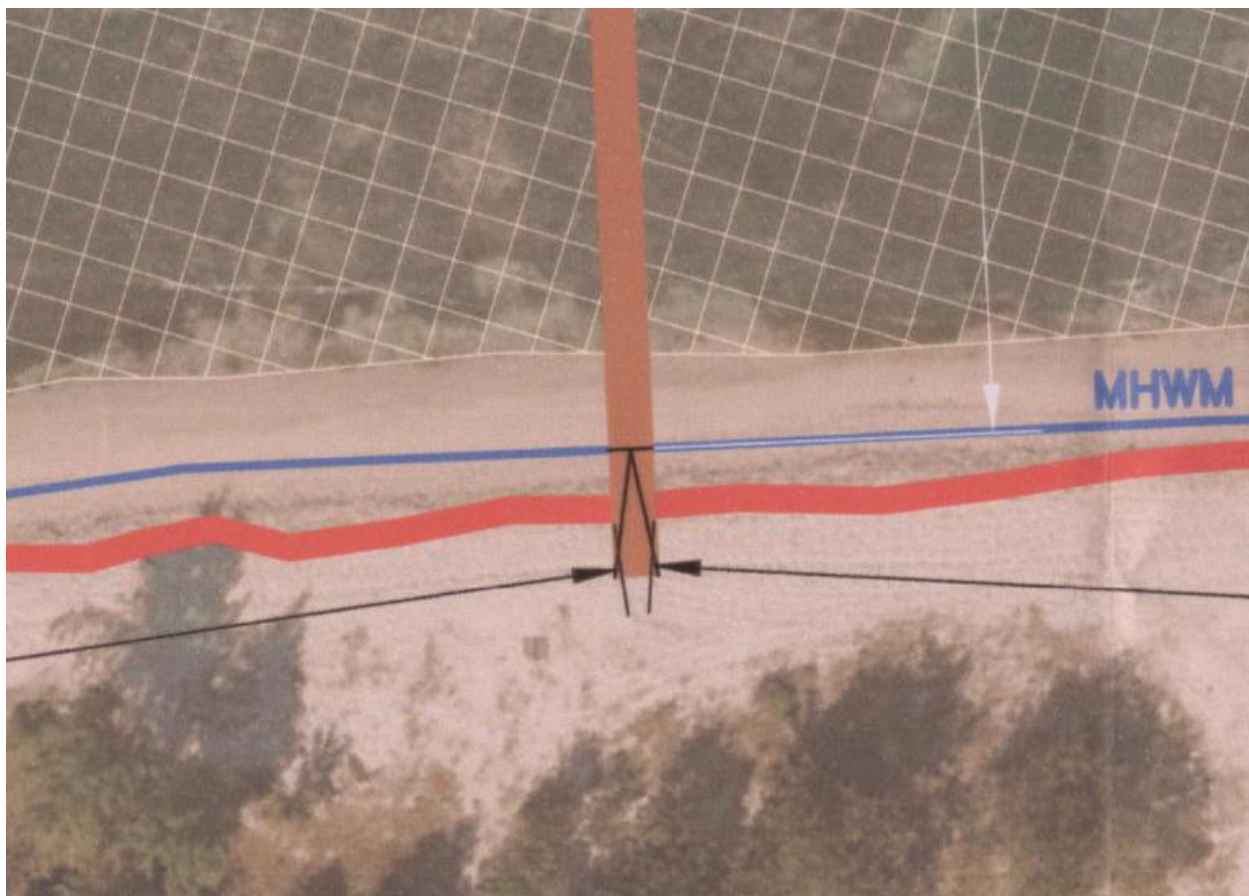


FIGURE 13: EXTENSION OF THE DOCK LANDWARD OF THE MEAN HIGH WATER MARK, PREVENTING PUBLIC ACCESS ALONG THE BEACH. THE HEIGHT OF THE DOCK IS 4 FEET ABOVE MEAN SEA LEVEL WITH A SLOPING SECTION OF 23.62 FEET DOWN TO 2 FEET ABOVE MEAN SEA LEVEL

Construction of the dock will adversely affect the ability of the public to use the beach because the top of the dock is 4 feet above Mean Sea Level seaward of the Mean High Water Mark.

