



May 21, 2020

Ms. Jenell Partap
Corporate Secretary
Environmental Management Authority
#8 Elizabeth Street
St. Clair, Port-of-Spain
Trinidad and Tobago
(submitted via email to CorpSec@ema.co.tt)

RE: NIDCO Toco Port Project Environmental Impact Assessment (CEC 5345/2017)

Dear Ms. Partap,

We are pleased to share with you our commentary on the NIDCO Toco Port Project Environmental Impact Assessment (CEC 5345/2017), which was made available for public viewing on the EMA's website on 14th April 2020. We would like to request additional time, if possible, to further review specific sections, in particular the Coastal Dynamics Modelling, and submit additional comments.

SpeSeas is a non-profit, non-governmental organisation promoting positive change and sustainable use of our ocean resources using science, advocacy, and outreach. Our objectives are to:

- Undertake research on coastal and marine ecosystems that informs and guides management, aids in understanding the relevant human impacts, and directs the development of innovative solutions.
- Improve stakeholders' understanding of their relationships with coastal and marine ecosystems.
- Advocate for integrated management, effective governance, and stewardship of coastal and marine ecosystems and the resources they provide to all sectors of society.

Consent is granted for sharing the opinions expressed.

Sincerely,

Dr. Diva Amon
Secretary, SpeSeas

SECTION A: GENERAL COMMENTS

The following represents an overview of our full assessment. A detailed description of our concerns is presented in Section B.

In our assessment we have found:

1. Inaccurate and inadequate descriptions of the baseline environment, which limits the quantification of impacts
2. An incomplete project description, which limits the impact assessment
3. A subjective impact assessment not supported by sufficient data
4. The application of mitigation measures which have not been demonstrated to be effective or practical, including some which are not under the control of the project proponent and have not been committed to
5. An out-dated analysis of alternatives that does not address the full range of alternatives required
6. An insufficient justification of the project that lacks evidence of the proposed benefits
7. A limited stakeholder engagement and incomplete records of public consultations
8. Impacts to the environment, which are in contravention of the Environmentally Sensitive Species Rules and not aligned with national policies or international treaties which call for the protection of biodiversity

SpeSeas recognizes that negative environmental impacts are to be expected with any development project, and that the benefits and costs must be weighed. However, in our assessment, the development and operation of the proposed project will result in significant negative impacts, including on the local, regional, and global environment, that are not commensurate with the proposed benefits. For example, the destruction of an important and unique reef system, and severe consequences to turtle populations in the Caribbean and Atlantic Ocean. In light of this, in our assessment, the development of the proposed Toco Port is not acceptable and should not move forward.

We urge the EMA to:

- Apply the precautionary principle
- Uphold Trinidad and Tobago's commitments to relevant international conventions concerning the protection of biodiversity
- Uphold Trinidad and Tobago's National Environmental Policy and Environmentally Sensitive Species Rules and designations
- Uphold its own mandate to conserve our natural resources
- Provide another opportunity for public review and comment on the EIA in the future

SECTION B: ITEMIZED COMMENTS

2. Legislative, Policy, and Institutional Framework

The EIA does not adequately address many of the existing legislative, policy, and institutional frameworks. It fails to include several international conventions relevant to the conservation of biodiversity, and also does not consider the United Nations Sustainable Development Goals. The EIA also fails to demonstrate that the core principles of Trinidad and Tobago's National Environment Policy and other local legislation (e.g., the National Wildlife Policy) were adequately considered in relation to this project. Furthermore, the requirements of the Environmentally Sensitive Species (ESS) Rules have not been adequately considered in relation to the direct impacts to sea turtles.

2.3 Legislative Framework

Pg 2-5: The Tobago House of Assembly Act should have been included given the purpose and expected socio-economic impact on Tobago.

Table 2.3-1: The Archipelagic Waters and Exclusive Zone Act should have been included given the potential for pollution and environmental harm from this activity.

Table 2.3-1: While the ESS Rules 2001 and relevant ESS Legal Notices are briefly mentioned, the EIA does not demonstrate that the requirements established by these Rules have been adequately taken into consideration. This is especially important given the potential impacts of the proposed port on sea turtles, and the lack of sufficient mitigation measures proposed to avoid these impacts (see Section 5). For example, Part III of the sea turtle notices includes prohibitions on "*(g) causing underwater noise that may negatively affect the species during its breeding periods or above-water noise that may negatively affect the species during its nesting period*" and "*(j) disturbing, destroying or any other action or habitat alteration (including beach mining, land reclamation, and alteration due to fisheries, agricultural and industrial development) that will alter or upset the integrity of the beach, habitat or surrounding ecosystems or cause undue disturbance to the plant or animal community upon which the ESS depends at any phase of its life cycle*". In our assessment, the proposed activities of the port are in direct contravention of these rules.

Table 2.3-1: The description of the Water Pollution Rules 2001 should be updated in line with the 2019 iteration.

2.4 National and Regional Policy

Pg 2-19: The EIA provides a brief overview of the National Environmental Policy (2018) and identifies the six priority areas. However, the EIA fails to demonstrate that the following core principles of the NEP were adequately considered.

- Precautionary Principle:

“The GoRTT will adhere to the principle that if there are threats of serious irreversible damage to humans or the environment, lack of full scientific certainty will not be used as a reason for postponing social and environmental safeguards. Furthermore, the GoRTT affirms:

- 1. Scientific uncertainty will not be used as a reason not to act in respect to environmental concerns;*
- 2. Action will affirmatively be taken with respect to environmental concerns;*
- 3. Those engaging in potentially damaging activities will shoulder the burden of establishing the absence of significant environmental harm;”*

Given the nature of the proposed activities outlined in the EIA, it is clear that the development proposes a threat of serious and irreversible damage to the environment. The comments outlined throughout this letter support this point. Furthermore, there is a lack of scientific certainty regarding the extent of these impacts and consequently the efficacy of proposed mitigation measures. This is highlighted by the lack of baseline information regarding the biodiversity and environmental conditions in the northeast region and, in our opinion, the EIA does not sufficiently fill the data gaps required to produce a scientifically robust assessment of impacts. Overall, the developer has not demonstrated within this EIA that the activities or mitigation measures proposed will not produce significant environmental harm. Approval of the project without this crucial information would amount to a contravention of the precautionary principle.

- Responsibility to Avoid Transboundary Harm

“The exercise of Trinidad and Tobago’s sovereign right to exploit its natural resources in accordance with its environmental and developmental policies shall not cause damage to the environment or impact human health of neighbouring States or areas beyond the limits of its national jurisdiction. As such, the GoRTT and entities operating within the boundaries of Trinidad and Tobago accept the responsibility to prevent damage to neighbouring environments.”

The EIA does not adequately assess the significant impacts the port development and operation are expected to have on marine turtles, which are a shared resource within the Caribbean region for hard-shell species, and throughout the Atlantic for Leatherback turtles. These impacts constitute transboundary harm and would be a direct violation of this policy.

- Prevention

“The concept of prevention of environmental harm, irrespective of whether there is transboundary harm, is a well-established concept for economic and ecological reasons. Often environmental ills create irreversible ecological or human health impacts, or where remedies exist the costs are prohibitive. Thus, comprehensive prior assessment of environmental harm and measures to avoid/mitigate significant environmental or human health impacts shall be utilised whenever there exists a risk of environmental damage.”

As outlined, the development proposes activities that would result in serious environmental harm. It is our opinion that this EIA does not provide a comprehensive assessment of this environmental harm nor does it provide sufficient mitigation measures against significant environmental impacts as required by this principle.

- Rights of Indigenous Peoples and Local Communities

“Indigenous peoples and local communities shall have a right to participate in the decision-making process, and share in managing the resources upon which their cultural identity and livelihoods depend.”

While consultations were held in the local community regarding the impacts of the proposed port, nowhere is it stated that the local communities had any input into the decision to build the port in the first place. The local communities were not afforded their right under this principle to participate in the decision-making process regarding whether this development should take place in their community.

- Priority 1: Protecting Environmental and Human Health through Pollution Control

- 2.01 Water Pollution

“b) vii. The water to become harmful or offensive to humans, livestock, or native animals;

c) Ensure that waters designated as protected or significant to species protected by law are maintained in a pristine state;”

The waters in Grande l’Anse Bay and the wider northeast region are heavily utilised by marine turtles which are protected by law. The proposed port is likely to cause a deterioration in the water quality in the bay and surrounding areas. This violates Priority 1 (2.01) of the NEP.

- Priority 2: Sustainably Managing Natural Assets

- “2.08 Biodiversity Management

e) Conserve representative examples of all terrestrial and marine ecosystems through their designation, and effective management of protected areas under national legislation;

2.09 Coastal and Marine Area Management

a) *Conserve representative examples of all coastal and marine ecosystems by including them in a system of protected areas;*

The reefs at Grande l'Anse Bay and along the north coast of Trinidad are unique and as such should be protected in accordance with this policy.

Pg 2-19: The EIA does not consider the National Wildlife Policy (2013) which is directly relevant to the proposed development given the projected impacts on wildlife. One of the main policy objectives outlined in the National Wildlife Policy (2013) is *"To protect nationally and globally critically endangered, endangered, vulnerable, and/or near threatened wildlife populations"* (Section 7). To achieve this objective, the Policy proposes to make every effort to *"not only protect species that are critically endangered, endangered, vulnerable, or near threatened nationally, but species that are also globally significant"* (Section 8.1). This highlights the significant priority the National Wildlife Policy places on the protection and conservation of species such as marine turtles, which will be negatively impacted by the proposed activities, and as such, more consideration should be given to this policy.

