

## 7.2 Environmental Management Plan EMP

Table 28: Environmental Management Plan

Issue / Aspect	Mitigation Measure / Monitoring	Responsibility	Timing of Implementation
<b>Construction Phase</b>			
Conditions at construction site are unsafe or harmful for the environment	<ul style="list-style-type: none"> <li>• Project Implementation Agency (PIA) and the contracting companies should appoint HSE officer.</li> <li>• Construction site should clearly be fenced before construction commences.</li> <li>• Environmental awareness training for construction staff, concerning the prevention of accidental spillage of hazardous material and oil; water and air pollution and litter control.</li> </ul>	Project Implementation Agency (PIA) and SVGPA	Prior to construction works
	<ul style="list-style-type: none"> <li>• Establish a Pest Management Plan and procedures for screening.</li> <li>• Liaise with public health department.</li> </ul>	Contractor	Prior to Construction works
	<ul style="list-style-type: none"> <li>• Screening of imported quarry/fill material and construction equipment to ensure invasive species are not introduced to the local ecosystem.</li> </ul>	Ministry of Health Wellness and the Environment	During mobilization and throughout reclamation and construction phase.
Noise impacts on residents	<ul style="list-style-type: none"> <li>• Conduct <b>noise monitoring</b> at the closest receptor/residential area.</li> </ul>	Contractor	Whenever new equipment is used / new construction phase starts
	<ul style="list-style-type: none"> <li>• Fitting of noisy construction equipment and vehicles with mufflers and other suitable noise attenuation devices.</li> <li>• Elaboration and observation of a maintenance plan for all sound-reducing devices.</li> <li>• Instruction of workers on anti-idling policy.</li> <li>• Avoid civil works during sensitive morning, evening, and nighttime periods.</li> <li>• Notify and coordinate with residents adjacent to project areas prior to construction to inform them of the possibility of temporary noise disruption, and how to report noise complaints; Scheduling noisy activities for daytimes.</li> <li>• Provision of temporary movable acoustic shielding / barriers where necessary and practicable.</li> </ul>	Contractor	Prior to construction works
Noise impacts on construction workers	<ul style="list-style-type: none"> <li>• Conduct <b>noise monitoring</b> directly at construction site.</li> </ul>	Contractor	Once per day during working hours

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	<ul style="list-style-type: none"> <li>• Information of workers if noise level of 80 dB is reached.</li> <li>• Provision of PPE / hearing protection to all workers exposed to noise, workers have the obligation to wear them.</li> <li>• Marking of noisy areas (when the noise limit is exceeded).</li> <li>• Preparation of a noise reduction programme.</li> <li>• Arranging of preventive occupational medical care (mandatory, when the limit value is reached).</li> </ul>	Contractor	As soon as limit value is reached
Residents complain about noise	Posting a sign indicating dates and duration of construction activities, including a telephone number where residents can inquire about the construction process and register complaints.	Contractor	Prior to construction works
Underwater Noise by pile driving / Impacts on marine mammals and other marine organisms	<ul style="list-style-type: none"> <li>• Implementation of mitigation measures as described in chapter 6.1.1.3.</li> <li>• Avoidance of breeding / nursery seasons.</li> <li>• Close cooperation between SVGPA and MOHWE as well as the National Parks, Rivers and Beaches Authority.</li> </ul>	Project Implementation Agency (PIA)	Prior and during pile driving activities
Impacts on air quality	<ul style="list-style-type: none"> <li>• Establishing an anti-idling policy for all construction equipment, including trucks and cargo handling equipment, or use automatic shut-down devices for vehicles and equipment that are on idle for more than 3 minutes.</li> <li>• All vehicles and equipment are properly operated and maintained according the manufacturer's specifications, and equipped with appropriate emission control devices like Diesel Oxidation Catalyst, Diesel Particulate Matter Filter.</li> <li>• Malfunctioning equipment is be repaired immediately or removed from the site. Training of workers on more environmentally conscious driving.</li> </ul>	Contractor	
	<ul style="list-style-type: none"> <li>• Preparation of a maintenance schedule.</li> </ul>	Contractor	Prior to construction works
	<ul style="list-style-type: none"> <li>• Regular maintenance of all equipment.</li> </ul>		During construction