Although no landside development has been presented in this application, the applicant has provided a cover letter and has made it clear in local media that his intention is to relocate his existing business at Calico Jacks to this location and it is therefore reasonable to consider that such a proposal will come forward in the future if a coastal works permit is granted by Cabinet. There are four unregistered beach access paths running through the site according to the 2017 Beach Access Report by the Lands & Survey Department, as shown on **Figure 14**.



FIGURE 14: THERE ARE FOUR UNREGISTERED BEACH ACCESS PATHS RUN THROUGH BLOCK 8A PARCEL 20 WHICH MAY BE ADVERSELY AFFECTED BY THE PROPOSED DOCK.

Construction of the dock may adversely affect the ability of the public to use the unregistered beach access paths through Block 8A Parcel 20.

Impact to Terrestrial Protected Areas

It is acknowledged that Block 8A Parcels 19 and 20 are outside of the proposed Barkers National Park boundary and outside of the existing Terrestrial Protected Areas (although the proposed seagrass removal and dock are wholly within a Marine Protected Area) as shown on **Figure 15**.

A national park was proposed in 2002 in the Barkers area in large part because of the long history of public recreational activity, including Easter camping tradition, and its use for low-impact commercial operations such as horse riding tours and kite surf training.

The park was also proposed because of the high terrestrial biodiversity value of the area. The Barkers beach ridge supports one of the last substantial coastal land forests remaining in Grand Cayman. The high sand ridge supports a diversity of tree species including Sea Grape, Ironwood, Bull Thatch, Broadleaf, Silver Thatch, Washwood and Mahogany with an understory of Cocoplum and other shrubs. A *Cerion* land snail endemic to Grand Cayman is associated with the forest, while an endemic butterfly breeds in the glasswort flats where the beach ridge transitions to mangroves.

The interior of Barkers Peninsula is wetland, supporting several distinct mangrove communities. Ponds including Sea Pond and Palmetto Pond are valuable for water birds and an endemic brackish water fish. The shallow water immediately off the south coast of the peninsula is an important shark nursery, and the mangroves release valuable nutrients into the North Sound ecosystem. A total of 100.8 acres of these important mangroves have now been protected under the National Conservation Law

The National Conservation Law requires that the natural environment in protected areas will be protected and managed according to a Management Plan to be developed under Section 10 of the Law. The protected areas cannot function in isolation, and the whole of Barkers Peninsula is important for maintaining the ecological features and aesthetics for which the protected area was nominated. The DoE has been working with a private company which owns almost the entire peninsula which is not Crown on the development of a management plan; however managing Barkers National Park is complex because it involves a variety of stakeholders, including the general public.

The proposed seagrass removal and dock could impact on the cultural significance and ecological integrity of the protected areas and act as a gateway project for development in the proposed Barkers National Park. Although there is no land-side development proposed at this time, the submission of this coastal works application implies that development is forthcoming. The applicant has provided little information on the landside amenities envisioned, and therefore it is not clear how many people will be expected to travel to Barkers Peninsula. The dock is of a commercial size and would need increased footfall and demand for watersport facilities in order to be economically justified. Barkers National Park cannot accommodate those facilities, e.g. waverunners and inexperienced boaters, without adverse effects. The concept for Barkers National Park is low-impact, non-motorised recreation in and on the water.

It is reasonable to consider that there will be some spill over onto Barkers National Park from tourists visiting this area, particularly as there will not be high quality beach amenity at the site following seagrass removal.

There will likely be adverse effects on the Terrestrial Protected Areas of Barkers due to the consequences of constructing a commercial dock and creation of a high volume tourist amenity adjacent to these areas.

