# Toledo Institute for Development and Environment (TIDE) Position Statement in response to Environmental Impact Assessment presented on 'Caribbean Castaways Ltd." development proposal

9th December 2016

The Toledo Institute for Development and Environment (TIDE) is a grass roots, community based protected areas management non-governmental organization responsible for the management of Port Honduras Marine Reserve (PHMR), among other protected areas in Toledo District, Belize.

TIDE has been entrusted under a co-management agreement with the Belize Fisheries Department to carry out activities related to enforcement, conservation, research and livelihood development associated with PHMR. This marine reserve encompasses unique habitats and ecosystems that support sustainable livelihoods in fisheries and tourism, providing a significant direct and indirect contribution to the local economy in the coastal and inland communities of Toledo District.

TIDE has reviewed the Environmental Impact Assessment (EIA) in relation to the proposed development of a resort on the island of West Snake Caye (alternatively known as Lagoon Caye), which lies within the Conservation Zone of PHMR. This position statement summarises the key concerns TIDE has in response to the contents of the EIA.

TIDE is not fundamentally opposed to development, as we recognize that Toledo is an economically depressed region in Belize that is in need of environmentally and socioeconomically sustainable development for the betterment of communities in Toledo. As such we require that development proposals considered as having potential negative impacts on the protected areas managed by TIDE are upheld to the stringent environmental protection measures afforded by the legislation and regulations governing activities taking place within PHMR and other protected areas falling under TIDE's management.

After thoroughly reviewing this EIA, TIDE's concerns can be divided into three broad categories. These are (a) Environmental impact considerations; (b) Legal considerations; (c) Other matters

## (a) Environmental impact considerations:

**i) Water resources –**

• **Option A: Rainwater capture:** The EIA stipulates on Page 19 three alternatives for acquisition of potable water, of which it is estimated that 1087 gallons per day will be needed to supply 30 guests and eight full time staff. The first option is rainwater, which would be chlorinated. It is extremely unlikely that a demand of 1087 gallons per day will be possible to sustain by capture of rainfall and we find it inadvisable to attempt to supply potable water at this remote location matching the national average quantity of 26 gallons per person per day for Belize as stated on Page 19. As an example, TIDE's Ranger Station on Abalone Caye has a 3,000 gallon tank that receives rainwater from roof surfaces on the caye and needs to supply approximately 5 staff on average throughout the year. Even though supply is strictly limited to one bucket (approximately 2.5 gallons) per person per day, the tank often runs dry. This is despite a ban on use of fresh water to flush toilets, which is currently done with seawater into self-contained tanks that are transported back to the mainland for safe disposal periodically throughout the year.

• **Option B – Reverse Osmosis Desalination Plant:** It is stated on Page 19 that a small reverse osmosis plant would be installed and utilized on an as need basis to supplement shortfalls in rainwater supply. It is not mentioned what are the energy demands of this system or how this energy will be supplied. It is therefore presumed this will be powered by the same diesel generator that is proposed as providing power to the overall resort facility, which will increase noise pollution to the sensitive wildlife on the caye such as birds, and increase quantities of diesel required, and therefore increase spill risk and consequent pollution of the waters surrounding the caye. It is also not adequately explained what are the inputs required (e.g. chemicals, freshwater etc.) and outputs generated from the reverse osmosis process, except in Table 5.2 on page 86, where it states in small type that desalination results in brine that would require disposal at sea. Depositing brine, or any other substance into the waters of PHMR is in direct violation of the PHMR Statutory Instrument, Section 22 part (b) which states that "*Without prejudice to the activities prohibited by the Fisheries Act and the penalties prescribed therein, no person shall deposit any material in or on the waters of the Reserve, except in the case where a license to do so has been issued by the Fisheries Administrator*". The current Fisheries Administrator is responsible for the successful implementation of Managed Access in Belize, which is under implementation in PHMR. Additionally, the Belize Fisheries Department requires all marine reserve management agencies to expand Replenishment Zones to at least 20% of all habitat types in marine reserves by the year 2020, a process dependent on stakeholder consultations where it can be shown that TIDE has been effective in managing the Replenishment zones and safeguarding them from negative impacts associated with illegal fishing and development. Therefore, the issuance of a license to deposit materials into the waters of PHMR by the Fisheries Administrator would directly undermine her own objectives in ensuring the success of these fisheries-related government initiatives, and undermine the trust TIDE and the Fisheries Department have built over many years with the fishing communities using PHMR to respect the integrity of Replenishment Zones in PHMR entrusted to TIDE to manage. Given that PHMR is one of two pilot sites for piloting Managed Access, its rollout to the entire waters of Belize (considered vital for ensuring fisheries sustainability nationally into the future) is dependent on this program being successful in the pilot sites. It would therefore be a direct conflict of interest for such a license to be issued. Furthermore, it is well documented that the deposition of brine produced by desalination into coastal waters results in a deleterious effect on surrounding marine flora and fauna, which is in direct violation of Section 22 part (a) of the PHMR Statutory Instrument "*Without prejudice to the activities prohibited by the Fisheries Act and the penalties prescribed therein, no person shall remove, damage or have in his possession any flora, fauna or part thereof except under a license issued by the Fisheries Administrator."* The deposition of brine into the waters of PHMR cannot therefore be accepted by TIDE.

• **Option C – Bottled water**: Given that rainwater is unlikely to come close to meeting the demand stated as 1087 gallons per day, and given that a desalination plant is inacceptable for the reasons stated above, the only other option would be bottled water. The quantity of bottled water required to make up this deficit (even just half the required amount would constitute over 100 x 5 gallon bottles per day) would be so great as to require continuous transportation back and forth from the mainland, the nearest source being 17 miles away in Punta Gorda as stated on Page 8, and would therefore quickly become economically and logistically unviable.