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Water quality impacts	<ul style="list-style-type: none"> <li>• Prevention of storm water run-off by constructing bonds (earth bunds or sand bag barriers) and silt fences around bare areas.</li> <li>• Construction of storm water basins / catch basins to collect and control run-off.</li> <li>• Containment around material stockpiles, in particular around hazardous material like oil, fuel, paint, etc. Always have a spill kit available for emergencies.</li> <li>• Establish procedures to prevent or avoid contamination of runoff by waste oils, grease or fuel from equipment operation and maintenance.</li> <li>• Procedure for the use and disposal of defouling agents.</li> <li>• On-going maintenance of sediment and erosion controls, coverage of exposed slope/soil surface.</li> <li>• Collection of debris and rubbish generated on-site at least once per day, proper disposal to avoid being flushed or blown by wind into the sea.</li> <li>• Stockpiles of construction material like cement should be kept covered when not being used.</li> <li>• Equipment refueling and maintenance shall be limited to designated areas outside construction site with a surface which allows the residue-free absorption of spillages.</li> <li>• Procedure for handling and disposal of hazardous chemicals. E.g. when spill kit is used, oil spills from equipment and machinery, oil mixed in sand etc.</li> </ul>	Contractor	During construction
	<ul style="list-style-type: none"> <li>• Provision of clean and convenient restroom facilities / portable toilets, at least one toilet and one urinal per 40 workers; disposal of waste and maintenance by a licensed contractor.</li> </ul>	Contractor	Prior to construction works
	<ul style="list-style-type: none"> <li>• Insert Silt Traps at North River to prevent buildup of sediment downstream.</li> <li>• Establish a procedure for sediment removal and disposal. Watershed Management and upstream maintenance of the North River</li> </ul>	Ministry of Transport, Works, Urban Development & Local Government & PIA	During and prior to construction.
	<ul style="list-style-type: none"> <li>• Develop procedure for handling and or disposal of dredged material.</li> </ul>	Contractor	
Impacts to / loss of bottom fauna and flora due to reclamation	Impacts cannot be mitigated. Development of one or more compensation projects in cooperation with relevant authorities, e.g. contribute to protection and preservation of the Brighton Salt Pond Mangrove or the South Coast Marine Park	PIA, SVGPA and GOSVG	Prior to reclamation works
Impacts to coastal hydrology	Impacts cannot be mitigated.	PIA	Prior to reclamation works

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	Development of one or more compensation projects in cooperation with relevant authorities, e.g. contribute to protection and preservation of the Brighton Salt Pond Mangrove or the South Coast Marine Park		
Dust impacting the environment	<ul style="list-style-type: none"> <li>• When earthworks are carried out, water has to be sprayed to control dust.</li> <li>• Street sweepers have to be used whenever sand and building material have reached the roads.</li> <li>• If wind blows sand from the unpaved reclaimed area, wind fences must be installed to reduce the amount of windblown material leaving the site.</li> <li>• To avoid dust from vehicles, an on-site speed limit for construction vehicles of twenty-five (25) km/hr should be imposed.</li> <li>• Soil stockpiles should be covered.</li> </ul>	Contractor	During construction
	<ul style="list-style-type: none"> <li>• Monitoring of dust emanation from the construction site on the neighborhood.</li> </ul>	Contractor	Once a week or daily if dry conditions and high winds prevail
Dust impacting workers' health	<ul style="list-style-type: none"> <li>• Use of use of construction materials that are harmless to health wherever possible, e.g. silica-free materials and abrasives.</li> <li>• Use of water spray to dampen down dust clouds.</li> <li>• Use of Respiratory Protective Equipment (RPE) adequate for the amount and type of dust.</li> <li>• Limiting the number of people to be exposed to dust, e.g. by work rotation.</li> <li>• Train workers to make sure they are carrying out the job in the correct way Ensure that workers know about dust risks and how this can impact their health, know how to use the dust controls and check that they are working, know how to use and look after RPE and other personal protective equipment (PPE), follow the correct work method.</li> </ul>	Contractor	During construction
Traffic impacts	<ul style="list-style-type: none"> <li>• When roads have to be closed, informational signs shall be posted where lane and road closures could substantially disrupt traffic circulation at least 7 days prior to the closure.</li> <li>• Proper traffic controls shall be in place during closures to minimize impacts on traffic circulation and for traffic safety, such as signs, flaggers, and temporary barriers.</li> <li>• Appropriate safety precautions shall be taken when transporting large construction material or equipment on public roadways, such as using a pilot car.</li> <li>• Construction vehicles should be scheduled during off-peak hours whenever feasible.</li> </ul>	Contractor	At the start of construction