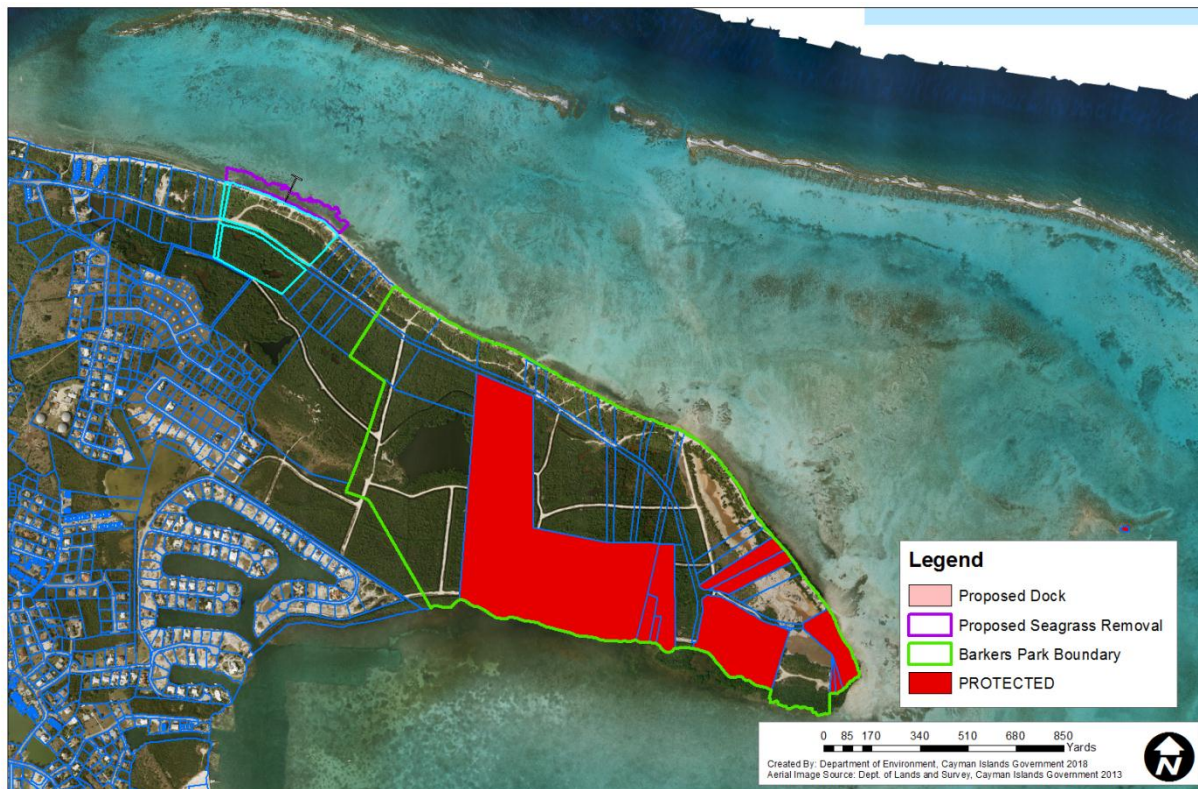


FIGURE 15: TERRESTRIAL PROTECTED AREAS WITHIN BARKERS NATIONAL PARK

Feasibility of the Proposal

The proposed seagrass removal and dock are considered by the applicant as necessary to recreate the Seven Mile Beach experience at Barkers. The DoE does not believe this is possible based on the information provided by the applicant. In addition, the proposal does not seem to be well thought out and the information provided by the applicant is very sparse in details and sometimes based on out-of-date information. Our reasons are outlined below.

The applicant has only proposed to remove the seagrass at the site; however the benthic habitat includes a very large amount of rubble and calcareous algae that is unpleasant to step on (as shown in **Figure 16**). The applicant did not provide evidence of an in-water benthic survey; our site visit confirmed that there are some areas where seagrass is absent and there is only rubble and calcareous algae. The applicant has provided CWL-02 which is labelled Habitat Map, however it is very inaccurate and should not be relied upon. It appears to use the Lands and Survey Department's 2013 bathymetric data and aerial imagery to estimate the habitats present and the survey has not been grounded to the actual present-day conditions on site. The applicant has not included for the removal of this material and therefore would either need to apply for a separate coastal works permit to remove it, or would be in breach of any issued coastal works permit should they attempt to remove this material.



FIGURE 16: CALCAREOUS ALGAE AND RUBBLE THAT WOULD NEED TO BE REMOVED TO CREATE THE DESIRED BATHING ENVIRONMENT

It will be extremely difficult to remove seagrass in the proposed footprint outline. The applicant has proposed the excavation of a very irregular shape, as shown on **Figure 17**, based on 2013 aerial imagery and out of date habitat surveys. The seagrass area has expanded since the 2013 aerial imagery, as shown in the overlain drone imagery taken on 27 November 2018 (**Figure 18**). It will be nearly impossible to stay within the boundary of the coastal works permit, because the area of the seagrass beds has changed shape.



