

**Joint UNEP/OCHA Environment Unit**  
 Environmental Risk Identification  
*Hurricane Dean and possible effects on Jamaica*

Disclaimer

*This profile is not a conclusive list. Other risks may be possible from sources that are not readily identifiable. The information sources used are public websites. All efforts are made to screen the websites for accuracy.*

**Objective:**

The objective of the Environmental Risk Identification (ERI) is to alert the UN Country Team after the natural disaster to potential secondary risks posed by large infrastructure and industrial facilities containing hazardous materials located in the affected area. This information can be shared with competent local and national authorities as appropriate. Any actual secondary risk should be addressed at the earliest possible stage.

**Event:** Hurricane Dean

**Summary of findings:**

The following large infrastructure and industrial facilities may pose a risk:

<b>Facility</b>	<b>Location</b>	<b>Hazardous material</b>	<b>Hazard</b>
<b>Mining activities</b>			
Bauxite/alumina	Jamaica is a leading global producer and related facilities expected in the affected area.	Fuels, explosives, metals, ammonium nitrate all associate with mining	Flammable, explosive, toxic
Gypsum, lime	Facilities expected in the affected area.	Fuels, explosives, metals, ammonium nitrate	Flammable, explosive, toxic
Gold	Facilities expected in the affected area.	Mercury, Cyanide, Arsenic, Fuels, explosives, metals, ammonium nitrate	Liquid toxic/persistent

**General risks of mining activities:**

<i>Possible type of incident</i>	<i>Typical cause of accidents possibly aggravated by the floods</i>	<i>Potential effects</i>
Tailings dam failure	Poor water management, overtopping, foundation failure, drainage failure, piping, erosion, earthquake	Loss of life, contamination of water supplies, destruction of aquatic habitat and loss of crops and contamination of farmland, threat to protected habitat and biodiversity and loss of livelihood
Failure of waste rock dump	Instability often related to presence of water (springs, poor dump drainage)	Loss of life, injuries, destruction of property, damage to ecosystems and farmland

Pipeline failure, e.g. tailings, leach solution	Inadequate maintenance, failure of equipment, physical damage to pipeline	Contamination of soil, water, effects on water users. May not be detected for some time.	
Transport of chemicals to/from site	Inadequate transport procedures and equipment, unsafe packaging, high-risk transportation routes	Contamination of soil, water, effects on water users, aquatic ecosystem damage, threat to human health	
Ground substance	Slope failure, breakthrough to surface	Loss of life, damage to property	
Spills of chemicals at site, e.g. fuel tank rupture, reagent store damage	Poor maintenance, inadequate containment	Contamination of soil and water. Air pollution could have health effects	
Fire	Poor design, unsafe practices in relation to flammable materials	Effects of air pollution on health, property damage	
Atmospheric releases	Inadequate design, failure to follow procedures, inadequate maintenance	Community concern, possible health effects	
Explosions (plant)	Inadequate design, failure to follow procedures, inadequate maintenance	Community concern, loss of life, destruction of property	
Blasting and explosives accidents	Poor practice, unsafe storage and handling	Property damage, risk to life	
<b>Nuclear facilities</b>			
'SLOWPOKE' Research Nuclear Reactor	University of West Indies	Nuclear fuel	Radioactive
<b>Oil and Gas infrastructure</b>			
36,000-bbl/d refinery	Near Kingston	Petroleum hydrocarbons, hydrogen sulphide, metals, polychlorinated byphenyls (PCV), acids and alkalis, ethylene, propylene, mercaptan, benzene, liquefied natural gas and other combustibles	Flammable, Toxic, Corrosive, Spontaneously combustible and Explosive
<b>Electric power stations</b>			
120-megawatt (MW) Bogue power plant		Ammonia (cooling), Fuel	Toxic Gas, Flammable
<b>Agro/Food Industry</b>			
Poultry, goats, milk	<i>These facilities are expected to be present in the affected area, but an exact location could not be specified</i>	Ammonia, Freons and Sulphur dioxide at cooling/slaughtering facilities	Toxic Gas, Corrosive
Sugar, sugarcane	<i>These facilities are expected to be present in the affected area, but an</i>	Sulphur dioxide associated with processing	Toxic gas

	<i>exact location could not be specified</i>		
<b>Specific base industry</b>			
Cement	Facilities expected in the affected area.  Carib Cement confirmed in Rockport.	Incineration of hazardous waste, Cement plants use fuels like coal, oil, petroleum coke and natural gas	Flammable, corrosive, toxic

**The Joint UNEP/OCHA Environment Unit :**

The Joint UNEP/OCHA Environment Unit is the United Nations mechanism to mobilize and coordinate the international response to environmental emergencies caused by natural disaster, technological accidents and complex emergencies.

