

## Pollution Prevention and Abatement Handbook – Part III



# Tourism and Hospitality Development

### Description and Practices

Development of new vacation, holiday and business venues continues to grow in developing countries. Governments and the business sector must ensure that new businesses and services that cater to travelers and vacationers have appropriate safeguards that protect the environment and the well being of the public both during development of the sector/business and during its lifetime.

The tourism and hospitality industry includes: the travel sector; accommodation and catering; leisure and entertainment facilities; and support services. This guideline applies to all aspects of the tourism sector except travel. The guideline does however also apply to hotels and other accommodations which are established to respond primarily to the needs of business travelers.

### Nature of Environmental Impacts and Waste Characteristics

#### *Development Phase*

New tourism or hospitality development may have wide ranging environmental, social, economic, and cultural impacts. Examples of potential impacts include: local populations may need to be relocated; employment practices may change; there may be additional noise associated with increased air and road traffic; increased demands may be placed on water supplies and sewage disposal facilities; there may be an increase in demand for more recreational uses in ecologically sensitive areas;

and there may be an increase in the number of tourists visiting cultural and heritage sites.

*Projects of particular concern:* Development of tourism facilities at remote and sensitive locations often pose special challenges with regard to such issues as infrastructure support, staff services, local community issues, and wildlife habitat management. Examples of potential impacts include: fuelwood use; secondary development associated with staff and families; local community involvement and participation, as appropriate; the use of child labor in the crafts/secondary industries; and both direct and indirect impacts on wildlife. These need to be recognized and addressed appropriately. Natural habitats of particular concern that need special attention include, for example, coral reefs, mangrove swamps, seagrass beds, tropical rainforests and coastal marshes.

#### *Construction Impacts*

In the development of a tourism facility, access roads and infrastructure are often part of the development (including temporary housing for construction employees). When roads and trails are developed, sediment may be carried off-site into local water bodies during construction and subsequent operation if appropriate control facilities are not included. Land disturbances may occur when borrow pits are developed for construction purposes and there may be associated noise. An inflow of construction workers may have social impacts. Construction activities may result in destruction of sensitive vegetation and may displace fauna. Impacts may also include resettlement of people and

destruction of cultural resources. Water is required for drinking, sanitation, and other purposes and its source needs to be selected carefully to minimize impacts on other users and to ensure sustainable use.

### *Operational Impacts*

Effluents may include sanitary sewage and possibly cooling water. Air emissions will be present where there are boilers, furnaces, and/or incinerators in use. Solid waste may consist of putrescibles and refuse from kitchen activities, and packaging materials. Hazardous wastes such as waste lubricants, oils and solvents from maintenance and sludges from wastewater may exist and require disposal.

## **Control of Environmental Impacts and Pollution Prevention**

### *Minimizing and Mitigating Impacts*

An environmental assessment (EA) is required to identify and minimize and/or mitigate the potential impacts for any new tourism or hospitality project. Where the project is in a remote or sensitive location then developers of the project should address issues relating to power supply (which may involve use of firewood), habitat management (due to, for example, provision of water to wild animals in the dry season), construction of airstrips (siting, erosion control), and involvement of local communities in project design and operation.

### *Measures During Construction*

Several measures related to the siting, construction and operation of facilities can be taken to minimize the impact on the environment:

*Siting and rights-of-way:* Rights-of-way for roads should be aligned and ancillary facilities located to minimize visual impacts and the need for physical alteration of the landscape, as well as impacts to natural resources, sensitive ecosystems, cultural resources, agricultural lands and populated areas.

*Erosion and sediment:* Erosion and sediment control in construction areas will prevent sediment discharge to nearby streams and lakes.

Areas cleared of vegetation for construction and roadway development should be minimized and slopes should be stabilized. Cleared areas should be revegetated as soon as possible. Overland drainage should be controlled to prevent channeling and sediment transport by diverting flows from areas where soils are exposed, and/or by providing filter barriers or settling basins to remove sediment before the runoff is discharged to surface waters. Culverts should be provided as necessary to prevent the road from disrupting or radically changing the existing drainage regime. Revegetated areas and areas subject to erosion must be monitored and maintained during project operation.

