Environmental, Health, and Safety Guidelines for Tourism and Hospitality Development

Introduction

The Environmental, Health, and Safety (EHS) Guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice (GIIP)[1]. When one or more members of the World Bank Group are involved in a project, these EHS Guidelines are applied as required by their respective policies and standards. These industry sector EHS guidelines are designed to be used together with the **General EHS Guidelines** document, which provides guidance to users on common EHS issues potentially applicable to all industry sectors. For complex projects, use of multiple industry-sector guidelines may be necessary. A complete list of industry-sector guidelines can be found at: www.ifc.org/ifcext/enviro.nsf/Content/EnvironmentalGuidelines

The EHS Guidelines contain the performance levels and measures that are generally considered to be achievable in new facilities by existing technology at reasonable costs. Application of the EHS Guidelines to existing facilities may involve the establishment of site-specific targets, with an appropriate timetable for achieving them. The applicability of the EHS Guidelines should be tailored to the hazards and risks established for each project on the basis of the results of an environmental assessment in which site-specific variables, such as host country context, assimilative capacity of the environment, and other project factors, are taken into account. The applicability of specific technical recommendations should be based on the professional opinion of qualified and experienced persons.

When host country regulations differ from the levels and measures presented in the EHS Guidelines, projects are expected to achieve whichever is more stringent. If less stringent levels or measures than those provided in these EHS Guidelines are appropriate, in view of specific project circumstances, a full and detailed justification for any proposed alternatives is needed as part of the site-specific environmental assessment. This justification should demonstrate that the choice for any alternate performance levels is protective of human health and the environment.

Applicability

The EHS Guidelines for Tourism and Hospitality Development contain information relevant to tourism and hospitality facilities, including business and city hotels, resorts, ecolodges, and other accommodation and catering facilities. Annex A contains a full description of industry activities for this sector. This document does not include the tourism travel sector nor does it apply to cruise ships or other ocean going activities. This document is organized according to the following sections:

Section 1.0 — Industry-Specific Impacts and Management
Section 2.0 — Performance Indicators and Monitoring
Section 3.0 — References and Additional Sources
Annex A — General Description of Industry Activities

[1] Defined as the exercise of professional skill, diligence, prudence and foresight that would be reasonably expected from skilled and experienced professionals engaged in the same type of undertaking under the same or similar circumstances globally. The circumstances that skilled and experienced professionals may find when evaluating the range of pollution prevention and control techniques available to a project may include, but are not limited to, varying levels of environmental degradation and environmental assimilative capacity as well as varying levels of financial and technical feasibility.

1.0 Industry-Specific Impacts and Management

The following section provides a summary of EHS issues associated with tourism and hospitality development, along with recommendations for their management.

1.1 Environmental

Environmental issues during the construction of tourism and hospitality facilities projects, particularly those in urban locations, are common to those of nonhazardous industrial activities and are discussed, along with their prevention and control recommendations, in the **General EHS Guidelines**. These issues include construction site waste generation, soil erosion and sediment control from materials-sourcing areas and site preparation activities, fugitive dust and other emissions (e.g. from vehicle traffic, land clearing and movement, and materials stockpiles), noise from heavy equipment and truck traffic, and potential for hazardous materials and oil spills associated with heavy equipment operation and fueling activities. Development of tourism facilities at remote and sensitive locations poses additional challenges specific to such issues as infrastructure support and wildlife habitat management.

During the site selection / development and construction phase of tourism and hospitality projects, potential EHS issues include increased demand on limited local infrastructure, including roads, water supply, and liquid effluent and solid waste disposal capacity, and increased stress on ecologically sensitive areas.

The recommended control methods to reduce impacts during site selection / development and construction include the following:

- Construction areas and morphological modifications (e.g. excavations, filling) should be kept to a minimum depending on habitat sensitivity and the potential for geotechnical hazards;
- Construction materials should be taken from sources that are adequately and sustainably exploited and managed (e.g. refer to the **EHS Guidelines for Construction Materials Extraction**), while maximizing use of recycled construction materials;
- Use of toxic substances in construction processes or as building materials []should be minimized or avoided, especially where frequent human contact is expected (e.g. surfaces or recreational areas) or where its subsequent disposal would represent a logistical or technical challenge due to the unavailability of specialized, licensed, hazardous materials treatment or disposal facilities.

Environmental issues associated with tourism and hospitality facilities during operations include the following:

- Resource consumption
- Emissions to air
- Wastewater
- Hazardous Materials Management
- Waste
- Biodiversity conservation
- Noise
- Pesticide use

Resource Consumption

Water Conservation

Water consumption is related to personal use by guests and facility requirements for housekeeping, laundry, cooking, swimming pools, spa facilities, and grounds maintenance. Total water usage in hotels may range from less than 200 l/day per person to over 1200 l/day per person. Luxury hotels and hotels with full-service restaurant and on-site laundry facilities typically

exhibit the highest water usage on a per room basis. In a large hotel, a swimming pool can increase freshwater consumption by as much as 10 percent. Apart from seasonal aspects, the main factors influencing the amount of water used are the presence of spa facilities (e.g. swimming pool, sauna, steam bath) and the installation of water-saving devices. Resorts with golf courses have significant water needs and involve pesticide use.