Pg 2-20: The year of enactment for the National Protected Areas Policy (Section 2.4.1.5) should be included.

Table 2.6-1: This table lists relevant International Conventions and Treaties, but fails to list the following which are relevant given the potential for significant negative impact to biodiversity including sea turtles. The following should be included:

- Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere.
Its objective is to preserve all species and genera of native American fauna and flora from extinction, and also preserve areas of wild and human value. Five sea-turtle species are listed.
- Cartagena Convention, Protocol Concerning Specially Protected Areas and Wildlife (SPA/W).
Each Party *"shall ensure total protection and recovery to the species of fauna listed in Annex II"* (which includes all sea-turtles species recorded in Trinidad and Tobago).
- Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention).

Endangered species, listed in Appendix I, (including all Caribbean sea-turtle species) are accorded full protection. Range States of Appendix I species are to endeavour to conserve their habitat, to counteract factors impeding their migration, and to control other factors that might endanger them.

The construction and operation of a port at the proposed location presents significant impacts to sea turtles, especially the globally important breeding population of

leatherbacks (as outlined elsewhere in our comments). In our opinion pursuing the proposed port at this location contradicts our commitments to these conventions.

Finally, there is no mention of the United Nations Sustainable Development Goals (SDG), which are implemented through institutional frameworks as part of the Vision 2030: The National Development Strategy of Trinidad and Tobago 2016 - 2030. Theme V - Placing the Environment at the Centre of Social and Economic Development medium-term goal #5 states: "*Biodiversity and ecosystem services are incorporated into all areas of national development.*" The development of the Toco Port will degrade the biodiversity and ecosystem services in the area, which contradicts many of the targets set out in Theme V of the SDG 14 Life Below Water:

- By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution.
- By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans.
- By 2030, increase the economic benefits to Small Island developing States and least developed countries from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism.

3. Project Description

- A. The EIA fails to adequately describe and assess the impacts of all activities related to the port during the operational phase. All potential activities and the impacts to the environment need to be included. The following operational activities require additional information:
 - The activities associated with the four additional berths provided
 - The boat repair shop/dry dock facility
 - Maintenance dredging
 - Processing of fish and disposal of waste
 - Potential for use of the port by cruise ships or vessels related to the oil/gas industry
- B. The EIA does not adequately carry out an independent analysis of alternatives. Instead the EIA relies on two outdated non peer-reviewed reports (>30 years ago) for the justification of site suitability and feasibility (IMA 1988, Sea Bridge Report 1990). It must also be highlighted that the IMA report is a rapid-assessment report, carried out with a two-week deadline and a disclaimer that further in-depth investigation was needed. Furthermore, the Toco Bay was not recommended as the preferred site by the IMA (1988), as each of the three sites had advantages and disadvantages.
- C. The project justification presented is rather a list of objectives of the proposed project. No evidence is presented to justify the need for or benefits of the project. Supporting studies should be completed to provide evidence that the proposed port will lead to the anticipated benefits.
- D. As indicated in the TOR, "*the purpose and need for the project should be clearly described*" (Annex 3A, Section 1.1, Pg 13 of 55). This has not been adequately addressed. The justification for the project is inadequately made on Pg 3-1 of the EIA based on four brief objectives of the port. The EIA of a project of this magnitude and environmental and social impact should present results of detailed studies to demonstrate that the objectives are

valuable and meaningful to the country, and achievable with the proposed project design. This should include economic studies to demonstrate the viability and benefits of the port.

3.1 Project Overview

This section identifies the key accommodations as an inter-island high-speed ferry terminal facility, a Coast Guard facility, a marina, a fishing facility, and boat repair workshop. However, Sections 3.1.1 and 3.5.7 mention berthing capacity for two additional 100m vessels and two additional vessels in the range of 50-75m length. It is unclear why these additional berths are necessary and what type of vessels and/or shipping activity these berths are meant to support. We note that Pg 5-20 has mention of cruise ships, and Attachments 2 and 3 of the CEC application have depictions of boats labelled “*cargo/oil/gas workboats*”. We request additional information on the purpose of the additional berths and the types of vessels and/or activity they are meant to support.

Detailed information of the boating repair workshop is severely lacking. As the function of the repair workshop can range from simple boat services to overhauls, painting, sanding, and antifouling for various vessel sizes, we request additional information on the types and sizes of vessels to be serviced as well as the disposal of boat repair wastes and mitigation of impacts.

Additionally, during the second stakeholder consultation (12th December 2019 - Toco Community Centre), there was mention of dry dock facility for vessels. Is this still the case as there is no mention of a dry dock facility presented in the project overview? Considering the potential impact of dry docks and the level of associated pollution that could affect the water quality and marine life, details of this activity should be provided. Furthermore, there should be careful examination of the potential environmental impacts and mitigation measures presented based on the proposed size of the workshop and/or dry dock facility.

3.3. Physical Constraints Influencing Toco Bay

Pg 3-9: The statement that “*The reef is very sparsely populated with corals and is effectively devoid of resident marine life*” is false and contradicts later descriptions of the unique marine biodiversity supported in the area. We request that this statement be removed.

3.5 Facilities, Operation, and Maintenance

Pg 3-25: “*Water will similarly be supplied through a tie-in to the WASA water distribution system of Toco.*” The feasibility of introducing this additional high demand on the existing water-distribution system has not been adequately addressed.

Pg 3-25: No detailed design/manufacture specifications or sample data from a comparable facility were provided to demonstrate that this facility would be capable of meeting the requirements of the Water Pollution Rules 2019.

Pg 3-25: It is not clear who would be responsible for the long-term operation and maintenance of this wastewater facility, i.e. will WASA be required to adopt this facility at any point?

3.10 Project Alternatives

Section 5 of Annex 3A of the TOR calls for “a discussion of all possible alternatives that were considered”. This section presents a discussion of two alternative locations (Grande Riviere and Balandra) compared with Toco Bay, based on studies conducted in 1988 and 1990. This is not an appropriate evaluation as these feasibility studies were conducted over 30 years ago without access to the data and information now available for these areas. Furthermore, it should be noted that these two locations are not viable or realistic alternative locations. More recent surveys should have been carried out on a broader scale to determine the suitability of ports in the bays along the north and east coast and analysis of alternatives. Additionally, discussing alternative locations for the site of the port is not sufficient for a true analysis of alternatives, as outlined in Annex 3A Section 5 of the TOR. Other possible alternatives should be captured including the ‘no action’ alternative, the consideration of other designs, and process alternatives. These alternatives should be discussed in sufficient detail to clarify the choices made and should include a comparison of adverse and beneficial effects of each alternative under consideration.

Pg 3-35: This section incorrectly states that Balandra “was closest to Salybia Reef, the only natural reef of Trinidad” and “Toco Bay is situated further from Salybia Reef than Balandra Bay, making it a more ideal location for protection of the reef...”. Salybia Reef is in fact located on the north coast, closer to Toco Bay than Balandra Bay, and it is not the only natural reef in Trinidad.

Pg 3-29-38: The statement that Toco was selected as the most suitable option “for economic development... least current recreational value... and least potentially disruptive to the surrounding environment” based on IMA (1988) is misleading. IMA (1988) did not conclude that Toco was not the most suitable of the three sites, and instead showcased positives and negatives for each site with no outright preference. Toco was not preferred for any criteria, whereas Grande Riviere was selected as the best option for a multipurpose port, while Balandra Bay was preferred for fisheries development. Please see excerpts below from the executive summary of the IMA report.

“Of the three locations, Grande Riviere offers the best option, in that it provides the best natural anchorage, offers the largest area with potential for harbour space, and would be least costly to develop as a port. Its major constraint relates to extremely poor access by road, unreliable public utilities and a very small resident manpower base. In addition, it is furthest away from the major fishing grounds off the east coast.

Toco Bay on the other hand though less remote, more populated, nearest to Tobago, and with somewhat better road access, offers the worst option for port development with respect to the cost factor. It offers the smallest area for harbour space, and requires the greatest amount of breakwater construction and land reclamation.

Balandra Bay, though not possessing as excellent natural features for port development as Grande Riviere, would require marginally greater expenditure for port development than the latter location, though the cost difference increases as the size of the facility increases. Balandra does, however, possess several key elements in its favour, in that it is serviced by a much better road than the other areas, is in much closer proximity to the major urban centres, and is in closest proximity to, and more centrally located to service the fishing grounds off the east coast. A major constraint at Balandra Bay would be a sedimentation problem, but proper surveys to identify sediment dynamics and transport in the area, could provide data which would facilitate efficient and effective dredging schedules. Location of the port would in the end be determined by political and economic considerations. However, it would seem logical to locate the port at Balandra if its prime focus would be on fishery development off the east coast. On the other hand, if what is desired is a multi-purpose port, also acting as a port of call for the ferries currently servicing Tobago, then Grande Riviere would appear to be the best option.”

All three sites had downfalls with respect to the location, establishment, and economics of building a multipurpose port. Even though Toco may require less dredging compared to the other sites, it also mentions the following:

“As a result of the absence of data, it is difficult to assess whether dredging would be required for the harbour facility. However, should dredging be necessary, the veneer in the bay would be very thin owing to the lack of offshore transportation, and blasting into bedrock may be required. Dredging activities will also be hampered by the existence of the submarine cable.”

