

A Guide to the Environmental Legal Regime of Singapore for Foreign Investors

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I. INTRODUCTION

This article is intended to provide an overview of the environmental legal regime in Singapore, with an emphasis on statutes, subsidiary legislation, and policies directed to the control and protection of the environment. The discussion includes legislation and policies specifically applicable to toxic waste disposal and working conditions and examines them in the context of Singapore's economic climate and political structure. Special attention is given to the concerns of foreign investors. The article concludes with a consideration of Singapore's more immediate environmental challenges and examines the successes of its environmental-protection policies.

II. FOREIGN INVESTMENT: THE POLITICAL, LEGAL, AND ECONOMIC ENVIRONMENT

Singapore was founded in 1819 as a trading post for the East India Company and became a British colony in 1867. It achieved fully elected self-government in 1959 and in 1963 became one of the constituent states of the Federation of Malaysia, with virtual freedom from colonial rule. In 1965 Singapore separated from Malaysia and became a republic.¹

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1. There are numerous historical accounts of Singapore's history and development. For a synopsis, see MINISTRY OF COMMUNICATIONS AND INFORMATION, SINGAPORE 1990, at 20-28, 35-36 (1990) [hereinafter MINISTRY OF COMMUNICATIONS AND

Singapore has given high priority to economic development. The 1970s were characterized by active government promotion of foreign investment and the adoption of a free-trade policy. Priority was also given to the development of infrastructures such as telecommunications, domestic and international transportation facilities, and vocational manpower training.² Official government policy is aimed at making the country an international business center and exporter of services by the 1990s.³ Singapore has achieved substantial growth, notwithstanding a recession in 1985,⁴ and is expected to continue its rapid economic development.

A. Government Investment Priorities

Foreign investment has played a significant role in the development of the Singapore economy and receives active government encouragement through tax concessions and other incentives. For example, the Income Tax Act⁵ and the more comprehensive Economic Expansion Incentives (Relief from Income Tax) Act⁶ offer concessionary tax rates on income generated from certain specialized activities,⁷ including:

- Oil trading and oil futures,
- Qualified equipment and plastics,
- Chemicals and plastics,
- Foods and beverages,
- Health care, pharmaceuticals and biotechnology,
- Electronics and electrical optics,
- Ocean engineering, ship repair/building,
- Aircraft-related industries,
- Automotive components,
- Manufacturing systems,
- Automation components, and
- Precision engineering.

These incentive schemes are largely administered by the Economic

INFORMATION].

2. *Id.* at 1-2; see also SINGAPORE INT'L CHAMBER OF COMMERCE, INVESTOR'S GUIDE TO THE ECONOMIC CLIMATE OF SINGAPORE § 3.56 (1991) [hereinafter SINGAPORE INT'L CHAMBER OF COMMERCE].

3. MINISTRY OF COMMUNICATIONS AND INFORMATION, *supra* note 1, at 1-2.

4. *Id.*; SINGAPORE INT'L CHAMBER OF COMMERCE, *supra* note 2, at § 3.57.

5. CAP. 134.

6. CAP. 86.

7. See SINGAPORE INT'L CHAMBER OF COMMERCE, *supra* note 2, at 16-19, 30-42; BAKER & MCKENZIE, SUMMARY OF TAX AND INVESTMENT INCENTIVES AVAILABLE IN SINGAPORE UNDER THE ECONOMIC EXPANSION INCENTIVES ACT (1990) (compiled in consultation with a Singapore correspondent law firm) [hereinafter BAKER & MCKENZIE].

Development Board (EDB), which has offices in many major commercial centers in Asia, Europe, and North America. The EDB is a statutory board operating under the auspices of the Ministry of Trade and Industry. It is responsible for coordinating and administering incentives under the Economic Expansion Incentives Act.⁸ It is also responsible for generally planning and promoting industrial and commercial development, advising industries on various aspects of investment, and encouraging particular industries and programs.

Singapore achieved full employment in the late 1970s, with the result that labor and other costs have increased. The Chairman of the EDB recently expressed the view that Singapore is no longer a "low-cost" business environment and that to sustain growth, it should shift its emphasis to activities with more capital-intensive operations and a higher skill and value content.⁹

B. Foreign Investment by Industry and Geographic Region

During 1989, total foreign investment in Singapore was S\$1.6 billion.¹⁰ Of that investment, 39.8% was in the electronic products and components sectors, in which the manufacture of computers and data processing equipment was strongly represented. A further 28.1% was in petroleum and petrochemical industries, industrial chemicals, and pharmaceutical industries. Eighty percent of the investment was in expansion projects. Europe and Japan made the greatest foreign investment, each with 28% of the total investment, followed by the United States with about 27%.¹¹

C. General Legal Regime

Singapore's legal system bears a close resemblance to the English legal system by reason of its historical colonial relationship with Britain. In fact, a number of mercantile statutes passed by the English Parliament automatically take effect in Singapore. However, Singapore's legislation is not derived completely from English legislation. For example, much corporation and securities law is based on

8. See *supra* note 6.

9. MINISTRY OF COMMUNICATIONS AND INFORMATION, *supra* note 1, at 2-3.

10. All references to "\$\$" refer to Singapore dollar amounts. One U.S. dollar equals approximately S\$1.77 at the time of writing.