FIGURE 17: PART OF THE PROPOSED DREDGING AREA, ILLUSTRATING THE IRREGULAR SHAPE OF DREDGING PROPOSED BY THE APPLICANT (SOURCE: APPLICANT'S DRAWING 11028/CWL-01 AND LIS 2013)

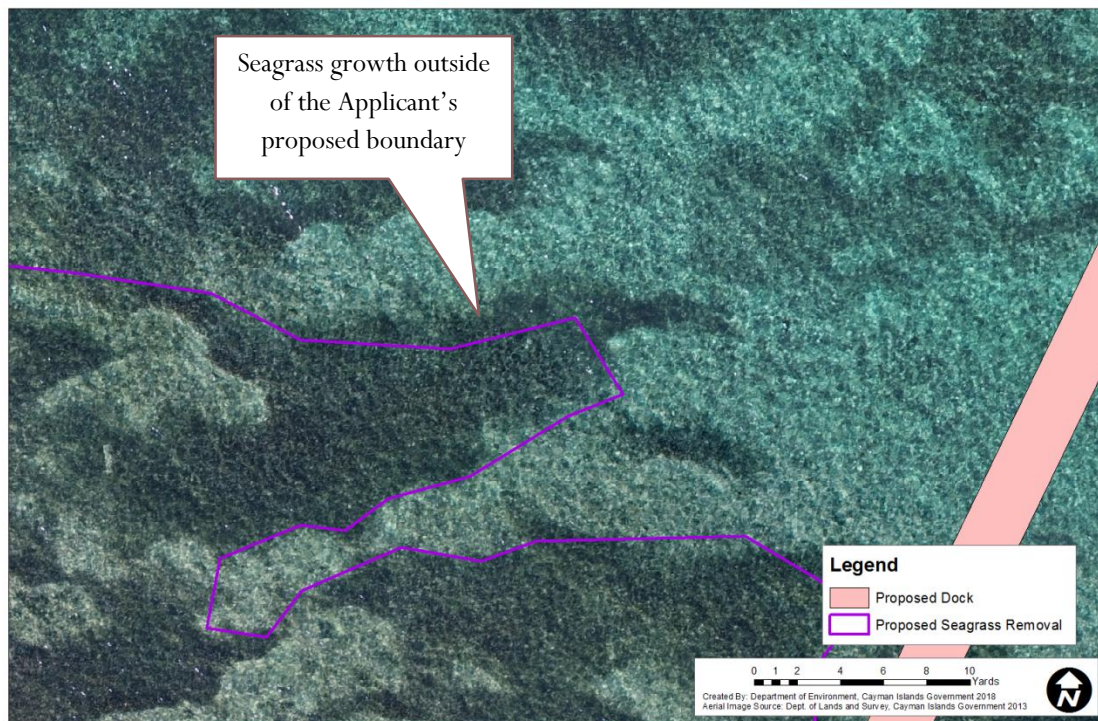


FIGURE 18: DRONE IMAGERY OF A PORTION OF THE SITE, SHOWING THAT THE SEAGRASS HAS GROWN SINCE THE 2013 AERIAL IMAGERY, AND THAT IT WILL BE EXTREMELY DIFFICULT TO DETERMINE WHERE THE DREDGING BOUNDARY IS DURING CONSTRUCTION (SOURCE: LIS, 2013)

The applicant has proposed to remove seagrass by hand or appropriate mechanical means. Seagrass is firmly rooted into the seabed, and often has roots and rhizomes of 1 to 2 feet deep. It will be extremely difficult to remove by hand, and no description of the mechanical means has been provided beyond ‘perforated buckets, screens etc.’ It is likely that the applicant has underestimated the effort required to remove the seagrass and the amount of material that will be generated. Crude estimates of volume based on 180,000 sq ft and an average 1 ft to 1.5 ft of seagrass and seabed removal equates to 7,000 to 10,000 cubic yards of material, equivalent to between 350 – 500 fully laden 20 yard dump trucks. The impact of the machinery required for the removal will be significant to the beach environment.

Figure 19 shows the profile of an area of seagrass with exposed roots and rhizomes within the site. The depth of the roots is normally much longer than the seagrass leaves.