4. Physical, Environmental, and Social Baseline

- A. The EIA fails to comprehensively describe the marine ecology within the bay and wider areas, limiting the quantification of impacts:
- The marine benthic ecological assessment was limited to shallow areas (<5 m) and insufficiently describes the affected baseline environment, which includes the deeper sections of the bay and the communities supported.
 - The available literature on sea-turtle habitat use has not been explored, therefore the presence of critical reproductive habitat for leatherbacks offshore Grande l’Anse Bay and the surrounding coastlines has not been acknowledged nor informed the impact assessment.
 - The fish assemblage present in Grande l’Anse Bay is inadequately described in terms of composition and abundance. This undermines the accuracy of the impact assessment. The possible nursery function of the area was not assessed. The loss of this nursery habitat may negatively affect the population of commercial fish stocks in the area resulting in reduced fish landings.

- B. Social baseline information was not always based on facts (demographic information), sometimes including broad opinions. The current perceptions on the socioeconomic status of Toco and future possibilities to improve this should instead be collated from a wide range of stakeholders e.g., residents, business owners, NGOs, farmers, to be assessed in the form of standardised surveys and presented in a different section.
- C. The stakeholder engagement, while meeting the minimum requirements of the TOR, fell short of identifying and engaging with key stakeholders who will be directly impacted by the proposed port including, but not limited to, ferry passengers, recreational sailors, tourists who engage in activities in the northeast region of Trinidad.
- D. Focus group meetings or some other tool should have been used to directly engage with these stakeholders.
- E. While the stakeholders most directly impacted by the development reside in Toco, and it is therefore appropriate to host meetings within the community, considering the scale and nature of this proposed project, it is of national concern and therefore additional public consultation meetings should have been held at a variety of locations to ensure that all stakeholders had sufficient opportunity to participate. At a minimum, public consultations should have been held in Tobago and Port of Spain.
- F. Important records of stakeholder engagement are missing (verbatim transcripts from the public meetings as required under the TOR). We are unable to critically evaluate the merits of the feedback received from the public and representative stakeholder groups, which is a serious impediment to the transparency of this EIA process.

4.1 Social and Economic Baseline

Pg 4-30: The Tourism Section fails to mention the considerable eco-tourism industry in Trinidad, including in the northeast region of Trinidad.

Pg 4-31: The inter-island ferry is described as “*the main connection between the two islands*” but this statement fails to recognise the equally-important significance of the domestic air bridge between Piarco, Trinidad and Crown Point, Tobago via Caribbean Airlines.

Pg 4-61: CSO data are presented from 2011, but in the same section, reference is made to an increased population size in 2016 from an uncited CSO report, and a 0.3% population growth rate in 2017 (World Bank 2018). References are also made to CSO 2017 (Tourism Section) and CSO 2018 (Figure 4.1.1.4-5, 4-6, 4-7 and 4-8). Please update these data accordingly.

Pg 4-62-66: The most recent CSO data should have been used to describe race, religion, and ethnicity.

- Pg 4-66: “The town centre of Sangre Grande has been targeted for economic growth, which some residents of the Toco area say has led to funnelling of resources away from their communities (ERM Personal Communication 18, 2019).” This reference is from a focus group of women from Toco that has been cited on multiple occasions throughout the document. The overview of the economy of this area should not be drawn from the opinions of a single focus group, rather it should be based on fact. In the absence of standard data, experts in the field of economic growth should be consulted or more informative data sought including via survey of across multiple groups.
- Pg 4-66: The statements describing the economic decline and related issues in the Sangre Grande region lack references. Are these opinions formed based on the information provided in the country’s history in the previous section (Pg 4-4-56)? The facts that are indicators of economic status, such as the unemployment rate, the rate of secondary school qualification and the breakdown of the job opportunities and income for the area, and migration of persons out of the community to work elsewhere, should be stated.
- Pg 4-68: The northeast coast of Trinidad is utilized by artisanal fishers from Toco and several other landing sites (e.g., those mentioned on Pg 4-67). In addition to artisanal fishers, the northeast coast is exploited by Trinidad’s oceanic longline fleet and a multigear industrial fleet. When assessing impacts, the areas fished by all vessels should be included in Figure 4.1.2.4-3, including those operating further offshore, in order to get the full picture of users of the area and to accurately assess possible impacts.
- Pg 4-69: Figure 4.1.2.4-3 is adapted from the Fisheries Division (2014). Is this the most up-to-date source of information?
- Pg 4-72-75: Some detail is given about the tourism industry in the region, but it appears that only the views of the tourism operators were elicited. More research on the tourists who engage in activities in northeast Trinidad should be undertaken to understand their reasons for visiting the area and to gather their opinions on the proposed port development. This will shed light on how the port development might impact tourism in the region.
- Pg 4-103-108: Thirty-nine ecosystem services that contribute to the economic prosperity and wellbeing of the wider (Sangre Grande) and narrower (Toco) regions were recognised. It is unclear however, how the ecosystem services presented were identified. Nevertheless, most are treated superficially. For the baseline of ecosystem services to be meaningful and a reference to mitigate impacts, some spatial quantification or valuation is necessary, as best as is practicable. For example, although not presented as ecosystem services, provisioning services related to agriculture, forestry, fishing, mining (Pgs 4-16-21, 4-67 to 4-69, 4-75-80), and tourism (Pg 4-72-75) are acknowledged, and broad values are presented for crop and fisheries production. If data are absent for other services, this should be recognised as a shortcoming of the EIA and reflected in the Impacts Assessment (Section 5), Environmental and Social Monitoring Plan (Section 6), and

Impact Summary (Section 7). See Ghermandi et al. (2018) for broad reference values, however due diligence should be exercised in the interpretation.

Pg 4-111: Cultural heritage is also an ecosystem service and should be included.

Pg 4-134: CSO data for Tobago is missing from Table 4.1.1.2-1.

4.2 Environmental Baseline

Pg 4-139-140: The following references are missing: Hyacinth-Ash (2011), Singh (1997), Taylor (2007), Kerr (2012), McSweeney (2010), and Royal Haskoning (2010).

Pg 4-153: Air-quality monitoring was carried out between June and October 2019. This is not a sufficient time frame to capture the natural variation of winds and combined seasonal impacts of Sahara dust. Data should be included that shows inter-annual and intra-annual trends.

Pg 4-179: The following references are missing: Water Resources Agency National Report (2001) and Environmental Services Limited (2019).

Pg 4-185: The EIA shows a narrow snapshot (1 week) of water levels. The inter-annual and intra-annual variation should be included.

Pg 4-186: What time frame has the average current speed reported been based on?

Pg 4-199: While the wave heights as a result of tropical storms and hurricanes passing within 300, 400, 500 km of the site show no significant difference and therefore impacts, tropical storms and hurricanes have passed ~50 km away (Hurricane Flora, Figure 4.2.1.4-22) and deserve a separate assessment. Also, four tropical storms and hurricanes have passed within 100 km of Toco in the last 20 years (NOAA National Hurricane Centre), prescribing that the impact of storms 200 km, 100 km or 50 km from the development should be included.

Pg 4-223: ERM's floodplain modeling – Does the model consider the cumulative impacts of tides (extreme high and low and storm surge?). It would be useful to understand this, given the predicted scenario of sea-level rise to get the upper potential limit for flooding in the area.

4.3 Biological Assessment

Pg 4-230-275: Sampling has been limited to the footprint of the port. This is inadequate as the impacts from the development of this Port will extend along the north coast to the west and east, as well as out to sea. It does not acknowledge the movement of vessels in and out the area and animals such as sea turtles and fishes that move throughout the wider area. The study area should be defined in similar detail to the terrestrial environment and should encompass all areas that may be impacted by proposed activities.

Pg 4-233: The marine-ecology survey methodologies used in the EIA are insufficient to describe the benthic communities as they do not comprehensively explore the full depth range of the bay and surrounding areas that may be impacted by the development. The transect surveys (6 x 100 m) deployed from the coast perpendicular to the shoreline with a recording interval of 20 m and a 0.5 m² quadrat area provided a mere 15 m² of quantitative data out of a potential port footprint area of 3320,000 m². The drop-camera sampling size was too small to capture the patchy distribution of hard-bottom communities that occur. The EIA undertaken was similar to previous studies carried out in the area that focused on the intertidal zone and shallow margins of the surf zone. This should be broadened to include all areas of the bay and surrounding areas.

Pg 4-235 While the Sea Bridge Team (1990) did not carry out any benthic-ecology surveys directly, it references IMA (1988): "*The Sea Bridge Team (1990) report did not perform a study of the marine environment of Grande l'Anse Bay, but instead utilized a previously performed study (IMA 1988) as support for their conclusion that Grande L'Anse Bay does not possess critical marine habitat.*" This statement is a misrepresentation of what was stated in IMA (1988) regarding the presence of critical habitat. IMA (1988) states: "*Toco Bay cannot be said to possess a critical habitat. However, the rocks scattered throughout the eastern section of the bay are the substrate on which a number of coral and octocoral communities have developed. The coral and octocoral communities have a recreational and educational potential.*" Furthermore, IMA (1988) is outdated as coral reefs serve more than recreational and educational purposes. Coral reefs are one of the most critically important marine ecosystems, housing significant biodiversity and serving crucial ecological functions and services that support livelihoods. This should be reflected in the EIA.

Pg 4-239: In Table 4.3.2.5-1, the listed Blue spotted angelfish (*Chaetodontoplus caeruleopunctatus*) is indigenous to the Western Pacific Ocean. Was this identification correct? Please provide evidence of this.

