Environmental Impact Assessment (EIA) for Central Bank of The Bahamas Demolition Project, New Providence

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Contents

ENVIRONMENTAL IMPACT ASSESSMENT FOR CENTRAL BANK OF THE BAHAMAS DEMOLITION PROJECT, NEW PROVIDENCE, THE BAHAMAS

Executive Summary

The objective of the Environmental Impact Assessment (EIA) for the Central Bank of The Bahamas Demolition Project is three-fold:

1. To evaluate potential environmental impacts of the proposed demolition project
2. To suggest potential mitigation measures that can be implemented to reduce or eliminate any negative environmental impacts
3. To evaluate whether the proposed project can be implemented in a manner that is environmentally sustainable

The Central Bank of The Bahamas (CBOB) Demolition Project involves the demolition of five (5) buildings on either side of East Hill Street on the island of New Providence in The Bahamas (see Map 1). The project is being executed by the Central Bank of The Bahamas.

The completed project will involve demolition of the following buildings:

1. Victoria Lodge (Royal Victoria Gardens)
2. Security booth (Royal Victoria Gardens)
3. Ministry of Health HIV-AIDS Centre (Royal Victoria Gardens)
4. Former Commission of Inquiry (Royal Victoria Gardens)
5. Former Post Office (East Hill Street)

The buildings are being demolished to enable construction of a new Central Bank headquarters, with the exception of the Post Office Building. The latter is being demolished as requested by the Government of The Bahamas. The construction of the new headquarters will be assessed in a separate Environmental Impact Assessment.

Employment of appropriate demolition methodologies can result in execution of the project site in a sustainable manner. Utilizing recommended mitigation measures can eliminate or minimize any negative environmental impacts resulting from project activities.

The Central Bank has expressed its commitment to implementing the recommended mitigation measures and executing the project in a manner that respects neighbouring businesses and communities, the natural resources of the site and is environmentally sustainable.

Map 1: Central Bank of The Bahamas Demolition Project, New Providence

1.0 Introduction and objectives

1.1 Objective of the EIA

The objective of the Environmental Impact Assessment (EIA) for the Central Bank of The Bahamas Demolition Project is three-fold:

1. To evaluate potential environmental impacts of the proposed demolition project
2. To suggest potential mitigation measures that can be implemented to reduce or eliminate any negative environmental impacts
3. To evaluate whether the proposed project can be implemented in a manner that is environmentally sustainable

1.2 Scope of the EIA

The EIA involved field surveys and research focused on the project site and its environs. Surveys conducted included:

- Terrestrial habitat survey (including avifaunal survey)
- Hazardous materials assessment
- Socioeconomic assessment

2.0 Project description and alternatives

2.1 Description of proposed project

The Central Bank of The Bahamas (CBOB) plans to construct its new premises on the Royal Victoria Gardens site between East Street and Parliament Street, south of Shirley Street. Several buildings will be demolished in preparation for construction including the former Post Office building, south of East Hill Street and buildings on the Royal Victoria Gardens property, north of East Hill Street.

The objective of this new facility is to provide a modern space for CBOB to conduct its business and act as a landmark structure that will not only serve as the new location of the Bank, but as an impetus for the revitalization of the city of Nassau. The environmental impacts of the construction of the new facility will be assessed in a separate Environmental Impact Assessment. This current EIA deals only with the demolition project. The CBOB Demolition Project involves the demolition of five (5) buildings on either side of East Hill Street on the island of New Providence in The Bahamas (see Map 1). It is being executed by the Central Bank of The Bahamas. The project concept plan is shown below in Figure 2-1.

Figure 2-1: CBOB Demolition Project Concept Plan

No	Name of Building
1	Victoria Lodge
2	Security Booth
3	Bahamas National Drug Council
4	HIV-AIDS Centre
5	Curry House
6	Zion Baptist Church
7	Commission of Inquiry
8	Former Post Office

Building Legend	
Building to Remain	
Building to be Demolished	

The completed project will involve demolition of the following buildings:

1. Victoria Lodge (Royal Victoria Gardens)
2. Security booth (Royal Victoria Gardens)
3. Ministry of Health HIV-AIDS Centre (Royal Victoria Gardens)
4. Former Commission of Inquiry (Royal Victoria Gardens)
5. Former Post Office (East Hill Street)

More detailed information on the buildings involved in the project is provided below in Table 2-1.

Table 2-1: Buildings included in CBOB Demolition Plan

Building No.	Building Name	To be Demolished	Notes	Images
1	Victoria Lodge	Yes	Derelict single-storey building opposite the Security Booth. Location: Near exit to Parliament Street.	
2	Security Booth	Yes	Small single-storey, single room structure located opposite Victoria Lodge. Location: Near exit to Parliament Street.	

3	Formerly offices of the Bahamas National Drug Council	No	Single-storey structure. Shuttered. BNDC no longer occupies the building.	
4	Ministry of Health – HIV-AIDS Centre	Yes	Two-storey building with half a basement. Currently used as a treatment facility for patients. Structure in need of maintenance, but does not appear to be in deteriorated condition.	
5	Curry House	No	Three-storey historic building. Currently occupied by the Ministry of Health's Reference Laboratory.	

6	Zion Baptist Church	No	Church is occupied and not part of demolition activities.	
7	Commission of Inquiry	Yes	Derelict three-storey building. Exterior of building shows signs of significant structural deterioration. There are files still stored in the building.	
8	Post Office Building	Yes	Building no longer occupied. Building is in 2 parts - main building with 3 levels and a 5-storey addition. Areas include Letter Post Floor, Administrative Block, Parcel Post Counter & Customs Section, General Mail Counter, offices used by Department of Social Services, and offices used by the Attorney-General's Office.	

Employment of appropriate demolition methodologies can result in execution of the project site in a sustainable manner. Utilizing recommended mitigation measures can eliminate or minimize any negative environmental impacts resulting from project activities.

The Central Bank has expressed its commitment to executing the project in a manner that respects the natural resources of the project site and is environmentally sustainable.

2.2 Demolition methodology

The methodology for demolition of the former Post Office building is detailed below:

1. The demolition crew will do a safety sweep of the building every morning and afternoon. This is done to ensure no one is in the building or can get in the building. This is an extra safety precaution in case vagrants may frequent the building.
2. A separate crew will come in and remove all light bulbs and ballasts that need to be removed from the building as part of the universal waste removal. During this process, employees will be using podium ladders to reach the lightbulbs. The lightbulbs will be ground in place using a bulb grinder or taken to the demolition firm's facility and put through their bulb grinder.
3. The demolition crew will be using a fire hydrant for water supply along with a 1 ½ water hose with a fire nozzle on the end of it. A fire hydrant is located northeast of the Royal Victoria Gardens site, approximately 75 feet from the East Street-East Hill Street intersection.
4. After all waste and removable materials are cleaned from the building, the demolition crew will then begin removing the building, starting with the roof structure and collapsing it into the 3rd floor slab. Once the roof structure is safely collapsed onto the 3rd floor slab, they will then clean off the 3rd floor slab of debris in preparation for demolition of the 3rd floor. This sequence will continue until all floors are demolished and debris removed from the site.
5. The crew will fold the outside walls of the top two stories of each subject bay inward toward the 2nd floor. They will start cleaning the 2nd floor slab of the wall debris. After the 2nd floor slab is clean, they will start removing 2nd floor slab down to the 1st floor, loading trash and debris out into waiting trucks. This will leave the ground floor slab as last to come out, after the entire building is gone. All material will be disposed of at approved disposal sites.
6. Once the lower structures are removed, the demolition crew will then start on the seven-storey portion of the building. This portion will be done using a high reach excavator that has a reach of 92' foot with concrete processor on the end.
7. The high reach will start two floors down from the top level. This will allow us to do the building bay by-bay column line by column line collapsing the build in a controlled manner, working the building from east to west collapsing. This will allow the crew to control the north wall, so it does not end up in the roadway (pictures of the high reach excavator are provided at Figure 2-2).
8. The 336 excavators will be used to clear the way for the high reach to continue to drop the building throughout this process.
9. Once all construction debris and trees are gone and only a bare slab remains, the demolition crew will then start removing the slabs and footers. This will be done north to south.
10. After all concrete and asphalt are removed and hauled off, they will rough grade the site.
11. All this work will be done with a 336, 345 cat excavators and one 450 Komatsu high reach excavator.

The methodology for four (4) of the buildings is detailed below:

1. Upon completion of the former Post Office building demolition, the other four buildings will be cleaned of waste and removable materials.

2. With equipment located at the Royal Victoria Gardens site, buildings will then be demolished to slab level in a manner that allows debris to collapse within the site.
3. Victoria Lodge and the Security Booth will be demolished first followed by the Commission of Inquiry building. The HIV-AIDS Centre will be demolished last.
4. Debris from demolition will be placed in the parking lot at the Royal Victoria Gardens site and will then be loaded and transported to the disposal site.

2.3 Description of alternative to the proposed development

The selection for the project site was made based on the following criteria:

- It was available for acquisition;
- It is in the city centre, which makes it an ideal location in terms of symbolism, logistics and practicality for the nation's Central Bank; and
- It is an opportunity to execute a project that contributes to national development, national pride and the revitalization and reimagination of downtown Nassau.

The design of the new CBOB headquarters seeks to take advantage of the elevations on the site and to develop an iconic architectural structure in the Downtown area.

In order to construct the new building, some of the buildings at Royal Victoria Gardens, as indicated, will need to be demolished. Most of these buildings are in great disrepair and could not be salvaged. Since buildings are being demolished for the project, the Government of The Bahamas has requested the Bank's assistance in demolishing the former Post Office as this building is also now uninhabitable and is in severe disrepair. The series of photos below indicate the conditions in the various buildings.

Figure 2-2: High Reach Excavator

Figure 2-3: Former Post Office

Figure 2-4: Commission of Inquiry Building

2.4 "No action" alternative

With development, there is always an alternative of 'no action' which leaves the proposed site untouched. If these buildings are not demolished, they will continue to fall into disrepair and may become hazards to motorists and passersby as they become more structurally unsound, particularly the former Post Office. Four of the buildings are not in a state that would enable them to be used for alternative purposes. Repair would be significantly more costly than demolition and new construction. In order to utilize the already impacted site, these buildings have to be removed.

The Central Bank has outgrown the accommodations of its current premises - operationally, logistically, and in terms of space for staff. The Bank has been renting nearby accommodations for roughly thirty percent of its staff compliment for the past 20 years, incurring unsustainable financial and functional costs. Additionally, the Bank is able to provide parking for only forty percent of its staff, presenting a risk to persons, property, and operations with the remaining staff having to find parking elsewhere. Since the Central Bank's construction in the early 1970s, issues, such as maintenance and security, have been generally outpaced and outplaced by the evolving contexts that the passage of time presents.

The exception to use is the HIV-AIDS Centre. It is currently being used by Ministry of Health and the patients they service. Ministry of Health is in the process of looking for new facilities to house the Centre that would provide better working conditions for its staff and treatment conditions for its patients. As the Centre treats patients with an immune suppression disease, any existence of mold in the building has the potential to put them at risk for fungal infections.

Demolition of the buildings provides opportunities for the construction of new buildings, like the new Central Bank headquarters, and the revitalization of the Downtown area with the economic benefits that this can generate.

The EIA outlines mitigation measures that can be employed to minimize or eliminate any negative environmental impacts from the demolition. With these measures instituted, the project can be done in an environmentally sustainable manner.

3.0 Baseline description of the project site

New Providence is the most populated island in The Bahamas with 246,329 residents (Department of Statistics, 2010). It is 80 square miles with a population density of approximately 3,079 persons per square mile. On the island of New Providence, the city of Nassau is the capital of The Bahamas and home to Central Government with the Houses of Parliament in the Downtown area.

3.1 Physical aspects

3.1.1 Climate

The Bahamas is located within the Atlantic Tropical Cyclone basin. This basin includes much of the North Atlantic, Caribbean Sea, and the Gulf of Mexico. On average, 6 to 8 tropical storms form within this basin each year. In 2016, The Bahamas was impacted by Hurricane Matthew with the islands of New Providence, Andros and Grand Bahama receiving severe damage in some coastal areas. In 2017, The Bahamas was impacted by Hurricane Irma. Significant damage occurred on the island of Great Inagua; Crooked Island was impacted as well. The Bahamas was not hit by any hurricanes in 2018.

In 2019, significant areas of the islands of Abaco and Grand Bahama were devastated by Hurricane Dorian. Estimated damage for these islands is US$3.4 Billion (IDB, 2019). Abaco has shown a reduction in monthly economic activity of 54 per cent comparing September 2019 to September 2018, and Grand Bahama has shown a 34 per cent decrease (IDB, 2020).

The hurricane season has not begun for 2020 as yet. The formation of these storms and possible intensification into mature hurricanes takes place over warm tropical and subtropical waters. Eventual dissipation or modification typically occurs over the colder waters of the North Atlantic or when the storms move over land and away from the sustaining marine environment. The official hurricane season lasts from June 1st to December 1st.

3.1.2 Topography

Topographically, the islands of The Bahamas are typically flat with elevations of less than 32 feet (10 meters). A higher coastal ridge may occur, usually located along the exposed side of most islands. Islands of the southeast and central Bahamas are generally of higher elevation than in the northern Bahamas. The islands are usually long and narrow oriented from northwest to southeast with central ridges extending to a maximum height of 200 feet (60 meters).

New Providence is composed of a mixture of rocklands and ridges. The project site located on East Hill Street sits on one of two ridges on New Providence. The ridge runs east to west and parallel to the northern coast of New Providence. The Post Office property is situated at a higher elevation than the Royal Victoria Gardens, which slopes slightly northward toward Shirley Street. The highest point of the ridge is the nearby Fort Fincastle, which is approximately 38 meters (126 feet) in elevation and is located less than ½ a mile from the Post Office property.

