

ENVIRONMENTAL IMPACT ASSESSMENT

BMR Wind Jamaica 34 MW
Wind Farm Project

Malvern St. Elizabeth

April 2014



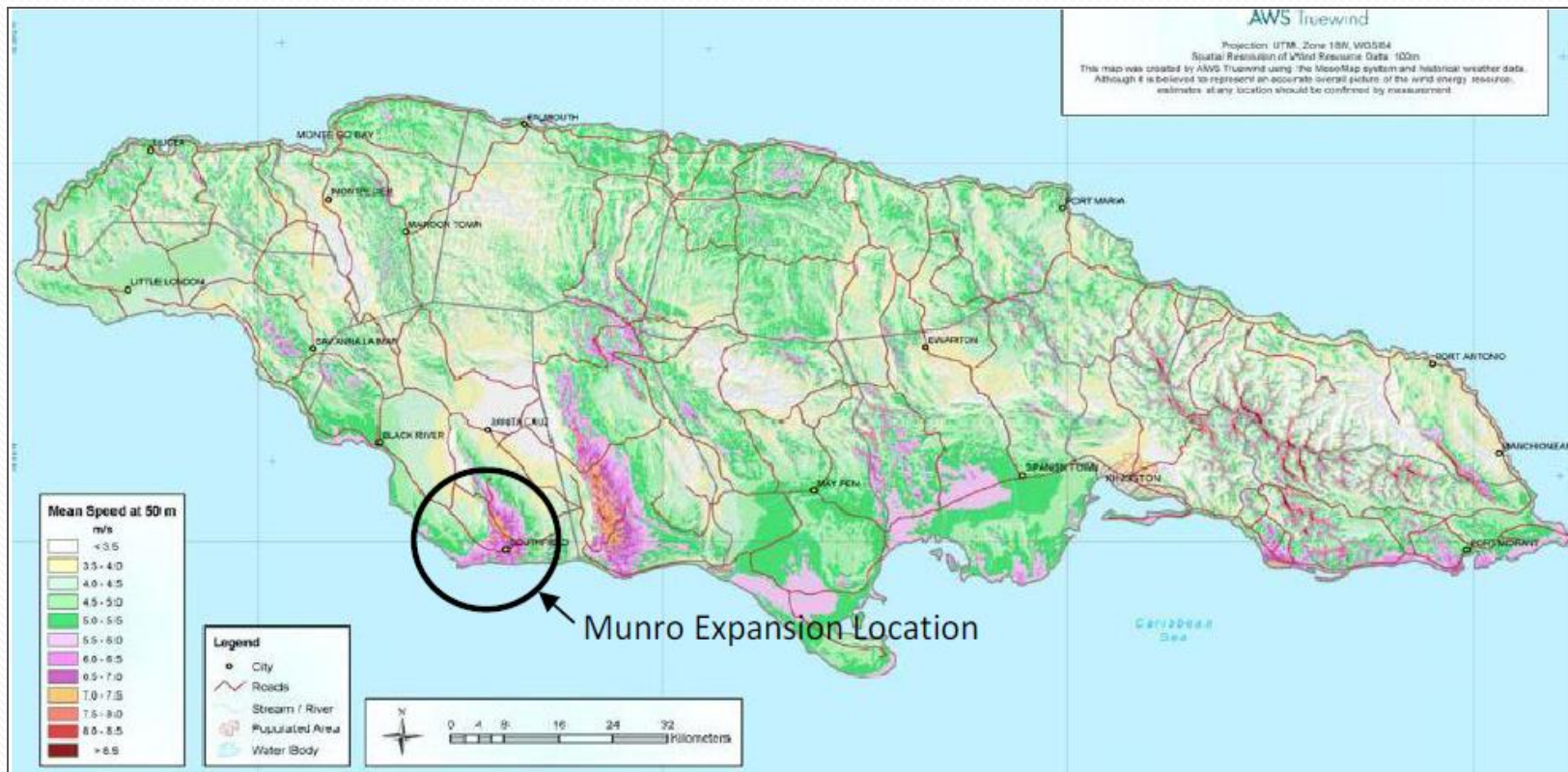
INTRODUCTION AND OBJECTIVES OF EIA

- BMR Jamaica Wind Ltd. (BMRJW) proposes to construct a 34 MW Wind Farm in Malvern located in the southern section of St. Elizabeth
- The main objective of the EIA is to identify and assess the potential physical, biological and socio-economic impacts of the proposed project