Pg 4-242 The EIA comments on the absence of IUCN endangered species (*Montastrea annularis* and *Montastrea faveolata*, which are important reef builders) in previous literature (Belford et al., 2019). However, most of the previous biodiversity surveys were only carried out along the reef flat and intertidal zones where *Montastrea* species do not naturally occur (*M. annularis* more commonly occurs between 8-20 m). Furthermore, IMA (1988) does mention the presence of *M. annularis* at 8 m. The EIA should include this and broader and deeper (to a minimum 20 m depth) exploration of the bay and eastern rocky margins should be undertaken.

Pg 4-244: Table 4.3.3.1-1 lists the Blacktip Reef Shark (*Carcharhinus melanopterus*) which is indigenous to the Indian and Pacific Oceans only. Was this identification correct? Please provide evidence of this.

- Pg 4-251: It should be made clear that the species diversity and evenness included represent only the benthic habitat in that shallows (<3 m depth) of the bay.
- Pg 4-252-256: Due to the absence of adequate ichthyofauna sampling, this section does not describe the species abundance or composition of fish assemblages in the area. No fish surveys were conducted due to environmental challenges. Attempts to draw conclusions from the sparse literature was inadequate. The possible function of the study site as a fish nursery area was not examined. We recommend thorough ichthyoplankton sampling be undertaken.
- Pg 4-252: The study area is a very specialized reef environment not found elsewhere in Trinidad. One would expect the fish composition to be different from the other habitat types around Trinidad e.g., the muddy substrate found in the Gulf of Paria or the rocky substrate along parts of the east coast. The assumption that the diversity and composition of the fish assemblage at Grande l'Anse Bay would be similar to Trinidad as a whole is erroneous, thus the paragraphs on Sciaenidae, Serranidae, and Gobiidae do not provide an accurate description of fish assemblages in Grande l'Anse Bay. We recommend more thorough surveys be undertaken.
- Pg 4-252: *“Based on the fish species observed during the ERM marine baseline study performed in April and September 2019, gobies are most likely the most abundant family in the Grande l'Anse Bay”*. While gobies are often quite common in reef environments, nothing in the work presented here or the peer-reviewed literature suggests that this is the case for this study area. The results of this study (Pg 4-255) state that 13 species were observed in the dry season and two in the wet season. Apart from illustrating that the fish assemblage is more indicative of a reef assemblage as opposed to a 'Trinidad' assemblage, the data is insufficient to make the broad conclusive statements that have been included here.
- Pg 4-254: *“However, of those listed as vulnerable, endangered or critically endangered, none were observed in field efforts in Grande l'Anse Bay in April or September”*. Fish surveys were not conducted and as many of these species are not benthic, it is unlikely they would have been observed during benthic surveys. Additionally, due to issues with visibility during the benthic surveys, it is clear that there is little knowledge of what fish species inhabit the area and therefore which may be most impacted by this development.
- Pg 4-255: *“Because of the limited number of fish observations, with only one individual observed per species, these results should be treated with caution”*. This again points to the inadequate survey of the ichthyofauna. We recommend more thorough surveys be undertaken so that the full scale of potential impacts can be understood.

Pg 4-255: “Other small fish were observed in the water, but were unable to be observed due to poor visibility”. Very often, hard-bottom substrates and inshore coral reefs serve as a nursery area for fish, especially commercially-exploited species. This ecosystem service is mentioned on Pg 4-106. No attempt was made to investigate this possible function of the area.

Pg 4-256-264: The section on sea turtles fails to make use of important and relevant literature and overall presents an inaccurate assessment of sea turtles around Trinidad and Tobago and in the vicinity of Grande l’Anse Bay in particular. Some recommended literature that should be referenced includes Eckert, 2006; Eckert and Eckert, 2019; Northwest Atlantic Leatherback Working Group, 2018; Northwest Atlantic Leatherback Working Group, 2019.

Additionally, the Environmentally Sensitive Species (Leatherback Turtle) Notice, 2014 (Part III) prohibits activities which involve:

- the use of any device or substance that may harm, stun or impact negatively on the ESS. The negative impacts would be, but not limited to, those that would impair the sight, hearing, ability to swim or move of the ESS or its ability to detect prey and predators or affect its habitat or nesting ground;
- the dumping, littering or polluting, including the discharging or depositing of any substances that are injurious to the ESS;
- cause underwater noise that may negatively affect the species during its breeding periods or above-water noise that may negatively affect the species during its nesting period;
- the disturbance of the ESS at any time. In this case, the Rules define “disturbance” as any act that would affect the animal (whether on land or in the sea) or its habitat;
- the disturbing, destroying or any other action or habitat alteration that will alter or upset the integrity of the beach, habitat or surrounding ecosystems or cause undue disturbance to the plant or animal community upon which the ESS depends at any phase of its life cycle.

The comments outlined above and below demonstrate that the EIA does not consider the impact of the activities on the movement of the ESS, its sensory abilities, its habitat, its sensitivity to noise during breeding and nesting periods, and the impact to surrounding ecosystems or to the disturbance to plants or animal communities upon which the ESS depends. It therefore does not propose any mitigation measures that respond to these impacts.

Pg 4-256-257: The section on leatherback turtles fails to emphasize the significant size of the Trinidad nesting population, its regional and global importance, and its conservation status. The leatherback turtle is an IUCN vulnerable species undergoing local, regional, and global population declines. Trinidad and Tobago hosts major nesting beaches of the Northwest Atlantic (NWA) leatherback subpopulation or regional management unit. In 2018, the Northwest Atlantic Leatherback Working Group reported that regional trends in annual nest counts have declined significantly at site-level and regional scales, during

long-term (1990-2017) and recent (2008-2017) time periods (Northwest Atlantic Leatherback Working Group, 2018). Based on this assessment, the most recent IUCN status for this subpopulation is Endangered (Northwest Atlantic Leatherback Working Group, 2019).

Pg 4-256-257: Leatherback turtles contribute to the significant economic growth experienced by communities in northeast Trinidad. This should be discussed further.

Pg 4-256-257: Of perhaps greatest importance to the assessment of impacts of the port on sea turtles is an understanding of the inter-nesting habitat for leatherback turtles, which is described by Eckert (2006) based on satellite tracking data from nesting leatherbacks from Matura and Grande Riviere beaches. The nesting leatherback turtles were found to range throughout the waters surrounding Trinidad and Tobago, but particularly frequent the area close to shore around northeast Trinidad, spending much of their time directly off the nesting beaches and up to 30 km offshore. Primary inter-nesting usage areas extended from nesting beaches toward Galera Point, an (exceptionally) important residence area (Eckert 2006). Grande l'Anse Bay falls within the epicentre of this activity, with leatherbacks expected to be found in high densities within this area during the nesting season, given the large numbers of leatherback turtles nesting in the northeast region of Trinidad. The EIA failed to mention this important data. The high density of leatherbacks in this area offshore Grande l'Anse Bay must be considered when evaluating the impacts of the port, especially the likelihood of vessel strikes as a result of increased vessel traffic. The abundance of turtles in the region is also supported by the comments from fisherfolk who mentioned the high levels of bycatch in the engagement meetings for the EIA.

Pg 4-256-257: The section on leatherback turtles gives size data for males and females, implying that males grow larger than females. It should be noted that this is a false impression based on the single record of the largest leatherback which happens to be male. It is generally accepted that "*there is no apparent sexual size dimorphism in adult leatherbacks*" (James et al. 2005; Eckert et al. 2012).

Pg 4-256: The paragraph discussing the interaction between leatherback nesting and nesting by hard-shell species of turtle is not relevant and is misleading. Impacts to hard-shell nests as a result of leatherback nesting have only been reported from Grande Riviere, which is a unique case due to the high-density nesting of leatherbacks there. Leatherbacks and the hard-shell species (especially hawksbills, which are most common after leatherbacks on our nesting beaches), normally utilize different zones of the beach and the peak hawksbill nesting is later in the year than peak leatherback nesting activity. This paragraph goes on to suggest that there is a need for a relocation or protection program for the nests of other turtle species, and while this may be the opinion of Turtle Village Trust, relocation of nests are only recommended in extreme situations and the need has not been demonstrated in Trinidad.

Pg 4-257: "...while Grande Riviere is a popular destination to witness leatherback nesting, Las Cuevas... yields the densest leatherback nesting". What is the source of this information? This statement contradicts the most recent leatherback-turtle monitoring records and serves to downplay the importance of Grande Riviere as a critical nesting habitat. As such, it should be removed. Grande Riviere is widely recognised as the highest-density nesting beach for leatherbacks locally, and arguably experiences higher-density nesting by leatherbacks than anywhere else in the world (<http://www.widecast.org/who-we-are/widecast-ccs/trinidad-tobago/>). Eckert and Eckert (2019) estimate >1000 leatherback crawls per year at Grande Riviere and only 100-500 at Las Cuevas. Furthermore, Las Cuevas is a long beach where nesting is widely distributed, compared with the smaller 700 m long beach at Grande Riviere where many more nests are concentrated.

Pg 4-257: Mention is made of the impact of *Sargassum* on leatherback nesting, but this statement is made as if this occurs on all nesting beaches, whereas this has only been a documented problem on the east-coast nesting beaches. Grande Riviere, Las Cuevas, and other beaches on the north coast including Mission Beach adjacent to the proposed port, are usually spared from *Sargassum*, and may in fact serve as a safe haven for nesting during times when the east coast beaches are impacted.