3.1.3 Geology

The Bahamas archipelago is situated in the western North Atlantic and is comprised of extensive carbonate islands and shallow banks. There are 29 large islands, over 600 small cays, and more than 2,000 rocks, all

low-lying. The surface deposits of archipelago are of Late Quaternary limestones from a glacioeustatic sea-level highstand position; a depositional record of platform flooding and carbonate sediment production. Simply put, alternating glacial expansions and retreats created vast changes in sea levels across geologic time, allowing for the formation of the islands. The islands are tectonically stable, consisting of carbonate sediments with interspersed paleosols (Mylroie, 2016).

With geologic origins that are biogenic and completely carbonate, The Bahamas differs from other islands in the region. The islands rest on shallow water banks which are primarily composed of calcium carbonate sediments. These limestone sediments were created from rapidly growing marine life which extracted calcium carbonate from seawater creating voluminous depositions of sand and mud. The Bahamas consists of eight carbonate banks with the north and central islands resting on two of these banks. New Providence, centrally located, is part of the largest formation – the Great Bahama Bank.

Oolitic sands have also contributed to the geologic development of the islands, specifically during the last ice age when sea levels were significantly lower. It was then that oolitic sand dunes hardened and when sea levels rose, the rock ridges formed by these dunes became islands along the edges of the shallow banks.

Another source of islands in the archipelago are limestone rocklands, which were formed from the seabed when sea levels were at their highest. As sea level declined, the exposed seabed underwent erosion and weathering. The resulting formation was rocklands. Rocklands make up the broader islands in the archipelago (such as Andros and Grand Bahama) and oolitic sand dunes are represented in thin long islands (including Long Island and Cat Island).

Soil composition in the archipelago consists of organic and inorganic materials and the young age of the soil is reflective of the geologic age (young) of the limestone. Soils layers are typically thin and usually arranged in one or two layers above bedrock. Three soil types are recognized throughout the islands: organic, red clay, and sedimentary soils. New Providence is primarily made up of organic soils, which is the most common soil type in the archipelago (Currie, 2019).

3.1.4 Hydrology and hydrogeology

In The Bahamas, the physical geology, hydrogeology, and water resources are very directly linked as there are no true rivers in The Bahamas. The only natural means of recharge for the underlying freshwater resources is via rainfall. The groundwater resources of the Commonwealth of the Bahamas comprise the fresh, brackish, saline and hypersaline waters found in the subsurface and in the lakes and ponds that intercept the land surface.

Salinity levels of water are expressed in parts per million (ppm) or milligrams per litre (mg/L) of the chloride content in the water, which is a constituent of the total dissolved solids. For the purposes of this particular site and the proposed water use, the ranges of salinity follow:

Water Description	**Dissolved Solids**
Fresh	Less than 1,500 mg/L
Brackish	1,500 – 3,000-mg/L
Salt	More than 3,000-mg/L
Saline	More than 30,000-mg/L

Climate variability and change is expected to greatly influence the existing weather and environment of the Bahamas. Problems that may be exacerbated in response to climate variability and change are: (1) the frequency and intensity of hurricanes and, (2) the potential of rising sea levels. Changes in the position and the distribution of fresh, brackish and saline groundwater is anticipated due to any rising sea level; combined with possible reduction in groundwater recharge from changes in rainfall distribution.

The Commonwealth of The Bahamas consists of an archipelago of islands atop the Bahama Platform. The platform is comprised of a series of thick, shallow carbonate banks horizontally aligned that have built up along the subsiding continental margin of North America. Geophysical data indicate that the shallow marine carbonates and evaporates beneath the banks is between 3.2 miles (5.4 kilometers) and 6 miles (10 kilometers) thick depending on the location across the Bank. The banks are separated by a series of deepwater channels upon which the islands of the Commonwealth occur unevenly usually on the margins of the larger and in the center of the shallower banks. In The Bahamas: 'from sea level down to a depth of about 5 miles (8.0 kilometers), the geology is dominated by limestone and dolomite, with anhydride, salt and gypsum appearing at deeper horizons.' (Cant, 1992).

The upper portions of the land area have been exposed several times in the geologic past as a result of sea-level fluctuations of the Pleistocene age. The rocks in which the easily exploitable groundwater resources occur extend down to approximately 130 feet (39.6 meters) in the zones of the Pleistocene and Holocene lime-stones and lime-sands. These rocks formed as a result of wave action, the chemical precipitation of calcium carbonate and the deposition of oolitic and skeletal sands of marine origin.

Pleistocene lime-stones in the form of shallow marine deposits, coral and wind blown deposits dominate the surface geology. These deposits have been cemented by the solution of calcium carbonate in fresh rainwater during low sea level, followed by the re-precipitation within the inter-grain pores.

The groundwater resources of The Bahamas comprise the fresh, brackish, saline and hypersaline waters found in the near and deep subsurface and in the lakes and ponds that intercept the surface. The freshwater resources occur as three-dimensional lens-shaped bodies, which overlie brackish and saline water.

Generally, there is nowhere on the islands of The Bahamas that groundwater cannot be met in holes that penetrate 10 feet (3 meters) below sea level. Water is always met in the range 0 to 3 feet (0 to 0.9 meters) above sea level. Tidal action induces an up and down movement to the entire groundwater table ranging from negligible amounts to about 3 feet (0.9 meters). The effect of tides decreases inland on the whole, but

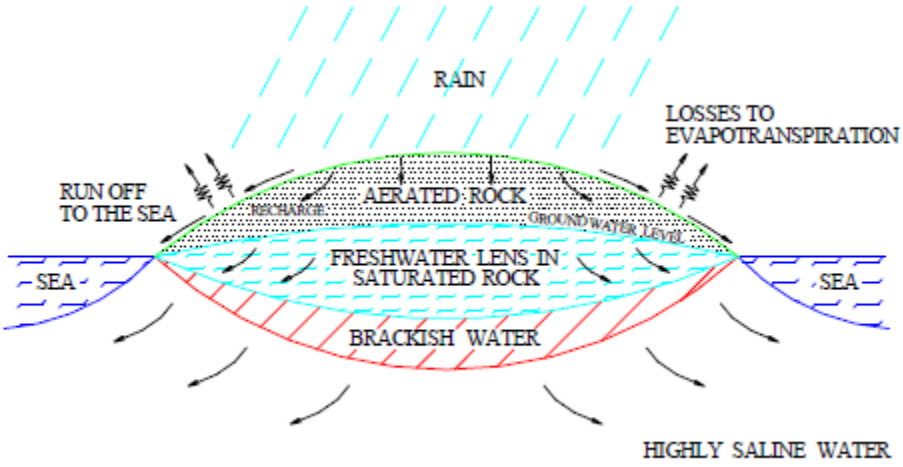
can be substantial inland if a well established cavern or other large opening directly connects the area to the sea. In many places inland, rise and fall of the water table is less than 1 foot (0.3 meters).

The typical normal water table elevations are estimated at 3 to 5 feet (0.9 to 1.5 meters) below ground level. Seasonal high water table elevations can range from 1 to 3 feet (0.3 to 0.9 meters) below ground level. During certain storm periods, the water table elevation can be above ground for a period ("perennial wetland areas") but dissipates following the storm period.

The main freshwater aquifer in The Bahamas occurs in the 'Pleistocene Age' formations named the Lucayan Limestone from approximately 3 to 130 feet (1 to 40 meters) below ground level (BGL). Younger Holocene deposits can contain freshwater, but freshwater is not present in older deposits beyond 150 feet (45 meters) BGL (Cant and Weech, 1986). Figure 3-1 below shows a typical aquifer.

Groundwater saturates the rock and all its pores, fissures and interconnected cavities. The size, shape and orientation of the island, the subsurface geology and the amount of rainfall control the shape size and thickness of the freshwater bodies. In excess of 90% of the freshwater lenses are within five feet of the surface.

Figure 3-1: Ghyben–Hertzberg Lens



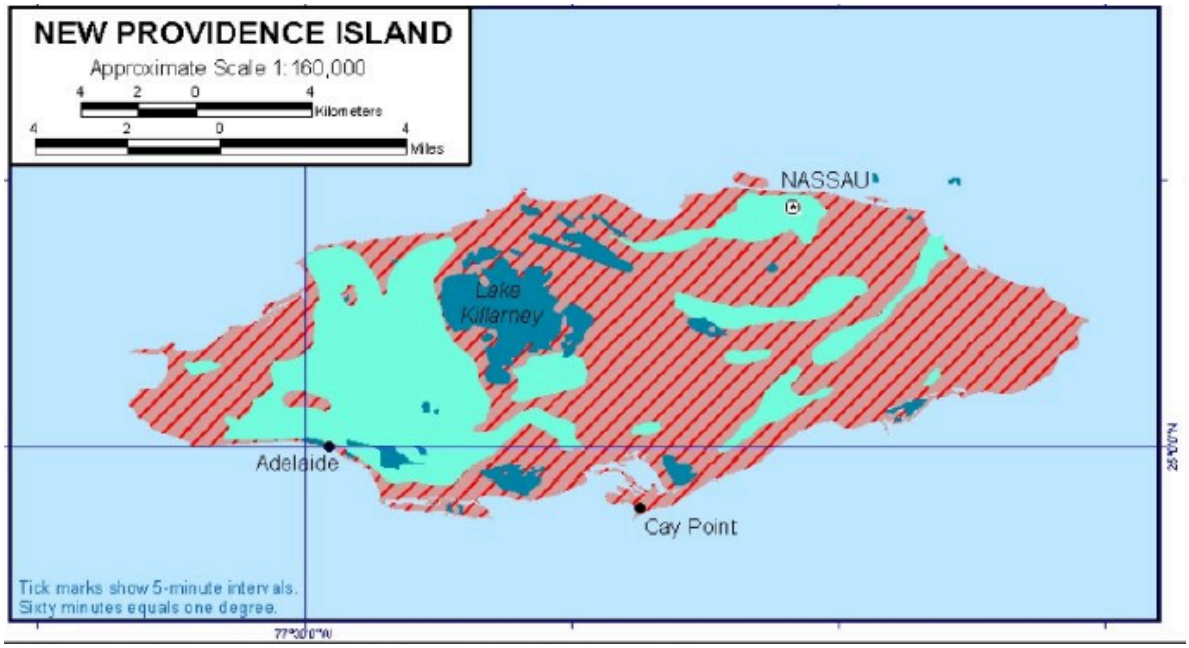
In The Bahamas, all freshwater comes from rainfall, which is in dynamic transit back to the ocean from which it came. It has been estimated that freshwater underlies some five percent (5%) of the total landmass of the Commonwealth of the Bahamas.

The physical geology, hydrogeology, and water resources are directly linked as there are no true rivers in The Bahamas. The only natural means of recharge for the freshwater resources is via rainfall. About 75% of precipitation that reaches the land is lost to the atmosphere through evapo-transpiration and as runoff from the surface back into the sea.

'The remaining amount of rainfall is estimated to form the lens (Sealey, 1994). Therefore, records of rainfall are pivotal in estimating the needed annual recharge of freshwater lenses from which water is extracted. The water in these lenses remains intact as long as the amount of water extracted does not exceed the amount of recharge through rainfall. "Over-extraction exceeding the amount of recharge leads to the shrinkage of freshwater lens and a rise in saline water" (Sealey, 1994).

Figure 3-2 below shows areas throughout New Providence where the fresh water (< 1,500-mg/l chloride) is "locally plentiful" with the water table within 0 to 6 meters (0 to 20 feet) of the surface (USACE, 2004) Thickness of the water lenses in New Providence range from 20 to 50 feet (Cant, n.d.). There is currently no sustainable groundwater source on the project site, so freshwater will have to be provided from municipal sources for project activities.

Figure 3-2: Diagram of New Providence Freshwater Lens



Map Legend	
Groundwater resources – Fresh water locally plentiful; unsuitable to large quantities of fresh water from shallow, freshwater lenses within poorly-stratified Pleistocene limestone aquifers. The water table is within 0 to 20 feet of the surface	
Ground water resources – Fresh water scarce or lacking; unsuitable quantities of fresh water from shallow poorly-stratified Pleistocene limestone aquifers.	
Surface water resources – Surface water features including ponds, lakes, creeks and blue holes; unsuitable to meager quantities of brackish to hypersaline water available.	

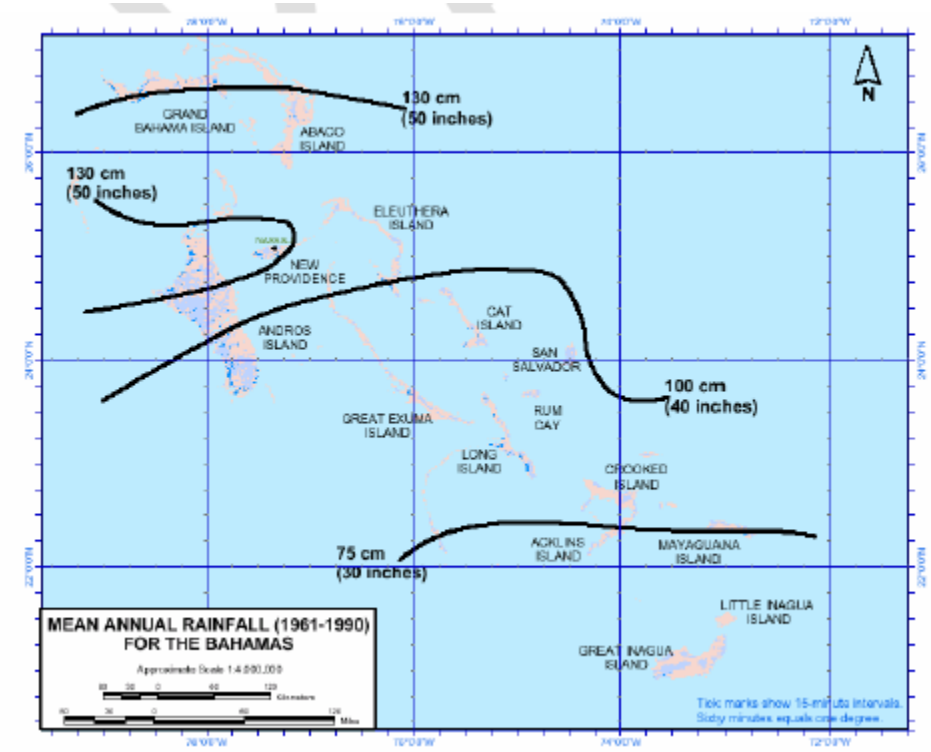
Source: USACE, 2004.