11. MINISTRY OF COMMUNICATIONS AND INFORMATION, *supra* note 1, at 74-75.

Australian legislation, while other legislation is indigenous. Nevertheless, Singapore's court procedure is very similar to England's.¹²

1. *Legal Entities*

A business presence may be established in Singapore by a variety of legal entities, including sole proprietorships or partnerships, limited liability companies (including joint venture companies), branches, and representative offices. Obviously, the activities proposed and relevant tax considerations will dictate the choice of organizational forms.¹³

2. *Restrictions on Foreign Investment*

As indicated, the Singapore government actively encourages foreign investment. There are generally no restrictions on foreign ownership of Singapore corporations except in certain industries, such as banking, insurance, air transport, public utilities, and newspaper publishing.¹⁴

3. *Labor Law*

All foreign citizens who take up employment in Singapore must obtain work permits if earning less than S\$1,500 per month, and employment passes if earning more.¹⁵ Work permits and employment passes are normally issued for a period of one to three years, subject to renewal.

The primary legislation regulating employment-related matters is the Employment Act.¹⁶ The Employment Act regulates terms of employment, including salary, termination, and liability for breach of contract. The Employment Act also specifies other terms and conditions, such as maximum hours of work, sick leave, and retirement and retrenchment benefits, which apply only to employees earning less than S\$1,250 per month. The Employment Act does not apply to persons employed in managerial, executive, or confidential positions, where terms of employment are usually determined by contract between the parties.

Employers and employees are also required to contribute specified

12. See E. SRINIVASAGAM, *TABLE OF WRITTEN LAWS OF THE REPUBLIC OF SINGAPORE 1819-1971* (1972) for a historical account of the reception of English law into Singapore and the development of Singapore's legal system.

13. See BAKER & MCKENZIE, *supra* note 7.

14. However, it may be a policy requirement that certain government and other projects undertaken by a foreign party involve a Singapore participant.

15. Foreign citizens who are permanent residents are not required to obtain work permits or employment passes.

16. CAP. 91.

portions of the employee's monthly wage to the Central Provident Fund.¹⁷ Other statutes dealing with labor matters are the Industrial Relations Act,¹⁸ Trade Disputes Act,¹⁹ and Workmen's Compensation Act.²⁰

4. Tax Laws

The current tax rate for both resident and nonresident companies in Singapore is a flat 31%. Income is subject to tax either if it has a Singapore source,²¹ or if it has a non-Singapore source and is remitted to Singapore. There is no capital gains tax as such, but gains of a recurring nature will often be assessable as income. Gains arising from the sale of assets that have enjoyed capital allowances and are sold for more than their written-down value are also taxable as income.

Withholding taxes apply to a number of types of payments sourced in Singapore and made to nonresidents, including interest, royalties, technical-assistance fees, and management fees.²² Withholding tax is a nonfinal tax, and partial refunds can in theory be obtained by filing tax returns and claiming deductions for expenses incurred in earning the income. Withholding tax does not apply to technical-assistance fees when the technical assistance is provided wholly outside Singapore. Straightforward expense allocations are also regarded as outside the scope of withholding tax, provided there is no profit element in the amount allocated to the Singapore company.

Singapore has entered into some twenty-five tax treaties with other countries, although no treaty has yet been signed with the United States. Most of the treaties reduce the rate of withholding tax on interest and royalties significantly and, in some cases, to zero.²³

Other taxes include property tax, stamp duty,²⁴ and estate and death duties.

17. For elaboration, see Central Provident Fund Act, CAP. 36.

18. CAP. 136.

19. CAP. 331.

20. CAP. 354.

21. *I.e.*, derived from or accrued in Singapore.

22. Payments are taxed at the full corporate rate of 31%.

23. *See also* BAKER & MCKENZIE, *supra* note 7.

24. A stamp duty is levied on instruments and agreements. *See* Stamp Duties Act, CAP. 312.

5. *Technology Transfer*

Foreign-owned trademarks may be registered in Singapore under the Trade Marks Act,²⁵ which is modeled on trademark legislation in the United Kingdom. Patents registered in the United Kingdom may be reregistered in Singapore, while designs registered in the United Kingdom are automatically protected in Singapore. The current copyright law was enacted at the beginning of 1987. It is closely modeled on the equivalent Australian legislation and makes specific provision for the protection of computer software. Reciprocal arrangements with the United Kingdom and the United States extend copyright protection to certain works first published in these jurisdictions.²⁶

6. *Exchange Controls*

Singapore suspended exchange controls in 1978. No exchange control approvals are therefore required for inward investment into Singapore, for the remittance of dividends or profits, or for the repatriation of capital.²⁷

7. *The Role of Environmental Laws in Foreign Investment*

The Singapore government recognized early the need to control and regulate potentially damaging activity to the environment. This need became pressing as the growth of petrochemical and other industries generated increasing amounts of pollutants and waste.²⁸ The result has been a growing body of legislation designed to protect the environment, and there is every indication that this trend will continue. Foreign investors in industries with environmental impact will therefore need to consider present and future legislation in assessing the feasibility, cost, and return on investment in Singapore.