Water efficiency is promoted by sustainable building siting, design, and construction. When water is drawn from natural resources, other than rainwater collection tanks, a water sustainability study (based on an assessment of current and future water withdrawal needs from the community and the project with consideration of climatic fluctuations) should be conducted to demonstrate that the amount of water needed is sustainable and does not affect local communities or ecosystems.

Good practice in design and operation can significantly reduce water consumption. Hotels and hospitality development, especially in dry climates or sensitive sites, should include water-efficient design features which typically include:

- use by communities and /Rainwater collection practiced through a network of gutters and pipes, and channeled into a cistern or a catchment basin. Rainwater collected can be used for irrigation, for evaporative cooling equipment, and for replacing pool water lost through evaporation and normal use;
- Biological treatment should be used to enable reuse of grey water, which can be reused for irrigating grounds or other non-potable purposes. Grey water from bathrooms, sinks, and kitchens has limited toxicity, requiring minimal treatment, has good reuse potential, and can be easily separated into one stream. Wastewater streams used for this purpose should be carefully monitored to ensure that grey water is not mixed with other sewage resulting in potentially hazardous situations;
- Garden design and plant selections to enable irrigation water requirements to be met by rainwater and natural water percolation in soils;
- Water-saving equipment, including ultra-low-flush toilets, spray nozzles, urinals, faucet aerators, and low-flow showerheads, infrared and ultrasonic sensors, water spigots, and pressure-control valves.
- Additional recommended water conservation guidance applicable to industrial and commercial water systems is presented in the **General EHS Guidelines**.

Energy Conservation

The hospitality industry consumes large amounts of energy in the form of heat and power. Building siting, design, construction and operating patterns all heavily influence energy use. The following aspects of building design can all reduce energy use when correctly applied:

- Use of passive solar design to take advantage of natural sunlight and airflow;
- Optimized building orientation;
- Use of direct gain and day lighting techniques, allowing sunlight to penetrate a building to provide light to illuminate interiors and to provide heat;
- Implementation of Trombe walls (glazing-encased thin airspace in front of a thermally massive wall);
- Installation of a renewable energy systems where local conditions permit (e.g. solar water heating, photovoltaic cells, geothermal heat pumps, small hydro power systems, wind turbines, and use of biofuels).

Energy use of hotel building services may be reduced by the following methods:

- Reduction of energy consumption associated with heating, ventilation, and air conditioning (HVAC) systems through:
  - Specification of well insulated building fabric to minimize heat transfer
  - Energy recovery of from exhaust to supply air in the building ventilation systems
  - Variable air volume air handling systems;
  - Use of inverter-driven variable speed fans;
  - Adoption of temperature control settings which avoid simultaneous heating and cooling;
  - Building zoning according to temperature needs and heat gains (e.g. a north zone and a south zone);
  - Use of enthalpy control to vary volumes of fresh and recycled air according to ambient and internal building conditions;
  - Adoption of relatively high (~+10°C chilled water flow temperature) and inverter-driven, variable speed chilled and hot water pumps
  - Selection of chillers which are efficient over wide ranging operating and load conditions (e.g. efficiency rates of at least 0.60 kW/TR, which is equivalent to a coefficient of performance [COP] of approximately 5.9)
- Reduction of energy consumption associated with lighting:
  - Use of occupancy sensors
  - Use of high-efficiency light bulbs (e.g. compact fluorescent light bulbs) where possible
  - Daylight controls (e.g. to adjust interior lighting, based on incoming daylight, using a photoelectric sensor)
  - Dimming-control retrofits for fluorescent, high-intensity discharge, and incandescent lamps
  - Adoption of an energy management and control systems, including centralized monitoring and reporting of energy and water use, switched time schedules, chiller optimization, load-based reset, and demand control
- Reduction of energy consumption associated with cooking and refrigeration equipment:
  - Match use of cooking range burners to facility needs
  - Use of appropriate lids
  - Select high efficiency refrigerators and walk-in coolers;
  - Use of an exhaust system that automatically varies fan speeds
- Additional recommended energy conservation guidance applicable to industrial and commercial consumers is presented in the **General EHS Guidelines**.

Emissions to Air

Potential air emissions generated from tourist facilities include products of combustion (e.g. carbon dioxide, nitrogen and sulfur oxides, and hydrocarbons) and particulates from fossil fuel-operated boilers, stoves, and generators. Tourism facilities may emit volatile organic compounds (VOC) from dry-cleaning, refrigeration, and air conditioning services. Use of ozone-depleting refrigerants should be avoided[2], and refrigerants with low global warming potential (GWP) should be selected. Recommendations for the management of small combustion-source emissions with a heat input capacity of up to 50 MWth are provided in the **General EHS Guideline**.

Wastewater

The most significant wastewater flow generated by tourism and hospitality facilities is domestic sewage from bathing and toilet flushing, but important streams are also produced by the laundry and dry-cleaning, housekeeping, maintenance, and kitchen departments. These streams may include cleaning agents, disinfectants, and linen washing agents, including liquid bleach and ionic and nonionic detergents, which may release excessive

[2] Refer to the Montreal Protocol (http://ozone.unep.org/) for a complete list of ozone depleting substances (ODS).

phosphates and cause eutrophication of natural waterways. Effluents from kitchens may contain oils and grease.