PROJECT LOCATION

- The project site is located in Malvern; adjacent to the existing JPS Munro Wind Farm
- The site is approx. 100 km west of Kingston and 12 km south of the parish capital of Santa Cruz
- The total area of the project site is 35.2 hectares (87 acres)
- The proposed site is located in an area of high wind and is considered a Class I wind site

PROJECT LOCATION



PROJECT OBJECTIVES

- The project will add 4.8% of energy generated by renewable sources to the existing energy mix
- Approximately US\$85-90 million is being invested in the construction and commissioning of the wind farm
- Key environmental benefits of the project include:
 - Eliminates need to import and burn 250,000 barrels of foreign oil per year
 - 5.0 million barrels saved over 20 year life – save over \$500 million US of oil expense
 - Zero emissions for power generation – significant reduction from current sources
 - Nitrogen Oxides emissions will be reduced by 7,000 tonnes annually
 - Sulphur Dioxide emissions will be reduced by 40,000 tonnes annually
 - Carbon Dioxide emissions will be reduced by over 2 million tonnes annually

PROJECT DESIGN AND TECHNOLOGY

- 3 types of wind turbine technology considered
- Turbines are designed by Vestas and include the following types:
 - V90-1.8MW
 - V80-2.0MW
 - V112-3.3MW
- The turbines are pitch regulated upwind turbines with active yaw and three-blade rotor. The turbine utilises a microprocessor pitch control system. **With these features, the wind turbine is able to operate the rotor at variable speed (rpm), helping to maintain the output at or near rated power.**
- To produce the 34 MWs, 18 turbine locations were selected, with a ***minimum*** of 11 to be utilised
- Final number and locations of turbines and configuration of the wind farm is based on:
 - The type of wind technology selected
 - The results of subsurface investigations and
 - Environmental considerations and
 - The recommendations of a comprehensive transportation study on the movement of turbines from the Ports to the Project site.

LEGAL AND POLICY FRAMEWORK

- The national policies applicable to this project are the National Energy Policy and the National Renewable Energy Policy.
- The legislation applicable to this project include:
 - Electric Lighting Act, 1890
 - The Office of Utilities Regulation Act, 1995
 - The Natural Resources Conservation Authority Act, 2001
 - The Natural Resources (Prescribed Areas) (Prohibition of Categories of Enterprise, Construction and Development) Order, 1996
 - The Natural Resources Conservation (Permits and Licences) Regulations, 1996
 - The Natural Resources Conservation (Permits and Licences) (Amendment) Regulations, 2004
 - The Natural Resources Conservation, (Ambient Air Quality Standards) Regulations, 1996
 - National Solid Waste Management Act 2001
 - Town and Country Planning Act, 1957
 - The Parish Council Building Act, 1901
 - The Wildlife Protection Act, 1945
 - Flood Water Control Act, 1958



ENVIRONMENTAL BASELINE

PHYSICAL ENVIRONMENT

- Geology, Hydrology and Pedology
 - No surface or underground water in area
 - Presence of possible sinkholes
 - There is a fault line located on the western end of the project site
 - Clay loam is the predominant soil type
- Hazards
 - The natural hazards likely to affect the area include hurricane and earthquake
- Noise Assessment
 - All individual readings were in the 30 – 47 dBA range while the overall average readings were in the 31 – 43 dBA range
 - All individual MAX readings were in the 32 – 68 dBA range while the overall average MAX readings were in the 37 – 54 dBA range