**Information sources:**

Infrastructure Risks	Source of information
Nuclear Facilities	<ul style="list-style-type: none"> <li>• <a href="http://www.iaea.org/programmes/a2/index.html">http://www.iaea.org/programmes/a2/index.html</a></li> <li>• <a href="http://www-pub.iaea.org/MTCD/publications/PDF/cnpp2003/CNPP_Webpage/pages/countryprofiles.htm">http://www-pub.iaea.org/MTCD/publications/PDF/cnpp2003/CNPP_Webpage/pages/countryprofiles.htm</a></li> <li>• <a href="http://www.iaea.org/worldatom/rddb/">http://www.iaea.org/worldatom/rddb/</a></li> <li>• <a href="http://www.grid.unep.ch/data/download/gnv181.gif">http://www.grid.unep.ch/data/download/gnv181.gif</a></li> <li>• <a href="http://www.worldenergy.org/wec-geis/publications/reports/ser/nuclear/nuclear.asp">http://www.worldenergy.org/wec-geis/publications/reports/ser/nuclear/nuclear.asp</a></li> </ul>
Large hydrodams.	<ul style="list-style-type: none"> <li>• <a href="http://www.worldenergy.org/wec-geis/publications/reports/ser/hydro/hydro.asp">http://www.worldenergy.org/wec-geis/publications/reports/ser/hydro/hydro.asp</a></li> </ul>
Large Chemical/Industrial Industries	<ul style="list-style-type: none"> <li>• <a href="http://www.pops.int/documents/implementation/nips/submissions/default.htm">http://www.pops.int/documents/implementation/nips/submissions/default.htm</a></li> <li>• <a href="http://www.chem.unep.ch/pops/pcdd_activities/inventories/default.htm">http://www.chem.unep.ch/pops/pcdd_activities/inventories/default.htm</a></li> </ul>
Gas/Oil: Refineries, Pipelines, explorations sites	<ul style="list-style-type: none"> <li>• <a href="http://www.eia.doe.gov/emeu/cabs/index.html">http://www.eia.doe.gov/emeu/cabs/index.html</a></li> <li>• <a href="http://www.worldenergy.org/wec-geis/publications/reports/ser/gas/gas.asp">http://www.worldenergy.org/wec-geis/publications/reports/ser/gas/gas.asp</a></li> <li>• <a href="http://www.lib.utexas.edu/maps/map_sites/oil_and_gas_sites.html">http://www.lib.utexas.edu/maps/map_sites/oil_and_gas_sites.html</a></li> </ul>
Mining activities	<ul style="list-style-type: none"> <li>• <a href="http://www.worldenergy.org/wec-geis/publications/reports/ser/coal/coal.asp">http://www.worldenergy.org/wec-geis/publications/reports/ser/coal/coal.asp</a></li> <li>• <a href="http://www.worldenergy.org/wec-geis/publications/reports/ser/uranium/uranium.asp">http://www.worldenergy.org/wec-geis/publications/reports/ser/uranium/uranium.asp</a></li> <li>• <a href="http://minerals.usgs.gov/minerals/pubs/country/2005/mzmyb05.pdf">http://minerals.usgs.gov/minerals/pubs/country/2005/mzmyb05.pdf</a></li> <li>• <a href="http://www.camec-plc.com/Investors_Media/RNS/2004/rns_025.php">http://www.camec-plc.com/Investors_Media/RNS/2004/rns_025.php</a></li> </ul>
Hazardous waste storage sites	<ul style="list-style-type: none"> <li>• <a href="http://www.basel.int/natreporting/compilations.html">http://www.basel.int/natreporting/compilations.html</a></li> </ul>

- Conseil pour la réduction des accidents industriels majeurs (CRAIM). *Risk Management Guide for Major Industrial Accidents intended for municipalities and industry*. 2002 Edition.
- International Atomic Energy Agency (IAEA). *Manual for the classification and prioritization of risks due to major accidents in process and related industries. Inter-agency Programme on the Assessment and Management for Health and Environmental Risks from Energy and other Complex Industrial Systems*. 1996.
- UNEP Industry and Environment (IE). *Hazard Identification and evaluation in a local community. Technical report n°12*. 1998.
- UNDAC *Field Handbook*
- *Emergency Response guidebook 2004. A guidebook for first responders during the initial phase of a dangerous goods/hazardous materials incident*.
- UNEP. *APELL for Mining. Guidance for the Mining industry in raising awareness and preparedness for emergencies at local level. Technical report N°41*. 2001

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