Recommended wastewater management strategies include:

- Minimizing use of the laundry by asking guests to reuse towels and bedding;
- Controlling consumption of cleaning chemicals;
- Substitution of cleaning chemicals with biodegradable products, when possible;
- Avoiding or minimizing the use of cleaning chemicals containing phosphates, nitrilotriacetic acid or any of its salts, ethylene diaminetetraacetic acid and ethylene dinitrilotetraacetic acid or any of their salts, alkylphenol ethoxylate, halogenated organic solvents (e.g. 1,1,1-trichloroethane and other Ozone Depleting Substances (ODSs)), butoxy-ethanol, and VOCs in excess of 10 percent by mass.

Treatment guidance on the management of non-contaminated wastewater from utility operations, non-contaminated stormwater, sanitary sewage, and grey water discharges is provided in the **General EHS Guidelines**. Contaminated streams should be routed to the wastewater treatment system.

Hazardous Materials Management

Tourism and hospitality facilities may use a variety of hazardous materials, including solvents (e.g. for dry cleaning), and pesticides (as discussed below). Recommendations for the management of hazardous materials are provided in the **General EHS Guidelines**.

Waste Management

Waste generated by tourism and hospitality facilities normally includes paper and cardboard items, glass and aluminum products, plastic items, organic waste, building materials and furniture, and used oils and fats. Hazardous wastes may include batteries, solvents, paints, antifouling agents, and some packaging wastes. Tourists typically may generate up to twice as much solid waste per capita as local residents, resulting in increased stress on local waste management infrastructure.

The following principles of waste reduction in tourism and hospitality facilities should also be considered as part of a formal Waste Management Plan:

- Buying in bulk quantities whenever possible;
- Use of refillable, bulk dispensers (e.g. toiletries) rather than individually packaged products;
- Working with suppliers to limit use of, and establish recycling for, product packaging;
- Avoiding use of polystyrene foam in all operations;
- Providing in-room recycling procedures and appropriate receptacles;
- Use of glass or durable plastic instead of disposable plastic items (e.g. straws, cups);
- Implementing organic-waste composting;
- Disposing of wastes only after all waste prevention and recycling strategies have been explored and maximized.

Tourism and hospitality facilities should carefully evaluate the capacity and quality of local infrastructure for the handling and disposal of wastes, in recognition of the potentially significant amounts that may be generated. In locations with limited infrastructure, tourism and hospitality facilities may be required to transport such wastes over long distances to locations with licensed facilities that are able to manage such wastes in an environmentally sound manner or else work with local authorities in the development of such capacity. Hazardous wastes may need to be exported to other locations as permitted

by local or national regulations.[3] Additional waste reduction and waste management recommendations are provided in the **General EHS Guidelines.**

Biodiversity Conservation

Construction of tourism and hospitality facilities may result impacts to biota, and vegetation can also be affected by the presence of tourists in ecologically sensitive areas engaging in activities (e.g. picking flowers, felling young trees, damage to coral reefs) that may damage biodiversity. Over time, only the more tolerant species survive these impacts, and some invasive species may be introduced, thus affecting local ecosystems and reducing species diversity. Soil compaction (caused by erosion and water and nutrient loss) may also affect plant growth and the age structure of vegetation.

Recommended methods to prevent and control damage to biodiversity include:

- Timely identification of sensitive habitats and implementation of protective measures (e.g. buffer zones or corridors) to maintain links between natural systems within and beyond the site, limiting habitat fragmentation;
- Avoiding the introduction of new invasive species during construction, landscaping, and operation of tourism facilities;
- After construction, restoring habitat through the use of native plants;
- Reducing the impact of the hotel presence on nocturnal environments by avoiding lighting that extends off site or into the night sky;
- Identification and engagement in regional coordination to enable management of potential impacts related to migratory species and transboundary ecosystems;
- Establishing limits (e.g. numbers of visitors), for excursions to sensitive sites;[4]
- Coordinating with ancillary suppliers (e.g. food suppliers / farmers, construction-material suppliers, product suppliers) to ensure sustainable practices for biodiversity conservation in the supply chain;
- Implementing appropriate landscape, sacred-site, cultural, and natural heritage conservation activities and plans;
- Promoting appropriate guest and staff behaviors and also developing specific codes of conduct for sustainable practices in tourism-related activities (e.g. walking and trekking; camping; vehicle, boat, and aircraft use; snorkeling and scuba diving; trail riding; wildlife watching; and fishing);
- Developing and implementing contingency plans for emergencies that may threaten the environment and the conservation and sustainable use of biodiversity;
- Implementing specifically tailored environmental and cultural sustainability audits and tourism activity reviews to assess the effectiveness of impact management measures.