BIOLOGICAL ENVIRONMENT

- Flora and Avi-fauna (Birds)
 - 32 bird species were observed; 10 endemic, none of which are currently on the endangered species list for Jamaica; 4 endemic sub species and 18 residents
 - Both winter migrants and summer residents were observed indicating the timeline as being transitional for Jamaican bird species population; 7 migratory species were observed.
 - 28 tree species were observed within the area; these species formed forest patches which showed various levels of degradation from anthropogenic disturbance
 - No endemic and/or endangered tree species were observed in the forest patches or trees used as fencing in the environs of the proposed wind turbines
 - 21 species of shrubs/herbs were observed of which there were 2 endemic species observed, the cactus *Hylocereus triangularis* and Mistletoe; all other observed species were native.
 - 9 butterfly species were observed of which there was one endemic sub-species

BIOLOGICAL ENVIRONMENT

- Research within the Project area identified the presence of 6 caves
 - Some of the named caves are likely the same
 - During the course of the fieldwork, 2 cave sites were located, Kinowl Cave and Blair's Cave.
- Bats (Wet Season)
 - Bats were found throughout the entire project area, but the rainy-season data suggests that distribution and foraging activities are not homogenous.
 - 21 bats were captured and released during the wet season survey of 18 sites, however the numbers observed visually and acoustically throughout the project site exceeded 100
 - The survey revealed that bat numbers, as well as foraging and fly-through activities were more concentrated at selected turbine locations; generally located near forested areas
 - 5 bat species were identified; 4 species were captured and released during the survey
 - Observations made across the project area revealed that there was a definite preference for forests and bushy fence-lines as flight paths and also as staging grounds for "hawking" attacks on flying moths

BIOLOGICAL ENVIRONMENT

- Bats (Dry Season)
 - 12 bats were captured and released during the dry season survey of 11 sites (1-11)
 - Approx. 70 bats were observed visually and acoustically detected at the sites. Foraging and fly through activities were noted throughout the turbine locations, but varied in intensity and occurrence.
 - During the dry season survey no new bat species were identified and/or captured.
 - 3 of the 4 species caught (*Artibeus jamaicensis*, *Ariteus flavescens*, and *Glossophaga soricina*) are known to roost in tree hollows
 - The larger forests in the southwest of the project area support a greater number of bats and species than the relatively barren areas of the north
 - Repeated visual observations over both surveying seasons have shown that bat species fly and forage at altitudes that are below the height of the turbine blades.

BIOLOGICAL ENVIRONMENT

1 *Artibeus Jamaicensis*



2 *Monophyllus redmani*



3 *Pteronotus parnellii*



4 *Ariteus flavescens*



SOCIAL ENVIRONMENT

- The social impact zone has a total population of 5,815 located in more than 15 communities and/or districts, situated across thirteen 13 enumeration districts (EDs). Communities included:
 - Malvern
 - Munro
 - Potsdam
 - Iver Cottage
 - Hermitage
 - Smithfield
 - Mount Pleasant
 - St. Mary's
 - Roseberry
 - Bideford
 - Torrington
- The district of Malvern has the largest population at 2,815 persons, while the community of St. Mary's has the smallest with approx. 360
- Males account for about 51% of the total population within the impact zone

SOCIAL ENVIRONMENT (PERCEPTION SURVEY)

- General Results
 - Males accounted for approx. 59% of the total number of persons interviewed
 - Approx. 29%, nearly 1/3 of survey participants belonged to the 18-29 age group
 - An estimated 99% of respondents had received at a minimum primary level education
 - 17.5% of respondents had tertiary level education
 - 35.5% of all persons surveyed indicated that they were farmers
 - The employment level amongst respondents was high, with only 3.6% of the total number of persons surveyed indicating they were unemployed
 - An estimated 40% of all respondents were self-employed

PERCEPTION SURVEY (POSITIVE)

- 45% of the total number of persons surveyed ranked the project as being '*very important*', while an additional 35% gave an overall ranking of '*important*'
- 74% of respondents expected the project to have an overall positive impact on job creation, both for community members and the general public
- Approx. 40% of survey participants held the view that the presence of the turbines would help to improve the overall appearance of their community