FIGURE 19: AN AREA OF THE SITE WITH PARTIALLY EXPOSED ROOTS AND RHIZOMES SHOWING THE DEPTH AND DENSITY OF THE SEAGRASS ROOT SYSTEMS COMPARED TO THE VISIBLE SEAGRASS LEAVES

Removal of the seagrass will not create a Seven Mile Beach experience because of the direction of the prevailing winds. The prevailing wind direction is from the north-east, which means that the area will be subject to a direct onshore wind for much of the year. The wind direction means that for much of the time the site will not be suitable for swimming due to rough seas and poor water quality. When the DoE first attempted a site visit on 23 November 2018, the water was too rough and there was very limited in-water visibility meaning the visit had to be postponed until there was an appropriate weather window. If the proposed project is permitted, with no seagrass to bind the sediment together, the direction of the wind will also mean that the water quality will likely be worse. The water quality was noticeably poorer in areas of exposed sand during the in-water site visit and there were areas of silt in the site. The beach will be least enjoyable during the height of the tourism season, when Seven Mile Beach is the most crowded and north-easterly winds are most prevalent. Therefore, it will likely not act as a desirable alternative during the busiest season for tourism. **Figure 20** shows an area of sand within the site displaying poor water quality, as indicated by the lower visibility, and there is accumulation of dead seagrass which has collected on top of the sand.



FIGURE 20: AREAS OF SAND WITHIN THE SITE, WITH POORER WATER QUALITY AND ACCUMULATIONS OF DEAD SEAGRASS (SOURCE: DOE, 2018)

It will require constant maintenance to keep the area clear of seagrass as is intended in the proposal to make it similar to Seven Mile Beach. Although there will be no living seagrass within the site unless it is left to regrow, dead seagrass will drift and collect within the site area. The beach will likely erode, and require frequent nourishment with sand in order to maintain its existing profile. Additional beach maintenance including the frequent removal of storm derived rubble, sargassum and other seagrass will also be required. The applicant has not provided any detail regarding expected on-going maintenance and this has not formed part of the coastal works application.

Objections to Proposal

The DoE has been notified of approximately 117 written objections from individuals to the proposed coastal works. There has also been a hand-signed petition with 365 objections and an online petition with 2,678 objections. The objections outline a number of concerns which we have responded to below:

Barkers has historically been an undeveloped area, the development is not in keeping with the surrounding area: Objectors noted that the Barkers Peninsula has historically been an undeveloped area and that the area has a long history of public recreational activity including culturally important annual traditions such as Easter camping in the area. The DoE agrees with this and notes that the vision for Barkers National Park includes low-impact nature tourism, rather than mass tourism of cruise ship passengers. In addition, the beach at the site is zoned Public Open Space.

The site is within a Replenishment Zone, a Marine Protected Area: Objectors have noted that the site is a protected Replenishment Zone first under the Marine Conservation (Marine Parks) Regulations and now under the National Conservation Law and that this should be respected. The DoE is in agreement.

This development would set a precedent for unsustainable development: Objectors have noted that this development is likely to set a precedent for further development of Barkers Peninsula, and that this is likely a 'gateway' project. While this is outside of the DoE's remit, we support these statements and encourage the consideration of development within Barkers holistically.

There will be increased vehicular and pedestrian activity: Objectors have noted that there will be an increase in vehicle and pedestrian movements resulting from the transport of cruise ship passengers to the site. The application does not cover any land-side development on Block 8A Parcels 19 and 20, or elsewhere in Barkers. However, based on the intended purpose of the proposed dock and seagrass removal, which is to provide an alternative amenity to Seven Mile Beach, it is very likely there will be an increase in vehicular and pedestrian activity in Barkers. The track road is not suitable for a large increase in vehicles or for buses or people carriers.

There will be increased boating and marine traffic: The purpose of the dock is to provide drop off and collection of people by watercraft, and temporary mooring of recreational watercraft. Therefore, the amount of boating and marine traffic will increase, and the increase is likely to be incompatible with existing recreational activity (e.g. kitesurfing and horse riding), particularly if, for example, waverunners are operated by tourists.

There will be an increase in trash and debris: Although no land-side activities have been formally proposed, the application indicates that Calico Jacks will relocate to the site. It is unlikely that the proposed seagrass removal and dock will result in an increase in trash and debris, however as this coastal works is likely a 'foot in the door' for any land-side development, there should be consideration of trash and debris, albeit as a secondary matter. An increase in trash and debris should be fully considered when any planning application for land-side activities such as a bar has been submitted.