Noise

The areas and sources of noise emissions include mechanical rooms, kitchens and laundries, waste management areas (including compactors), garages, entertainment areas, and lobby areas. Noise management is largely an issue relevant to indoor environmental quality and guest comfort. It is, however, important to include noise management measures in the overall external design concept to prevent potential impacts on nearby

[3] Additional requirements may include host-country commitments under the Basel Convention on the Control of Transboundary Movements of Hazardous Waste and their disposal (http://www.basel.int/) and Rotterdam Convention on the prior Inform Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (http://www.pic.int/)

[4] Examples of internationally recognized planning methodologies used for this purpose include the Limits of Acceptable Change Process and Recreation Opportunity Spectrum system.

human and environmental receptors. Noise guidelines are presented in the **General EHS Guidelines**.

Pesticide Use

Tourism resorts with large land tracts (e.g. golf courses, vineyards, and sports fields) may use significant quantities of chemicals (e.g. chemical fertilizers and pesticides, including herbicides, rodenticides, and insecticides). The primary aim of pest management should be not to eradicate all organisms, but to manage pests and diseases that may negatively affect tourism facilities so that they remain at a level that is under an economically and environmentally damaging threshold. Pesticides should be managed to avoid their migration into off-site land or water environments by establishing their use as part of an Integrated Pest Management (IPM) strategy and a documented Pest Management Plan (PMP). The following stages should be considered when designing and implementing an IPM strategy, giving preference to alternative pest management strategies, with the use of synthetic chemical pesticides as a last option.

Alternatives to Pesticide Application

The following alternatives to pesticides should be considered:

- Provide those responsible for deciding on pesticides application with training in pest identification, weed identification, and field scouting;
- Use mechanical weed control and / or thermal weeding;
- Support and use beneficial organisms, such as insects, birds, mites, and microbial agents, to perform biological control of pests;
- Protect natural enemies of pests by providing a favorable habitat, such as bushes for nesting sites and other original vegetation that can house pest predators;
- Use animals to graze areas and manage plant coverage;
- Use mechanical controls such as traps, barriers, light, and sound to kill, relocate, or repel pests.

Pesticide Application

If pesticide application is warranted, users should take the following precautions:

- Train personnel to apply pesticides and ensure that personnel have received applicable certifications or equivalent training where such certifications are not required; [5]
- Review the manufacturer's directions on maximum recommended dosage or treatment, as well as published reports on using the reduced rate of pesticide application without loss of effect, and apply the minimum effective dose;
- Apply pesticides based on criteria (e.g. field observations, weather data, time of treatment, and dosage) and maintain a pesticide logbook to record such information;
- Avoid the use of pesticides that fall under the World Health Organization Recommended Classification of Pesticides by Hazard Classes 1a and 1b;
- Avoid the use of pesticides that fall under the World Health Organization Recommended Classification of Pesticides by Hazard Class II if the project host country lacks restrictions on distribution and use of these chemicals, or if they are likely to be accessible to personnel without proper training, equipment, and facilities to handle, store, apply, and dispose of these products properly;

[5] Examples of certification schemes are provided by the US EPA (2006), which classifies pesticides as either "unclassified" or "restricted" and requires workers that apply unclassified pesticides to be trained according to the Worker Protection Standard (40 CFR Part 170) for Agricultural Pesticides. It further requires restricted pesticides to be applied by or in the presence of a certified pesticide applicator.

- Avoid the use of pesticides listed in Annexes A and B of the Stockholm Convention, except under the conditions noted in the convention;[6]
- Use only pesticides that are manufactured under license and registered and approved by the appropriate authority and in accordance with the Food and Agriculture Organization's (FAO) International Code of Conduct on the Distribution and Use of Pesticides[7];
- Use only pesticides that are labeled in accordance with international standards and norms, such as the FAO Revised Guidelines for Good Labeling Practice for Pesticides[8];
- Select application technologies and practices designed to reduce unintentional drift or runoff only as indicated in an IPM program, and under controlled conditions;
- Maintain and calibrate pesticide application equipment in accordance with manufacturer's recommendations;
- Establish untreated buffer zones or strips along water sources, rivers, streams, ponds, lakes, and ditches to help protect water resources.

Pesticide Handling and Storage

Contamination of soils, groundwater, or surface water resources, due to accidental spills during transfer, mixing, and storage of pesticides should be prevented by following the hazardous materials storage and handling recommendations presented in the **General EHS Guidelines**. Additional recommendations include the following:

- Store pesticides in their original packaging, in a dedicated, dry, cool, frost-free, and well aerated location that can be locked and properly identified with signs, with access limited to authorized people[9]. No human or animal food may be stored in this location. The store room should also be designed with spill containment measures and sited in consideration of potential for contamination of soil and water resources;
- Mixing and transfer of pesticides should be undertaken by trained personnel in ventilated and well lit areas, using containers designed and dedicated for this purpose.
- Containers should not be used for any other purpose (e.g. drinking water). Contaminated containers should be handled as hazardous waste, and should be treated accordingly. Disposal of containers contaminated with pesticides should be done in a manner consistent with FAO guidelines and with manufacturer's directions;[10]
- Purchase and store no more pesticide than needed and rotate stock using a "first-in, first-out" principle so that pesticides do not become obsolete.[11] Additionally, the use of obsolete pesticides should be avoided under all circumstances;[12] A management plan that includes measures for the containment, storage and ultimate destruction of all obsolete stocks should be prepared in accordance to guidelines by FAO and consistent with country commitments under the Stockholm, Rotterdam and Basel Conventions.
- Collect rinse water from equipment cleaning for reuse (such as for the dilution of identical pesticides to concentrations used for application);
- Ensure that protective clothing worn during pesticide application is either cleaned or disposed of in an environmentally responsible manner

6 The Stockholm Convention on Persistent Organic Pollutants (2001) controls the use of the following POPs-pesticides: Aldrin, Chlordane, DDT, Dieldrin, Endrin, Heptachlor, Hexachlorobenzene, Mirex, and Toxaphene.