PERCEPTION SURVEY (POSITIVE)

- 59% of the total number of persons surveyed felt the project would have a positive impact on the economy overall
- Job creation, reduction in fuel imports, introduction of new technologies, development of local capacity through skills development training and development of a potential tourist product were likely benefits on a macro-economic scale
- Several community members interviewed felt the project could be used as an educational opportunity for young people within the community and across Jamaica
- Respondents proposed that under the project, school children are given the opportunity to visit the wind farm and learn about the functions of the turbines

PERCEPTION SURVEY (NEGATIVE)

- Approx. 19% of survey participants felt the project would have a negative impact on agricultural lands; 12% felt farmers would be placed at a disadvantage
- Approx. 19% of respondents expected an increase in nuisance noise levels during operations
- An estimated 55% of respondents did not expect to see a reduction in their electricity bills, even though many felt community members should at least benefit directly from this project
- There were concerns about:
 - turbines attracting lightning and that parts of the turbines could become dislodged hitting someone during lightning storms
 - increased risk of vehicular and pedestrian accidents with the transportation of turbine equipment during construction

RESPONDENTS DESIRED PROJECT OUTCOMES

- Provide training opportunities for locals in the maintenance of the turbines, thereby giving them an opportunity to secure employment during the operational phase of the project
- Provide financing for the construction of a community training facility, offering various types of programmes for young people, including a training programme on the management of turbines
- Partner with the Bethlehem Teacher's College in developing a programme focusing on environmental conservation and renewable energy and provide a scholarship grant for one student at the institution wishing to further their studies in environmental management and energy conservation
- Provide funding, equipment and/or technical support for the restoration of the Munro Wind turbine
- Establish scholarship grants for 2 students from either the Munro College and/or Hampton School for Girls wishing to pursue tertiary studies in the field of civil and/or environmental engineering
- Partner with the Malvern Science Resource Centre to restore the centre and open a section focusing on wind turbines and their functions



ENVIRONMENTAL IMPACTS

ENVIRONMENTAL IMPACTS

- 11 negative impacts identified during the construction phase of which 5 of which are considered significant
- 4 significant impacts identified during the operational phase
 - susceptibility of turbines to lightning strikes
 - disruption to avifauna species and
 - increased noise nuisances
 - shadow flicker
- In all cases steps can be taken to mitigate against the negative impacts

CONSTRUCTION PHASE

ASPECT /POTENTIAL NEGATIVE IMPACTS	SIGNIFICANT
Fugitive dust emissions & vehicular emissions <ul style="list-style-type: none"> • Air pollution • Respiratory problems 	NO
Noise <ul style="list-style-type: none"> • Nuisance to persons • Habitat disturbance • Hearing impairment (temporary, permanent) 	YES
Loss of Agricultural Crops and Temporary Displacement of Farmers	NO
Loss of Vegetation and Disturbance of Biological Communities <ul style="list-style-type: none"> • Habitat destruction • Disruption of ecosystems • Displacement of small farmers 	YES
Soil erosion and sedimentation <ul style="list-style-type: none"> • Off-site effect is the movement of sediment and agricultural pollutants into drainage channels • On-site impact is the reduction in soil quality which results from the loss of the nutrient-rich upper layers of the soil • Slope failure 	YES

CONSTRUCTION PHASE

ASPECT /POTENTIAL NEGATIVE IMPACTS	SIGNIFICANT
Land and water pollution (solid waste) <ul style="list-style-type: none"> • Top soil, vegetation, construction debris, garbage 	NO
Traffic Disruption and Vehicle Conflicts <ul style="list-style-type: none"> • Traffic congestion • Motor vehicle accidents 	YES
Vibration from blasting <ul style="list-style-type: none"> • Noise interferences 	NO
Use of fuel <ul style="list-style-type: none"> • Depletion of (oil) resources 	NO
Use of water <ul style="list-style-type: none"> • Depletion of water resources 	NO
Land and water pollution <ul style="list-style-type: none"> • Human waste • Fuel and oil spills 	NO
Accidents from construction work causing death or injury	YES