Rainfall

Rainfall is unevenly distributed across The Bahamas. Figure 3-3 below shows the distribution of rainfall for The Bahamas.

The north and north central Bahamas receives some 50 to 60 inches (1270 to 1524 millimeters) of rainfall annually while in the southeast Bahamas, the rainfall decreases to some 36 inches (914 millimeters) annually. There is a distinct dry season (November to April) and a pronounced wet season (May to October). The seasonal effects of tropical cyclones have a pronounced effect on annual rainfalls across The Bahamas. Additionally, winter storms flowing off the North American continent also impact rainfall during the normally dry period. This effect however rarely extends into the central and southern Bahamas.

Figure 3-3: Mean Annual Rainfall for The Bahamas



Source: USACE, 2004.

Climate and Sea Level Rise

Climate variability and change is expected to greatly influence the existing weather and environment of The Bahamas. Problems that may be exacerbated in response to climate variability and change are the frequency and intensity of hurricanes and the potential of rising sea levels. Changes in the position and the distribution of fresh, brackish and saline groundwater is anticipated due to any rising sea level, combined with possible reductions in groundwater recharge from changes in rainfall distribution.

It appears that the sea has been rising at a rate in the order of 6 to 10 inches (152 to 254 mm) per 100 years in The Bahamas, not taking account of possible differences in the rates of uplift or subsidence at these sites. The observations are consistent with the model predictions, and it is generally agreed that the rate of sea level rise in the next century will be 2 to 5 times that in the last 100 years.

In The Bahamas, rising sea levels will lead to considerably less fresh groundwater resources, accelerated erosion of coastal shorelines, and the deeper penetration of storm surges inland.

3.1.4 Air quality

There are no issues related to air quality impairment at the site presently. Air quality is not expected to be impaired by the activities associated with this project.

3.1.5 Noise pollution

Noise pollution is not an issue at the site. Noise levels during demolition may be raised. This will be discussed in more detail in Section 4.0 on Impacts.

3.2 Biological aspects

3.2.1 Terrestrial habitats

The Post Office property and the Royal Victoria Hotel property have been significantly developed. Both have extensive impervious surfaces in the form of buildings and parking lots. Classification of both properties would follow Areces et al. (1999) as Non-agricultural Disturbed Areas.

The Post Office property is predominantly impervious (concrete and asphalt) surface, with the post office building, sidewalks, and the adjacent parking lots to the east and west of the building. A small strip of vegetation is present on the boundary of the eastern parking lot, comprised of Shortleaf fig (*Ficus citrifolia*), Silver Top Palm (*Cocothrinax argentata*), Mahogany (*Swietenia mahogoni*) and Wild Tamarind (*Lysiloma latisilliquum*) trees. Small patches of Guinea grass (*Megathyrsus maximus*) and Shepherd's needle (*Bidens pilosa*) were observed among cracks in pavement and sidewalks.

The Royal Victoria Garden Hotel was built during the American Civil War and was regarded as a tranquil locale for visitors to the island, primarily due to its garden-like atmosphere. While the main hotel building succumbed to fire in the 1990's and the space transformed into an impervious parking lot, much of the garden still exists. Plant species observed are listed in Table 3-1 below.

Table 3-1: Plant Species observed at the project site

Common Name	Scientific Name
Royal Poinciana	*Delonix regia*
Spike Grass	*Uniola virgata*
Juju	*Ziziphus jujuba*
Wild Tamarind	*Lysiloma latisilliquum*
Shortleaf fig	*Ficus citrifolia*
Golden wild fig	*Ficus aurea*

Coconut palm	*Coco nucifera*
Silver Top Palm	*Cocothrinax argentata*
Thatch Palm	*Leucothrinax morrisii*
Sabal Palm	*Sabal palmetto*
Royal Palm	*Roystonea regia*
Bahama Century Plant	*Agave bahamana*
Mango sp.	*Mangifera indica*
Silk Cotton	*Ceiba pentandra*
Bahama Waltheria	*Waltheria bahamensis*
Lignum Vitae	*Guaiacum sanctum*
Mahogany	*Swietenia mahogoni*
Bougainvillea	*Bougainvillea sp. (various)*
Almond tree	*Terminalia catappa*
Horseflesh	*Lysiloma sabicu*
Sappodilla	*Manilkara zapota*
Satin leaf	*Chrysophyllum oliviforme*
Shepherd's Needle	*Bidens pilosa*
Spanish Bayonet	*Yucca aloifolia L.*
Jumbay	*Leucaena leucophala*
Autograph Tree	*Clusia rosea*
Yellow Elder	*Tecoma stans*
Scarlet Calamint	*Calamintha coccinea*
Woman's Tongue	*Albizia lebbeck (L.) Benth.*
White Frangipani	*Plumeria alba*
Frangipani	*Plumeria obtusa*
Agave	*Agave cacozela*
Snake Plant	*Dracaena trifasciata*
Oleander	*Nerium oleander*

Small patches of Bermuda grass, Crabgrass, Guinea grass (*Megathyrsus maximus*) and Shepherd's needle (*Bidens pilosa*) were observed in the parking lot, along sidewalks and walls.

Figure 3-4: Silk Cotton Tree

Figure 3-5: Yellow Elder

Figure 3-6: Autograph Tree

Protected Trees

There are 1,371 plant species recorded for The Bahamas (Correll and Correll, 1982) and twenty of those recorded are endemic. The Conservation and Protection of the Physical Landscape Act, Protected Tree Order, 1997, ensures the protection of several species. Table 3-2 lists the protected species of The Bahamas and indicates which were observed at the demolition sites. During the preliminary site visit, four species of protected trees were observed on the demolition sites.

Table 3-2: Protected tree species observed at the project site

Common Name	***Scientific name***	**On-Site**
Beefwood (Blolly)	*Guapira discolor*	Not observed
Black ebony	*Pera bumeliifolia*	Not observed
Brasiletto	*Caesalpinia vesicaria*	Not observed
Candlewood	*Gochnatia ilicifolia*	Not observed
Caribbean Pine	*Pinus caribea var. bahamensis*	Not observed
Horseflesh	*Lysiloma sabicu*	Observed
Lignum vitae	*Guaiacum sanctum*	Observed
Mahogany	*Swietenia mahogoni*	Observed
Rauwolfia	*Rauvolfia nitida*	Not observed
Red cedar	*Juniperus bermudiana*	Not observed
Silk Cotton	*Ceiba pentandra*	Observed

A number of bird species were also observed at the project site. These are listed in Table 3-3.

Table 3-3: Bird species observed at the project site

Common Name	**Scientific Name**
Smooth-billed ani	*Crotophaga ani*
White-crowned pigeon (Protected)	*Patagioenas leucocephala*
Laughing gull	*Leucophaeus articilla*
Rock pigeon	*Columba livia*
Common ground dove	*Columbina passerina*
Green heron	*Butorides virescens*
Northern mockingbird (Invasive)	*Mimus polyglottos*

While they were not observed during the site visits for the ornithological survey, Bahama parrots (*Amazona leucocephala*) are known to frequent the area.

Figure 3-7: White-crowned Pigeon

Figure 3-8: Northern Mockingbird

Other animal species observed on the site included anoles, spiders and butterflies.

3.2.2 Caves and blue holes

There were no caves or blue holes observed at the project site.

3.2.3 National parks and protected areas

One protected area is within two miles of the demolition site - The Retreat Garden (1.9 miles east) on Village Road. Established in 1985, this 11-acre national park houses a historical palm collection and is representative of coppice forest habitat within an urban setting.

This protected area is not expected to be impacted by the demolition project.

Figure 3-9: The Retreat Garden

3.3 Socioeconomic aspects

3.3.1 Communities, demography and economic base and status

The population of The Bahamas is provided in the 2010 Census as 246,329 and over 70% reside on New Providence. Between the 2000 and 2010 Census, the population has grown by almost 16%, the lowest increase since the 1950's. At just 80 square miles and 3,079 persons per square mile, New Providence is the most densely populated island in the archipelago (Dept of Statistics, 2010).

Tourism is the number one industry in The Bahamas, accounting for 20% of the labour force, and contributing 60% of the GDP. Financial services sector is the second major industry in The Bahamas and includes commercial and private banking institutions.

In August 2019, the Government of The Bahamas announced that the unemployment rate for the country was the lowest it has been in over a decade (Ministry of Finance, 2019). The following month the islands, communities, and economy were dealt a staggering blow in the form of Hurricane Dorian. Estimated damages and losses totaled in excess of $3.4 billion dollars, representing one third of the country's GDP (IDB, 2019). The December 2019 Labour Force Survey showed that employment on New Providence rose by 3,340 in December 2019 when compared to May 2019 (Dept of Statistics, 2019).

Every sector was impacted by the devastation of Hurricane Dorian, with housing being impacted the most. Some 9,000 homes were damaged on Abaco and Grand Bahama. Almost 3,000 homes were deemed uninhabitable. Since the devastation of hurricane Dorian over 3,000 persons have relocated to New Providence, significantly impacting demographics on the island (Dept of Statistics, 2019).

Enrollment in school is mandatory in The Bahamas for youth between the age of 5 and 16. Approximately 75,120 students are enrolled at the preschool school to secondary school levels and between 8-9,000 enrolled at the tertiary level. There are several schools located within a one-mile radius of the demolition site (Dept of Statistics, 2010). They include:

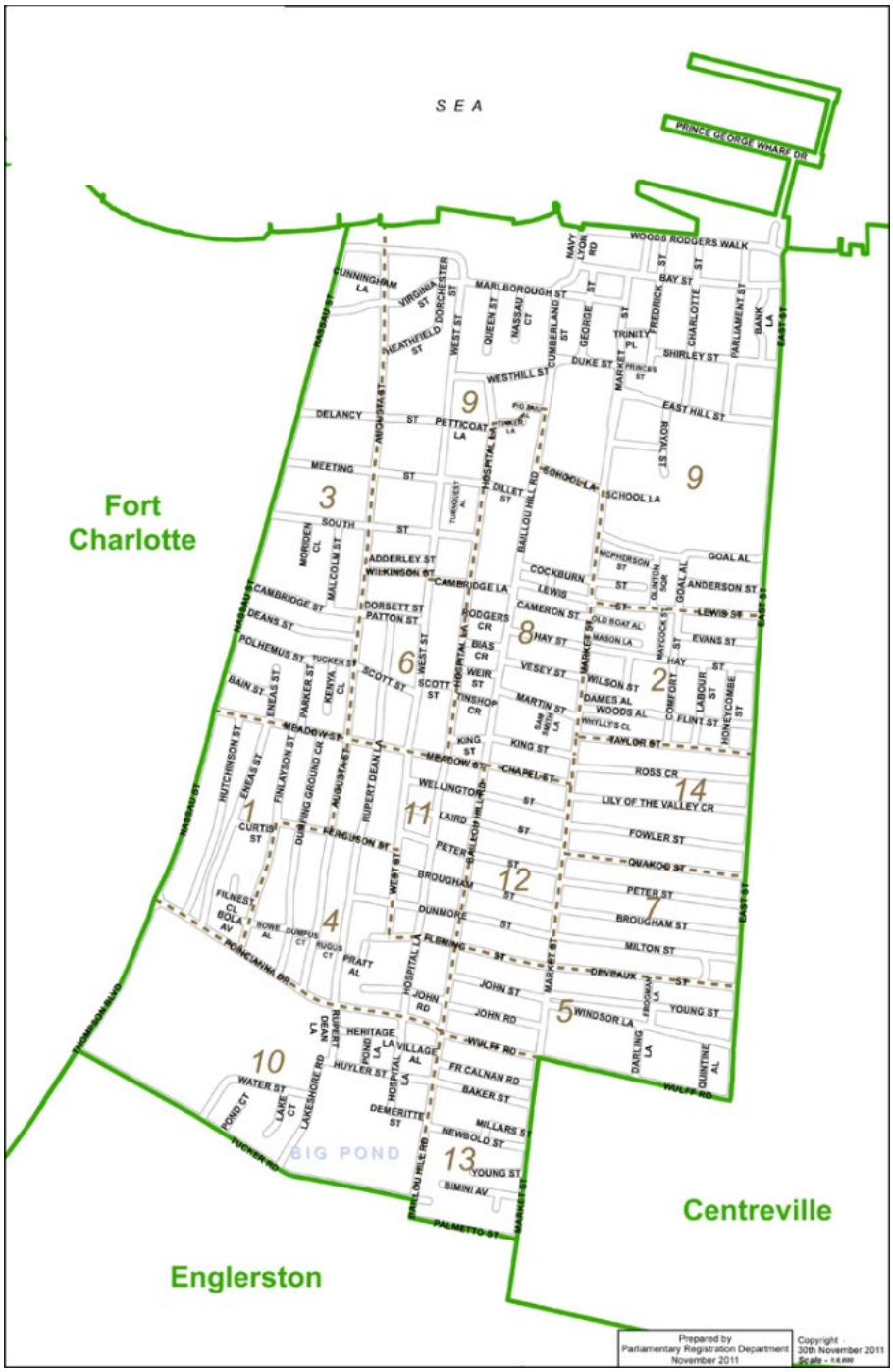
- CR Walker High School
- Bayview Academy
- Willard Patton Preschool
- Albury Sayle Primary School
- Woodcock Primary School
- Genesis Academy
- Temple Christian Primary School
- St. Francis and Joseph Primary School
- St. Thomas Moore Primary School
- Centerville Primary School
- Palmdale Primary School
- D W Davis Junior High School
- Columbus Primary School
- Stephen Dillet Primary School
- University of The Bahamas

After the abolition of slavery, thousands of liberated slaves settled on New Providence. The largest concentration of which lived in the "Over the Hill" communities of Bain and Grants Town. In present day New Providence, these communities still represent the most populous parts of the city of Nassau (OPM, 2018). The demolition sites are located in the Bain and Grants Town Constituency. According to the 2010 Census of The Bahamas, the Bain and Grants Town constituency has a population of 8,743 with almost 2,500

households, spanning approximately 1 square mile. It is described in the Sustainable Nassau Plan as a densely populated low-income residential area (Sustainable Nassau Action Plan, 2018).