7 FAO (2002)

8 FAO (2002)

9 FAO (2002)

10 See FAO Guidelines for the Disposal of Waste Pesticides and Pesticide Containers.

11 See FAO (1996).

12 See the FAO publication on pesticide storage and stock control manual. FAO Pesticide Disposal Series No. 3 (1996).

- Implement groundwater supply wellhead setbacks for pesticide application and storage
- Maintain records of pesticide use and effectiveness.

Fertilizer Use

Fertilizer use in ornamental and recreational areas, particularly golf courses, should be conducted in a manner that aims to prevent, reduce, or control contamination of groundwater resources and eutrophication of surface water resources from runoff and leaching of excess fertilizer. The periods of greatest risk for runoff and leaching may be during and immediately after fertilizer application and during heavy rains that cause rapid runoff. Recommended fertilizer management strategies include:

- Avoiding excess fertilization by analyzing soil to establish nutrient needs;
- Timing the application of crop nutrients using meteorological information to avoid, where feasible, application during or close to precipitation events;
- Establishing buffer zones, strips, or other "no-treatment" areas along water sources, rivers, streams, ponds, lakes, and ditches to act as a filter to catch potential runoff from the land;
- Storing fertilizers in their original packaging and in a dedicated location that can be locked and properly identified with signs, and with access limited to authorized persons.

1.2 Occupational Health and Safety

The following guidance applies to occupational health and safety during operations potentially affecting facility workers and, where noted, facility guests. Additional guidance on occupational health and safety issues common to tourism and hospitality and other commercial activities is presented in the **General EHS Guidelines**.

Health and safety impacts during the operation of tourism and hospitality facilities primarily include the following:

- Noise
- Physical hazards
- Biological–chemical hazards

Noise

Workers and guests may be subject to noise, including from the kitchen, laundry, housekeeping, and other guest rooms. In the case of the workforce, repetitive exposure over long periods may impact hearing. For guests, unnecessary noise in public areas and rooms is a nuisance. Noise management measures should be developed to a significant extent during the design and construction stages of hotel development.

Recommended control techniques to reduce indoor and outdoor noise pollution include:

- Installing double doors between guest rooms and between rooms and noisy environments (e.g. kitchens, laundries);
- Installing windows with sound-reduction materials;
- Positioning, enclosing, and isolating noisy equipment (e.g. permitting space or buffer zones encompassing two walls between the laundry and public areas).

Physical Hazards

Slips and Falls

General prevention measures applicable to workers are presented in the **General EHS Guidelines**. Facility guests may also be susceptible to slip and fall accidents in hotel room showers or common areas (e.g. lobbies, restaurants, and recreational areas). Recommended prevention and management methods include the following:

- Equipping shower stalls with nonslip surfaces or antislip strips, secure handles, and ready access to emergency phones;
- Installing nonslip surfaces in areas with potentially slippery floors or subject to frequent wetting (e.g. open hallways or swimming pool decks);
- Maintaining frequently transited areas as dry as possible;
- Placing of temporary or permanent warning signs on wet floors during cleaning or after rain.

Biological / Chemical Hazards

Water and Food Quality

Food and water provided to workers and guests should be safe. The following food hygiene measures should be adopted:

- Compliance with food hygiene and water-quality standards defined by central authorities or, in their absence, application of international food-handling, preparation and storage and water-quality recommendations;[13]
- Supply of safe potable water for drinking, bathing, food preparation, and other purposes where it may be ingested;
- Regular testing of potable water according to World Health Organization (WHO) standards as a minimum.

Indoor Air Quality

Indoor air quality is the quality of air inside buildings, as represented by concentrations of pollutants and thermal conditions that affect the health, comfort, and performance of hotel occupants and employees. Providing good indoor air quality is critical to asthma and allergy prevention and the prevention of other health effects and discomfort situations, such as headaches and nausea. Typical indoor air-quality contaminants may include ammonia (from cleaning products), VOCs (from use of interior products, such as solvents, paints, adhesives, dry cleaning, and cosmetics), odors, dust, formaldehyde (from fabrics, insulation, furniture, and cigarette smoking), carbon dioxide and nitrogen oxides, and bacteria and fungi (mold and mildew from carpets, HVAC filters).

Respiratory irritation from breathing fumes (e.g. chlorine, hypochlorite, ammonia, and sulfur dioxide) may present potential health impacts for laundry department workers.