**Given these considerations, it is the opinion of TIDE that the remoteness of the proposed location for this development, as well as the unacceptable environmental risks resulting from brine deposition during the desalination process to ecologically and economically important habitats, ecosystems and commercially important fisheries species protected within the Conservation Zone encompassing West Snake Caye, render this project unviable in terms of maintaining supply of sufficient potable water to sustain the demands of the proposed development.**

**ii) Liquid waste management –**

In addition to the aforementioned concerns on negative environmental impacts and violations of the PHMR Statutory Instrument from chlorine and brine depositions into the waters of PHMR resulting from the described methods to provide potable water, TIDE has significant concerns relating to the described methods to deal with "*grey water*" (waste water produced by domestic uses not including toilet waste, e.g. showers, laundry, kitchen waste) and "*black water*" (waste produced from toilet flushing).

• It is stated on Page 90 that domestic wastewater is converted to effluent at an approximate rate of 85% by total volume of water consumed for domestic use. This equates to approximately 924 gallons per day of wastewater which will contain chlorine (mentioned as being added to collected rainwater, a chemical inherently toxic to all living organisms, particularly in marine and aquatic environments). It is further stated on Page 19 that this chlorinated wastewater will be used for "*irrigation purposes*". TIDE sees no justifiable need to carry out any irrigation (a term used to describe artificially supplying water to plants at regular intervals for agriculture) on West Snake Caye, since no agriculture is proposed as part of the development, and contaminants contained therein are likely to have deleterious impacts on the terrestrial and marine flora and fauna of the caye as well as via leaching through the thin, porous, calcareous soils of the caye to the surrounding marine environment.

• Furthermore, it is stated on Page 19 that wastewater generated by the development shall be treated using a tertiary wastewater treatment system, and then also chlorinated before being used for "irrigation". Meanwhile, on Page vii, it is stated that a centralized system will be used for treatment at secondary *or* tertiary (preferable) level. It is unclear therefore whether the proposal is committing to the use of secondary or tertiary treatment. It is also of concern that tertiary treatment is only considered *preferable* and not mandatory given that the site is in the middle of a conservation zone surrounded by ecologically and socioeconomically important habitats and species that support traditional livelihoods. Regardless of this, neither secondary nor tertiary treatment generate effluent that is clean enough to swim in or drink, and still contains substantial quantities of nutrients that are known to be detrimental to marine flora and fauna. Furthermore, the PHMR Statutory Instrument prohibits deposition of "*any* material in or on the waters of the Reserve", regardless of treatment level, and therefore any proposal to deposit effluent into the waters of PHMR cannot be supported by TIDE.

• We note the proposal to discharge both grey and black water, whether having been subjected to secondary or tertiary treatment, into a "*constructed wetland*", described on Page 93 as constituting a gravel filter bed through which waste water would be passed prior to release into the mangroves on the caye. It appears from Page 11 that the plan is to construct this gravel filter bed by excavating the inner lagoon "*to improve water circulation*". If the lagoon is not being excavated for use as a gravel filter bed, we see no justifiable reason to consider that the circulation in this lagoon is insufficient for any purpose, and therefore see no justifiable cause to "*re-contour*" it (Page 110). If the intention is to use the lagoon for wastewater treatment; this lagoon, located within a small isolated caye is a unique and critical habitat that has not been sufficiently studied to determine its ecological importance in terms of connectivity with the surrounding reefs that lie within the Conservation Zone encompassing West Snake Caye or ecological importance in its own right.

• Also, as stated on Page viii and on Page 77 of the EIA, the lagoon is directly influenced by sea water particularly during rough seas and high tides. Salt water intrusion into the gravel filter beds, stated as a risk on Page 77, will almost certainly disrupt the treatment processes taking place on effluent in the gravel filter bed, and may result in the failure of secondary and/or tertiary treatment, as well as causing a highly unpleasant odor in close proximity to the guest facilities. Without stringent regular tests and a robust accountability process, this may result in inadequately treated wastewater reaching the delicate marine habitats in the surrounding conservation zone.

• No evidence is given that the mangroves into which effluent would be released after passing through the gravel filter bed have sufficient capacity to absorb nitrates, nitrites and phosphates remaining in the effluent, and other potential contaminants such as chlorine and salt brine are likely to have a negative impact on these mangroves, potentially leading to their death, subsequent inability to act as a buffer to nutrient discharge into the surrounding marine environment, and consequent inability to protect the caye from wind and wave erosion. Also, even if the mangroves into which treated effluent is released do not suffer detrimental effects, in the case where effluent quantities exceed the absorption capacity of the mangroves, surplus effluent will simply run off into the surrounding marine environment. The risk of underground leaching of contaminated effluent into the surrounding marine environment, only a few feet away via a porous calcareous soil base, has also not been addressed in the current EIA. No regular quality assurance inspections have been proposed to ensure that effluent treatment, whether secondary or tertiary, is resulting in effective treatment prior to discharge. The only measures proposed are in Section 5.6.1 "Analysis" on Page 88, which states that "*water samples from a minimum of two sample sites around the island will be monitored once a year using the recommended protocol required by the Effluent Limitations Regulations, measuring salinity, temperature, dissolved oxygen, pH, turbidity, total dissolved solids and conductivity, with laboratory analysis of total suspended solids, total nitrate, sulphates, hardness, alkalinity, total phosphorus and total and fecal coliform bacteria*". TIDE considers a frequency of once per year wholly inadequate given that the coastal areas of the caye are a popular swimming and snorkeling area daily throughout the year, and is particularly concerned that this type of testing would only reveal failures to the effluent treatment system *after* effluents had reached the marine environment and caused potential health impacts to swimmers, snorkelers and delicate marine habitats. Tests would need to be far more regular (weekly) and take place at a point in the system prior to release into the mangroves and/or surrounding environment. In the case where effluent treatment was not working properly for any reason, a control system should be in place to prevent further effluent from passing from the gravel bed into the mangroves, and a contingency plan for evacuating guests due to the highly unpleasant resulting odor and high risk of disease. No such system is described in the EIA.