Pg 4-257-258: While olive ridley turtles are certainly considered rare locally, it is important to take a precautionary approach and consider that they may be present. There have also been more recent anecdotal sightings of this species on beaches in Tobago and offshore Tobago and the east coast of Trinidad.

Pg 4-258-259: "From 2013-2016, there were no green sea turtle nesting events recorded in Trinidad." Please provide the source for this nesting data. To our knowledge, green turtles are regularly recorded at Grande Riviere and Matura beaches, albeit generally in small numbers, and at Grande Riviere, green turtles have been part of a nest relocation project since at least 2015.

Pg 4-258-259: The conclusion that green turtles utilize the coastal habitats of Trinidad for foraging and mating while nesting in other areas of the insular Caribbean is incorrect. There is evidence for all sea-turtle species that mating occurs directly offshore nesting beaches, so if mating occurs here, nesting does also. The lack of data on green-turtle nesting locally does not confirm their absence. In the absence of data, the precautionary approach should be applied.

Pg 4-259: It is suggested that loggerheads "*primarily live in the open ocean until they are ready to reproduce*". This is false. Loggerhead turtles, like green turtles and hawksbill turtles, spend their first years in the open ocean before exhibiting a shift to shallow coastal/nearshore habitat as juveniles, years before reaching maturity. While loggerheads have been considered the most rare species locally, in recent years, evidence of their presence offshore around both islands has been increasing. In 2017, a sub-adult washed ashore on the east coast of Trinidad and was fitted with a satellite tag upon release after

rehabilitation. The track is available online at: <http://turtlevillagetrust.org/map.htm>. The track shows that this turtle traversed the east coast, north coast, and the Gulf of Paria, and stayed relatively close to shore around northeast Trinidad. This emphasizes how little we know about loggerhead-turtle habitat use around Trinidad and Tobago, and again the need for the precautionary approach in the absence of data. We can also confirm other recent sightings of loggerheads offshore Tobago, on the east and south coasts of Trinidad, and in Chaguaramas (northwest peninsula of Trinidad).

Pg 4-260: The section on hawksbill turtles fails to discuss the potential for their foraging offshore in the study area. While they may not have been documented during the offshore surveys, hawksbill turtles are expected to be coincident with suitable habitat which includes the type of reef habitat and rocky habitat in and around Grande l'Anse Bay. Furthermore, a hawksbill individual has been satellite tracked from Barbados following nesting to Toco in 1998 and 2002 by the Barbados Sea Turtle Project (unpublished data, Julia Horrocks). This provides strong evidence that the area is the foraging ground of at least this adult female, and it follows that this is likely the case for other individuals. The precautionary approach should be applied and the presence of hawksbills in the impact zone of the proposed port activity should be assumed.

Pg 4-260-261: This section identifies Mission Beach as a known sea-turtle nesting beach but downplays its proximity to the proposed port. It is 400-500 metres to the west of the proposed Toco Port but given the orientations of the bay and the proposed port, the proposed port and associated vessel traffic will undoubtedly affect the movement of sea turtles to and from the nesting beach. Furthermore, while it is a small beach and undoubtedly hosts less nesting activity than some of the larger beaches in northeast Trinidad, critical nesting habitat is widely under threat globally so conservation of all nesting beaches is important to the future of sea-turtle species.

Pg 4-260-261: This section also reports a total of 18 nests observed on Mission Beach by the EIA team and suggests that these nests were several months old. This deserves some further explanation since it is difficult to locate and identify sea-turtle nests that are even a few days old. How were these nests identified? Some were associated with eggs and egg shells, but others were also noted. It is stated that the species was not determined but it is likely that the nesting turtles were green turtles. Please provide evidence of these claims. As stated earlier, green-turtle nesting is relatively rare locally. If the nests were months old, then no tracks would be visible to help identify species. The presence of juvenile greens foraging in the bay is no reason to suspect green turtles were responsible for the nests on Mission Beach.

Pg 4-264-268: This section suggests three marine-mammal species are the only species recorded within 5 kilometres of the proposed project site, based on a reference to <https://ibat-alliance.org/>. This is not a reliable resource and should not be used to narrow focus to these three species and take attention away from the many more species that may be found in the area.

5. Assessment of Impacts

- A. The impact assessment for several identified impacts is, in our opinion, subjective and not supported by sufficient relevant scientific evidence. Additionally, several impacts have been overlooked or are only superficially addressed including, but not limited to, water quality, tourism and the service industry during construction and operations, and local livelihoods as a result of impacts on fisheries.
- B. The EIA assessed a myriad of individual impacts to each identified receptor as discrete assessments, but failed to assess their combined effect on ecological receptors. An assessment should have been done on how the stressors act together to determine if the combined stressors may have additive or multiplicative and synergistic interactions.
- C. There was no attempt to assess impacts or propose mitigation measures and maintenance activities associated with the following port activities that were not fully described in the Project Description:
- The activities expected to be associated with the four additional berths provided
 - Operation of the boat repair shop/dry dock facility
 - Maintenance dredging every 5-7 years as indicated in the Operational Maintenance Plan (Section 6.2.4.1)
 - Processing of fish and disposal of waste
 - The creation of a temporary fishing facility at Salybia Bay
 - Bunkering facilities and fuel dispensing pumps
 - Installation of an artificial reef
- D. No quantitative risk assessment was presented for the effects to human health and safety.

5.3 Impact Assessment

Pg 5-14-15: During the construction phase, it was stated that the NO₂ emissions exceeds the 1 hour standard (200ug/m³) but the range of exceeding values are actually 3 to 6 times the concentration limit for tested areas surrounding the work areas (794 – 1356 ug/m³), which included schools. The mitigation strategy of “*addressing the emissions*” by regular monitoring and maintenance of engines is not sufficient and should include additional strategies to reduce emission concentrations. The option of rotating work and vehicular activities should be explored, including the institution of some limit of maximum emissions per day and measures taken to cap activities that contribute (number of vehicles or time

of vehicular use). Additionally, has the model been run with an assumption that the engines are not well-maintained? This should be included.

Pg 5-16: During the operational phase, the modelling of normal port emissions appears to only include emissions from boat operations (ferries, pleasure crafts, and patrol boats) but does not include vehicular traffic (cars) that will be entering and exiting the port, or idling vehicles waiting to disembark or board the ferry when in port. These are significant sources of emissions that should be included.

Pg 5-28: Impacts to water quality from the release of fish waste, sewage, vessel releases and dry dock/boat repair activities are gaps which should be addressed.

Pg 5-56: *“Marine receptors with the potential to be impacted, such as sea turtles, are evaluated as Medium sensitivity due to their local importance and protected status”*. This contrasts with the previous evaluations for sea turtles as ‘High sensitivity’. Similarly, on Pg 5-141: *“Marine receptors with the potential to be impacted, such as sea turtles, are evaluated as Medium sensitivity due to their local importance and protected status”*. Perhaps the reason for this is because sea turtles are not evaluated independently in these cases, but as part of a larger group of marine fauna. We suggest that the group should be changed to high sensitivity or sea turtles treated as a distinct sensitive group of interest.

Pg 5-91-94: The impacts of *“Spills or leaks of fuels or lubricants from construction vessels and machinery”*, are only very briefly addressed on Pg 5-94, and do not capture impacts to marine environment. Legal Notices 88-92 (2014) designating the leatherback, loggerhead, green, hawksbill, and olive ridley turtles as ESS prohibit activities which pollute, including the discharge or deposit of any substances that are injurious to the ESS. Mitigation measures should therefore be outlined for any such activities that contravene these requirements.

Pg 5-28-33: It is unclear how the silt curtain will curb sediment impacts beyond the immediate area. The suspended material can be transported by waves and currents at different points in the current depending on their density. Lighter particles will also likely remain suspended for longer periods, and thus be subject to the prevailing currents for longer periods, increasing the risk of sedimentation on nearby ecosystems. More information should be presented on this mitigation measure (also related to Section 6.2.2).

Pg 5-28-33: Effluent discharge from the on-site Wastewater Treatment Plant was not considered as a potential source of impact. Accidental spills, mechanical failure, bypass during maintenance, and overflows during high flow events such as heavy rainfall have the potential to release raw or partially treated sewage into the ocean. This could have serious and far-reaching impacts on human health and the environment. What contingencies are in place to contain waste and wastewater in case of leakages or mechanical failure? In fact, the EIA does not address any impacts of establishing a Wastewater Treatment Plant at this site, including the cumulative impacts with other port operations. As this is listed as

a designated activity (42) within the CEC application, all related impacts should be addressed.

Pg 5-29: The following text is unclear “*The model identified that the TSS suspended in the water column by the dredging activities would exceed the TSS regulatory threshold in an area of 641-10,190 m² surrounding the dredging activities. However, the impact is short-term, with TSS values below thresholds within 1-3 hours following the completion of dredging activities (Appendix D). The dredging activities will be a 17-month portion of the project, with activities only during the day, and the area of impact will be the Project area and the surrounding Grande l’Anse Bay. Therefore, impacts to water quality from the dredging of the Project site are likely to be of Medium magnitude.*”

Dredging activities will exceed the regulatory threshold in the area for 1-3 hours at a time, yet the dredging will take place over 17 months. The text suggests there will be regular intense pulses of dredging disturbance for 17 months, but is not clear how often this will occur. This is a long-term severe activity, yet is only considered to be a ‘medium’ magnitude. There will certainly be significant cumulative effects that affect an area >1 km and more than 3 hours, especially considering the water movement in the area. We would suggest that the magnitude be classified as ‘large’ given the definition included on Pg 5-28. Secondly, this will have significant impacts on marine ecology. While fish and mobile marine life can “*move away*” from their living and nursery habitats and food sources, sessile fauna such as algae, corals, and invertebrates that live attached to the bottom, will be smothered and killed. Significant sediment will prevent re-establishment of benthic life, especially if dredging occurs periodically during operation, which has not been stated in the EIA. Again, this fits the ‘large’ magnitude (and not medium) for both magnitude of impact and the sensitivity of receptors (the marine life and fish resources impacted).