The following control techniques are recommended for contaminant sources associated with housekeeping and maintenance (e.g. cleaning products, waxes and polishes, air fresheners, drain cleaners, solvents, pesticides, lubricants, paints, and coatings, as well as those applicable to technical standards of building, such as construction adhesives, carpet–carpet adhesives, insulation, vinyl–plastic floor coverings and wall coverings, and asbestos products):

- Use low-VOC-emitting products (e.g. water-base paints rather than oil based paints, low VOC containing adhesives for flooring and wall decorations);
- Avoid aerosols and sprays;
- Use housekeeping and cleaning products during unoccupied hours taking care to follow safety precautions including appropriate ventilation;
- Avoid the use of “air fresheners”;
- Expose products in open or ventilated areas before installation and increase ventilation rates during and after installation.

For contaminant sources associated with guest rooms (e.g. tobacco products, cooking, tracked-in dirt or pollen, and personal products [perfumes, hairsprays, or deodorants]), recommended control techniques include the following:

[13] Additional information on food safety is available at the WHOWorld Health Organization website: http://www.who.int/en/.

- Institute a no-smoking policy;
- Use exhaust ventilation with pressure control for major local sources;
- Avoid paper clutter;
- Provide specific staff-training and guest information.

For contaminant sources associated with the HVAC system (e.g. contaminated filters, contaminated duct lining, dirty drain pans, humidifiers, refrigerants, and mechanical rooms), recommended control techniques include the following:

- Implement a program of periodic preventive maintenance, including cleaning drain pans and changing filters;
- Keep duct lining dry;
- Maintain clean mechanical rooms;
- Rapidly fix leaks and clean spills.

Use of Chemical Cleaners

Occupational dermatitis from chemical cleaners is one of the main occupational hazards for housekeeping and laundry workers. Prevention measures are focused on using nontoxic, hypoallergenic cleaning products and limiting skin exposure through the use of gloves and other personal protection equipment. Additional guidance on the management of chemical occupational hazards is presented in the **General EHS Guidelines.**

Exposure to pesticides

Potential exposures to pesticides include dermal contact (e.g. in storage rooms or from leaking containers) and inhalation during their preparation, storage, and application. The effect of such impacts may be increased by climatic conditions, such as wind, which may increase the chance of unintended drift, or high temperatures, which may be a deterrent to the use of personal protective equipment (PPE) by the operator. Recommendations for the management of chemicals hazards related to pesticides include the following:

- Train personnel to apply pesticides and ensure that personnel have received the necessary certifications,[14] or equivalent training where such certifications are not required;
- Respect post-treatment intervals to avoid operator exposure during reentry to crops with residues of pesticides;
- Ensure hygiene practices are followed (in accordance to FAO and PMP) to avoid exposure of family members to pesticides residues.

1.3 Community Health and Safety

Many community health and safety impacts during the construction of tourism and hospitality facilities are common to those of most nonhazardous industrial and commercial activities and are discussed in the **General EHS Guidelines.** These impacts include dust, noise, and vibration from construction vehicle transit and communicable disease and adverse impacts associated with the influx of temporary construction labor.

Swimming Pool Safety

Environmental issues related to the operation of swimming pools include water consumption and energy use for heating, and have been described in previous sections of this document. Additional swimming pool issues are related to the health and safety of workers and guests and include water sanitization and drowning hazards.

[14] The US EPA classifies pesticides as either "unclassified" or "restricted." All workers that apply unclassified pesticides must be trained according to the Worker Protection Standard (40 CFR Part 170 and 171) for Agricultural Pesticides. Restricted pesticides must be applied by or in the presence of a certified pesticide applicator. For more information, see http://www.epa.gov/pesticides/health/worker.htm

Recommended health and safety management methods include

- Design of swimming pool depths and configuration to reduce or avoid the risk of injuries or drowning, including posting of depth warning information;
- Institution of lifeguard supervision policies;
- Implementation of a pool water sanitization program to prevent the growth of microorganisms that can cause stomach upset, diarrhea, and infections in the ear, nose, and throat. Bacterial control may be achieved by adding a sanitizer (usually chlorine based, such as sodium and calcium hypochlorite, and chlorinated isocyanurates although ozone and UV-based systems are also becoming common), a flocculant to help mass together particulates and bacteria in the water, and filtration to remove it. The pool water sanitation program should include monitoring of water quality to establish treatment need and frequency.[15]

Fire Safety

Fire presents a safety risk to hotel workers and guests alike. Fire safety recommendations applicable buildings accessible to the public, including tourism and hospitality facilities, are presented in the Life and Fire Safety section of the **General EHS Guidelines**.

2.0 Performance Indicators and Monitoring

2.1 Environment

Emissions and Effluent Guidelines

Combustion source emissions guidelines associated with steam- and power-generation activities from sources with a heat capacity equal to or lower than 50 MWth are addressed in the **General EHS Guidelines** with larger power source emissions addressed in the **EHS Guidelines for Thermal Power**. Guidance on ambient considerations based on the total load of emissions is provided in the **General EHS Guidelines**.

Tourism and hospitality effluents should be managed to a level that is consistent with the conventional treatment and discharge of sanitary wastewater, as discussed in the **General EHS Guidelines**.

Resource Use

Tables 1 and 2 provide examples of indicators for resource consumption of energy and water, and for waste generation in this sector. Industry benchmark values are provided for comparative purposes only, and individual projects should target continual improvement in these areas.