• Additionally, it is not understood by TIDE why a raised walkway is proposed to be constructed over the lagoon area and through the mangrove forest (Page v) when these areas are proposed for excavation and conversion into a gravel filter bed for effluent treatment. Besides all of this, the deposition of any materials into the waters of PHMR is in direct violation of Section 22 of the PHMR Statutory Instrument, as described above.

**Given these considerations, it is the opinion of TIDE that:**
**• The excavation of an ecologically important and understudied unique habitat of a brackish lagoon on a caye in the middle of a conservation zone surrounded by environmentally and socioeconomically important habitats that support local livelihoods,**
**• The unacceptable risks posed by lack of quality insurance inspections and insufficient testing measures which can only identify poor water quality after it has been discharged into the marine environment,**
**• The insufficient research into the absorption and carrying capacity of the lagoon and mangrove areas designated for receiving discharge of effluent,**
**• The direct violation of Section 22 of the PHMR Statutory Instrument,**
**• The high risk of water borne diseases in close proximity to guest facilities in the event of failure of the treatment process,**

**render this project unviable as it does not meet the requirements of the Statutory Instrument governing PHMR, does not adequately safeguard the health of the environment, guests and recreational users of the caye, and no system that is affordable, environmentally and economically**

**sustainable in this remote location is available. TIDE cannot therefore support any of the suggested methods for dealing wastewater produced by the proposed development.**

**iii) Dredging -**

• The EIA is self-contradicting on the issue of dredging. In some places (e.g. Pages 108, 111, 114) it assures the reader that no dredging will be done at this time, while in other places (e.g. Pages 110 114, 121), it implies possible future plans to dredge in the event of erosion of property. In the text indicating that dredging may take place, it indicates this material would be sourced from a portion of the sea floor (Page 111), while on page 114 it states that a site visit will be done to determine the most suitable area for dredging. Meanwhile under Section 9.12 "Mitigation Measures" on Page 121, it states that "*to minimize any potential environmental damage the following mitigation measures are recommended (Table 9.1)";* however Table 9.1 is absent from the EIA. Additionally, given that dredging is considered a possible requirement to achieve the completion and ongoing maintenance of the development, the developer is mandated by the Terms of Reference for the EIA, (Annex 1), to meet the requirements in the EIA under Section 8.06:

*Should any dredging/excavation be required, determine the following:*

. *8.06.1 Benthic survey of the area to be dredged;*
. *8.06.2 Determine disposal/use of dredged and excavated materials;*
. *8.06.3 Physical character of materials to be excavated/dredged and the volume;*
. *8.06.4 Type of dredging and excavation equipment/method of dredging and excavating;*
. *8.06.5 Need for shoreline protection;*

None of these requirements have been met by the existing EIA. Furthermore, the EIA states that a mining license will be needed to conduct dredging activities, however, no mining license should be permitted due to such a license being in direct contradiction to the aforementioned regulations in the PHMR Statutory Instrument.

• On page 111 it states that where dredging is deemed to be necessary then dredged material will be obtained by dredging a portion of the seafloor. Any dredging activities taking place within PHMR, whether in Conservation Zones or the General Use Zone would constitute a direct violation of both Section 22 part (a) of the PHMR Statutory Instrument "*Without prejudice to the activities prohibited by the Fisheries Act and the penalties prescribed therein, no person shall (a) remove, damage or have in his possession any flora, fauna or part thereof except under a license issued by the Fisheries Administrator".* It is unavoidable that flora and fauna would be contained within material dredged in any part of PHMR, and the impacts to habitats and to commercially and ecologically important species adjacent to dredged areas via inundation from heavy siltation would constitute total damage and destruction. Furthermore, even if dredged material is sourced from outside PHMR, this is unlikely to be economically viable to the project team due to the distances involved in transporting dredged material to the project site.

• Dredged material is stated as being intended to replenish the beach in the event of beach erosion; however this poses an unacceptable risk of destruction of known nesting grounds of the IUCN listed Critically Endangered Hawksbill turtle.

• Finally it is stated on Page 179 that should any dredging occur, a sediment curtain would be installed to contain the silt. However, a sediment curtain poses an unacceptable risk of damaging delicate flora and fauna on the sea floor and would consequently be in direct violation of Section 22 part (a) of the PHMR Statutory Instrument "*Without prejudice to the activities prohibited by the Fisheries Act and the penalties prescribed therein, no person shall (a) remove, damage or have in his possession any flora, fauna or part thereof except under a license issued by the Fisheries Administrator."*

**Therefore given the unacceptable risk to habitats and ecosystems in PHMR, impacts to turtle nesting beaches, violation of the PHMR Statutory Instrument, and failure to fulfill the requirements stipulated in Section 8.06 of the TOR for this EIA (Appendix 1) TIDE cannot support any dredging activities associated with this development proposal.**

**iv) Erosion -**

• **Dredging** is stated as being required in the event that erosion takes place on the caye and the beach. The anticipated cause of erosion is cited as due to future climate change. While this is a valid consideration and likely to result in the eventual complete inundation and loss of West Snake Caye, as with other cayes in PHMR, (possibly within the timeframe of the expiry of at least one of the two leases), and as has happened to previously existing cayes that have now disappeared, a far more likely potential cause of erosion to West Snake Caye is clearing of the natural vegetation as proposed on page 194, where it states that approximately 2 acres will be cleared for the construction of buildings, roads and utilities. Besides being likely to cause major loss of ecological function of the project area, as conceded on Page 194 of the EIA, removal of vegetation is likely to initiate a rapid and continuous process of wind erosion of the fine calcareous sand of which the entire caye is comprised. Wind erosion has not been considered in any part of the EIA. It further states on Page 194 that initially erosion will be addressed through the planting of mangroves. However, mangrove planting is unlikely to be effective in areas where existing old growth mangroves are already succumbing to the sea, as has been demonstrated by attempts to plant mangroves on nearby and fast-eroding Abalone Caye. Underlying regional scale conditions that are poorly understood are driving erosion throughout the entire coastal areas of southern Belize at a rate that that is in excess of what even sturdy old-growth mangroves are capable of safeguarding against. Therefore this "*non-invasive*" approach, which is the only measure offered in lieu of using dredged material, is not considered a realistic option by TIDE.