OPERATIONAL PHASE

ASPECT /POTENTIAL NEGATIVE IMPACTS	SIGNIFICANT
Noise <ul style="list-style-type: none"> ● Nuisance to persons ● Habitat disturbance 	YES
Disruption in avifauna flight patterns <ul style="list-style-type: none"> ● Bird and bat deaths 	YES
Vibration and noise <ul style="list-style-type: none"> ● False earthquake signals 	NO
Disruption in air traffic	NO
Lightning strikes <ul style="list-style-type: none"> ● Fires ● Damage to wind turbines ● Disruption in electricity supplies ● Injury to workers 	YES
Flickering (photosensitive epilepsy)	NO
Shadow flicker	YES

OPERATIONAL PHASE

ASPECT /POTENTIAL NEGATIVE IMPACTS	SIGNIFICANT
Diffraction/Shadowing, Reflection, Scattering <ul style="list-style-type: none"> ● Electromagnetic interference which can affect radar and radiocommunication 	NO
Aesthetics <ul style="list-style-type: none"> ● Visually unattractive 	NO
Land use <ul style="list-style-type: none"> ● Alteration of development and land use in the area ● Depreciate land value 	NO
Land and water pollution <ul style="list-style-type: none"> ● Fuel and oil spills 	NO

MAINTENANCE PHASE

ASPECT /POTENTIAL NEGATIVE IMPACTS	SIGNIFICANT
Land and water pollution <ul style="list-style-type: none">● Human waste● Fuel and oil spills	NO
Land pollution <ul style="list-style-type: none">● Solid waste	NO
Accidents from maintenance work causing death or injury	NO

DECOMMISSIONING PHASE

ASPECT /POTENTIAL NEGATIVE IMPACTS	SIGNIFICANT
Land pollution <ul style="list-style-type: none"> • Solid waste 	YES
Noise from equipment <ul style="list-style-type: none"> • Nuisance to persons • Habitat disturbance • Hearing impairment (temporary, permanent) 	YES
Land and water pollution <ul style="list-style-type: none"> • Human waste • Fuel and oil spills 	NO

MITIGATION MEASURES (CONSTRUCTION)

Impacts	Mitigation Measures
<p>Noise Nuisance to persons</p> <ul style="list-style-type: none"> • Habitat disturbance • Hearing impairment (temporary, permanent) 	<ul style="list-style-type: none"> • Provide workers with the necessary PPE e.g. hearing protection and ensure that they are worn • Sensitise residents in the area to the types of activities that will take place ahead of the works and assign a liaison person with whom the residents can relate • Ensure project activities are scheduled during working hours of 7:00 a.m. to 7:00 p.m. • Operate well maintained vehicles and equipment • Blasting should be done in accordance with the requirements of Mines and Geology Department
<p>Emissions and Fugitive Dust</p> <ul style="list-style-type: none"> • Health impacts e.g. respiratory problems • Air pollution 	<ul style="list-style-type: none"> • Cover haulage vehicles transporting aggregate, soil and cement • Cover and/or wet onsite stockpiles of aggregate, soil etc. • Ensure proper stock piling/storage and disposal of solid waste • Wet cleared land areas regularly • Use water sprays to minimise dust • Blasting should be done in accordance with the requirements of Mines and Geology Department • Provide workers with the necessary PPE e.g. dust masks and ensure that they are worn • Operate well maintained vehicles and equipment

MITIGATION MEASURES (CONSTRUCTION)