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	<ul style="list-style-type: none"> <li>For safety reasons, pedestrian access should be prohibited within the delineated construction area.</li> </ul>		
	<ul style="list-style-type: none"> <li>Adopt best operational practice.</li> <li>Monitoring and management to include state institutions.</li> </ul>	St. Vincent and the Grenadines Police Force, Traffic Department.	During construction
Waste Impacts	<ul style="list-style-type: none"> <li>Nomination of an approved person, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site.</li> <li>Preparation and implementation of a Waste Management Plan addressing the sources of waste; waste minimization, reuse, and recycling opportunities; and waste collection, storage, and disposal procedures.</li> <li>Training of site personnel in proper waste management and handling of hazardous waste.</li> </ul>	Contractor	At the start of construction
	<ul style="list-style-type: none"> <li>Provision of sufficient waste disposal points and regular collection for disposal through a licensed waste hauler.</li> <li>Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal.</li> <li>Appropriate measures to minimise windblown litter by either covering trucks or by transporting wastes in enclosed containers.</li> <li>Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors.</li> <li>All food waste shall be contained in covered bins and disposed of on a frequent basis to avoid attracting vermin.</li> <li>The project area shall be kept clean and free of litter and no litter shall be allowed to disperse to the surrounding area.</li> <li>Human waste associated with the worker camp and latrines shall be properly contained and disposed of.</li> </ul>	Contractor	During construction
<b>Operational Phase</b>			
Noise Impacts on Environment and Residents	<ul style="list-style-type: none"> <li>Monitoring of noise directly at the terminal and at nearest sensitive receptor.</li> </ul>	SVGPA	During operation, preferably long-term
	<ul style="list-style-type: none"> <li>Cargo handling equipment should be noise reduced e.g. by good sound isolation, mufflers, exhaust silencers and other suitable noise reduction devices.</li> </ul>	SVGPA	Prior to start of operation

Issue / Aspect	Mitigation Measure / Monitoring	Responsibility	Timing of Implementation
	<ul style="list-style-type: none"> <li>Establishing an anti-idling policy for all trucks and for cargo handling equipment.</li> <li>Training of equipment operators on “soft” driving as lower driving speed gives lower engine and tire noise.</li> <li>Training of crane drivers on “soft” lowering of containers, general noise awareness training.</li> <li>Reduction of loud impulse noises generated by ferry ramps e.g. by putting rubber linings and insulations onto the ramps to eliminate the noise.</li> <li>Construction of noise walls or barriers to keep the noise under the limit values outside the port area, if necessary.</li> </ul>		
	<ul style="list-style-type: none"> <li>Regular maintenance of all sound-reducing devices.</li> <li>Acquisition of a more silent machine fleet when investing in new machines, e.g. electrically-driven or hybrid machinery.</li> <li>SVGPA should maintain good communication with residents; any complaints about noise disturbances should be resolved.</li> </ul>	SVGPA	During operation
Noise Impacts on Port Workers' Health	<ul style="list-style-type: none"> <li>Monitoring of noise directly at the work place.</li> <li>Informing workers (before the value is reached).</li> <li>Obligation to wear PPE / hearing protection.</li> <li>Arranging of preventive occupational medical care (mandatory, when the action value is reached).</li> <li>Marking of noisy areas (when the noise limit is exceeded).</li> <li>Preparation of a noise reduction programme (when the noise limit is exceeded).</li> </ul>	SVGPA	During operation
Port Worker Health. (As per legislation, standard International Labor Organization and Occupational Health and Safety requirements.)	<ul style="list-style-type: none"> <li>Procedure for suspect or contaminated containers e.g. radioactivity.</li> <li>Procedures for handling and treatment of fumigated containers (in case they have to be opened)</li> </ul> <p>Note: Standards and procedures should follow IMO's international Maritime Dangerous Goods Code (IMDG Code).</p>	St. Vincent and the Grenadines Customs and Excise Department, SVGPA and Ministry of Health Wellness and the Environment	Before and during operation
	<p>Pest or Invasive Species Control Mechanisms:</p> <ul style="list-style-type: none"> <li>Establish a Pest Management Plan and procedures for pest and vector control.</li> </ul>	SVGPA and Ministry of Health Wellness and the Environment	Before and during operation

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Impacts on Air Quality	<ul style="list-style-type: none"> <li>• Establishing an anti-idling policy for all construction equipment, including trucks and cargo handling equipment, or use automatic shut-down devices for vehicles and equipment that are on idle for more than 3 minutes.</li> <li>• All vehicles and equipment are properly operated and maintained according the manufacturer's specifications, and equipped with appropriate emission control devices like Diesel Oxidation Catalyst, Diesel Particulate Matter Filter.</li> <li>• Malfunctioning equipment is be repaired immediately or removed from the site. Training of workers on more environmentally conscious driving.</li> <li>• Preparation of a maintenance schedule.</li> <li>• Regular maintenance of all equipment.</li>   <li>• Training of port environmental officers Port State Control Officers in order to be able to monitor compliance of vessels with stricter emissions regulations by the MARPOL Convention from 2020.</li> </ul>	SVGPA	During operation
Water Quality Impacts	<ul style="list-style-type: none"> <li>• SVGPA's HSE-Department should at least visually monitor the water quality around the port on a regular basis. Mooring areas and anchorages should regularly be checked for visible oil pollution / oily sheen.</li> <li>• Dangerous goods should not be stored inside the port; such cargo should be subject to direct delivery.</li> <li>• If Dangerous Goods have to be stored, containers should be stored as described in chapter 4.2.6.</li> <li>• One or two mobile "spill trailers" (a container trailer equipped with a collecting tray that can be moved by terminal tractor to a place of damaged container) should be available as an emergency measure in case of a leaking container.</li> </ul>	SVGPA and Ministry of Health Wellness and the Environment	During operation
	<ul style="list-style-type: none"> <li>• Inspection of ships according to the number specified in the "Memorandum Of Understanding On Port State Control In The Caribbean Region".</li> </ul>	SVG Maritime Administration	