• **Wave attenuation devices** (Page 194) are presumed by TIDE to mean cement or rock wall structures deployed close to shore to prevent wave erosion of the shoreline. A sea wall will disrupt circulation with unknown consequences for critically important habitats and cause potentially detrimental impacts on the beach at West Snake Caye, known through long term monitoring of turtle nesting activity to be an important nesting site for the IUCN listed Critically Endangered Hawksbill turtle. TIDE has conducted an annual satellite tagging program on turtles at this caye after they have laid their eggs, and this has revealed that Hawsbill turtles nesting at this caye come from as far as Utila in Honduras, and Drowned Cayes near Belize City, and therefore this caye constitutes an important site at the regional level for maintaining ecological and genetic connectivity between reefs in Honduras and reefs in Belize.

• **Land clearing –** it is stated on Page 68 under Section 4.9 "Type and amount of vegetation to be removed" that "*clearing of at least 30% of the vegetation will be removed or altered*", adding that *"efforts will be made to leave the mature mangroves intact, however some thinning will occur".* Furthermore, in Table 3.1, Page 45, it states that approximately 2 acres of mangroves would be removed or altered. This clearing of vegetation is presumably considered necessary by the developers to allow space for the construction of buildings and for other purposes associated with the resort, yet claiming that attempts would be made to *"preserve as much mangrove as possible, while at the same time removing dead mangroves".* There are no dead mangroves, with the possible exception of mangroves at the fringes of the most exposed areas of the caye were the most severe erosion is taking place. Dead mangrove material is one of the few sources of recycled nutrients on the caye, as demonstrated by TIDE's ongoing mangrove leaf litter monitoring program, providing precious nutrition in the form of foliage for extant flora. The removal of dead mangroves is therefore detrimental to the terrestrial ecosystem of the caye, and certain to lead to rapid wind erosion due to the exposed location and fine calcareous sand forming the caye. Additionally, it is stated in Section 16.2.1 on Page 194 that *"the impact of land clearing for the construction of the tourism project will result in the long-term removal of habitats for flora and fauna, and will also result in long-term changes to the ecological functions of the mangrove forest"* – the same mangrove forest that is being relied upon to receive and absorb treated sewage and grey water effluent.

**Given these considerations, it is the opinion of TIDE that:**

**• The removal of vegetation and dead mangroves is detrimental to the terrestrial ecosystem of the caye and is likely to cause major loss of ecological function of the same mangrove forest that is being relied upon to receive and absorb treated sewage and grey water effluent, initiating a rapid and continuous process of wind erosion which has not been considered by the EIA; the construction of 'wave attenuation devices' which are presumed to constitute cement or rock wall structures close to shore will disrupt circulation with unknown consequences for protected marine habitats and potentially detrimental impacts to turtle nesting activity on the beach which is known to be an important nesting site for the IUCN listed Critically Endangered Hawksbill turtle;**

**v) Invasive species -**

Section 16.3.2, Page 201, states that "*Biological parameters that will be monitored include vegetation loss as a result of land clearing activities, the resulting re-vegetation of exposed areas with native and introduced species".* No information is given on what species would be introduced, and TIDE considers this unacceptable in a marine reserve comprising isolated islands supporting delicate unique ecosystems.

**vi) Energy generation –**

• **Diesel** - The primary energy source for the proposed developed is stated as diesel generators. Diesel is one of the most polluting forms of fuel available, likely to produce odors disagreeable to resort guests. Furthermore, the noise of a diesel generator large enough to power the resort, including the reverse osmosis desalination plant and aeration systems that would be required for proper wastewater treatment would be unavoidable to the guests on such a small island, thus degrading the experience of a tropical island paradise that high paying guests have come for. It is stated on Page x that the transport of diesel fuel would be done either in bulk by means of a barge or transported in 55 gallon containers. Meanwhile it is stated on Page 126 that 20 gallon containers would be used for transport. This inconsistency in the proposal sheds doubt on the ability of the developers to ensure safe transport and environmental protection measures would be strictly adhered to. Unless significant dredging of the waters adjacent to the western beach area was carried out, access would not be possible for a barge, as the draft would be too deep. Since dredging is not acceptable for reasons explained above, the only other option would be 55 gallon containers. However these pose a high risk of spillage during transport and transfer from boats to storage facilities on the key, threatening turtle nesting beaches, corals, fish and health of swimmers and snorkelers. Indeed, it is stated on Page 126 that the developers cannot guarantee there will be no spillage – "*the accidental spill of fuel will be avoided as much as possible, and in the event of accidental spills, these will be cleaned properly*" – however no details are given of methods that would be used to ensure a proper cleanup, nor any details on standards by which a cleanup would be measured as being 'proper'. Any spillage may also result in aesthetic and ecological damage to beaches, wildlife (including IUCN listed Critically Endangered Hawsbill turtles nesting on the beach here, and the IUCN listed Vulnerable West Indian Manatee) and waters in swimming areas, while also creating undesirable odors. Any spillage on land is likely to have negative impacts on terrestrial flora and fauna, and on marine environments via leaching.

• Solar is cited as possible secondary source of power. While this would undoubtedly be less intrusive in terms of noise and odor, and would reduce risks associated with diesel and spillage. However, solar power is extremely expensive to install, requires a lot of large batteries, requires regular and expert maintenance, and has been shown in numerous examples from other island developments to often result in total system failure due to inadequate care, lack of training of operators, salt and water corrosion problems, and lack of funds for continued maintenance. Once such systems fail, associated infrastructure is usually left in situ, whereby it degrades, with battery systems often leaking chemicals and heavy metals into the surrounding area.