The site is within a fragile ecosystem: Objectors noted that the ecosystem within the Replenishment Zone and on land at the Barkers Peninsula is fragile, and that the proposed seagrass removal and dock could have knock-on consequences for the terrestrial ecosystem, culturally important fisheries, and on turtles and other marine life. This has been discussed above.

The site should be conserved for future generations: Objectors were concerned that the Barkers should be left undeveloped and conserved for future generations. Objectors noted a pattern of development (which the DoE has also observed) where after seagrass is removed, the beach will erode away and the property owner will construct retaining measures including seawalls, groynes and boulders. Planning variances will be requested for private

structures to build inside the required setback because the beach is now smaller, and this will result in the privatisation of beach. Objectors noted that Barkers is supposed to be a beach for the people and it is a mistake to allow private enterprise to compromise the beach and control the coastline.

The coastal works will increase beach erosion: Objectors noted that the proposed seagrass removal and dock could result in beach erosion, which has been discussed above. One objector provided evidence of additional cases of seagrass removal beyond those noted above (shown in **Figure 21 and 22**). The DoE has also noted erosion at these locations, however the aerial photography available from the 1970s is of a low resolution and therefore it is more difficult to see the effects at these locations in that imagery.

An objector noted, “1970s - Dredging by Pirate Cove Estates in South Sound. The massive project caused extensive beach loss that persists to that day. Removal of seabed material caused permanent beach loss of thousands of feet of shoreline in the area extending from east of Red Bay public dock to public access across from Vienna Circle. Resulted in seawall construction on three adjoining properties and the destruction of natural beach shoreline with no chance of remediation.

1970s – Winter Haven – 15D Parcel 37 – South Sound. Small scale seagrass removal for the purpose of swimming beach and dock (sound familiar?). Resulted in extensive beach erosion as sand from beach washed into sea to replace removed seagrass material. Seawall and concrete groin built to retain eroded beach still in place 40 years later.”