*Construction materials:* When siting raw material borrow pits, quarries, and asphalt and concrete plants, consideration should be given to adjacent land uses. A closure and reclamation plan that incorporates the following provisions is required for borrow pits and quarry sites: (i) restoration of the land, to the extent feasible and practicable, to conditions capable of supporting prior land use, or uses that are equivalent to the prior land use; (ii) prevention or mitigation of significant adverse effects on adjacent water resources; (iii) planting of native vegetation to prevent erosion and encourage self-sustaining development of a productive ecosystem; (iv) final grading for the closure to ensure that stormwater runoff does not accumulate and become stagnant, potentially contaminating surface waters or serving as a breeding ground for disease vectors. Closure plans for asphalt and concrete plants should include provisions for disposal and/or recycling of excess materials, disposal of hazardous wastes, control of erosion, and reclamation of the site.

*Other construction guidelines:* The following general construction guidelines, as required, will further prevent or minimize environmental impacts from the project:

- construction crews should be trained to recognize cultural resources and should consult project managers in developing plans to mitigate impacts;
- roadways should be designed to include provisions for animal bridges and/or tunnels at migratory route crossings, fencing and/or vegetation to prevent animal and vehicle collisions, and additional habitats and

migration routes for local animals that may be displaced by the project;

- provisions should be made for residential and business areas affected by project development by reducing right-of-way land guidelines, minimizing severance of local access routes, improving crossings and/or alternative access routes, maintaining temporary traffic diversions during the construction phase, and establishing and enforcing safe speed limits;
- a plan should be developed to mitigate visual impacts resulting from the project and should include the selection of construction materials that adopt local colors and textures, regrading roadside slopes to match the natural topography, and landscaping and revegetating disturbed areas to enhance natural views;
- ambient noise impacts should be mitigated through appropriate pavement design and maintenance, and aesthetically acceptable noise barriers, such as the placement of earth mounds or vegetation between the road and sensitive receptors;
- contamination of water resources as a result of stormwater runoff should be minimized in sensitive areas by directing the runoff to settling basins prior to discharge to surface waters;
- storage and liquid impoundment areas for fuels, solvents, deicing materials and waste products should be designed with secondary containment, such as dikes, to prevent the contamination of soils, groundwater and surface waters due to accidental spills or releases;
- Storage facilities should be located to minimize potential risks from earthquakes, tsunamis, floods, windstorms and fires from surrounding areas. Structures must be designed to criteria appropriate to the local seismic risk, wind loading or any other dynamically imposed loads associated with climatic and geological factors inherent at the location; certification of the criteria used and their application to the project should be provided by the structural engineers and architect;
- disposal facilities must be provided to minimize the amount of roadside litter, and assurances should be made by the project sponsor that these wastes will be collected and properly disposed of in accordance with government regulations; and

- pesticides, fertilizers and other maintenance chemicals must be applied strictly according to the directives of the manufacturer, and used in compliance with government regulations (preference should be given to natural fertilizers and insecticide/pesticides over chemical compounds).

### *Measures During Operation*

*Water conservation and effluent reduction:* The volume of effluents requiring treatment can be minimized by using water conservation devices on domestic facilities and by using water recycling where feasible. Stormwater should be kept separate from the domestic sewerage system. Rainwater capture for displacing surface water needs should be considered. Treated wastewater should be considered for other uses such as land irrigation.

*Solid wastes:* Solid wastes should be recycled or reclaimed to the extent possible. Garbage disposal is often an issue that requires particular attention: scavengers can be a problem. In remote areas and on trails provisions should be made to control all litter and solid waste (leave nothing behind)—bundling and removal may be required.

*Hazardous materials and wastes:* Formulations containing chromates should be avoided in water treatment processes. Transformers or equipment containing polychlorinated biphenyls (PCBs) or PCB-contaminated oil must not be installed. Processes, equipment and ancillaries involving the use or potential release to the environment of chlorofluorocarbons (CFCs), halons, and other ozone depleting substances must not be installed.<sup>1</sup> Where facilities that are being upgraded have asbestos, the asbestos should be safely removed and properly disposed or encapsulated to avoid exposure. Sludges from water treatment and sewage treatment must be disposed of in a manner to prevent the contamination of soil, groundwater and surface water. Spent oils, lubricants, and solvents should be sent to an authorized disposal or recycling company. Application of pesticides such as fumigants

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<sup>1</sup> Some hydrochlorofluorocarbons (HCFCs) may be allowed depending on the technologies that are available.

should be done according to internationally recognized good practices.