Impacts	Mitigation Measures
<p>Vegetation Loss / Disturbance of Biological Communities</p> <ul style="list-style-type: none"> ● Air Pollution ● Habitat destruction ● Disruption of ecosystems 	<ul style="list-style-type: none"> ● Only areas that are absolutely necessary for clearance should be cleared ● In areas where vegetation has been removed and the lands have not been converted to permanent land uses (roadways and siting of turbines), re-vegetation exercises should be undertaken. ● Replant trees in the same area of the project site or other areas ● In cases where sensitive habitats will be disturbed, re-siting of turbines should be undertaken ● Bring to the attention of the Jamaica National Heritage Trust and the NEPA immediately if any artefacts are found and safeguard same
<p>Displacement of Farmers</p> <ul style="list-style-type: none"> ● Loss of revenue ● Disturbance of farming plots/ destruction of crops 	<ul style="list-style-type: none"> ● A walk through of proposed lands to be used for the siting of turbines should be undertaken where farming plots are present. This should be done prior to the finalisation of the siting layout for the wind turbines ● Make arrangements with farmers to compensate them for farm crops which may have to be removed

MITIGATION MEASURES (CONSTRUCTION)

Impacts	Mitigation Measures
<p>Soil erosion and sedimentation due to land clearing and slope modification</p> <ul style="list-style-type: none"> ● Disruption of ecosystems ● Land slippages ● Blocked drainage channels ● Loss of soil ● Water pollution 	<ul style="list-style-type: none"> ● Identify and avoid areas with very steep and unstable slopes and near to sinkholes ● Minimise, where possible the clearance of vegetation and removal of top soil ● Place or design access roads to follow natural topography and minimize hill side cuts. ● Design runoff control features to minimise soil erosion ● Re-vegetate areas not be used for the placement of permanent features ● Place berms around stockpiles of top soil and aggregate (sand, gravel, marl) ● Avoid steep cuts and where there are steep cuts they must be shored up ● Utilise sediment traps to minimise sediment runoff
<p>Land pollution and displeasing aesthetics due to Solid Waste</p>	<ul style="list-style-type: none"> ● Contain garbage and construction debris onsite until disposal at the approved municipal disposal site at Myersville ● Prohibit burning of solid waste on project sites

MITIGATION MEASURES (CONSTRUCTION)

Impacts	Mitigation Measures
<p>Traffic Congestion/ <ul style="list-style-type: none"> ● Immobility ● Vehicle-vehicle conflicts ● Vehicle-pedestrian conflicts ● Delayed traffic movements ● Damage to road infrastructure ● Alteration of private property </p>	<ul style="list-style-type: none"> ● Obtain permission from the owners of properties identified for alteration along transportation route. Compensation, if required, should be done at market prices ● Erect traffic signs along main transportation route and in sensitive areas such as schools ● Erect traffic assisting devices at the entrance/exit of construction sites and corners e.g. mirrors, flagmen, etc. ● Transport heavy equipment and wind turbine parts during off-peak traffic hours (between 10:00p.m. to 4:00 a.m.) with police outriders and JPS to raise electrical wires ● Trucks transporting construction material should be advised to comply with the speed limits ● Use traffic signals or flagmen to manage traffic flows where road improvement works are being undertaken ● Advise schools and residents of the proposed project construction schedule and seek their buy-in and support

MITIGATION MEASURES (CONSTRUCTION)

Impacts	Mitigation Measures
<p>Land and water pollution</p> <ul style="list-style-type: none">• Human Waste• Fuel and Chemical Spills	<ul style="list-style-type: none">• Use a reputable company to provide portable toilets for workers on site• The company should only dispose of sewage at an approved municipal treatment plant• Store fuel and chemicals with secondary (spill) containment infrastructure• Utilise proper dispensing equipment• Have spill containment and cleanup equipment on site and dispose of waste in accordance with best practices• Develop an Emergency Preparedness and Response Plan and train workers accordingly

MITIGATION MEASURES (OPERATIONAL PHASE)