[15] Additional information on water quality for recreational use and other swimming pool health and safety issues is provided by WHO (2000).

Table 1. Resource and energy consumption.				
Energy Consumption (kWh/m² serviced space)	**Excellent**	**Satisfactory**	**High**	**Excessive**
Luxury serviced hotels[a]			**Temperate climate**	
Electricity	<135	135–145	145–170	>170
Other energy	<150	150–200	200–240	>240
TOTAL	<285	285–345	345–410	>410
			Mediterranean climate	
Electricity	<140	140-150	150–175	>175
Other energy	<120	120–140	140–170	>170
TOTAL	<260	260–290	290–345	>345
			Tropical climate	
Electricity	<190	190–220	220-250	>250
Other energy	<80	80–100	100-120	>120
TOTAL	<270	270–320	320-370	>370

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Energy Consumption (kWh/m² serviced space)	Excellent	Satisfactory	High	Excessive
Mid-range serviced hotels			**All climate zones**	
Electricity	Insufficient data	70–80	80–90	>90
Other energy	Insufficient data	190–200	200–230	>230
TOTAL	Insufficient data	260–280	280–320	>320
Small serviced hotels			**All climate zones**	
Electricity	Insufficient data	60-70	70–80	>80
Other energy	Insufficient data	180-200	200–210	>210
TOTAL	Insufficient data	240-270	270–290	>290
Water Consumption (m³/guest per night)	**Excellent**	**Satisfactory**	**High**	**Excessive**
Luxury serviced hotels[a]				
Temperate climate	<0.50	0.50–0.56	0.56–0.90	>0.90
Mediterranean climate	<0.60	0.60–0.75	0.75–1.10	>1.10
Tropical climate	<0.90	0.90-1.00	1.00-1.40	>1.40
Mid-range serviced hotels				
Temperate climate	<0.35	0.35–0.41	0.41–0.75	>0.75
Mediterranean climate	<0.45	0.45–0.60	0.60–0.95	>0.95
Tropical climate	<0.70	0.70–0.80	0.80–1.20	>1.20
Small serviced hotels				
Temperate climate	<0.20	0.20–0.21	0.21–0.31	>0.31
Mediterranean climate	<0.22	0.22–0.25	0.25–0.38	>0.38
Tropical Climate	<0.29	0.29–0.30	0.30–0.46	>0.46

Source: Conservation International and IBLF (2005).

[a] Luxury hotel in this context is a large hotel (about 400 rooms) with air conditioning (electrical chillers) and laundry.

Table 2. Waste Generation				
Waste generation (kg/guest per night)	Excellent	Satisfactory	High	Excessive
Luxury serviced hotels[a]	<0.60	0.60–1.20	1.20–2.00	>2.00
Mid-range serviced hotels	<0.40	0.40–1.00	1.00–1.50	>1.50
Small serviced hotels	<0.60	0.60–0.80	0.80–1.50	>1.50

Source: Conservation International and IBLF (2005).

[a] Luxury hotel in this context is a large hotel (about 400 rooms) with air conditioning (electrical chillers) and laundry.

Environmental Monitoring

Environmental monitoring programs for this sector should be implemented to address all activities that have been identified to have potentially significant impacts on the environment during normal operations and upset conditions. Environmental monitoring activities should be based on direct or indirect indicators of emissions, effluents, and resource use applicable to the particular project.

Monitoring frequency should be sufficient to provide representative data for the parameter being monitored. Monitoring should be conducted by trained individuals following monitoring and record-keeping procedures and using properly calibrated and maintained equipment. Monitoring data should be analyzed and reviewed at regular intervals and compared with operating standards so that any necessary corrective actions can be taken. Additional guidance on applicable sampling and analytical methods for emissions and effluents is provided in the **General EHS Guidelines**.

2.2 Occupational Health and Safety

Occupational Health and Safety Guidelines

Occupational health and safety performance should be evaluated against internationally published exposure guidelines, of which examples include the Threshold Limit Value (TLV®) occupational exposure guidelines and Biological Exposure Indices (BEIs®) published by American Conference of Governmental Industrial Hygienists (ACGIH),[16] the Pocket Guide to Chemical Hazards published by the United States National Institute for Occupational Health and Safety (NIOSH),[17] Permissible Exposure Limits (PELs) published by the Occupational Safety and Health Administration of the United States (OSHA),[18] Indicative Occupational Exposure Limit Values published by European Union member states,[19] or other similar sources.

Accident and Fatality Rates

Projects should try to reduce the number of accidents among project workers (whether directly employed or subcontracted) to

[16] Available at: http://www.acgih.org/TLV/ and http://www.acgih.org/store/
[17] Available at: http://www.cdc.gov/niosh/npg/
[18] Available at: http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9992
[19] Available at: http://europe.osha.eu.int/good_practice/risks/ds/oel/

a rate of zero, especially accidents that could result in lost work time, different levels of disability, or even fatalities. Facility rates may be benchmarked against the performance of facilities in this sector in developed countries through consultation with published sources (e.g. US Bureau of Labor Statistics and UK Health and Safety Executive)[20].