Bain and Grants Town is "bounded on the North by the Sea, (Marlborough Street, Woodes Rogers Walk); on the East by East Street, Lewis Street, Market Street, Wulff Road, Blue Hill Road; on the South by an imaginary line that extends from Cordeaux Avenue to Moss Road; on the West by Thompson Boulevard, Nassau Street, Cambridge Street and Augusta Street" (Dept of Statistics, 2010).

Figure 3-10: Bain and Grants Town Constituency Map



Both sites slated for demolition activities are located in the what is considered downtown Nassau, the center of commerce and governmental affairs for The Bahamas. Downtown Nassau, specifically Woodes Rogers Walk, Bay and Shirley Streets, constitute the central hub for tourism, commerce, and civic activity for New Providence (Ministry of Finance, 2018).

The demolition activities for this project span two properties: the former Post Office building (closed) and specific buildings on the grounds of the Royal Victoria Gardens (see Table 2-1). Both properties are separated by East Hill Street, with the Royal Victoria Gardens north of East Hill Street and the Post Office on the south side. There are a few residential properties in the immediate vicinity (south) of the Post Office. All other residential properties are 0.2 miles away or more.

Officially regarded as the Bahamas General Post Office, the building was opened with much fanfare by the first Prime Minister of The Bahamas, in 1971. It was a towering four-storey building in a prominent location just beyond the Royal Victoria Garden Hotel, which closed its doors in 1971. Over the decades, the post office housed numerous government offices, including the Attorney General's Office. The Post Office property, inclusive of parking lots to the east and west of the main building, encompasses about 2 acres.

The area north of East Hill Street and bound to the east by East Street, Woodes Rogers Walk (north), Nassau Street (west) is approximately 0.18 square miles and includes:

- Zion Baptist Church
- Central Police Station
- Courthouses
- Nassau Port
- Straw Market
- Retail Stores
- Law Firms
- Parliament
- Nassau Public Library
- Grand Central Hotel
- Credit Suisse
- Bank of The Bahamas
- Fidelity Bank
- Rodney E. Bain Building
- Trinity Methodist Church
- Central Bank (Current location)
- Local and Offshore Banking Institutions
- Restaurants – Taj Mahal, Jacaranda
- Art Galleries
- United States Embassy (current location)
- British Colonial Hilton
- The Pointe (under construction)
- Holiday Inn Express
- The Bahamian Brewery
- Bayview Academy
- Willard Patton Preschool
- Albury Sayle Primary School
- St. Mary of the Virgin Anglican Church & Cemetery
- St. Francis Xaviers Cathedral
- St. Francis and Joseph Primary School
- Genesis Academy
- Temple Christian Primary School

The area south of East Hill Street and bound to the east by East Street, Lewis and South Streets (to the south), and Nassau Street (to the west), also encompasses approximately 0.18 square miles and includes the following:

- Post Office (Demolition Site)
- Intertrust Bahamas
- Ministry of Environment and Housing
- Royal Bank House
- Royal Fidelity Merchant Bank and Trust
- Government House
- Restaurants
- The National Art Gallery
- John Watlings Distillery
- Ministry of Health

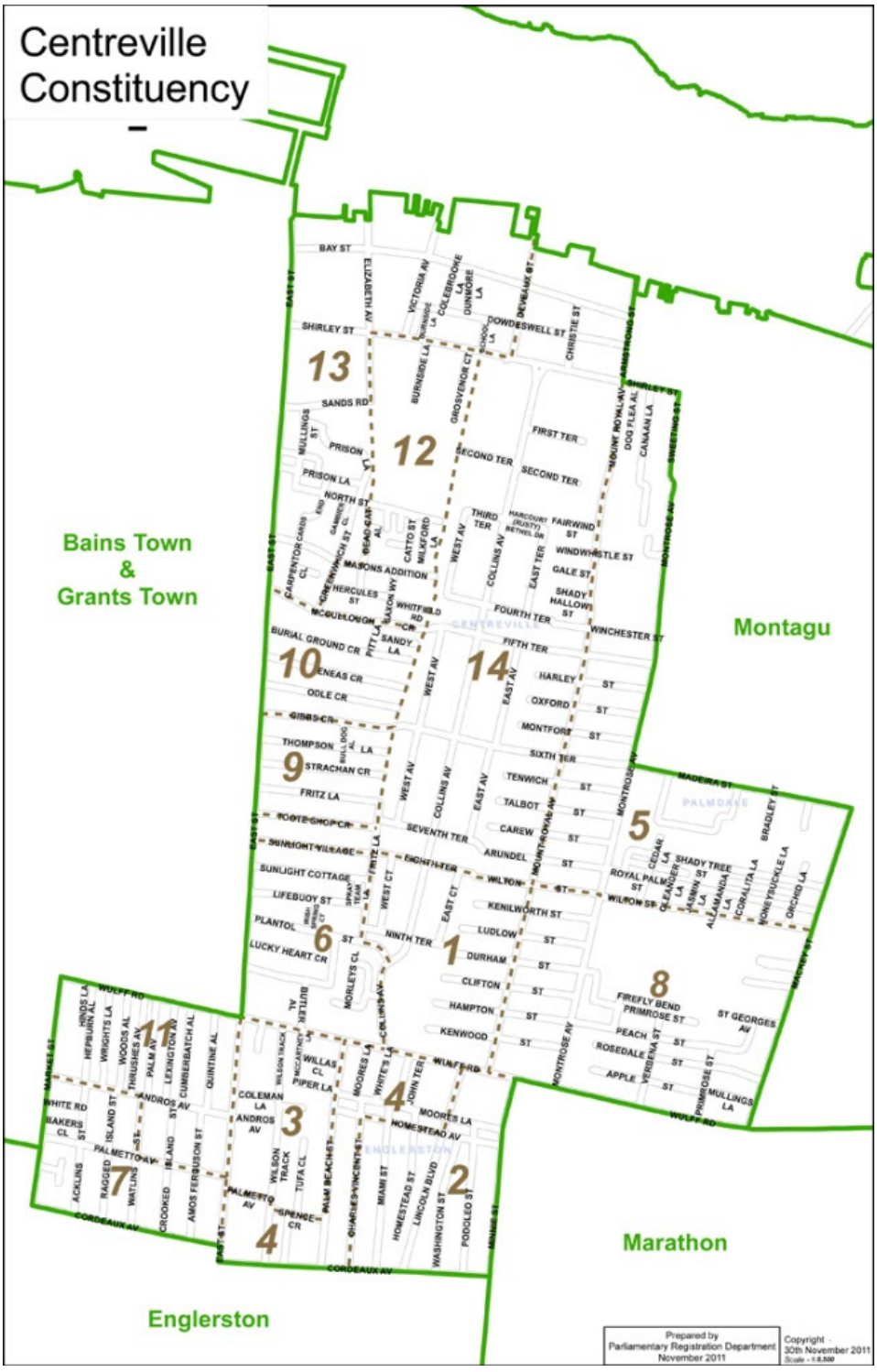
- Magistrate and Traffic Courts
- Retail Stores
- Willard Patton Preschool
- Bethel Baptist Church
- CR Walker High School
- St. Agnes Anglican Church
- Purity Bakery Ltd.
- Motels
- Police Headquarters
- Retail Stores
- St. Andrews Presbyterian Kirk
- Historic Gregory's Arch
- The Private Trust Corporation Limited

The Commissioner of Police residence at Police Headquarters is the closest residence to the project, just over the wall to the south of the Post Office building.

The remaining area within the Bain and Grants Town Constituency; south of Lewis and South Streets, East Street (to the east), Nassau Street (to the west), is approximately 0.75 square miles. It is primarily residential properties, with numerous small businesses, retail stores, churches, fuel stations, and schools. The University of The Bahamas and the Bahamas Power and Light Company are also located at the southern end of the constituency.

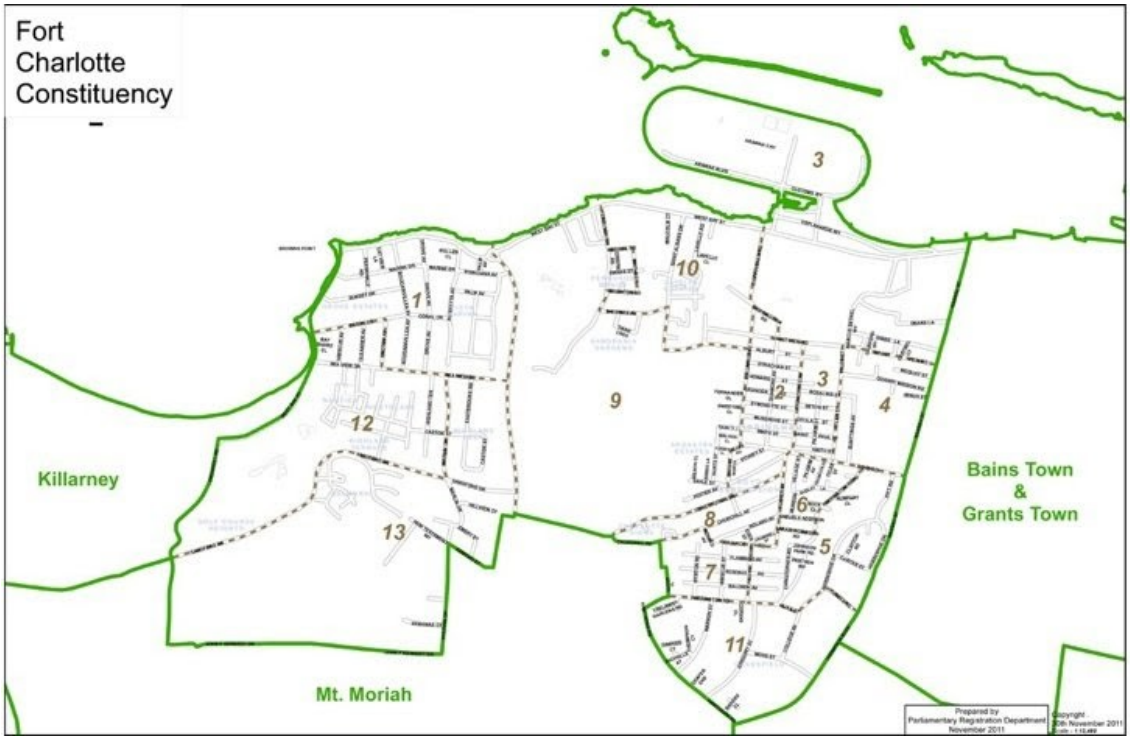
East of Bain and Grants Town is the Centerville Constituency which is similar in demography and also includes the future site of the United States Embassy (under construction) which is adjacent to the Post Office property. Centerville is also home to several historic sites including Fort Fincastle, the Water Tower, the Queen's Staircase, Princess Margaret Hospital, Doctor's Hospital, the Public Treasury, the majority of national news and media houses, medical service providers and insurance companies. Centerville has a population of about 10,000 and approximately 3,000 households.

Figure 3-11: Centreville Constituency Map



West of Bain and Grants Town is the Fort Charlotte Constituency, with a population of 8,292 and 2,639 households. Its demography is similar to Bain and Grants Town and includes the Nassau Container Port, Junkanoo Beach and Long Warf, headquarters for the Bahamas Telecommunication Corporation, National Sporting Venues, and Perpall Tract.

Figure 3-12: Fort Charlotte Constituency Map



East Hill Street and Parliament Street provide the only access to several private and public institutions including local and offshore banks and the western entrance of Government House. The only other entrance to Government House is on the eastern side at the crest of Baillou Hill Road.

The Post Office Building has been condemned, but the parking lots adjacent to it are still in use and a larger parking lot, south of the building is also still being used. Access in and out of the rear parking lot is limited to a single lane road adjacent to the western parking lot. The rear parking lot will still be accessible through the single lane road during demolition. The parking lot adjacent to the Post Office building will be closed and utilized as a staging area for the demolition company, Woslee Construction.

Private buildings and restaurants are located along the perimeter of the demolition sites, specifically East Hill Street, Parliament Street, East and Shirley Streets. The many government offices, financial institutions, retail stores, and other economic players draw pedestrian and motor traffic. These include private and public transportation utilized by Bahamians and visitors alike.

Shirley and Bay Streets are main thoroughfares connecting transportation routes from east to west and over the hill. The majority of tour operators are based in Downtown Nassau and utilize these thoroughfares for business. These include taxis, horse and carriage operators, tour buses, and vehicle rental companies (bikes, 4 wheelers, scooters, etc.).

3.3.2 Transportation and other infrastructure

Infrastructure and services on the island of New Providence include:

- Roads – constructed by the Ministry of Public Works
- Potable water - provided by the Water & Sewerage Corporation or private wells
- Telecommunications - provided by the Bahamas Telecommunications Corporation
- Cable television and Internet - provided by Cable Bahamas
- Electricity - provided by Bahamas Power and Light
- Medical clinics - managed and operated by the Department of Public Health
- Hospitals – the main hospitals on New Providence are Princess Margaret Hospital managed by the Public Hospitals Authority and Doctors Hospital, a private facility
- Docks/ports – these are managed by the Port Department and include the cruise ship port in Downtown Nassau
- Airports – The Lynden Pindling International Airport is located in western New Providence.