Impacts	Mitigation Measures
<p>Noise</p> <ul style="list-style-type: none"> • Nuisance to persons • Habitat disturbance <p>Hearing impairment (temporary, permanent)</p>	<ul style="list-style-type: none"> • Situate wind turbines as far away as possible from residences and schools • Wind farm noise limits should be set relative to existing background noise levels and should not exceed 55 dB (daytime) and 50dBA (night time) at receptors such as schools, residences and commercial establishments. • Establish barriers to deflect sound e.g. trees • Develop a shutdown strategy during times of excessive wind when noise is likely to exceed the acceptable threshold • Wind turbines should contain no tonal component • Monitor sound levels to ensure that they are within acceptable limits
<p>Disturbance/ destruction of avifauna species (bats and birds)</p> <p>Injury and/or death</p>	<ul style="list-style-type: none"> • Target hilltops for the siting of turbines • Establish buffer zones of 200m from forested areas • Install deterrents such as ultrasound blasters • Locate turbines away from the flight path of birds <ul style="list-style-type: none"> • Shut down turbines during high risk conditions • Alter blade speed during high risk periods • Increase blade 'cut in' speed

MITIGATION MEASURES (OPERATIONAL PHASE)

Impacts	Mitigation Measures
Shadow Flicker	<ul style="list-style-type: none"> • Turbines should be sited away from communities to prevent extended exposure to flickering. A distance of 10 times the rotor diameter (called the zone of influence for shadow flickering) is considered the minimum distance for the siting of turbines to mitigate against flickering. • In the event shadow-flicker becomes an annoyance within an inhabited dwelling, some sort of screening should be considered. This could include strategically placed vegetation, window awnings, or window shades.
Lightning <ul style="list-style-type: none"> • Fires • Destruction/ disturbance of vegetation 	<ul style="list-style-type: none"> • A SCADA system to remotely monitor the turbines will be used and includes features to shut down the turbines in the event of a fire • Ensure that fire extinguishers are available on the wind farm for emergency use
Shadowing, Reflection, Scattering Electromagnetic Interference with RF signals	<ul style="list-style-type: none"> • Install outdoor or higher antennae • Relocate or realign antennae

MITIGATION MEASURES (OPERATIONAL PHASE)

Impacts	Mitigation Measures
Disruption of Air Traffic	<ul style="list-style-type: none">• Final turbine designs and layout should be submitted to the Jamaica Civil Aviation Authority, allowing for a risk assessment to be done examining the potential risks of the proposed wind farm to air traffic movement• The rotor blades, nacelle and upper two-thirds of the supporting mast of the wind turbines should be painted white.• The nacelle must be lit by a medium density obstacle light of 2000 candelas per m² showing flashing red. The obstacle light should be installed on the nacelle in such a manner as to provide an unobstructed view for aircraft approaching from any directions.• The lights should operate at 20-60 flashes per minute and flash simultaneously with lights installed at other wind turbines to show the extent of the wind farm.• The tower should be inspected regularly to detect any failure of these lights which must be replaced in minimum time.

MITIGATION MEASURES (OPERATIONAL PHASE)

Impacts	Mitigation Measures
Vibration Disturbance of seismological equipment Noise interferences	<ul style="list-style-type: none"> • The design of the wind farm must be such as to prevent or reduce noise interferences
Land and water pollution <ul style="list-style-type: none"> • Oil Spills/leaks 	<ul style="list-style-type: none"> • Ensure that spill and oil cleaning kits and equipment are onsite • Ensure that workers are trained in spill management
Land use change <ul style="list-style-type: none"> • Depreciation of land costs • Loss of revenues • Land use development change • Loss of bauxite mining lands 	<ul style="list-style-type: none"> • Turbines, where possible, should be sited away from farming lands • In cases where farming lands will be used to site turbines, access roads or any other infrastructural feature associated with the wind farm, farmers of said lands should be compensated • Turbines should not be sited on bauxite deposits, except in cases where formal approval has been granted by the Jamaica Bauxite Institute

MITIGATION MEASURES (MAINTENANCE PHASE)