TURTLE GRASS REMOVAL = BEACH EROSION = SEAWALL CONSTRUCTION

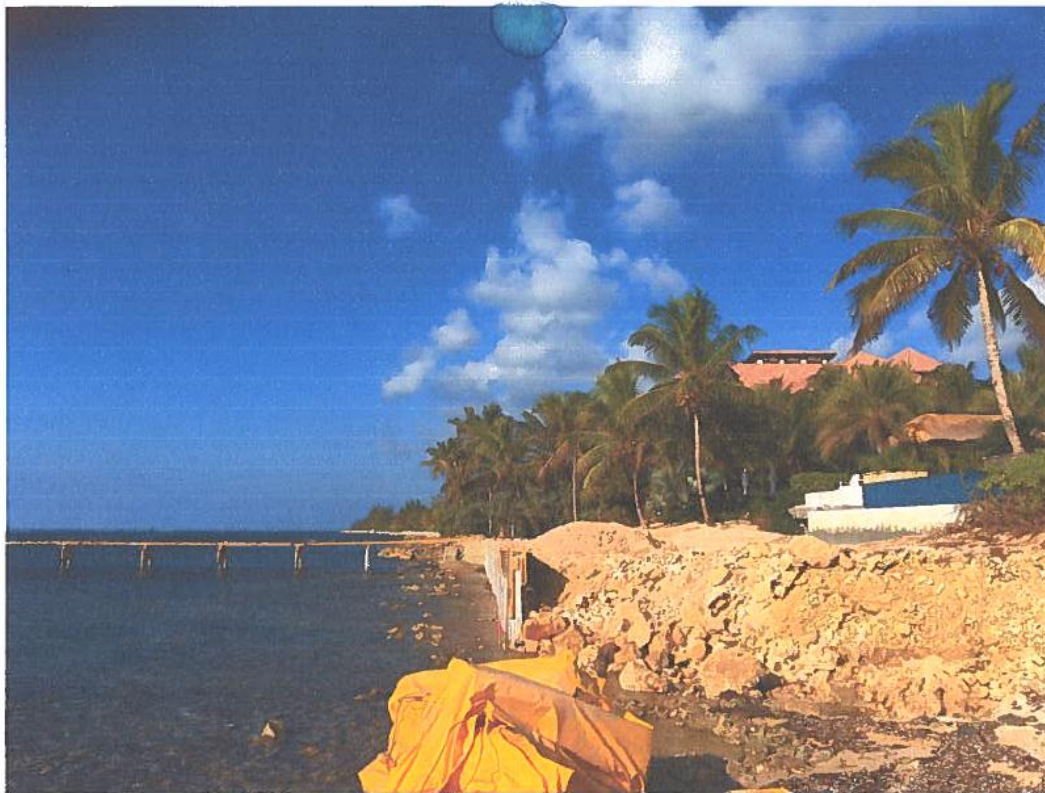


FIGURE 21: EVIDENCE OF TURTLE GRASS REMOVAL FOLLOWED BY BEACH EROSION FOLLOWED BY SEAWALL CONSTRUCTION (PHOTO PROVIDED BY ROBERT WALKER, DATE UNKNOWN)

**Small scale turtle grass removal caused beach erosion
Picture taken 2018 - the problem persists 25 years later!**



FIGURE 22: EVIDENCE OF TURTLE GRASS REMOVAL FOLLOWED BY BEACH EROSION FOLLOWED BY SEAWALL CONSTRUCTION (PHOTO PROVIDED BY ROBERT WALKER, DATE UNKNOWN)

The coastal works will reduce the ability to go fishing: Objectors noted that the proposed seagrass removal and dock could decrease the ability to fish in the Replenishment Zone.

The coastal works will reduce the ability of the public to access the beach: Objectors noted the public beach access paths identified in the 2017 Beach Access Report and believed that the proposed seagrass removal and dock will interfere with the right of the public to use public land. In addition, objectors noted that the beach erosion will impact the ability of the public to use the land and that it may result in structures such as seawalls and boulders being placed which prevent public beach access (as shown in **Figure 23**).



FIGURE 23: EVIDENCE OF SEAWALL CONSTRUCTION PREVENTING BEACH ACCESS IN AREAS WHERE BEACH EROSION FOLLOWED SEAGRASS REMOVAL (PHOTO PROVIDED BY ROBERT WALKER, 2018)

Comments & Recommendations

While we have used our expertise and best professional judgement to estimate the environmental effects of the development based on the information submitted, it should be borne in mind that we have not had access to the plans for the land-based facility, nor have we been provided with any concrete data regarding predicted level of footfall or use of the area as a result of the development.

There have been a very large number of objections and valid concerns raised by a wide cross-section of the community regarding the application, and the DoE strongly recommends that these objections are considered in full.

Section 41(3) of the National Conservation Law states:

“Every entity shall, in accordance with any guidance notes issued by the Council, consult with the Council, and take into account any views of the Council before taking any action including the grant of any permit or licence and the making of any decision or the giving or undertaking or approval that would or would likely to have an adverse effect on the environment generally or on any natural resource.”

The DoE submits the following recommendation on behalf of the National Conservation Council so that Cabinet may take it into consideration in fulfillment of this obligation.

The proposal will remove a large area of important habitat within a protected area. Additionally, the proposed works:

- will not recreate the Seven Mile Beach experience and will not provide a high-quality tourism amenity;
- will cause adverse effects to the integrity of the protected area first established in 1986 and carried forward as a protected area under the National Conservation Law (2013);
- will adversely affect the habitat of species (conch and lobster) protected under the National Conservation Law;
- will destroy live coral;
- will cause beach erosion;
- will likely affect the adjacent area during construction;
- will affect the ability of the public to traverse the beach because the top of the dock is 4 feet above Mean Sea Level seaward of the Mean High Water mark;
- will affect the ability of the public to use the unregistered beach access paths through Block 8A Parcel 20;
- may cause adverse effects on the proposed Barkers National Park due to the consequences of construction a commercial dock and creation of a high volume tourist amenity adjacent to these areas; and
- will impact a turtle nesting beach.

We also have concerns regarding the feasibility of the project, both with the creation of the amenity area and with its maintenance and do not believe that the economic benefit outweighs the environmental impact.

The DoE therefore **recommends refusal** of this Coastal Works Application.

If after considering this submission Cabinet is minded to grant permission, then the DoE strongly recommends that the applicant be required to supplement and support his application with much more detailed information and plans. These should be resubmitted to the DoE for evaluation and assessment.

Technical Review Committee

For Director of Environment

On behalf of the National Conservation Council