3.4 Cultural aspects

The Royal Victoria Gardens is an important historical location located between Shirley and East Hill Street. It is recognized as the first tourist hotel in the country, established in 1861. It is a cultural landmark that still attracts tourists and is home to several iconic old growth trees. The Royal Victoria Gardens property, inclusive of the parking lots represents.

3.5 Provision of services

Services will be provided during demolition as follows:

- Potable water – supplied by the Water and Sewerage Corporation (WSC) via the fire hydrant described in Section 2.2.
- Sewerage and wastewater – Portable toilets will be utilized by construction workers. 1 toilet will be provided on site for 10 workers. The toilets will be changed out twice weekly on Wednesday and Friday/Saturday to maintain sanitary conditions on site.
- Electricity – supplied by generator to be installed by Woslee Construction during demolition.
- Roads – The road closures and diversions are detailed in Figure 3-13 below.
- Solid waste disposal – construction waste will be disposed of at the New Providence sanitary landfill by a licensed contractor.

Figure 3-13: Planned road closures and diversions

Hoarding

Direction of Travel for Loaded Trucks

Trucks will enter site from East Street, receive load and exit with load onto Market Street

Gates to remain lock. To be opened only for demolition works

WOSLEE CONSTRUCTION

3.6 Legal and regulatory

Relevant laws and regulations that will need to be considered for the demolition project include:

Conservation and Protection of the Physical Landscape of The Bahamas Act 1997

This Act prohibits all significant excavation, landfill operation, quarry mining or mining of physical natural resources (such as sand) without permission of the Director of Physical Planning. The Act also gives the Director the authority to request an Environmental Impact Assessment (EIA) for any excavation or land reclamation activities. It also provides for the protection of trees that are rare and of historical significance and imposes stiff penalties for violators of this law.

Environmental Health Services Act 1987

This Act promotes conservation and maintenance of the environment and also addresses the control of contaminants and pollutants that may adversely affect the environment and human health. The Act also outlines regulations with respect to water supplies, solid and liquid waste, beaches, seaports, harbours and marinas.

Environmental Health Services (Collection and Disposal of Waste) Regulations 2004

These regulations provide for the collection and disposal of domestic, commercial and construction waste. Commercial waste includes ashes, refuse and rubbish. Construction waste includes any waste materials from construction, renovation, repairs and demolition.

Environmental Planning and Protection Act 2019

This Act provides a legal framework for the protection, enhancement and conservation of the environment. It also provides for the prevention and mitigation of pollution in order to maintain the quality of the environment. It establishes a Department of Environmental Planning and Protection to regulate and oversee the review of Environmental Impact Assessments and Environmental Management Plans. Until the Department is formally established, this latter role is being fulfilled by the BEST Commission, Ministry of Environment and Housing.

Health and Safety At Work Act 2002

The Act provides for:

- Securing the health, safety and welfare of persons at work;
- Protecting persons other than persons at work against risks to health or safety arising out of the activities of persons at work; and
- Controlling the keeping and use of explosive, highly flammable or other dangerous substances and preventing the unlawful acquisition, possession and use of such substances.

Planning and Subdivision Act 2010

This Act provides for:

- A land use planning based development control system led by policy, land use designations and zoning;
- Prevention of indiscriminate division and development of land;
- Efficient and orderly provision of infrastructure and services to the built environment;
- Planning processes that are fair by making them open, accessible, timely and efficient;
- Recognition of the decision-making authority and accountability of the Government in land use planning; and
- Planning for the development and maintenance of safe and viable communities.

The Act provides for regulating activities such as quarrying, mining, road construction and subdivision development.

Water and Sewerage Corporation Act 1976

This Act establishes the Corporation. Functions of this organization include the application of appropriate standards and techniques for investigation, use, control, protection, management and administration of water. The Corporation is also mandated to oversee waste disposal, water treatment and water quality.

Wild Animals (Protection) Act 1968

This Act prevents the taking, capture or export of any wild animal without the permission of the Minister of Agriculture & Fisheries. These animals include wild horses, the hutia and iguanas.

Wild Birds Protection Act 1952

This Act provides for the protection of wild birds. The Act lists several species including the White-Crowned Pigeon, Whistling Duck and Yellow-Crowned Night Heron.

3.7 Government agencies

Government agencies that will be involved with aspects of approval and permitting of this component of the project include:

Bahamas Environment, Science and Technology (BEST) Commission

The BEST Commission, formed by a directive from the Chief of State in 1994, has in effect been the country's environmental agency since 1995. BEST, a division of the Ministry of the Environment, is responsible for developing the Government of The Bahamas' (GOB) environmental and natural resource management policies. As mandated, the BEST Commission is responsible for the administration of the EIA process, overseeing the technical review of EIAs, coordinating the public review of EIAs, and providing advice to Cabinet for consideration in their decision-making process.

BEST is also the lead agency in ensuring that the GOB implements its requirements under the various international Conventions on environmental matters such as biodiversity, climate change, wetlands, land degradation, etc. In this role, BEST establishes committees, drawing on appropriate staff from different government agencies, for promoting actions to implement the specific requirements of the various conventions. To date, committees have been established on wetlands, climate change and biodiversity.

The BEST Commission also collaborates closely with other agencies with responsibilities for environmental matters such as the Water and Sewerage Corporation, Ministry of Agriculture and Fisheries, Department of Meteorology, and The Bahamas National Trust.

Department of Environmental Health Services (DEHS)

Under the *Environmental Health Act* of 1987, and the Environmental Health Regulations, the DEHS mandate is to promote and protect public health and ensure conservation and maintenance of the environment. One role of the DEHS is to regulate, monitor, and control actual and likely contamination and pollution of the environment and establish minimum standards required for a clean, healthy, and pleasing environment.

For proposed projects, the DEHS evaluates the effectiveness of pollution control measures and initiatives to protect the health and safety of workers, and the natural environment. DEHS also issues the necessary effluent discharge and emissions permits.

Department of Labour

The Department of Labour oversees labour relations and occupational health and safety. The Department is the lead agency for regulating occupational health and safety under the *Health and Safety at Work Act* (2002). Through its Inspection Unit, the Department also conducts inspections to ensure adequate worker safety and compliance with regulations.

Department of Physical Planning

The Department authorizes activities such as dredging, filling, harvesting or removal of protected trees, and any work that will affect coastlines. It also administers the new Planning and Subdivision Act of 2010, which includes ensuring the preparation of land use plans and other physical planning activities.

Ministry of the Environment and Housing

The Ministry of the Environment and Housing oversees conservation of wild animals, birds, and plants, as well as forests. It administers the Wild Birds and Wild Animals Protection Acts.

Ministry of Public Works

The Ministry oversees and maintains physical infrastructure in the country. It is entrusted with the administration of the Building Control Act (BCA) and Regulations.

Water and Sewerage Corporation (WSC)

The WSC, with its Water Resources Management Unit (WRMU), has responsibility for optimal development of the country's water resources and the control of water quality. It shares (with DEHS) the responsibility for monitoring water quality. WSC issues water supply franchises to developers in areas where the supply of water is impractical for the GOB or its agencies to undertake.

3.8 Non-governmental organizations

Non-governmental organizations (NGOs) that are active in New Providence include:

Bahamas National Trust (BNT)

The BNT was established by an Act of Parliament in 1959, which makes it unique in the NGO community. It represents a unique collaboration of governmental, private sector and scientific interests dedicated to the conservation of the natural and historic resources of The Bahamas for the enjoyment and benefit of the Bahamian people. The major mandate of the Trust is management of the National Parks System of The Bahamas.

Bahamas Reef Environment Educational Foundation (BREEF)

The Bahamas Reef Environment Educational Foundation (BREEF) is concerned primarily with coral reef education and fund-raising for the protection of marine resources of The Bahamas through education. Its mission is to strengthen the symbiosis between the Bahamian people and the reefs, which protect, nourish, and enrich us, by focusing Bahamian and allied minds on this relationship. The Foundation's raison d'etre is the restoration of the reefs of The Bahamas to their former glory and abundance.

4.0 Environmental impacts

4.1 Hazardous materials assessment

In order to ensure that debris from the demolition could be handled and disposed of safely, a hazardous materials assessment for asbestos, lead and mold was conducted for the three largest buildings on the site – Post Office, Commission of Inquiry and HIV-AIDS Centre. 46 samples were collected from the buildings as outlined in Table 4-1 below and analysis was completed by EMSL Analytical laboratory in Orlando, Florida. The results of the analysis are provided at Appendix 1 to the EIA.

Table 4-1: Sample collection for hazardous materials assessment

Potential hazardous material	HIV-AIDS Centre	Commission of Inquiry	Post Office
Asbestos	0	6	11
Lead	1	3	7
Mold	6	3	9
		Total	46

The results of the analysis revealed the following:

1. **Asbestos** – No asbestos was detected in any of the building materials sampled. This was expected as all the buildings have gone through some type of renovation in the last 10 to 15 years. It should be noted that no asbestos samples were collected from the HIV-AIDS Centre as the building was still occupied and it would have been unsafe to disturb potential materials in case they did contain asbestos. As this building has also been recently renovated, it is unlikely that any of the building materials contain asbestos.
2. **Lead** – Lead was found above the detection limit on a sample taken from the third floor of the Commission of Inquiry building. However, the concentration of 0.0098% wt is above the reporting limit, but below the United States Environmental Protection Agency (US EPA) definition for a lead-based paint of 0.5% wt.
3. **Mold** – A number of fungal species were found during the analysis. Species found that may aggravate conditions, such as asthma and hay fever, include *Aspergillus/Penicillium, Basidiospores, Chaetomium, Myxomycetes, Nigrospora*, Rust, *Stachybotrys/Memnoniella*, and *Trichoderma*. Directly linking mold to health effects or disease in humans is usually a lengthy process of elimination. Harmful health effects that are associated with damp indoor environments as are found at the buildings to be demolished include:
   - Allergies
   - Respiratory illnesses including symptoms such as coughing, wheezing, asthma, chest tightness and shortness of breath
   - Headaches

   It should be noted that persons with immune suppression or lung diseases are considered high risk for fungal infections. Individuals with chronic respiratory diseases (e.g. chronic obstruction pulmonary disorder (COPD) and asthma) may experience difficulty breathing if exposed to mold. To minimize exposure to molds that can cause allergic reactions, it is recommended that workers wear respirators (P2 or higher) and gloves when handling materials with mold on it.

4.2 Impact assessment

The severity of an environmental impact is a measure of the magnitude of impact an event has on the environment. Severity is measured by such factors as toxicity to humans, the negative effect on flora and fauna, impact on wildlife habitat, the reduction of natural resources, contamination of air and water, the potential for reversible versus irreversible environmental damage, and short-term versus long-term recovery of the environment. Other factors such as noise, heat, odour, and visuals are also used to determine severity.

Severity is given a numerical rating of 1 for low impact, 3 for medium impact and 5 for high impact:
1. Low Impact (score 1) - There is little or no impact on the environment.
2. Medium Impact (score 3) - There is impact on the environment that falls within regulatory guidelines. The impact is considered short-term and reversible.
3. High Impact (score 5) – There is high and lasting impact on the environment.

Table 4-1 below summarizes the environmental impacts that can result from the CBOB Demolition Project.

The most significant environmental impacts from the project will be demolition of the buildings, construction waste disposal and clearing of land with removal of native vegetation to make way for the next phase of the project – construction of the new Central Bank headquarters.

Table 4-1: Summary of Environmental Impacts

	Severity of Impact	**Environmental Impacts**
Materials	3	Demolished building materials can potentially be toxic or hazardous to the environment and human health if not managed properly.
Air quality and dust	3	Illegal construction activities, such as burning of waste, can negatively impact air quality. Poorly maintained construction equipment can also impair air quality, such as diesel fumes emissions. Construction activities can generate significant quantities of dust that impair air quality and negatively impact human health if proper management techniques are not employed.
Waste management	5	Improperly managed waste, particularly hazardous waste, can negatively impact the environment and human health, through attracting pests which are disease vectors, introducing toxic/hazardous substances into the air, soil or groundwater and posing safety hazards to small children.
Landscape and visual	5	Demolition will result in removal of trees and plants during land clearing.

	Severity of Impact	Environmental Impacts
		If demolished building materials are not disposed of in a timely manner, this can impair visual aspects of the site for long periods of time which can be an issue as the project is in the Downtown area.
Water resources	3	Groundwater resources can be polluted by fuel or chemical spills at the project site as well as improper disposal of hazardous waste from demolition. Over-extraction of groundwater resources can result in salt-water intrusion, thus destroying these resources.
Ecology	3	While the project site would not be considered an ecosystem, the vegetation on the site provides what is referred to as a wildlife corridor. Wildlife corridors are particularly important in highly-developed urban areas, such as Downtown Nassau. They provide a safe means for animals, like birds, to move around the island from one habitat to another for feeding and nesting. These corridors can be destroyed by construction activities such as land clearing, use of toxic/hazardous chemicals, improper waste disposal and the like.
Avifauna	3	The noise levels generated by the project have the potential to deter birds from utilizing the site during demolition activities.
Noise and vibration	3	Construction activities can raise noise to levels that disturb bird and animal species at the project site and in its vicinity where these species nest or find shelter. Equipment that is projected to produce loudest noise levels are: • Generator – maximum of 81 dB • 336 & 345 excavators – maximum of 106 dB • High reach excavator – maximum of 119 dB This can result in displacement of these species which may leave the area. Prolonged, elevated noise levels from construction activities can also negatively impact human health. Prolonged exposure to noise levels above 70dB may cause hearing damage. Loud noises above 120 dB can cause immediate damage (CDC, 2019).