### *Management Programs*

Many of those involved in providing tourism and hospitality services are now adopting a code of environmental conduct as a tool for developing and implementing a sound environmental program for their business. Codes of environmental conduct have been written by several tourism and hospitality business associations to assist their members and to elevate the standards of environmental protection for the industry. Some elements of a code of practice are contained in Attachment 1. Developers are encouraged to adopt and implement a code of practice for their location and activities.

### **Treatment and Control Technologies**

Liquid effluent may be discharged to a public or private central wastewater treatment system. Where this is the case information from the local authority or private central wastewater treatment company is to be provided to confirm that the treatment system has the capacity and is managed to adequately treat the project's liquid effluents to meet applicable standards. The World Bank Group may require pre-treatment prior to such discharge.

Garbage disposal alternatives may include removal to on-site or off-site managed disposal facilities (i.e. controlled incineration or landfills).

Air emissions from boilers and incinerators may require filters or other mechanisms to control particulate matter.

Storage and handling of hazardous materials must be in accordance with local regulations/international standards, and appropriate to their hazard characteristics. Storage and liquid impoundment areas for fuels, raw and in-process materials, solvents, wastes and finished products should be designed with secondary containment (e.g. dikes, berms) to prevent spills and the contamination of soil, groundwater and surface waters.

### **Emission Guidelines**

Emission levels for the design and operation of each project must be established through the Environmental Assessment (EA) process, based on country legislation and the *Pollution Prevention and Abatement Handbook* as applied to local conditions.<sup>2</sup> The emission levels selected must be justified in the EA and acceptable to the World Bank Group.

The following guidelines present emission levels normally acceptable to the World Bank Group in making decisions regarding provision of World Bank Group assistance; any deviations from these levels must be described in the World Bank Group project documentation.

The guidelines are expressed as concentrations to facilitate monitoring. Dilution of air emissions or effluents to achieve these guidelines is unacceptable.

All of the maximum levels should be achieved for at least 95% of the time that the plant or unit is operating, to be calculated as a proportion of annual operating hours.

### *Air Emissions*

The following air emissions levels should be achieved:

<b>Air emissions requirements</b>	
<i>Parameter</i>	<i>Maximum value</i>
Particulate matter	
Fossil fuels	100 mg/Nm <sup>3</sup>
Other fuels*	150 mg/Nm <sup>3</sup>
Nitrogen oxides, from boilers, as NO <sub>2</sub>	
Coal fired	750 mg/Nm <sup>3</sup>
Oil fired	460 mg/Nm <sup>3</sup>
Gas fired	320 mg/Nm <sup>3</sup>
Sulfur dioxide	2000 mg/Nm <sup>3</sup>

\* Examples of other fuels include wood and biomass

<sup>2</sup> For reference, see the Tables in the Statement of Principles (first section of Part III of the Handbook).

This technical guideline is part of the World Bank Group's *Pollution Prevention and Abatement Handbook* and should be read in conjunction with the Introduction as well as Parts I and II which spell out important policy and procedural considerations. The information is intended for use by World Bank staff and consultants in carrying out the policies set out in the Operational Policy on Environmental Assessment (OP 4.01) and related documents.

### Liquid Effluents

The following effluent emissions levels should be achieved:

<b>Effluent requirements</b>	
<i>Parameter</i>	<i>Maximum value</i>
pH	6 - 9
BOD <sub>5</sub>	50 mg/L
Oil and grease	10 mg/L
Total suspended solids	50 mg/L
Total residual chlorine	0.2 mg/L
Coliforms	400 MPN/100 mL (MPN – Most Probable Number)
Temperature increase	Less than or equal to 3° C <sup>a</sup>

<sup>a</sup>The effluent should result in a temperature increase of no more than 3 degrees Celsius at the edge of the zone where initial mixing and dilution take place. Where the zone is not defined, use 100 meters from the point of discharge.

Note: Effluent requirements are for direct discharge to surface waters.

In tourist areas and at hotel projects reuse of treated wastewater for irrigation must also meet the following quality guidelines:

#### **Requirements for treated wastewater used for irrigation**

<i>Parameter</i>	<i>Maximum value</i>
Coliforms	Less than 100 MPN/100 ml
Helminth Standard	< 1 viable intestinal nematode egg per liter (>99% egg removal)

Although a number of treatment methods are available to meet these guidelines, chlorination should be used only with care. It is difficult to maintain a uniform and predictable level of disinfecting efficiency with chlorination; it is expensive; and chlorinated, organic by-products may be toxic, mutagenic or carcinogenic. The stabilization pond system of treatment is effective in meeting health criteria economically.