Impacts	Mitigation Measures
<p>Land and water pollution</p> <ul style="list-style-type: none"> • Solid waste • Oil spills/Leaks 	<ul style="list-style-type: none"> • Properly contain garbage and construction debris for disposal at the approved dumpsite at Myersville • Have spill containment and clean up equipment on site and dispose of waste in accordance with best practices
<p>Accidents due to maintenance work</p>	<ul style="list-style-type: none"> • Erect signs during maintenance activities • Provide workers with the necessary Personal Protective Equipment (PPE) • Train construction personnel in good safety practices and emergency preparedness and response measures

MITIGATION MEASURES (DECOMMISSIONING PHASE)

Impacts	Mitigation Measures
<p>Land and water pollution</p> <ul style="list-style-type: none"> • Solid waste 	<ul style="list-style-type: none"> • Properly contain garbage and construction debris for disposal at the approved dumpsite at Myersville • The disposal of large parts will need to be done with the approval of the National Solid Waste Management Authority (NSWMA)
<p>Noise</p> <ul style="list-style-type: none"> • Nuisance to persons • Habitat disturbance • Hearing impairment (temporary, permanent) 	<ul style="list-style-type: none"> • Advise community members of the times that decommissioning activities will take place • Ensure that decommissioning activities are undertaken within the stipulated times • Provide workers with the necessary Personal Protective Equipment (PPE) e.g. hearing protection and ensure that they are worn

MITIGATION MEASURES (DECOMMISSIONING PHASE)

Impacts	Mitigation Measures
<p>Land and water pollution</p> <ul style="list-style-type: none"> ● Human Waste ● Fuel and Chemical Spills 	<ul style="list-style-type: none"> ● Use a reputable company to provide portable toilets for workers ● The company should only dispose of sewage at an approved municipal treatment plant ● Store fuel with secondary spill containment infrastructure ● Utilise proper dispensing equipment ● Have spill containment and cleanup equipment on site and dispose of waste in accordance with best practices ● Develop an Emergency Preparedness and Response Plan and train workers accordingly
<p>Accidents/Injury due to Decommissioning work</p>	<ul style="list-style-type: none"> ● Erect signs during decommissioning activities ● Provide workers with the necessary Personal Protective Equipment (PPE) ● Train construction personnel in good safety practices and emergency preparedness and response measures

EMERGENCY RESPONSE MEASURES

- Hurricane
 - All turbine blades will be shut down
 - The hurricane will be monitored for direction and wind speed
 - Ratchet straps may be placed on nacelle covers
 - The turbines may be manually yawed 90° clockwise out of the wind 12 hours after a hurricane warning is issued
 - Liaise with System control
 - The site will be secured
 - Additional mitigation measures may be employed by BMRJW's Operational Personnel in order to secure the safety of the Project and Project Personnel

EMERGENCY RESPONSE MEASURES

- Earthquakes
 - Wind turbines have been designed to withstand aerodynamic forces
 - Wind turbines are designed based on the results of seismic loading tests that are undertaken during the design phase of the turbines
 - Turbines are being designed with an emergency stop

ENVIRONMENTAL MANAGEMENT PLAN

- The EMP outlines the prevention methods and procedures that will be adopted by BMRJW to ensure that the physical, biological and social environments are protected. The plan covers the following:
 - Management Objectives during Construction and Operational Phases
 - Management and Monitoring Actions
 - Persons responsible for the implementation and management of monitoring actions
 - Performance targets and specifications
 - Implementation Schedule

PROJECT BENEFITS (SUMMARY)

- Creation of an estimated 250 direct, indirect and induced jobs
- Creation of approximately 120 direct, indirect and induced local jobs
- Reduction in Oil Imports by 250,000 barrels of oil annually
- Accrue savings of approximately US\$500 million annually in oil expenses
- Improvement in local road, electricity and water infrastructure
- Reduction in Green House Gas Emissions
- Development of new tourism product



THANK YOU!

- A copy of the environmental impact assessment can be viewed at the following locations:
 - XXXXXX
 - XXXXXX
 - XXXXXX
- For additional information on the project please contact:
 - XXXXXXXXXXXXXXXXX
 - XXXXXXXXXXXXXXXXX