• Furthermore, if any of the systems proposed for power generation breaks down, the ability to pump both potable and wastewater, as well as operate desalination plant and the wastewater treatment facility will cease,

resulting in inability of the resort to supply basic needs to the guests, and creating unacceptable environmental and health risks to the environment, guests, staff and recreational users. Given the remote location, it cannot be affirmed how long repairs would take, and no backup system that is capable of running all the essential functions of the development is mentioned.

• Light pollution from cabanas and other buildings and docks is a major concern for nesting turtles, which are known to become confused by lights on beaches. Indeed in many turtle nesting beach areas, the use of lights is heavily restricted or banned. Given this site is in the center of a conservation zone and that Hawksbill turtles are an IUCN listed Critically Endangered Species, the use of lights visible from beach areas presents an unacceptable level of risk of impact on turtle nesting activities, and thus cannot be supported by TIDE.

**The use of diesel generators requires ongoing supply of fuel, which the authors admit they cannot guarantee will not result in accidental spillage. While assuring any spills would be cleaned up properly, no details are given of methods that would be used to ensure a proper cleanup, nor any details on standards by which a cleanup would be measured as being 'proper'. Any spillage may result in aesthetic and ecological damage to beaches, wildlife (including IUCN listed Critically Endangered Hawksbill turtles nesting on the beach here, and the IUCN listed Vulnerable West Indian Manatee) and health hazards to swimmers and snorkelers, while also creating undesirable odors. The inconsistency in fuel transportation plans (use of barge, 55 gallon containers or 20 gallon containers) sheds doubt on the ability of the developers to ensure safe transport and environmental protection measures would be strictly adhered to, and therefore continuous transportation of diesel to the Caye cannot be condoned by TIDE. Solar power is extremely expensive to install, requires a lot of large batteries and requires regular and expert maintenance, without which total system failure is likely due to inadequate care, lack of training of operators, salt and water corrosion problems, and lack of funds for continued maintenance, with battery systems often leaking chemicals and heavy metals into the surrounding area. No training or maintenance plans for a solar powered system are mentioned in the EIA. If any of the systems proposed for power generation breaks down, the ability to pump both potable and wastewater, as well as operate desalination plant and the wastewater treatment facility will cease, resulting in inability of the resort to supply basic needs to the guests, and creating unacceptable environmental and health risks to the environment, guests, staff and recreational users. Given the remote location, it cannot be affirmed how long repairs would take, and no backup system that is capable of running all the essential functions of the development are mentioned. TIDE cannot therefore condone the energy supply plans presented in this EIA, on grounds of insufficient spillage management plans, and insufficient contingency plans to mitigate environmental impacts in the event of energy system failure.**

**vii) Use of Data:**

• Throughout the EIA there are references to data collected by TIDE, particularly regarding water quality, coral reef health and reef fish abundance. TIDE monitoring data was used without seeking permission from TIDE to use for this purpose. It has been presented inaccurately and not cited appropriately. For example, only 2009 water quality data and only May 2012 coral and fish data have been used as a portrayal of baseline conditions. There is no explanation for why these particular years, some 7 and 4 years ago respectively, were chosen. Additionally, the use of data from only one year provides only a snapshot of conditions, whereas a baseline can only be established through analysis of multiyear time series data. TIDE has this data, yet it was not requested and was not used in the EIA. TIDE does not know where or how the authors acquired this particular year of data, was not consulted, did not give consent, does not agree with the conclusions drawn from the data by the EIA preparers, and it has not been cited and acknowledged properly in the EIA. TIDE considers the lack of request for permission to use its data, the lack of informing TIDE of its use and for what purpose, the lack of appropriate use and improper conclusions of the data used, the lack of units being displayed, the lack of proper

citation of where the data was acquired, and the lack of appropriate acknowledgement of TIDE personnel involved in collecting the data, to collectively be wholly unprofessional and reckless on the part of the EIA preparers, and TIDE cannot therefore support the use of its data for this purpose nor the conclusions drawn in the EIA from this data.

• Chapter 4, Section 4.1 "Field study on the marine fauna and flora" Page 53 states that "*Our fisheries advisor is of the opinion that these studies adequately represent the present status of the flora and fauna around West Snake Caye*". There is no mention in any part of the EIA who the "fisheries adviser" is. The only potential person mentioned is James Azueta, named in Annex B as the "marine ecosystems technical adviser". If this is indeed the person being referred to as the fisheries adviser, the advice is incorrect, as the status of the flora and fauna around West Snake Caye is known by TIDE (from continuous monitoring data stretching back to 2003 for both water quality and coral/fish health and abundance) to not be adequately represented by this snapshot data.

• Furthermore, the EIA states in Chapter 5, Section 5.1 on Page 77 that "i*n order to further establish baseline. Two samples were taken, one from the low lying lagoon inside the island, and the other from the sea".* The text then goes on to draw conclusions on baseline conditions from just these two individual samples. These snapshot samples are not enough to describe water conditions at the Caye. In order to be statistically robust, at least three replicates are needed from each site, and at least five sites in the lagoon and in the sea respectively, sampled on multiple occasions over years to produce time series data are needed to understand baseline conditions. The use of only a single sample at a single point in time at each of the lagoon and the sea is woefully inadequate to determine baseline conditions, and draws into question the professionalism of the EIA preparers.