Pg 5-30: With respect to the baseline turbidity conditions of the area implying a lower sensitivity to sedimentation, this is not necessarily the case. There may be chronic, low-level sediment disturbance that marine life has adapted to. However, dredging is a case of an acute and severe disturbance which will damage marine species whether or not they have adapted to low level sediment.

Pg 5-29-30: One of the suggestions for mitigating the impacts of dredging is “*Management of dredging activities around wave and weather action.*” Please provide more detail on how this is feasible for a 17-month window of use, where the wave action of Toco Beach can be challenging during certain times of the year. As the natural wave conditions of the bay will more likely exacerbate the dredging impact rather than abate it, the impact after mitigation cannot be considered as minor.

Pg 5-31-32: The following statement should be reconsidered: “*Based on the results of the model, the Project is expected to increase the residence time of seawater in the bay, however the formation of eddies near the Project entrance will help mix and disperse any seawater constituents from stormwater runoff.*” While eddies mix and disperse in some areas, they

don't necessarily assist in the flushing of the bay. The development of the port will increase the residence time of water in some areas up to 40-68 hours (Appendix D Coastal Dynamics Modelling Report Section 4.2 Water Quality modelling). Such long residence times combined with a potentially significant accumulation of daily storm discharge, pollutants waste and garbage may significantly reduce water quality, and increase deoxygenation and plankton or bacteria blooms that can kill marine life.

Pg 5-34-35: *“Hard-bottom benthic communities, especially those comprised of corals such as in Grande L'Anse Bay, take a longer time to recover from disturbances than soft bottom communities. Hard bottom benthic communities such as those in Grande l'Anse Bay will likely take between 10-20 years to recover from the project activities.”* Recovery is based on the environment becoming conducive to support the survival of newly recruited organisms, as well as the presence of hard substrate which will have been removed during the dredging process. If there is periodic dredging during operations every 5 -7 years (Section 6), which is less than the suggested recovery time of the hard bottom communities (10 -20 years) along with declines in water quality as the port functions, the recovery of the same hard bottom communities is not likely.

Pg 5-34-35: This section does not adequately describe the potential impacts to sea turtles from dredging activity. Some evaluation of the possibility of their entrainment in the dredger, and entanglement or entrapment in silt curtains and resulting mortality should be provided. Risk may vary for each species present due to size, behaviour and abundance, and should be evaluated. Legal Notices 88 and 91 of 2014 designating the leatherback and the hawksbill turtles respectively as ESS prohibit activities, which result in the harming, injuring, or killing of the ESS; and the disturbance of the ESS at any time. Mitigation measures outlining how the compliance with these requirements would be ensured in light of the proposed activities should be described.

Pg 5-35, 37: *“The placement and installation of the breakwater, pilings, and fill material is considered a mitigation measure for hard-bottom benthic organisms and will eventually serve as feeding habitats for sea turtles following recolonisation.”* More details based in science are required to determine the suitability of this mitigation measure and indicators of success. Please provide suitable case study with similar conditions that dominate in the study site. We therefore recommend that this residual impact should remain as 'Major'.

Pg 5-36: With the absence of more details on the purpose of the artificial reef, dimensions, composition, location, etc., we note that a separate EIA would have to be conducted for the artificial reef, which is a Designated Activity (13.b).

Pg 5-39: This section describes the existing currents as travelling along the coast from west to east, which is incorrect - it is well known that the net current flow along Trinidad's north coast is from east to west.

Pg 5-40: It is inaccurate to suggest that because soft-bottom and hard-bottom subtidal species of Grande l'Anse Bay currently experience high turbidity throughout the year, they may have a low ecological sensitivity to the activities of the port development that encourage sedimentation and resuspension of sediments

Pg 5-45: With respect to the change in beach deposition rates at the project site, the following statement is unclear: "*The mobile intertidal organisms, such as urchins, chiton and fishes will likely move to intertidal reef habitats without increased sedimentation.*" Is the suggestion that they will move to other areas in the bay? Or outside the bay? While urchins and chitons are "*mobile*" they have extremely limited spatial ranges. Moreover, how would these fauna know when or where to go to escape sedimentation? The reality is that these marine organisms will die when their intertidal habitat is lost.

Pg 5-51: Various mitigation measures are proposed for management of artificial lighting on the port. It seems unlikely that these measures will result in sufficient control of artificial lighting to mitigate the potential impacts to sea turtles and birds. It is simply not feasible to run a port and associated operations without lighting when there is activity in the evenings. Due consideration must be given to the multiple sources of light including vehicles, restaurants, etc. Legal Notices 88, 90, and 91 (2014) designating the leatherback, green and hawksbill turtles respectively as ESS prohibit activities which result in the disturbance of the ESS at any time. Mitigation measures outlining how the compliance with these requirements would be ensured considering the proposed artificial lighting, should be described.

Pg 5-52: The EIA correctly indicates that any sea turtles present may be at risk of vessel strikes, with greens and leatherbacks the most likely to be impacted due to their known presence in the area. However, the EIA fails to emphasize the high concentration of reproductively active leatherback turtles around northeast Trinidad inclusive of Grande l'Anse Bay during the breeding and nesting season (Eckert, 2006), and therefore potentially severity of these impacts. The risk of vessel strikes and mortality, and a potential change to behaviour and local distribution, including links to breeding and nesting, as a result should be discussed in sufficient detail. This in addition to the increased mortality of the breeding turtles from vessel strikes is significant. Adult sea turtles appear to be at increased risk of vessel strikes during breeding and nesting season (<https://www.fisheries.noaa.gov/insight/understanding-vessel-strikes>), so deserves further attention. Two nesting females tagged by Eckert (2006) spent approximately 30% of their time during the inter-nesting period at depths <3m, which is within range of vessel strikes. Dive durations were also relatively short (<14min), indicating frequent surfacing. This area is critical habitat for this protected migratory species, so this impact is not just of local concern but also regional and international.

The proposed mitigation of a Marine Wildlife Observer on board is, in our opinion, inadequate to reduce this impact. Sea turtles spend the majority of their time underwater, and, due to their size and typical sea surface conditions, will not be easily detected, unless they surface in close proximity to the vessel. An effective response of the vessel captain

at this time is unlikely to be possible. It is also impractical to enforce an MWO onboard every ferry once the port is operating. Finally, as vessels will also be operating at night, visibility will not allow for detection.

Pg 5-57: Boat and industrial noise has been shown to affect the recruitment of coral and fish larvae. Coral larvae are often deterred from settlement in the presence of boats, preferring healthier reef sounds (Lecchini et al., 2018). The industrial sounds of the port may inhibit recruitment of coral and fish larvae preventing recovery.

Page 5-76-77: The section on vessel noise incorrectly refers to noise from pile driving related to impacts on sea turtles and mid-frequency cetaceans.

Page 5-80-82: It has been suggested that increased fishing in the region could lead to increased bycatch of sea turtles, and “*change the local distribution of sea turtles*”, but fails to mention the primary immediate impact of increased mortality and potential population decrease to this globally threatened species (leatherback turtles). Please provide further critical analysis.

Pg 5-81-82: The mitigation measures suggested in this section reflect a lack of understanding of the dynamics of the local fisheries sector, Trinidad and Tobago’s fisheries legislation, and the general principles of fisheries management regarding small scale fisheries. Area and gear restrictions that could have significant socioeconomic impacts on an increasingly marginalized artisanal fisheries sector have been suggested. Additionally, our present fisheries legislation does not allow for the implementation of some of these measures. It is highly unlikely that this will change in the near future. In our assessment, these mitigation measures should not be considered and should be removed with the relevant impacts re-assessed. The mitigation measures proposed to address increased fishing pressure on stocks that are fully exploited or over-exploited are also not practical and are outside the scope of this study.

Pg 5-81: “*The number of vessels operating on the northeast of Trinidad should be limited to that number (the number of artisanal vessels currently operating) annually to protect the region from overfishing*”. Our present fisheries legislation does not allow this so would require a change to policy which is not feasible. Additionally, this does not include the industrial and semi-industrial fleet that also fish on the northeast coast. In our assessment, these measures cannot be considered and should be removed with the relevant impacts re-assessed.

Pg 5-82: “*To implement this measure, NIDCO would develop a communication forum with relevant agencies regarding fishing pressure*”. What is meant by this?

Pg 5-82: “*Phasing out gillnet fisheries with incentives for fisherfolk that switch to alternative types of fishing gear, such as trolling or banking, that catches fewer sea turtles, marine mammals, and seabirds. This measure would be developed by the Fisheries Division in*

consultation with the local fisherfolk.” Was the feasibility of implementing this measure explored or discussed with the local authorities? Is there a commitment in writing that can be referenced? This is a longstanding issue and it is highly unlikely that phasing out gillnets in the area will be the mitigation measure employed as the gillnet fishery for coastal pelagics is one of the most important national fisheries. Banning gillnets in a particular area would also require significant resources to enforce. A more plausible measure, that has been suggested in previous years, might be to switch to an alternative gear during the turtle-nesting season in the northeast region, which would also be difficult to enforce. In our assessment, these measures cannot be considered as mitigation and should be removed with the relevant impacts re-assessed.