	Severity of Impact	Environmental Impacts
Traffic and transport	5	Traffic and transport during construction can introduce invasive species to a project site and result in spills/accidents at the site if proper care and precaution are not taken inclusive of safe handling of equipment and vehicles. Changes to traffic flow can result in loss of income to businesses if patrons can no longer easily access them.
Contaminated land	5	During construction, there is the potential to contaminate lands from improper disposal of hazardous materials.
Occupational health and safety	5	Workers can be put at risk during construction phase through failure to wear protective personal equipment (PPE), improper handling of equipment and materials, and not adhering to standard safety procedures. These failures can result in loss of life or permanent physical damage. The molds on the building materials that have to be handled during this project have the potential to negatively impact the health of workers if they do not wear appropriate PPE, particularly if any workers suffer from immune suppression diseases, lung disease or chronic respiratory diseases (e.g. asthma). COVID-19 virus poses a health risk to workers if they are in close proximity to each other.
Impacts on neighbouring communities	5	Demolition activities can impact neighbouring communities through disruption of traffic, increased noise levels, impairment of air quality, and contamination of land and groundwater. Depending on the severity of impacts, such as noise, air pollution and groundwater contamination, they can impair health in the long-term.

5.0 Proposed mitigation measures

Table 5-1 below summarizes the mitigation measures that are recommended to minimize or eliminate any negative environmental impacts from the project.

Table 5-1: Summary of Environmental Mitigation Measures

	Mitigation Measures
Materials	Any toxic or hazardous chemicals to be utilized on site can be done so according to Material Safety Data Sheet (MSDS) guidance and safety protocols can be established by project management. Demolished building materials containing hazardous materials, such as mold, will be safely removed and properly disposed of to prevent any risks to human health.
Air quality and dust	Impairment to air quality can be reduced when no illegal construction activities occur during this project. Construction equipment should be properly maintained to ensure they do not impair air quality. Construction methodologies and best practices can be employed to minimize generation of quantities of dust that can impair air quality including watering of the site.
Waste management	All waste can be properly disposed of according to regulations and standards of the Department of Environmental Health Services (DEHS) and the Water and Sewerage Corporation (WSC). Waste management will need to include proper disposal of chemical waste and hazardous building materials from demolition.
Landscape and visual	Protected trees removed should be replaced at a ratio of 2:1 as per the Conservation and Protection of the Physical Landscape Act or as directed by the Department of Physical Planning. An effort should be made to minimize clearing of land to the footprint of any planned new buildings.
Water resources	Chemical and fuel management of the site will ensure that groundwater and freshwater resources are not negatively impacted. Spill response protocols can be established for effectively dealing with spills in the event of an accident to minimize any pollution of water resources. Hazardous waste from demolition will be properly disposed of. Potable or fresh water will be provided by the Water and Sewerage Corporation so there will not need to be extraction of groundwater resources.

	Mitigation Measures
Ecology	Efforts can be made to minimize negative impacts to all remaining vegetation by preserving as much of it as possible during demolition. This can be achieved through selective clearing of the site rather than bulldozing the entire area. Protected tree species removed during clearing should be replaced at a ratio of 2:1 or as directed by the Department of Physical Planning. Native trees and plants should be maintained wherever possible, especially where they are clustered so that they can continue to function as wildlife corridors.
Avifauna	While noise levels during demolition may deter birds from the area, it is expected that once demolition is complete that birds will return. There are sufficient vegetated areas neighbouring the project site that can be utilized by birds during active demolition. Every effort will be made to maintain protected trees on the project site to be utilized by birds when demolition is not occurring. Protected trees will be marked prior to construction so they can be avoided. Staff will be advised on the importance of not interfering with or harming bird species which are all protected under Bahamian law.
Noise and vibration	Demolition activities should be for a limited time period to minimize disturbance to birds and other animals at the project site. Once construction is completed in as short a timeframe as possible, the animals should return to habitats they normally utilize. Construction workers will wear appropriate PPE (i.e. earplugs or ear muffs). Nearby residents are not expected to be exposed to high noise levels as there will be no work occurring during the evening and night. Nearby businesses are a sufficient distance away to reduce their exposure to high noise levels.
Traffic and transport	All workers utilizing vehicles and equipment should have adequate training and skills in their proper and safe handling. Equipment to be utilized for this project moving from other sites should be inspected and cleaned, as necessary, to ensure they do not introduce invasive plant material, such as seeds. Alternative access routes will be provided for businesses so that their patronage can continue.

	Mitigation Measures
Contaminated land	Any toxic or hazardous chemicals to be utilized on site will be done so according to Material Safety Data Sheet guidance and safety protocols as established by project management. Staff should be trained in spill response measures to effectively handle such incidents. Hazardous building materials from demolition will be safely handled and properly disposed of.
Occupational health and safety	Workers will be provided with appropriate protective personal equipment (PPE) for the assigned tasks. Workers should wear respirators (P2 or higher) and gloves when handling materials with mold on it. All workers will receive training in proper handling of equipment and materials as a part of their orientation before being admitted to the site during demolition and before starting work on site. There will be regular reinforcement of occupational health and safety procedures during weekly meetings. Information on health and safety procedures (e.g. Material Safety Data Sheets) will be accessible to staff during working hours. At least one staff member will be assigned to ensuring health and safety procedures are being followed during demolition activities. Workers will adhere to COVID-19 Emergency Orders requirements inclusive of wearing masks and social distancing.
Impacts on neighbouring communities	Regular communication with neighbouring businesses and communities will occur so they are informed of disruptions to traffic and can plan accordingly. They will also be advised when noise levels may be elevated so they can choose to leave the area or wear appropriate protective equipment, such as noise-cancelling headphones. Elevated noise levels during demolition should be limited to the hours of 10 am to 5 pm so as not to disturb residents during sleeping hours. The site should be managed following best management practices to reduce or eliminate impacts related to air pollution as well as land and groundwater contamination, so there are no long-term health impacts on communities.

6.0 Conclusions

Employment of appropriate design and planning methodologies can result in execution of the CBOB Demolition Project in a sustainable manner. Utilizing the recommended mitigation measures can eliminate or minimize any negative environmental impacts demolition activities.

Central Bank has expressed its commitment to implementing the recommended mitigation measures and executing the project in a manner that respects neighbouring businesses and communities, the natural resources of the site and is environmentally sustainable.

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Appendix 1: Hazardous analysis results

EMSL Analytical, Inc.

3303 PARKWAY CENTER COURT Orlando, FL 32808

Tel/Fax: (407) 599-5887 / (407) 599-9063

http://www.EMSL.com / orlandolab@emsl.com

EMSL Order:	342006560
Customer ID:	+22SEVC02
Customer PO:	
Project ID:	

Attention:	S. Helena Moultrie	**Phone:**	(242) 557-9416
	SEV Consulting Group	**Fax:**	
	Chesapeake Road	**Received Date:**	05/04/2020 10:25 AM
	P.O. Box N1416	**Analysis Date:**	05/08/2020
	Nassau,	**Collected Date:**	04/28/2020
Project:			

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
C1A1 *342006560-0001*	Ceiling Tile-COI Building	Tan/White Fibrous Heterogeneous	40% Cellulose 35% Min. Wool	10% Perlite 15% Non-fibrous (Other)	None Detected
C1A2 *342006560-0002*	Ceiling Tile-COI Building	Tan/White Fibrous Heterogeneous	40% Cellulose 35% Min. Wool	10% Perlite 15% Non-fibrous (Other)	None Detected
C2A1 *342006560-0003*	Ceiling Tile-COI Building	Tan/White Fibrous Heterogeneous	10% Cellulose 65% Min. Wool	<1% Perlite 25% Non-fibrous (Other)	None Detected
C2A2 *342006560-0004*	Ceiling Tile-COI Building	Tan/White Fibrous Heterogeneous	40% Cellulose 35% Min. Wool	10% Perlite 15% Non-fibrous (Other)	None Detected
C3A1 *342006560-0005*	Ceiling Tile-COI Building	Tan/White Fibrous Heterogeneous	40% Cellulose 35% Min. Wool	10% Perlite 15% Non-fibrous (Other)	None Detected
C3A2 *342006560-0006*	Ceiling Tile-COI Building	Tan/White Fibrous Heterogeneous	40% Cellulose 35% Min. Wool	10% Perlite 15% Non-fibrous (Other)	None Detected
P1A1 *342006560-0007*	Ceiling Tile-PO Building	Tan/White Fibrous Heterogeneous	40% Cellulose 35% Min. Wool	10% Perlite 15% Non-fibrous (Other)	None Detected
P1A2 *342006560-0008*	Ceiling Tile-PO Building	Tan/White Fibrous Heterogeneous	40% Cellulose 35% Min. Wool	10% Perlite 15% Non-fibrous (Other)	None Detected
P2A1 *342006560-0009*	Ceiling Tile-PO Building	Tan/White Fibrous Heterogeneous	40% Cellulose 30% Min. Wool	10% Perlite 20% Non-fibrous (Other)	None Detected
P4A1 *342006560-0010*	Ceiling Tile-PO Building	Tan/White Fibrous Heterogeneous	40% Cellulose 30% Min. Wool	10% Perlite 20% Non-fibrous (Other)	None Detected
P4A2 *342006560-0011*	Ceiling Tile-PO Building	Tan/White Fibrous Heterogeneous	40% Cellulose 30% Min. Wool	10% Perlite 20% Non-fibrous (Other)	None Detected
P5A1 *342006560-0012*	Ceiling Tile-PO Building	Tan/White Fibrous Heterogeneous	40% Cellulose 30% Min. Wool	10% Perlite 20% Non-fibrous (Other)	None Detected
P5A2 *342006560-0013*	Ceiling Tile-PO Building	Tan/White Fibrous Heterogeneous	40% Cellulose 30% Min. Wool	10% Perlite 20% Non-fibrous (Other)	None Detected
P6A1 *342006560-0014*	Ceiling Tile-PO Building	Tan/White Fibrous Heterogeneous	40% Cellulose 30% Min. Wool	10% Perlite 20% Non-fibrous (Other)	None Detected
P6A2 *342006560-0015*	Ceiling Tile-PO Building	Tan/White Fibrous Heterogeneous	40% Cellulose 35% Min. Wool	10% Perlite 15% Non-fibrous (Other)	None Detected
P7A1 *342006560-0016*	Ceiling Tile-PO Building	Tan/White Fibrous Heterogeneous	40% Cellulose 30% Min. Wool	10% Perlite 20% Non-fibrous (Other)	None Detected

Initial report from: 05/08/2020 10:54:56

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EMSL Order:	342006560
Customer ID:	+22SEVC02
Customer PO:	
Project ID:	

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
P7A2	Ceiling Tile-PO Building	Tan/White Fibrous Heterogeneous	40% Cellulose 20% Min. Wool	10% Perlite 30% Non-fibrous (Other)	None Detected
342006560-0017					

Analyst(s)

Jessicka Lopez (17)

Carlos Rivadeneyra, Laboratory Director
or Other Approved Signatory

EMSL maintains liability limited to cost of analysis. The above analyses were performed in general compliance with Appendix E to Subpart E of 40 CFR (previously EPA 600/M4-82-020 "Interim Method"), but augmented with procedures outlined in the 1993 ("final") version of the method. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. All samples received in acceptable condition unless otherwise noted. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. EMSL recommends gravimetric reduction for all non-friable organically bound materials prior to analysis. Estimation of uncertainty is available on request.

Samples analyzed by EMSL Analytical, Inc. Orlando, FL NVLAP Lab Code 101151-0

Initial report from: 05/08/2020 10:54:56

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CustomerID:	+22SEVC02
CustomerPO:	
ProjectID:	

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P.O. Box N1416
Nassau,

Phone:	(242) 557-9416
Fax:	
Received:	05/04/20 10:25 AM
Collected:	4/28/2020

Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B/7000B)*

Lab ID:	Analyzed		Weight	Collected	Reporting Detection Limit	Lead Concentration	
342006517-0001	5/6/2020		0.2583 g	4/28/2020	0.0080 % wt	<0.0080 % wt	☑
Client Sample H1L1		Site: MOH Centre					
342006517-0002	5/6/2020		0.2701 g	4/28/2020	0.0080 % wt	<0.0080 % wt	☑
Client Sample C1L1		Site: COI Building					
342006517-0003	5/6/2020		0.2624 g	4/28/2020	0.0080 % wt	<0.0080 % wt	☑
Client Sample C2L1		Site: COI Building					
342006517-0004	5/6/2020		0.2640 g	4/28/2020	0.0080 % wt	0.0098 % wt	⚠
Client Sample C3L1		Site: COI Building					
342006517-0005	5/6/2020		0.2559 g	4/28/2020	0.0080 % wt	<0.0080 % wt	☑
Client Sample PBL1		Site: PO Building					
342006517-0006	5/6/2020		0.2947 g	4/28/2020	0.0080 % wt	<0.0080 % wt	☑
Client Sample P1L1		Site: PO Building					
342006517-0007	5/6/2020		0.2546 g	4/28/2020	0.0080 % wt	<0.0080 % wt	☑
Client Sample P2L1		Site: PO Building					
342006517-0008	5/6/2020		0.2742 g	4/28/2020	0.0080 % wt	<0.0080 % wt	☑
Client Sample P4L1		Site: PO Building					
342006517-0009	5/6/2020		0.2675 g	4/28/2020	0.0080 % wt	<0.0080 % wt	☑
Client Sample P5L1		Site: PO Building					
342006517-0010	5/6/2020		0.2949 g	4/28/2020	0.0080 % wt	<0.0080 % wt	☑
Client Sample P6L1		Site: PO Building					
342006517-0011	5/6/2020		0.2601 g	4/28/2020	0.0080 % wt	<0.0080 % wt	☑
Client Sample P7L1		Site: PO Building					

Carlos Rivadeneyra, Laboratory Director
or other approved signatory

*Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.008 % wt based on the minimum sample weight per our SOP. Unless noted, results in this report are not blank corrected. EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. When the information supplied by the customer can affect the validity of the results, it will be noted on the reoprt. "<" (less than) result signifies the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. The QC data associated with the sample results included in this report meet the recovery and precision requirements unless specifically indicated otherwise. Definitions of modifications are available upon request.