Occupational Health and Safety Monitoring

The working environment should be monitored for occupational hazards relevant to the specific project. Monitoring should be designed and implemented by accredited professionals,[21] as part of an occupational health and safety monitoring program. Facilities should also maintain a record of occupational accidents and diseases and dangerous occurrences and accidents. Additional guidance on occupational health and safety monitoring programs is provided in the **General EHS Guidelines**.

[20] Available at: http://www.bls.gov/iif/ and http://www.hse.gov.uk/statistics/index.htm

[21] Accredited professionals may include certified industrial hygienists, registered occupational hygienists, or certified safety professionals or their equivalent.

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Annex A: General Description of Industry Activities

The tourism and hospitality industry provides overnight lodging (the main service), leisure, and entertainment services to tourists, including leisure seekers and business travelers.

Potentially significant environmental, health, and safety (EHS) impacts and risks are associated with tourism and hospitality facilities throughout their life cycle. The site selection and development phase is particularly important in ecologically sensitive areas. Construction activities typically include site preparation and development, the removal of existing vegetation, if any, and the grading and excavation of soils for the installation of structural foundations and site utilities that are typical of hotel, resort, and commercial high-rise development projects. These activities depend on a number of factors, including topography, hydrology, and desired site layout.

Tourism Structures

The tourism and hospitality industry encompasses a variety of structures, facilities, and services. According to location, size (number of buildings and rooms), and type of facilities and services, three different classifications of tourism and development projects can broadly be defined, namely hotels, resorts, and ecolodges.

Hotels

A hotel is an establishment that provides lodging, usually short-term, for tourists and business travelers. Hotels often provide a number of additional guest services and facilities (e.g. restaurants, swimming pools, spas, or childcare). Some hotels have conference services and encourage groups to hold conventions and meetings at their location.

Business hotels are often located in the city center close to business districts and the main transport facilities (E.g. airports and rail stations). There is no typical building size or size classification (measured by number of rooms) worldwide.

Resorts

A resort is a vacation center, usually run by a single company, which attempts to provide for all or most of the tourist services. Generally, a resort is characterized by a large offering of activities (e.g. restaurants, bars, lodging, sports facilities, spas, entertainment facilities, and shopping centers). A resort is sometimes called a “destination” resort, when some or all of these services are provided within the facility so that customers have little need to leave the facility once they arrive. Resort types vary according to location (e.g. mountain resorts, and beach resorts) and according to the leisure and sport activities offered to the customers (e.g. golf resorts and spa resorts). Their lodging capacity is typically high, ranging from hundreds up to thousands of rooms.

Ecolodges

The term “ecolodge” is a tourism industry label used to identify a nature-dependent tourist facility that meets the principles of ecotourism. An ecolodge is recognized by distinct design features that are intended primarily to blend in with the natural environment. Sustainable site design requires holistic, ecologically based strategies to create projects that do not alter the site’s natural systems (e.g. ecosystems, soils, and hydrology) but instead restore these systems, if required. Aesthetically, ecolodges are typically integrated with the natural surroundings and incorporate cultural characteristics. The

capacity of an ecolodge is often between 25 and 100 guests and the typical ecolodge is quite small (up to 50–70 rooms).

Facility Operations

From the operational point of view hotels, resorts, and ecolodges are similar, and are collectively referred to as hotels in the remainder of this section. The supply of services is usually managed by separate departments for engineering and maintenance, housekeeping, laundry, purchase of consumption goods, and food / beverages.

The engineering and maintenance department manages and maintains heating, ventilation, and air conditioning (HVAC) systems; lighting; hot water and steam systems; kitchen and cooking equipment; and refrigeration systems. repair and maintenance among others. Hotel recreational facilities (e.g. swimming pools, water sports, game rooms, spas, and gyms) are energy and resource demanding and may cause direct and indirect EHS impacts. Fitness centers require high levels of energy for lighting, air conditioning, and air ventilation. Swimming pools require a significant amount of clean water and, therefore, require water filtration and circulation systems that use electricity continuously. HVAC systems can affect the recreational area's indoor air quality which is an important issue for a tourist facility. may lead Resorts with golf courses have significant water and pest / weed control needs.

The housekeeping department ensures the cleanliness of the hotel and maintains facilities in guest rooms, offices, and public areas. The housekeeping department uses different types of cleaning agents and collects soiled linen for the laundry.

Almost every large hotel has an in-house laundry department. The laundry operation in a hotel consumes significant amounts of resources (e.g. hot and cold water, electricity, steam, chemicals) and generates a large amount of wastewater, potentially containing phosphates and detergents.

The purchasing department typically spends 10 to 30 percent of the total hotel operating costs. This department is significant in that the purchased products affect the hotel's environmental impacts, depending on the nature of packaging and life cycle of these products (including their manufacture, use, and eventual disposal).

The food and beverage department refers to kitchen and bar services. This department often manages all restaurants, bars, lounges, clubs, room service, banquets, and outdoor catering and contributes approximately 15 to 30 percent of the total hotel operating costs. This is typically the third most energy-consuming department next to engineering and laundry, and accounts for approximately 20 to 25 percent of total energy consumed by the hotel. The food and beverage department uses energy in the form of electricity (for lighting and electrical cooking equipment) and different types of fuels.