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	<ul style="list-style-type: none"> <li>• Training of Port State Control Officers / Environmental Officers on vessel control with regard to compliance with MARPOL Annexes I, V and VI and with the BWC.</li> <li>• Employees should be trained regularly (at least every two years) on handling and storage of Dangerous Goods in accordance with the IMDG Code.</li> <li>• The actual version of the 2-volume IMDG Code plus supplements should be available on the terminal and in the operations office. Note that amendments are made to the IMDG Code on a two-year cycle, updates are required!</li> <li>• For incidents involving small spills, a spill kit should be available containing a range of spill clean-up tools like absorbents, over drums, drainage seals, drip trays and PPE for spill responders.</li> <li>• For emergencies involving big spills, there should be a contingency plan at SVGPA in cooperation with NEMO and the local oil companies who possess sufficient equipment to control bigger oil spills.</li> </ul>	<p>SVGPA</p> <p>SVGPA and NEMO</p>	<p>Prior to start of construction</p>
Coastal Impacts	<ul style="list-style-type: none"> <li>• Sedimentation at up-drift side of terminals has to be dredged regularly.</li> <li>• Deposition of sand to mitigate erosion at the down-drift side of terminals.</li> <li>• Monitoring of sedimentation and erosion processes through depth measurements on a regular basis.</li> </ul>	<p>SVGPA</p> <p>Ministry of Transport and Works</p>	<p>Regularly</p> <p>every 6 month</p>
Visual Impacts	<ul style="list-style-type: none"> <li>• The light intensity on the terminal should be limited to the minimum safety, security and operational requirement.</li> <li>• The lighting should be directional and full cut off – any glare and direct upward light, sky glow and glare should be avoided.</li> <li>• It should be possible to switch off terminal light, lighting should be only applied at areas where operation takes place, unnecessary over lighting should be avoided.</li> <li>• LED lighting is recommended for energy saving and for more stringent light control reducing light spills and light trespass.</li> </ul>	<p>SVGPA</p>	<p>Permanently</p>
Traffic Impacts	<ul style="list-style-type: none"> <li>• Trucks are should enter the port during off-peak hours.</li> <li>• Extension of terminal gate hours to reduce queuing and idling of trucks.</li> </ul>	<p>SVGPA</p>	<p>During operation</p>
Waste Impacts	<ul style="list-style-type: none"> <li>• Arranging for regular pickups of the garbage to avoid odour nuisance or infestation by vermin.</li> <li>• The garbage should be collected by an approved carrier.</li> <li>• Provision of color-coded waste containers for sorting and recycling.</li> </ul>	<p>SVGPA and CWSA</p>	<p>During operation</p>



Issue / Aspect	Mitigation Measure / Monitoring	Responsibility	Timing of Implementation
Water Quality and Waste Impacts due to toxic or contaminated water and substances	<ul style="list-style-type: none"> <li>• Procedure for waste disposal of hazardous material resulted from seaside operations. E.g. large and small oil spills, leaking equipment or when spill kit is used.</li> </ul>	SVGPA and NEMO	During operation
	<ul style="list-style-type: none"> <li>• Procedure for landside for cleanup and disposal of hazardous material e.g. oil spills from equipment and machinery, oil mixed in sand etc.</li> <li>• Procedure for handling of hazardous or dangerous material.</li> </ul>	SVGPA	
<b>Performance Monitoring</b>			
Monitoring	<ul style="list-style-type: none"> <li>• Progress reports and record keeping done by Contractor on site conditions and performance of mitigation measures on-site and off-site. E.g. on noise monitoring, waste disposal practice monitoring etc.</li> </ul>	Contractor	During construction works
	<ul style="list-style-type: none"> <li>• Project monitoring by the Client through site inspections, reports and record keeping.</li> </ul>	Project Implementation Agency	
	<ul style="list-style-type: none"> <li>• Procedure for waste disposal of hazardous material resulted from seaside operations. E.g. large and small oil spills, leaking equipment or when spill kit is used.</li> </ul>	SVGPA and NEMO	During Operation
	<ul style="list-style-type: none"> <li>• Procedure for landside for cleanup and disposal of hazardous material e.g. oil spills from equipment and machinery, oil mixed in sand etc.</li> <li>• Procedure for handling of hazardous or dangerous material.</li> </ul>	SVGPA	