Samples analyzed by EMSL Analytical, Inc. Orlando, FL AIHA-LAP, LLC--ELLAP Accredited #163563

Initial report from 05/08/2020 12:09:34

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ProjectID:	

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P.O. Box N1416
Nassau,

Phone:	(242) 557-9416
Fax:	
Received:	05/04/20 10:25 AM
Collected:	4/28/2020

Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B/7000B)*

Lab ID:	***Analyzed***	*Weight*	***Collected***	***Reporting Detection Limit***	***Lead Concentration***

Guidelines for Federal USEPA/HUD Lead in Paint Chips
=0.5 % Wt or =1.0 mg/cm² is the EPA definition of a lead-based paint.

Below Method Reporting Limit (RL)

Above RL but below EPA definition of a lead-based paint

Above EPA definition of a lead-based paint

These guidance limits are typically used in most scenarios. More stringent local or project specific guidelines may apply.
Please contact the laboratory for statement of uncertainty data for the utility of properly evaluating these results against any regulatory standards or guidelines.
No responsibility or liability is assumed for the manner in which the results are used or interpreted.

Carlos Rivadeneyra, Laboratory Director
or other approved signatory

*Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.008 % wt based on the minimum sample weight per our SOP. Unless noted, results in this report are not blank corrected. EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. When the information supplied by the customer can affect the validity of the results, it will be noted on the reoprt. "<" (less than) result signifies the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. The QC data associated with the sample results included in this report meet the recovery and precision requirements unless specifically indicated otherwise. Definitions of modifications are available upon request.

Samples analyzed by EMSL Analytical, Inc. Orlando, FL AIHA-LAP, LLC--ELLAP Accredited #163563

Initial report from 05/08/2020 12:09:34

EXPANDED FUNGAL REPORT ™

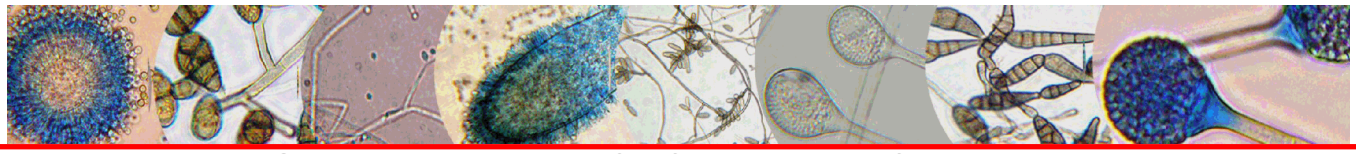
Prepared Exclusively For

SEV Consulting Group

Chesapeake Road
PO Box N1416
Nassau,
Phone:242-557-9416

Report Date:	**5/8/2020**
Project:	**CBOB**
EMSL Order:	**342006580**

AIHA-LAP, LLC--EMLAP Accredited
#163563



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Attn: S. Helena Moultrie
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Nassau,

Proj: CBOB

EMSL Order:	342006580
Customer ID:	SEVC42
Collected:	4/25/2020
Received:	5/04/2020
Analyzed:	5/08/2020

1. Description of Analysis

Analytical Laboratory

EMSL Analytical, Inc. (EMSL) is a nationwide, full service, analytical testing laboratory network providing Asbestos, Mold, Indoor Air Quality, Microbiological, Environmental, Chemical, Forensic, Materials, Industrial Hygiene and Mechanical Testing services since 1981. Ranked as the premier independently owned environmental testing laboratory in the nation, EMSL puts analytical quality as its top priority. This quality is recognized by many well-respected federal, state and private accrediting agencies, and assured by our high quality personnel, including many Ph.D. microbiologists and mycologists.

EMSL is an independent laboratory that performed the analysis of these samples. EMSL did not conduct the sampling or site investigation for this report. The samples referenced herein were analyzed under strict quality control procedures using state-of-the-art microbiological methods. The analytical methods used and the data presented are scientifically and legally defensible.

The laboratory data is provided in compliance with ISO-IEC 17025 guidelines for the particular test(s) requested, including any associated limitations for the methods employed. These data are intended for use by professionals having knowledge of the testing methods necessary to interpret them accurately.

2. Analytical Results

See attached data reports and charts.

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PO Box N1416
Nassau,

Proj: CBOB

EMSL Order: 342006580
Customer ID: SEVC42
Collected: 4/25/2020
Received: 5/04/2020
Analyzed: 5/08/2020

Test Report: Microscopic Examination of Fungal Spores, Fungal Structures, Hyphae, and Other Particulates from Tape Samples (EMSL Method MICRO-SOP-200)

Lab Sample Number:	342006580-0001	342006580-0002	342006580-0003	342006580-0004	342006580-0005
Client Sample ID:	PBM1	P1M1	P1M2	P2M1	P2M2
Sample Location:	PO Building	PO Building	PO Building	PO Building	PO Building
Spore Types	Category	Category	Category	Category	Category
Alternaria (Ulocladium)	-	-	-	-	-
Ascospores	-	-	-	Rare	Rare
Aspergillus/Penicillium	-	*High*	-	Low	High
Basidiospores	Rare	-	-	-	-
Bipolaris++	-	-	-	-	-
Chaetomium	Rare	Low	-	-	-
Cladosporium	-	-	-	Low	-
Curvularia	-	-	-	-	-
Epicoccum	-	-	-	-	-
Fusarium	-	-	-	-	-
Ganoderma	-	-	-	-	-
Myxomycetes++	-	-	-	Rare	-
Pithomyces++	-	-	-	-	-
Rust	-	-	-	Rare	-
Scopulariopsis/Microascus	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	*High*	Low	Rare
Unidentifiable Spores	-	-	-	-	-
Zygomycetes	-	-	-	-	-
Cercospora++	-	-	-	Rare	-
Nigrospora	-	-	-	Rare	-
Trichoderma	-	-	-	-	-
Hyphal Fragment	Rare	-	-	-	-
Insect Fragment	Rare	-	-	-	-
Pollen	-	-	-	-	-

Category: Count/per area analyzed
Rare: 1 to 10 Low: 11 to 100 Medium: 101 to 1000 High: >1000
++ = Includes other spores with similar morphology; see EMSL's fungal glossary for each specific category.
* = Sample contains fruiting structures and/or hyphae associated with the spores.
- = Not detected.

No discernable field blank was submitted with this group of samples.

Yessica Martinez Seeman, Microbiology
Technical Manager, Central Florida

Initial report from: 05/08/2020 16:32:13

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Proj: CBOB

EMSL Order: 342006580
Customer ID: SEVC42
Collected: 4/25/2020
Received: 5/04/2020
Analyzed: 5/08/2020

Test Report: Microscopic Examination of Fungal Spores, Fungal Structures, Hyphae, and Other Particulates from Tape Samples (EMSL Method MICRO-SOP-200)

Lab Sample Number:	342006580-0006	342006580-0007	342006580-0008	342006580-0009	342006580-0010
Client Sample ID:	P4M1	P5M1	P6M1	P7M1	C1M1
Sample Location:	PO Building	PO Building	PO Building	PO Building	COI Building
Spore Types	Category	Category	Category	Category	Category
Alternaria (Ulocladium)	-	-	-	-	-
Ascospores	-	Low	-	-	-
Aspergillus/Penicillium	Low	*High*	*High*	*High*	*High*
Basidiospores	-	-	-	-	-
Bipolaris++	-	-	-	-	-
Chaetomium	-	Medium	-	-	-
Cladosporium	-	-	-	*Medium*	-
Curvularia	-	-	-	-	-
Epicoccum	-	-	-	-	-
Fusarium	-	-	-	-	-
Ganoderma	-	-	-	-	-
Myxomycetes++	-	-	-	-	-
Pithomyces++	-	-	-	-	-
Rust	-	-	Rare	-	-
Scopulariopsis/Microascus	-	-	-	-	-
Stachybotrys/Memnoniella	*High*	-	-	-	*High*
Unidentifiable Spores	-	-	-	-	-
Zygomycetes	-	-	-	-	-
Cercospora++	-	-	-	-	-
Nigrospora	-	-	-	-	-
Trichoderma	-	*High*	-	-	-
Hyphal Fragment	-	-	-	-	-
Insect Fragment	-	-	-	-	-
Pollen	-	-	-	-	-

Category: Count/per area analyzed
Rare: 1 to 10 Low: 11 to 100 Medium: 101 to 1000 High: >1000
++ = Includes other spores with similar morphology; see EMSL's fungal glossary for each specific category.
* = Sample contains fruiting structures and/or hyphae associated with the spores.
- = Not detected.

No discernable field blank was submitted with this group of samples.

Yessica Martinez Seeman, Microbiology
Technical Manager, Central Florida

Initial report from: 05/08/2020 16:32:13

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PO Box N1416
Nassau,

Proj: CBOB

EMSL Order: 342006580
Customer ID: SEVC42
Collected: 4/25/2020
Received: 5/04/2020
Analyzed: 5/08/2020

Test Report: Microscopic Examination of Fungal Spores, Fungal Structures, Hyphae, and Other Particulates from Tape Samples (EMSL Method MICRO-SOP-200)

Lab Sample Number:	342006580-0011	342006580-0012	342006580-0013	342006580-0014	342006580-0015
Client Sample ID:	C2M1	C3M1	H1M1	H1M2	H2M1
Sample Location:	COI Building	COI Building	MOH Centre	MOH Centre	MOH Centre
Spore Types	Category	Category	Category	Category	Category
Alternaria (Ulocladium)	-	-	-	-	-
Ascospores	-	-	-	Rare	-
Aspergillus/Penicillium	-	High	-	Rare	-
Basidiospores	-	-	-	-	-
Bipolaris++	-	-	-	-	-
Chaetomium	-	-	-	-	-
Cladosporium	-	-	-	-	Low
Curvularia	-	-	-	-	-
Epicoccum	-	-	-	-	-
Fusarium	-	-	-	-	-
Ganoderma	-	-	-	-	-
Myxomycetes++	-	-	-	-	-
Pithomyces++	-	-	-	-	-
Rust	-	-	-	-	-
Scopulariopsis/Microascus	-	-	-	-	-
Stachybotrys/Memnoniella	*High*	*High*	Rare	-	-
Unidentifiable Spores	-	-	-	-	-
Zygomycetes	-	-	-	-	-
Cercospora++	-	-	-	-	-
Nigrospora	-	-	-	-	-
Trichoderma	-	-	-	-	-
Hyphal Fragment	-	-	-	-	Rare
Insect Fragment	-	-	-	-	-
Pollen	-	-	-	-	-

Category: Count/per area analyzed
Rare: 1 to 10 Low: 11 to 100 Medium: 101 to 1000 High: >1000
++ = Includes other spores with similar morphology; see EMSL's fungal glossary for each specific category.
* = Sample contains fruiting structures and/or hyphae associated with the spores.
- = Not detected.

No discernable field blank was submitted with this group of samples.

Yessica Martinez Seeman, Microbiology
Technical Manager, Central Florida

Initial report from: 05/08/2020 16:32:13

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Chesapeake Road
PO Box N1416
Nassau,

Proj: CBOB

EMSL Order: 342006580
Customer ID: SEVC42
Collected: 4/25/2020
Received: 5/04/2020
Analyzed: 5/08/2020

Test Report: Microscopic Examination of Fungal Spores, Fungal Structures, Hyphae, and Other Particulates from Tape Samples (EMSL Method MICRO-SOP-200)

Lab Sample Number:	342006580-0016	342006580-0017	342006580-0018		
Client Sample ID:	H2M2	H2M3	H2M4		
Sample Location:	MOH Centre	MOH Centre	MOH Centre		
Spore Types	Category	Category	Category		
Alternaria (Ulocladium)	-	-	-		
Ascospores	-	-	-		
Aspergillus/Penicillium	-	Rare	Low		
Basidiospores	-	-	-		
Bipolaris++	-	-	-		
Chaetomium	-	-	-		
Cladosporium	Rare	Low	Medium		
Curvularia	-	-	-		
Epicoccum	-	-	-		
Fusarium	-	-	-		
Ganoderma	-	-	-		
Myxomycetes++	-	-	-		
Pithomyces++	-	-	-		
Rust	-	-	-		
Scopulariopsis/Microascus	-	-	-		
Stachybotrys/Memnoniella	-	-	-		
Unidentifiable Spores	-	-	-		
Zygomycetes	-	-	-		
Cercospora++	-	-	-		
Nigrospora	-	-	-		
Trichoderma	-	-	-		
Hyphal Fragment	Rare	Medium	High		
Insect Fragment	-	-	Rare		
Pollen	-	-	-		

Category: Count/per area analyzed
Rare: 1 to 10 Low: 11 to 100 Medium: 101 to 1000 High: >1000
++ = Includes other spores with similar morphology; see EMSL's fungal glossary for each specific category.
* = Sample contains fruiting structures and/or hyphae associated with the spores.
- = Not detected.

No discernable field blank was submitted with this group of samples.

Yessica Martinez Seeman, Microbiology
Technical Manager, Central Florida

Initial report from: 05/08/2020 16:32:13

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3. Understanding the Results

EMSL Analytical, Inc. is an independent laboratory, providing unbiased and scientifically valid results. These data represent only a portion of an overall IAQ investigation. Visual information and environmental conditions measured during the site assessment (humidity, moisture readings, etc.) are crucial to any final interpretation of the results. Many factors impact the final results; therefore, result interpretation should only be conducted by qualified individuals. The American Conference of Governmental Industrial Hygienists (ACGIH) has published a good reference book covering sampling and data interpretation. It is entitled, Bioaerosols: Assessment and Control, 1999.