Pg 5-93: *“Dredging and marine works activities will disrupt the seabed and result in short-term increases in TSS in the water column... Given the short duration of this impact, the mobile nature of fish and the large offshore area the local fisherfolk use of fishing, this is not expected to have a direct effect on fishing”.* We disagree with this assessment. The impact of a 17-month period of dredging as part of the construction of the port (22 months total construction on the sea) is not a short duration, and will permanently destroy vital habitats that serve as crucial refuges for fish communities including larvae and juveniles as well as provide sources of food. While fish can “move”, their survival is dependent on many conditions including habitat and food, with this likely altering the dynamics of the fish communities in the area.

Pg 5-95: In our opinion, the permanent loss of habitat, and significant and permanent changes to the marine environment with no guarantee of natural recovery, in addition to the question of the suitability of harvesting from the vicinity of the operational port, constitutes a major impact to marine provisioning resources that cannot be mitigated.

Pg 5-96: *“In some respects it is also likely that the project could encourage increased tourism activity, given the improved connection with Tobago and the provision of facilities that could be of interest to tourists and visitors...”.* This conclusion appears to be the opinion of ERM but has not been demonstrated through appropriate data gathering. Please provide some evidence to support this position. Furthermore, the potential negative impacts on the local tourism sector from the proposed port are not adequately evaluated. The EIA notes that Toco’s main appeal as a tourist destination is its tranquillity and eco-tourism. The local tourism industry is highly dependent on the presence of leatherback turtles and the potential negative impacts on these turtles has been inadequately assessed (see comments related to Pgs 5-52, 5-55, etc.). There are also many other potential negative impacts to tourism in the region including chronic water pollution and the impact to the aesthetics and character of the community. Finally, there may be additional negative impacts as a result of increased tourism. Please provide a thorough evaluation of these impacts.

Pg 5-97: A brief discussion is provided on the potential for changes to tourism in the region due to operation of the port. It is concluded that these impacts are challenging to predict due to the dependence on policy, planning, management, etc. We suggest that the impacts considered here have the potential to be major negative impacts on the area and as such deserve further analysis, including in-depth interviews of local persons involved in the tourism sector and visitors to the area. Furthermore, alternative scenarios should be explored to address the influence of policy and planning.

Pg 5-99: Reference is made to alternative views from Toco residents about expected changes to the community, but no quantification is given to understand what proportion of the community may have these views. It is important to quantify these perceptions to understand and assess the potential impact.

Pg 5-122: Mitigation measures suggested for impacts to the water availability include “*liaise with WASA to conduct a study of water availability and potential alternate sources*”. This is not a mitigation measure. Results of this study could potentially conclude e.g. that there is no water available and there are no alternate sources. This study should be undertaken to ensure that the use of an alternate source is in fact a feasible mitigation measure. Since the use of alternate sources of water at this point is uncertain, we recommend that the pre-mitigation assessment of ‘moderate-major’ should be used as there is no firm mitigation plan in place. Furthermore, if an alternate source of water can be found, the development of possible options (the establishment of wells, intakes, Water Treatment Facilities, Desalination Plants) are designated activities under the CEC Rules (Designated Activity 38(a, b and c) and as such, should also be listed in the CEC and assessed within this EIA.

Pg 5-133-135: It is suggested that the proposed project will boost the local economy through job creation, but it is not clear whether the local community has the requisite training and experience to avail themselves of any new jobs created. The proposed measures to enhance these positive benefits rely on implementation by external parties such as the local Regional Corporation and the Ministries of Labour and Community Development. Have these parties committed to undertaking these tasks? If not, they should not be consulted.

Pg 5-140: The only unplanned events identified and addressed are diesel spills and marine vessel collisions. What is the criteria for listing an unplanned event? Has consideration been given to other unplanned events such as fire, natural disaster, financial loss or economic downturn and the impacts on port maintenance and function, or water shortage? This section should be expanded.

Pg 5-142: “*Ensure that all vessels are equipped to meet international maritime standards (i.e. navigation lights, area lighting, communication equipment and radar reflectors.*” The EIA does not mention the existing standard for safety equipment on the Toco fishing vessels (artisanal or industrial) (Section 4). How will fishermen be incentivised to obtain, carry,

maintain and use the necessary safety equipment? Will there be training of the fishing community on standards of navigating around larger vessels in a confined area? Also, there is no mention of the use of light channel markers to direct vessel movement in and out of the port as a mitigation strategy, or markers to indicate areas where anchoring may be permitted e.g., high voltage areas. Please confirm what measures will be used.

5.4 Cumulative Impact Analysis

The cumulative impacts assessment was conducted to assess the contribution of the proposed project to impacts from other projects and external drivers. The spatial boundary for the analysis was described as “*the vicinity of the town of Toco*”. This spatial scope is not sufficient considering the extent of the activities associated with the proposed project, particularly in the coastal nearshore. The only project addressed was the ‘Valencia to Toco Road’ project. The only external drivers addressed were natural hazards and climate change. In our opinion, this is grossly inadequate and we recommend that the following activities also be considered:

- With respect to the existing Toco fisheries sector, the port development will destroy the marine habitats that support the fisheries in the area. This is unsustainable, especially as the port will increase fishing pressure on an already declining industry. The combined effect will have major environmental and socioeconomic consequences.
- As previously highlighted, the area around Galera Point is critical habitat for a globally important population of leatherback turtles which is in decline (Northwest Atlantic Leatherback Group, 2018). Bycatch in gillnets in this area has been identified as a major source of mortality. The proposed port will contribute to a myriad of other threats to this population, all assessed as ‘major’ or ‘moderate’, and will likely lead to increased bycatch through increased local fishing effort.
- The new shipping lane from Toco to Scarborough will cross existing lanes used by vessels associated with cargo and oil and gas, increasing the risk of vessel collisions.
- What are the combined effects of polluting activities and external events, such as Sahara dust, on human health, especially when the external factor may push the total exposure levels above the acceptable threshold?
- Dredging will reduce the water clarity, while storm discharge will alter the chemical and biological composition of the surrounding seawater (including reducing the oxygen content and promoting disease outbreaks). When both activities are combined this will result in water conditions unfit to support life.
- The combined effects of impacts on water quality, reduced flushing rates, and dredging during construction and operations will likely severely impair the recovery potential of the benthic communities.
- What are the combined effects of impacts including, but not limited to, below and above water noises, dredging, artificial lighting, and increased boat traffic on the overall navigation of marine life in the area? This could be very disorienting for marine animals (especially sea turtle hatchlings) that use sight and sound to move around.

- Eight discrete impacts are evaluated for sea turtles (Change in beach deposition rates at the Project Site, Project Lighting, Vessel traffic/vessel strikes, Noise Associated with Dredging, Noise Associated with Vibratory Pile Driving, Noise Associated with Impact Pile Driving, Noise Associated with Vessels, Fishing Pressure), with all listed as 'moderate' or 'major'. The combined effect of these impacts on these ESS should be evaluated as they could severe. Legal Notice 88 designating the leatherback turtle as an ESS prohibits activities which result in the disturbance, destruction of habitat alteration that will alter or upset the integrity of the beach, habitat or surrounding ecosystems or cause undue disturbance to the plant or animal community upon which the ESS depends at any phase of its life cycle. Mitigation measures outlining how the compliance with these requirements would be ensured in light of the proposed activities should be described.

Furthermore, related to the TOR, Section 7.15.1 on *"effects to the social climate and civil amenities/infrastructure"* was not addressed. Section 7.11 indicates that *"areas of impact/hazards shall be illustrated in map form and those that are unavoidable or irreversible must be specifically identified"*. These impacts and hazards have not been mapped. Please address. Section 7.14.15 called for a Quantitative Risk Assessment to address the risk to the health and safety of the public, and this has not been addressed. Please provide.

Pg 5-148: A more detailed assessment of climate change is needed given the large number of impacts on the environment and the potential for cumulative impacts with those from the development and operation of the Port. The main impacts of climate change likely to affect the Toco Port are sea-level rise, increased storm strengths, and their combined effects in extreme storm events. These possibilities should be included.

6. Environmental Monitoring Plan

Environmental programmes usually monitoring against established thresholds dependant on use. For instance, the EMA provides 'human health' thresholds for air quality, water quality, and noise emissions as to not have a negative impact on human quality of life. In this instance, water quality perturbations due to construction and operations will also affect nearby natural ecosystems such as coral reefs. While guidelines are not explicit for coral reef water quality for Trinidad and Tobago, it is within the remit of the consultant to recognise the shortcoming of the existing EMA guidelines as well as the sensitivity of the affected ecosystems, against which the monitoring programme will function. Suggested thresholds should include suspended sediment, nutrient loads and dissolved oxygen, at a minimum.

6.2 Monitoring and Management Plan

Pg 6-21: It is proposed to use beach nourishment to address any observed changes in sediment grain size. Beach nourishment is an expensive and challenging undertaking. Who will be responsible for this? What is the source of the sand to be used? Further, if erosion and accretion are occurring on different beaches, then sand can be moved from the accreting

beach to the eroding beach to maintain the pre-development condition of the various beaches. This is also an expensive, impractical and often infeasible measure.