However, primary sedimentation techniques and secondary biological treatment also can be used to comply with the above water quality guidelines.

### Ambient Noise

Noise abatement measures should achieve either the following levels or a maximum increase in background levels of 3 dB(A). Measurements are to be taken at noise receptors located outside the project property boundary.

<b>Ambient Noise</b>		
	Maximum Allowable L <sub>eq</sub> (hourly), in dB(A)	
Receptor	Daytime 07:00 - 22:00	Nighttime 22:00 - 07:00
Residential; institutional; educational	55	45
Industrial; commercial	70	70

The emission requirements given here can be consistently achieved by well-designed, well-operated and well-maintained pollution control systems.

### Monitoring and Reporting

Frequent sampling of the effluent from the treatment system may be required during start-up and upset conditions. Once a record of consistent performance has been established, sampling for the parameters listed above should be as detailed below.

Liquid effluents should be monitored daily for pH and chlorine and weekly for all other parameters. Monitoring data should be analyzed and reviewed at regular intervals and compared with the operating standards so that any necessary corrective actions can be taken. Records of monitoring results should be kept in an acceptable format. These should be reported to the responsible authorities and relevant parties, as required.

## **Potable Water Requirements**

Potable water, and water used for food preparation, sanitary needs or for other purposes where it may be ingested, should meet the drinking water requirements that are recommended by the WHO in "Guidelines for Drinking-Water Quality", World Health Organization, Geneva, 1984.

## **Life and Fire Safety (L&FS)**

All new and existing buildings accessible to the public and financed by IFC must be designed and operated in full compliance with IFC's Life and Fire Safety (L&FS) guideline. Please refer to the L&FS guideline document for specific requirements.

## **Key Issues**

The following box summarizes the key issues that will minimize impacts on the environment:

- Carry out an Environmental Assessment (EA) commensurate with the degree of potential impacts, complexity of the project, and any special issues
- Implement sound design and management practices during construction and operation

- Adopt or develop an Environmental Code of Conduct

## **Further Information**

The following are suggested as sources of additional information (these sources are provided for guidance and are not intended to be comprehensive):

World Bank, Environment Department. 1997. "Environmental Guidelines -- Tourism and Hospitality Development" Draft document.

World Travel & Tourism Environment Research Centre. 1994 Review. "Travel & Tourism"

United Nations Environment Programme, Industry and Environment. Technical Report No. 29. "Environmental Codes of Conduct for Tourism"

International Hotels Environment Initiative. 1995. "Environmental Management for Hotels -- The Industry Guide to Best Practice"

National Fire Protection Association—NFPA  
101 Life Safety Code

## Attachment 1

### Some Elements That May be Included in an Environmental Code of Conduct

Codes of environmental conduct may include, for example, the following recommendations<sup>3</sup>:

- Companies should state their commitment to environmentally compatible development -- includes conducting an appropriate level of environmental assessment for all new projects; conducting regular audits for all on-going activities; development of environmental improvement programs.

- Targets for improvement should be established and monitored -- goals should be developed and communicated for environmental improvement programs, including cost/benefit assessments; results to be reviewed and assessed by senior management.

- Company wide commitment -- programs to have full support of Board of Directors, to be an integral part of management practices, to be communicated to all personnel and the public.

- Training and research for staff to include environmental issues.

- Implement sound environment principles through self-regulation -- embrace the results and recommendations of environmental assessments and audits; cooperate with other companies and the public sector.

- Adopt systematic and comprehensive environmental improvement programs -- continue to reduce environmental impacts; include environmental concerns in design, planning, construction, implementation; conserve environmentally threatened or protected species; practice energy conservation; reduce and recycle waste; conserve fresh water and control sewage disposal; minimize and control air emissions; monitor, reduce and/or control noise; control and reduce or avoid the use of environmentally unfriendly products (CFCs, asbestos, pesticides, and substances that are toxic, infectious, corrosive, explosive or flammable); design products with consideration of environmental impact and end-of-life issues; use suppliers who maintain high levels of environmentally sound performance including no use of child/forced labor); respect and support historic and religious objects and sites; exercise due regard for the interests of local populations; consider environmental issues as a key factor when planning developments.

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<sup>3</sup> From "Environmental Guidelines by the World Travel & Tourism Council (WTTC)" with edits by IFC.

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