Fungal spores are found everywhere. Whether or not symptoms develop in people exposed to fungi depends on the nature of the fungal material (e.g., allergenic, toxic, or infectious), the exposure level, and the susceptibility of exposed persons. Susceptibility varies with the genetic predisposition (e.g., allergic reactions do not always occur in all individuals), age, pre-existing medical conditions (e.g., diabetes, cancer, or chronic lung conditions), use of immunosuppressive drugs, and concurrent exposures. These reasons make it difficult to identify dose/response relationships that are required to establish “safe” or “unsafe” levels (i.e., permissible exposure limits).

It is generally accepted in the industry that indoor fungal growth is undesirable and inappropriate, necessitating removal or other appropriate remedial actions. The New York City guidelines and EPA guidelines for mold remediation in schools and commercial buildings define the conditions warranting mold remediation. Always remember that water is the key. Preventing water damage or water condensation will prevent mold growth.

This report is not intended to provide medical advice or advice concerning the relative safety of an occupied space. Always consult an occupational or environmental health physician who has experience addressing indoor air contaminants if you have any questions.

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4. Glossary of Fungi

ASCOSPORES	
Natural Habitat	Everywhere in nature.
Suitable Substrates in the Indoor Environment	Depends on genus and species.
Water Activity	Depends on genus and species.
Mode of Dissemination	Forcible ejection or passive release and dissemination by wind or insects.
Allergic Potential	Depends on genus and species.
Potential or Opportunistic Pathogens	Depends on genus and species.
Industrial Uses	Depends on genus and species.
Potential Toxins Produced	Depends on genus and species.
Other Comments	Ascospores are the result of sexual reproduction and produced in a saclike structure called an ascus. All ascospores belong to members of the Phylum Ascomycota, which encompasses a plethora of genera worldwide.

ASPERGILLUS/PENICILLIUM	
Natural Habitat	Plant debris ·Seed ·Cereal crops
Suitable Substrates in the Indoor Environment	Grows on a wide range of substrates indoors ·Prevalent in water damaged buildings ·Foods (blue mold on cereals, fruits, vegetables, dried foods) ·House dust ·Fabrics ·Leather ·Wallpaper ·Wallpaper glue
Water Activity	Aw=0.75-0.94
Mode of Dissemination	Wind ·Insects
Allergic Potential	Type I (hay fever, asthma) ·Type III (hypersensitivity)
Potential or Opportunistic Pathogens	Possible depending on the species.
Industrial Uses	Many depending on the species
Potential Toxins Produced	Possible depending on the species.
Other Comments	Spores of Aspergillus and Penicillium (including others such as Acremonium, Talaromyces, and Paecilomyces) are small and spherical with few distinguishing characteristics. They cannot be differentiated or speciated by non-viable impaction sampling methods. Some species with very small spores may be undercounted in samples with high background debris.

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BASIDIOSPORES

Natural Habitat	Forest floors. Lawns .Plants (saprobes or pathogens depending on genus)
Suitable Substrates in the Indoor Environment	Depends on genus. Wood products
Water Activity	Unknown.
Mode of Dissemination	Forcible ejection. Wind currents.
Allergic Potential	Type I allergies (hay fever, asthma) . Type III (hypersensitivity pneumonitis)
Potential or Opportunistic Pathogens	Depends on genus.
Industrial Uses	Edible mushrooms are used in the food industry.
Potential Toxins Produced	Amanitins. monomethyl-hydrazine. muscarine. ibotenic acid. psilocybin.
Other Comments	Basidiospores are the result of sexual reproduction and formed on a structure called the basidium. Basidiospores belong to the members of the Phylum Basidiomycota, which includes mushrooms, shelf fungi, rusts, and smuts.

CERCOSPORA

Natural Habitat	Parasite on higher plants, commonly causes leaf spot diseases.
Suitable Substrates in the Indoor Environment	Unknown
Water Activity	Moderate –High humidity
Mode of Dissemination	Irrigation water, Insects, Rain Wind
Allergic Potential	Unknown
Potential or Opportunistic Pathogens	Unknown
Other Comments	Includes morphologically similar spores of Cercospora, Pseudocercospora, and Septoria.

CHAETOMIUM

Natural Habitat	Dung. Seeds. Soil. Straw.
Suitable Substrates in the Indoor Environment	Paper. Sheetrock. Wallpaper.
Water Activity	Aw=0.84-0.89.
Mode of Dissemination	Wind. Insects. Water splash.
Allergic Potential	Type I (asthma and hay fever).
Potential or Opportunistic Pathogens	Onychomycosis. C. perlucidum recognized as a new agent of cerebral phaeohyphomycosis.
Industrial Uses	Cellulase production, Textile testing.
Potential Toxins Produced	Chaetomin. Chaetoglobosins A,B,D and F are produced by Chaetomium globosum. Sterigmatocystin is produced by rare species

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CLADOSPORIUM

Natural Habitat	Dead plant matter. Straw. Soil. Woody plants
Suitable Substrates in the Indoor Environment	Fiberglass duct liner. Paint. Textiles. Found in high concentration in water-damaged building materials.
Water Activity	Aw 0.84-0.88
Mode of Dissemination	Air
Allergic Potential	Type I (asthma and hay fever).
Potential or Opportunistic Pathogens	Edema. keratitis. onychomycosis. pulmonary infections. Sinusitis.
Industrial Uses	Produces 10 antigens.
Potential Toxins Produced	Cladosporin and Emodin.

MYXOMYCETES++

Natural Habitat	Decaying logs, Dead leaves , Dung , Lawns , Mulched flower beds, Lawns
Suitable Substrates in the Indoor Environment	Rotting lumber
Free moisture required for mold growth	Unknown
Mode of Dissemination	Insects, Water, Wind
Allergic Potential	Type I
Potential or Opportunistic Pathogens	Unknown
Industrial Uses	
Other Comments	Includes Myxomycetes, Smut, and Periconia.

NIGROSPORA

Natural Habitat	Common on live or dead grass, seeds & soil.
Suitable Substrates in the Indoor Environment	Unknown
Water Activity	Unknown
Mode of Dissemination	Forcibly projected.
Allergic Potential	Type 1 allergies (hey fever, asthma)
Potential or Opportunistic Pathogens	Keratitis & skin lesions

RUSTS

Natural Habitat	Parasitic on cultivated and many types of plants
Suitable Substrates in the Indoor Environment	Unknown- rust fungi require a living plant host for growth
Free moisture required for mold growth	Unknown
Mode of Dissemination	Wind, Forcible Ejection
Allergic Potential	Type I. (hay fever, asthma)
Potential or Opportunistic Pathogens	Unknown

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STACHYBOTRYS/MEMNONIELLA

Natural Habitat	Decaying plant materials and Soil.
Suitable Substrates in the Indoor Environment	Water damaged building materials such as: ceiling tiles, gypsum board, insulation backing, sheet rock, and wall paper. Paper. Textiles.
Water Activity	Aw=0.94
Mode of Dissemination	Insects, Water, and Wind
Allergic Potential	Type I (hay fever, asthma)
Potential or Opportunistic Pathogens	Unknown.
Industrial Uses	Unknown.
Potential Toxins Produced	Mycotoxins produced by Stachybotrys include Roridin A, Roridin E, Roridin H, Roridin L-2, Satratoxin G, Satratoxin H, Isosatratoxin F, Verucarin A, Verucarin J, and Verrucariol.
Other Comments	Stachybotrys and Memnoniella are closely related and many Memnoniella species have been renamed under Stachybotrys. Mycologists are continuing to debate whether Stachybotrys and Memnoniella should be grouped or split apart (see references below). Stachybotrys may play a role in the development of sick building syndrome. The presence of this fungus can be significant due to its ability to produce mycotoxins. Exposure to the toxins can occur through inhalation, ingestion, or skin exposure.
References	Generic hyper-diversity in Stachybotriaceae. L. Lombard et al., Persoonia 36, 2016: 156–246. Overview of Stachybotrys (Memnoniella) and current species status. Y. Wang et al., Fungal Diversity, 2015: DOI: 10.1007/s13225-014-0319-0.

TRICHODERMA

Natural Habitat	A worldwide saprophytic fungi, being isolated from dead plant material and soil.
Suitable Substrates in the Indoor Environment	Paper, textiles, wet wood
Water Activity	Unknown
Mode of Dissemination	Insects, water splash, wind
Allergic Potential	Hay fever, asthma, hypersensitivities
Potential or Opportunistic Pathogens	Occasionally associated with disease in immunocompromised people.

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5. References and Informational Links

Books

- Bioaerosols: Assessment and Control. Janet Macher, Ed., American Conference of Governmental Industrial Hygienists, Cincinnati, OH 1999.
- Exposure Guidelines for Residential Indoor Air Quality. Environmental Health Directorate, Health Protection Branch, Health Canada, Ottawa, Ontario, 1989.
- Fungal Contamination in Public Buildings: Health Effects and Investigation Methods. Health Canada, Ottawa, Ontario, 2004.
- IICRC: S500 Standard and Reference Guide for Professional Water Damage Restoration. 3rd Edition, Institute of Inspection, Cleaning, and Restoration Certification, Vancouver, WA, 2006

  IICRC: S520 Standard and Reference Guide for Professional Mold Remediation. 1st Edition, Institute of Inspection, Cleaning, and Restoration Certification, Vancouver, WA, 2004
- Field Guide for the Determination of Biological Contaminants in Environmental Samples. 2nd Edition, American Industrial Hygiene Association, 2005.

Consumer Links

Read the full text of AIHA's "The Facts About Mold" consumer brochure.
<http://www.aiha.org/get-involved/VolunteerGroups/Documents/BiosafetyVG-FactsAbout%20MoldDecember2011.pdf>

The Occupational Safety and Health Administration (OSHA)
http://www.osha.gov/SLTC/molds/index.html

CDC Mold Facts
http://www.cdc.gov/mold/faqs.htm

CDC Stachybotrys - Questions and answers on Stachybotrys chartarum and other molds
http://www.cdc.gov/mold/stachy.htm

IOM, NAS: Clearing the Air: Asthma and Indoor Air Exposures
https://www.epa.gov/indoor-air-quality-iaq/should-you-have-air-ducts-your-home-cleaned

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National Library of Medicine-Mold website
http://www.nlm.nih.gov/medlineplus/molds.html

California Department of Health Services (CADOHS)
https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/EHLB/IAQ/Pages/Mold.aspx

Minnesota Department of Health
http://www.health.state.mn.us/divs/eh/indoorair/mold/index.html

New York City Department of Health and Mental Hygiene
https://www1.nyc.gov/site/doh/health/health-topics/mold.page

H.R.: The United States Toxic Mold Safety and Protection Act

EPA

"Should You Have the Air Ducts in Your Home Cleaned?"
<http://www.epa.gov/iaq/pubs/airduct.html>

General information about molds and actions that can be taken to clean up or prevent a mold problem.
<http://www.epa.gov/asthma/molds.html>

“A Brief Guide to Mold, Moisture, and Your Home” - Includes basic information on mold, cleanup guidelines, and moisture and mold prevention
http://www.epa.gov/mold/moldguide.html

“Mold Remediation in Schools and Commercial Buildings” - Information on remediation in schools and commercial property, references for potential mold and moisture remediators.
https://www.epa.gov/mold/mold-remediation-schools-and-commercial-buildings-guide

FEMA

“Homes That Were Flooded May Harbor Mold Problems” - Information and tips for cleaning mold.
http://www.fema.gov/news-release/homes-were-flooded-may-harbor-mold-problems

“Dealing With Mold & Mildew in Your Flood Damaged Home.
http://www.fema.gov/pdf/rebuild/recover/fema_mold_brochure_english.pdf

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6. Important Terms, Conditions, and Limitations

A. Sample Retention

Samples analyzed by EMSL will be retained for 60 days after analysis date Storage beyond this period is available for a fee with written request prior to the initial 30 day period. Samples containing hazardous/toxic substances which require special handling will be returned to the client immediately. EMSLreserves the right to charge a sample disposal fee or return samples to the client.

B. Change Orders and Cancellation

All changes in the scope of work or turnaround time requested by the client after sample acceptance must be made in writing and confirmed in writing by EMSL. If requested changes result in a change in cost the client must accept payment responsibility. In the event work is cancelled by a client, EMSL will complete work in progress and invoice for work completed to the point of cancellation notice. EMSL is not responsible for. holding times that are exceeded due to such changes.

C. Warranty

EMSL warrants to its clients that all services provided hereunder shall be performed in accordance with established and recognized analytical testing procedures and with reasonable care in accordance with applicable federal, state and local laws. The foregoing express warranty is exclusive and is given in lieu of all other warranties, expressed or implied. EMSL disclaims any other warranties, express or implied, including a warranty of fitness for particular purpose and warranty of merchantability.

D. Limits of Liability

In no event shall EMSL be liable for indirect, special, consequential, or incidental damages, including, but not limited to, damages for loss of profit or goodwill regardless of the negligence (either sole or concurrent) of EMSL and whether EMSL has been informed of the possibility of such damages, arising out of or in connection with EMSL's services thereunder or the delivery, use, reliance upon or interpretation of test results by client or any third party. We accept no legal responsibility for the purposes for which the client uses the test results. EMSL will not be held responsible for the improper selection of sampling devices even if we supply the device to the user. The user of the sampling device has the sole responsibility to select the proper sampler and sampling conditions to insure that a valid sample is taken for analysis. Any resampling performed will be at the sole discretion of EMSL, the cost of which shall be limited to the reasonable value of the original sample delivery group (SDG) samples. In no event shall EMSL be liable to a client or any third party, whether based upon theories

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of tort, contract or any other legal or equitable theory, in excess of the amount paid to EMSL by client thereunder.

E. Indemnification

Client shall indemnify EMSL and its officers, directors and employees and hold each of them harmless for any liability, expense or cost, including reasonable attorney's fees, incurred by reason of any third party claim in connection with EMSL services, the test result data or its use by client