Pg 6-54-61: Who is responsible for the implementation of this proposed marine monitoring plan?

Pg 6-60: Monitoring should be extended to at least 15-20 m depth and include the submerged areas around the headlands of the bay.

Appendix C. Stakeholder Engagement Report for Toco Port EIA

2. Stakeholder Identification

Pg C-4-5: This section outlines the stakeholder identification process. The process leaves much to be desired as several key stakeholder groups were not included:

- Ferry passengers - In addition to the Toco community and fisherfolk, this group will be the most directly impacted by the proposed inter-island ferry service through the proposed Toco Port. Among this group are many residents of both islands who use the ferry service regularly for a variety of purposes including vacation and business. The failure to have any public consultations in Tobago and elsewhere in Trinidad has resulted in a significant stakeholder group not being consulted.
- Mariners - The proposed port includes a marina for recreational yachts, yet this group of stakeholders were not included.
- Civil society - Social and environmental impacts resulting from the proposed activities may be of interest to stakeholders in Tobago and elsewhere in Trinidad. The Stakeholder Engagement Report as well as Chapter 1 of the EIA (Pgs C-5 and 1-3 respectively), highlight Tobago as an Indirect Study Area meaning a “*broader area affected by the development.*” It describes the area as “*the broader regional context with respect to the Project, such as general maritime traffic ... and relevant coastal areas that are potentially vulnerable to any accidental releases or influence from the project.*” Therefore, while the EIA clearly recognises the potential impacts of the proposed development on areas beyond the proposed site of the Toco Port, it failed to undertake consultations with all stakeholders who could be affected.

We would like to see further efforts made to engage directly with these key stakeholders who may be directly impacted or concerned by the proposed port.

3. Stakeholder Categorization and Analysis

Pg C-9-10: Table 3-1 appears to have columns intended to indicate what level priority has been placed on each stakeholder group, but the columns are empty.

4. Engagement Activities and Schedule

Pg C-30-32: Table 4-3 states that it is the prerogative of the Project Proponent to conduct alternative analyses, however, Item 5 of the TOR clearly outlines the need to assess alternatives, including ‘no action’ alternatives and significant delay or abandonment before

completion, as part of this EIA. These have not been adequately addressed in the EIA (as mentioned previously in the comments related to Section 3.10).

Attachment C4 Public Meeting Minutes

The Final TOR (Section 6.9.4) indicates: “*All comments/questions from the meeting(s) shall be documented and submitted as the Stakeholder Engagement Report, within the EIA Report, including a verbatim record of the proceedings*”. However, only brief meeting minutes were provided in Attachment C-4 of Appendix C. A table is presented with minutes from the Public Consultation held on December 16th 2019, though no header/title is provided. The questions and comments presented in the table do not accurately reflect the questions that were actually asked (at least for WASA and SpeSeas). Please clarify.

We are concerned that providing only minutes compromises the transparency of the process and provides a biased record of the meetings held. Full verbatim transcripts of both public consultation meetings must be provided. Additionally, there should be an opportunity for public review and comment on the EIA again, once these are submitted.

References

- Aguirre, A.A., and P.L. Lutz, 2004. Marine Turtles as Sentinels of Ecosystem Health: Is Fibropapillomatosis an Indicator? *EcoHealth* 1(3), 275-283. doi: 10.1007/s10393-004-0097-3.
- Balazs, G.H., A.A. Aguirre, and S.K.K. Murakawa, 1997. Occurrence of oral fibropapillomas in the Hawaiian green turtle: differential disease expression. *Marine Turtle Newsletter* 76, 1-2.
- Cazabon-Mannette, M., and A.C.N. Phillips, 2017. Occurrence of Fibropapilloma Tumours on Green Sea Turtles, *Chelonia mydas* in Trinidad, West Indies. *Living World, Journal of the Trinidad and Tobago Field Naturalists' Club* 2017, 14-20.
- Eckert, S.A., 2006. High-use oceanic areas for Atlantic leatherback sea turtles (*Dermochelys coriacea*) as identified using satellite telemetered location and dive information. *Marine Biology*, 149(5), 1257-1267.
- Eckert, K.L., and A.E. Eckert, 2019. An Atlas of Sea Turtle Nesting Habitat for the Wider Caribbean Region. Revised Edition. WIDECAS Technical Report No. 19. Godfrey, Illinois. 232 pages, plus electronic appendices.
[http://www.widecast.org/Resources/Docs/Atlas/19_Eckert_and_Eckert_\(2019\)_Atlas_of_Caribbean_Sea_Turtle_Nesting.pdf](http://www.widecast.org/Resources/Docs/Atlas/19_Eckert_and_Eckert_(2019)_Atlas_of_Caribbean_Sea_Turtle_Nesting.pdf)
- Eckert, K.L., B.P. Wallace, J.G. Frazier, S.A. Eckert, and P.C.H. Pritchard, 2012. Synopsis of the biological data on the leatherback sea turtle (*Dermochelys coriacea*). Washington, D.C., U.S. Department of Interior, Fish and Wildlife Service.
- Foley, A.M., B.A. Schroeder, A.E. Redlow, K.J. Fick-Child, and W.G. Teas, 2005. Fibropapillomatosis in stranded green turtles (*Chelonia mydas*) from the eastern United States (1980–98): trends and associations with environmental factors. *Journal of Wildlife Diseases* 41(1), 29-41. doi: 10.7589/0090-3558-41.1.29.
- George, R.H., 1997. Health problems and disease of sea turtles. In *The Biology of Sea Turtles*, edited by P. L. Lutz and J. A. Musick, 363-385. Boca Raton, Florida: CRC Press.
- Ghermandi, A., J. Agard, and P.A. Nunes, 2018. Applying Geographic Information Systems to ecosystem services valuation and mapping in Trinidad and Tobago. *Letters in Spatial and Resource Sciences* 11(3), 289-30
https://www.researchgate.net/profile/Paulo_Nunes4/publication/325068593_Applying_Geographic_Information_Systems_to_ecosystem_services_valuation_and_mapping_in_Trinidad_and_Tobago/links/5be8864e4585150b2bb03acc/Applying-Geographic-Information-Systems-to-ecosystem-services-valuation-and-mapping-in-Trinidad-and-Tobago.pdf
- Herbst, L.H., and P.A. Klein, 1995. Green turtle fibropapillomatosis: Challenges to assessing the role of environmental cofactors. *Environmental Health Perspectives*, 103(4), 27-30.
- Lackovich, J.K., D.R. Brown, B.L. Homer, R.L. Garber, D.R. Mader, R.H. Moretti, A.D. Patterson, L.H. Herbst, J. Oros, E.R. Jacobson, S.S. Curry, and P.A. Klein, 1999. Association of herpesvirus with fibropapillomatosis of the green turtle *Chelonia mydas* and the loggerhead turtle *Caretta caretta* in Florida. *Diseases of Aquatic Organisms* 37(2), 89-97. doi: 10.3354/dao037089.

Lecchini, D., F. Bertucci, C. Gache, A. Khalife, M. Besson, N. Roux, C. Berthe, S. Singh, E. Parmentier, M.M. Nugues, R.M. Brooker, D.L. Dixon and L. Hédouin, 2018. Boat noise prevents soundscape-based habitat selection by coral planulae. *Scientific Reports* 8, 9283. <https://doi.org/10.1038/s41598-018-27674-w>

Northwest Atlantic Leatherback Working Group, 2018. Northwest Atlantic Leatherback Turtle (*Dermochelys coriacea*) Status Assessment (B. Wallace and K. Eckert, Compilers and Editors). Conservation Science Partners and the Wider Caribbean Sea Turtle Conservation Network (WIDECAST). WIDECAST Technical Report No. 16. Godfrey, Illinois. 36 pp. [http://www.widecast.org/Resources/Docs/16_NWA_Leatherback_Working_Group_\(2018\)_NWA_Leatherback_Status_Assessment.pdf](http://www.widecast.org/Resources/Docs/16_NWA_Leatherback_Working_Group_(2018)_NWA_Leatherback_Status_Assessment.pdf)

Northwest Atlantic Leatherback Working Group, 2019. *Dermochelys coriacea* (Northwest Atlantic Ocean subpopulation). The IUCN Red List of Threatened Species 2019: e.T46967827A83327767. <https://dx.doi.org/10.2305/IUCN.UK.2019-2.RLTS.T46967827A83327767.en>. Downloaded on 01 May 2020.)

Quackenbush, S.L., T.M. Work, G.H. Balazs, R.N. Casey, J. Rovnak, A. Chaves, L. duToit, J.D. Baines, C. R. Parrish, P.R. Bowser, and J.W. Casey, 1998. Three closely related herpesviruses are associated with fibropapillomatosis in marine turtles. *Virology* 246(2), 392-9. doi: 10.1006/viro.1998.9207.

Santos, R.G., A.S. Martins, E. Torezani, C. Baptistotte, J.N. Farias, P.A. Horta, T.M. Work, and G.H. Balazs, 2010. Relationship between fibropapillomatosis and environmental quality: a case study with *Chelonia mydas* off Brazil. *Diseases of Aquatic Organisms*, 89: 87-95

Van Houtan, S., S.K. Hargrove, and G.H. Balazs, 2010. Land Use, Macroalgae, and a Tumor-Forming Disease in Marine Turtles. *PLOS ONE* 5(9), e12900. doi: 10.1371/journal.pone.0012900