**TIDE monitoring data has been presented inaccurately, using cherry-picked snapshot data from 2009 and 2012 without justification of why these two particular years were used. TIDE does not know where or how the authors acquired these particular years of data, was not consulted, did not give consent, does not agree with the conclusions drawn from the data by the EIA preparers, and it has not been cited and acknowledged properly in the EIA. TIDE considers this as wholly unprofessional and reckless on the part of the EIA preparers, and TIDE cannot therefore support the use of its data for this purpose nor the conclusions drawn in the EIA from this data.**

**viii) Conservation Value –**

• On Page 187, under the "Conservation Value of the Area" section, the EIA simply describes "*red and black mangroves, coconuts and reed grasses*", while the marine environment is simply described as having "*a number of coral formations around the Cay, especially in the eastern and southern side of the Cay. A number of marine fishes and invertebrates are found in the vicinity of the Cay, however no crocodiles have been reported close to the Caye".* Firstly, the description of the coral formations is inaccurate, as it is known by TIDE that a majority of the coral exists close to the northeastern area of the caye. Furthermore, no reference is made to the critical importance of the habitats and ecosystems in the Replenishment Zone, which provides spillover to the surrounding General Use Zone, supporting livelihoods of over 120 fishers. Also no consideration is given to the fact that TIDE has spent 17 years building relationships of trust with local fishers on the benefits to them of respecting RZs. TIDE therefore finds the assessment of the conservation value of the site by the EIA preparers to be over simplistic, inaccurate and not comprehensive in describing why these areas are valuable for conservation.

## (b) Legal considerations:

**i) No-Action Alternative:**

• **Leased or owned? -** it is stated on Page 188 that "*the no-action alternative is difficult to consider as a viable option due to the pre-existing investments which have been incurred by the developers"*. It also states here that land purchase took place prior to the EIA preparation, however it was stated earlier that this land had been leased, not purchased. The EIA therefore contradicts itself on the issue of whether the land is owned or leased. Given that lease documents are included in the EIA, TIDE is assuming that the land is under lease and is not owned by the leaseholders. This is an important distinction with serious potential ramifications for the viability of the project in the long term, and should not be a matter treated with such lack of clarity in an EIA, or in any other capacity.

• **Justifications for rejecting the no-action alternative -** Based on the lease documents, the total cost to the leaseholders has been as follows:

Rhoda Duncan lease: $275 per year since 26th June 2012
Wayne Bardalez lease: BZ$650 per year since 28th April 2014

Assuming each lease fee was paid each year on these dates, the total paid to date is calculated as:

(BZ$275 x 4) + (BZ$650 x 2) = BZ$1,100 + BZ$1,300 = **BZ$2,400**

Therefore, unless other undeclared transactions have taken place (in which case these should be declared in the EIA), the value of West Snake Caye in terms of the existing tourism activities it supports for multiple tourism operators, as well as the revenue generated by the fisheries supported via spillover from RZs into the GUZ is being given lesser importance and value by the EIA preparers than the BZ$2400 currently invested by the existing leaseholders. In any case, the size of the investment made already is irrelevant in the context of the potential opportunity costs incurred to the existing economic value of the site to the existing fisheries and tourisms sectors, as well as the potential ecological damage to this critically important site, known as some of the healthiest coral reefs in the MAR. The revenue generated in the fisheries sector resulting from the ecological integrity of this site can be determined from managed access fishers' logbook data as being far in excess of the investment made by the proponents of this proposed project.

• **High value property** - The no-action alternative is also being disregarded based on the high commercial value of the property based on its location on a Caye having sea frontage, its privately held status, location within a marine reserve and readily available labor force. However, if the property has such a high commercial value, why is the lease only BZ$925 collectively per year for the two lots?

• **Lack of regard for existing economic activities that would be impacted -** The no-action alternative is also being disregarded on the assumption that there would not be economic benefits generated in this case. However, the no-action alternative would enable existing economic benefits to be sustained that may be negatively impacted by the development, and these hold much higher value to a much broader spectrum of the local population than the revenue that would not be made by the development in the event it does not get approval.

• **Transfer of lease** – there is no evidence provided that the lease was relinquished by the previous leaseholders the Westbys. Also it states on Page iv, and in Section 1.3 on Page 6 that the lease was transferred

from the Westbys to the new leaseholders; however the lease agreements show the leases were granted by the Registrar of Lands and thus not transferred directly from the Westbys to Wayne Bardalez and Rhoda Duncan. Proper documentation tracking the termination of the leases by the Westbys and return of property to the Registrar of Lands, therefore should be shown in the EIA.

• **Violations of terms and conditions of lease agreements –** Figure 1.5 on Page 9 shows the locations of the two lots under lease, indicating that they are immediately adjacent to each other. However, Figure 1.7 on Page 13 indicates that at least two buildings – the main lodge and the workers' quarters physically straddle the boundary between the two lots. The terms of Rhoda Duncan's lease do not permit this, stating in Section 3 (b) of this lease agreement (Lease No. 16 of 2014, lessee Rhoda Duncan, 2.20 acres with effect from 26 June 2014) that in the case that *"Any assignment of transfer or setting over or by any act or deed or in any manner whatsoever dealing with any right or interest under the lease without the consent in writing of the Minister or some person delegated by the Minister"* shall *"…declare this Lease forfeited and thereupon the same shall cease and become null and void to all intents and purposes and the land may be entered upon on behalf of Her Majesty, her heirs or successors by any person duly authorized to do so, and possession thereof may be resumed as the property of Her Majesty, her heirs or successors, and in such case the lessee shall have no claim to compensation for any improvement or outlay".* Meanwhile the lease for the larger plot (Lease No. 14 of 2014, lessee Wayne Robert Bardalez, 6.35 acres with effect from 28th April 2014), also states that it is *"subject to terms and conditions attached hereto",* yet no such terms and conditions are attached. It is stated on Page 139 that the two adjacent parcels of land "*form a continuous bloc*". However it is not a continuous bloc, and the terms and conditions of the respective leases expressly state that any assignment or setting over by any act or deed without the written consent of the Minister is not permitted. Regardless of the fact that the terms and conditions of the lease agreement for the larger lot are missing, the terms of Rhoda Duncan's lease alone do not permit assignment, transfer or setting over of land from one property to the other without written consent of the Minister. No such written consent is shown in the EIA. The lease document format is also clearly long out of date since it is referring to "*Her Majesty, her heirs or successors",* when it should be referring to the Minister in modern Belize. This therefore throws into question the legal legitimacy of both leases. Finally, the two leases are for 30 years and 99 years respectively. It is not stated what will happen to the properties upon expiry or termination of one or other of the leases, and adds further concern to the proposal to construct buildings straddling the property line between the two plots, as there would be no opportunity to separate the functions of these buildings for purposes on one or other side of the property line upon termination or expiry of one or other of the leases. If the either lease were to expire or be terminated at any point, either the buildings would have to be destroyed (with plans for environmentally responsible destruction of these buildings included in the current EIA) or the property lines redrawn – a lengthy process of subdivision that should be done prior to any construction in the first place. The Land Utilization Act, Chapter 188, Revised Edition 2000, Page 49 states that this act required a person to submit an application accompanied by a proposed plan of the parcel of land intended for subdivision, and that the approval of a subdivision will be needed for any land transaction including transfer, and registration of parcels.

**Shareholder concerns -** it is also of serious concern that Wayne Bardalez, the leaseholder and Belizean representative promoting this development is only a 10% shareholder in the company "Caribbean Castaway Retreat Ltd.", while Craig Woodward, a United States Citizen base in Prineville, Oregon is a 90% shareholder in this company, registered in the USA under the name "Sea Breeze Belize LLC" – Registry No. 115718991. This means that only 10% of the profits generated from the development would remain in Belizean hands, undermining any claims that this development would result in significant economic benefits to the affected communities. "Caribbean Castaway Retreat Ltd." is a new company registered under the Belize Companies and Corporate Affairs Registry, Belmopan, Belize (certificate No. 15416) on 31st March 2016, and therefore has no proven track record of successfully carrying out development projects, especially not on remote, isolated, ecologically sensitive and environmentally and socioeconomically important islands located inside a Conservation Zone in a marine reserve. There are numerous examples in Belize of foreign investors being

majority shareholders, who are therefore most interested in profits and have little regard for local impacts of their activities abroad, since they are unaffected themselves by these impacts. Without a track record of proven environmentally responsible development to be evaluated against, we are expected to take it on trust that this company will hold itself accountable in ensuring its environmental and social responsibilities for developing inside the Conservation Zone of a protected area. TIDE has not been convinced it can afford this trust based on the exceptionally low quality of the EIA.

• **Objectivity** - Furthermore, Wayne Bardalez is not only the leaseholder of the larger property, but also a shareholder in the company "Caribbean Castaway Retreat Ltd.", as well as a coauthor of the EIA. It is not therefore possible for Mr. Bardalez to maintain an objective stance in the EIA process, and this represents a three-way conflict of interest.

• **Lack of consideration for other legislative frameworks –** No mention or consideration is given to the Belize Coastal Zone Management Plan. A review of this document reveals that for many reasons this development proposal does not comply with the regulations and recommendations contained therein.

**Given TIDE's concerns over the legitimacy of the leases, the plans to construct buildings straddling the property lines without supporting documentation provided showing permission to do so from appropriate authorities, the unconvincing economic argument for rejection the no-action alternative and uncertain future of the development in the event of expiry or termination of one or other, or both of the leases, the strong shareholder bias in favor of foreign investors, the three-way conflict of interest of Mr. Wayne Bardalez, and the lack of a track record for environmentally and socioeconomically responsible execution of resort developments in remote isolated locations inside protected areas, TIDE considers the legal foundation of the project to be insecure, with ill consideration for consequent future environmental impacts and therefore cannot condone the proposed development.**

## (c) Other matters:

• **Public Consultation –** The public consultations described in the EIA are totally inadequate. Firstly, the EIA suggests on Page 3 that TIDE was consulted on this development and would allow it depending on the size, location and proposed sea sport activities. However, TIDE was at no point consulted on the design of the proposed development and only learned the details upon release of the EIA. Based on the numerous arguments above, TIDE does not approve of the proposed development. It is stated on Page x that "C*onsultations and interviews with stakeholders were carried out during the month of May 2015. Interviewees were receptive of the project and participated fully by giving their views of the project. However interviewees preferred not to have their name shared on any document".* Additionally, in Section 12.2 "Interviews" on Page 149 that *"Interviewees were receptive of the project and participated fully by giving their views of the project. However, interviewees preferred not to have their name shared on any document. Therefore the list of persons interviewed has not been included".* If people had no objections to the development, TIDE does not understand why they were not willing to have their names recorded in the EIA. No information is given about the number of people consulted, who they are, how they were selected or why they are considered to have a stake in the decision. It is therefore not understood how it can be justified that the project should proceed based on the approval of anonymous stakeholders. A public consultation is not public if the public are not allowed to know who was consulted. The views of this anonymous group of unknown size should not be considered binding when no information is given on whether these people are aware of the restrictions of the PHMR Statutory Instrument, no information is given on whether their opinions are grounded in knowledge of legal matters regarding the leases, conservation zones, experience and knowledge of impacts of the proposed development on the marine environment and livelihoods currently dependent on its continued integrity. Furthermore, the questions allegedly asked to these stakeholders make no differentiation between social, economic and

environmental impacts. TIDE therefore considers the public consultation process described in the EIA to be completely meaningless and therefore cannot condone the project.

• **Economic viability and social impacts –** In order to generate sufficient income to sustain this business and generate a profit agreeable to the company shareholders, the project will need to target the high end market, since middle and lower market tourism will not generate enough income to cover the high setup, servicing and maintenance costs. As demonstrated by the Belcampo business in Toledo, which currently offers the highest end tourism facility in Toledo, the number of staff required to provide services to guests paying for high end tourism would far exceed the 8 permanent employees proposed for this development. No provision has been made in calculations of potable water demands, energy demands, and increased wastewater treatment requirements to support the number of staff required to provide a competitive service required to sustain a profitable business model. Therefore TIDE considers the target market and consequent staff requirements and additional resources needed at the Caye to meet the increased number of staff to have been ill-considered by the EIA preparers, and therefore cannot condone the project as proposed. Furthermore, while the developers claim that free open access will remain to the general public that have used West Snake Caye for recreation since time immemorial, it is known from experience of other high end tourism developers, such as the current manager of Belcampo Lodge, that guests who are paying high end prices for an exclusive experience on a remote caye will not tolerate sharing this space with non-paying locals, as they will be continuously concerned about security to themselves and to their property, and will question why they have paid so much to share the caye with the public when other similar experiences are available elsewhere that do provide exclusive access to resort guests. The lodge will either have to succeed by preventing public access to the beaches, or fail in the process of allowing continued public access. The two are mutually exclusive. Given that the investors will want to see a return on their investment, it is inevitable that the general public will become excluded from use of the caye for recreation, one of the last places in southern Belize with nice beaches that are open to the public and are accessible to those with limited means. This will negatively change the way of life forever of the citizens of Toledo, and this is unacceptable to TIDE.

• **Pest control -** Mosquitos and sandflies are prevalent on West Snake Caye, and these are likely to be incompatible with high-end guests. As a result measures will be needed to control these pests. The current standard solution in Belize has been the application of Malathion. However this may have negative impacts on turtle eggs of endangered species, and may leach into the surrounding waters of the conservation zone, not only contributing to stress and damage of ecologically and socioeconomically important reefs surrounding the caye. Furthermore, pesticide use will likely occur on the beach as this is where sandfly eggs hatch. This is unacceptable due to the potential health hazards that could result for users of the beach. Furthermore, West Snake Caye is known to be home to a rare subspecies of boa constrictor, which while being an endangered species, may be considered a pest or even a threat to paying guests. It would violate international treaties signed by Belize to remove them, and therefore they would have to remain, posing an unacceptable risk to health and safety of guests and staff.

• **Security –** West Snake Caye is in the middle of a Conservation Zone that is there to protect species and ecosystem processes that are critical to the continued sustainability of PHMR fisheries. They also contain resources that are highly sought after, not least by illegal transboundary fishers. TIDE rangers can attest to the potentially dangerous circumstances that periodically arise in areas in close proximity to West Snake Caye, involving illegal fishers, often at night, and often armed with various weapons. Indeed illegal fishers have been known to fire weapons at TIDE's ranger station on nearby Abalone Caye. Given the unstable relationship between Belize and Guatemela, and the questionable security of these areas so remote from the Belize mainland and so close to the international border with Guatemala, the safety of high-paying guests on West Snake Caye cannot be assured. A security guard on Tom Owens caye just 10 miles away was tied up at gunpoint by bandits about 3 years ago, who then proceeded to relieve Reef CI company of the majority of their assets on the caye. No one found out until the next group of people came to the island to find the security guard still tied up. It is therefore considered by TIDE that the safety and security of paying guests at West Snake Cay

cannot be assured, and therefore cannot condone the project. It is feared also that dogs may be introduced to the caye for security purposes. This would pose an unacceptable negative impact to birds and other wildlife on the caye, and also to nesting turtles, turtle eggs and turtle hatchlings, which are known to be heavily impacted by domestic dogs. TIDE therefore considers the environmental impact of dogs too great to be acceptable, and no other security solutions are offered by the EIA.

• **Archaeology –** no consideration has been given to the potential archaeological value of West Snake Caye. Other Cayes in close proximity, for example Wild Cane Caye, have been found to have extraordinarily rich archaeological value. It is therefore expected that this proposal would contain serious considerations in regard to the potential archaeological value of West Snake Caye. TIDE is not best qualified to comment further on archaeological matters, but recommends the EIA preparers to contact Dr. Heather McKillop, renowned expert on archeology in Toledo, for further guidance.

• **Punta Gorda Public Consultation -** Finally, the EIA public consultation held on 7th December 2016 at the FR Parish Hall in Punta Gorda, drew an enormous crowd of over 200 people, demonstrating how passionate the local community feels about West Snake Caye. The reaction from the public was overwhelmingly negative, with diverse representation from the community, including fishers, NGOs, tourism sector, rich, poor, and all ethnicities. This issue has therefore united all sectors of society, demonstrating that the public see no benefits to this development that outweigh any positive impacts. Only one community member who spoke voiced support for the development, Mr. Dennis Usher representing the Southern Fisherfolk's Alliance Association. Mr Usher claimed that his comments represented the opinions of over 100 fishers in the area, however none of these were present at the meeting and it is not known who these people are. Mr Usher did not offer any reasons for why he supported this development, and other fishers at the meeting passionately expressed disagreement to his claim of representing over 100 fishers, citing that these fishers are from Sarstoon Village in Guatemala and have no legal right to be fishing in PHMR anyway. This sentiment is understandable given that PHMR fishers stand to receive no benefit whatsoever from the proposed development.

**Based on the reasoning detailed above, TIDE's final position on the proposed development on West Snake Caye is as follows:**

**TIDE is not inherently opposed to development in its area of interest, but as co-managers of Port Honduras Marine Reserve TIDE has been entrusted by the Government of Belize, the Belize Fisheries Department, and the communities and stakeholders associated with this marine reserve to uphold the rules, regulations and legislation governing the reserve. After full review of the EIA, TIDE considers that on many points as listed above, not only is it the case that the EIA does not meet these standards in its current form, but that it is not possible for many of these standards to be met and still uphold environmental and socioeconomic integrity of the reserve and the people who depend upon it for livelihoods and recreation, and that it is not possible to generate sufficient revenue to sustain the facility and thus the proposal is inherently environmentally, socially and economically unviable. West Snake Caye is simply too remote, too small, too close to unstable political boundaries, too physically dynamic, too environmentally sensitive and too socioeconomically important to sustain a viable resort capable of conforming with the stringent regulatory framework under which the area it is situated is governed. TIDE therefore rejects the proposal by Caribbean Castaway Retreat Ltd. to develop a resort on West Snake Caye, in accordance with the vast majority of stakeholders who expressed their negative opinions at the EIA public consultation held on 7th December 2016 at the FR Parish Hall in Punta Gorda.**