III. OVERVIEW OF ENVIRONMENTAL LAWS OF SINGAPORE

A. *Statutes and Regulations*

Singapore's environmental protection regime is created and defined primarily by the following legislation:

25. CAP. 332.

26. See also BAKER & MCKENZIE, *supra* note 7.

27. See MONETARY AUTHORITY OF SINGAPORE, EXCHANGE CONTROL LIBERATION, NOTICE TO BANKS, MERCHANT BANKS, INSURANCE COMPANIES (ID Circular 1978).

28. P. Jothieswaran, Environmental Protection - Measures Adopted and Future Directions 2 (paper presented to Glaxochem Ltd., Apr. 25, 1991).

- (a) the Factories Act²⁹ and regulations and orders passed under that act, which regulate the health, safety, and welfare of persons employed in factories and other workplaces;
- (b) the Environmental Public Health Act³⁰ and its regulations and orders, which regulate matters of public health and cleanliness, including refuse collection, refuse disposal facilities, disposal and treatment of industrial waste, food establishments, public nuisance, and noise;
- (c) the Clean Air Act³¹ and its regulations and orders, which regulate activities that generate air pollutants and prescribe standards for reducing air pollution;
- (d) the Water Pollution Control and Drainage Act³² and its regulations and orders, which deal with drainage and pollution of rivers and watercourses and regulate the treatment and disposal of sewage;
- (e) the Petroleum Act³³ and its regulations, which regulate the transport and storage of petroleum and constituent substances;
- (f) the Prevention of Pollution of the Sea Act³⁴ and its regulations, which regulate the discharge of pollutants into ocean waters;
- (g) the Poisons Act³⁵ and its regulations and notifications, which regulate the importation, possession, manufacture, compounding, storage, transport, and sale of poisons.

The substantive and enforcement provisions of these statutes, together with corresponding subsidiary legislation and other legislation impacting on environmental protection, are detailed below.

The Ministry of Environment, which includes the Pollution Control Department (PCD), is principally responsible for administering and enforcing the noted legislation and generally overseeing matters of environmental concern. However, as will be discussed, other ministries and departments are also responsible for administering certain provisions of that legislation.

29. CAP. 104; *see* Recitals.

30. CAP. 95; *see* Recitals.

31. CAP. 45.

32. CAP. 349.

33. CAP. 229; *see* Recitals.

34. CAP. 243.

35. CAP. 234; *see* Recitals.

1. *Environmental Regulation Regime - Land*

The following legislation regulates activities potentially damaging to land.

a. The Environmental Public Health Act

The following provisions of the Environmental Public Health Act (EPA)³⁶ are directed primarily to the disposal of industrial waste produced in the course of a trade, business, manufacture, or building construction:

— The Commissioner of Public Health³⁷ may require persons carrying out building and construction works to provide such devices as the Commissioner directs for the removal of dirt, earth, and other materials.³⁸

— The Commissioner of Public Health may require persons carrying on a trade or business to periodically remove industrial waste or refuse to a disposal facility³⁹ and to construct and operate disposal and waste-storage facilities in a prescribed manner.⁴⁰

— The EPA prohibits the disposal of refuse and industrial waste at any place other than a disposal facility established with the permission of the Commissioner of Public Health.⁴¹

— A person “disposes” of industrial refuse or waste if he burns, sells, gives away, discards, dumps, incinerates, deposits, processes, recycles, “throws,” or treats such waste.⁴²

— The occupier of any workplace may be required to recycle or treat any industrial waste found or produced in those premises (at its expense) before the waste is brought to any public disposal facility.⁴³ The Commissioner of Public Health may require the owner or occupier of a workplace to furnish information on the amount, type, and nature of any industrial waste produced in such place.⁴⁴

Regulations passed under the EPA also regulate industrial waste disposal. The Environmental Public Health (General Waste Collection) Regulations 1989⁴⁵ prescribe the mode of transporting “general

36. Environmental Public Health Act (EPA), CAP. 95.

37. The Commissioner of Public Health is attached to the Environmental Public Health Division of the Ministry of Environment.

38. EPA § 20.

39. *Id.* § 26.

40. *Id.* §§ 23(2), 25.

41. *Id.* § 24.

42. *Id.* § 24(2).

43. *Id.* § 28.

44. *Id.* § 27.

45. S 116/89.

waste" listed under Classes A and B in the Schedule to those regulations. "General waste" is defined as refuse or industrial waste, excluding any toxic industrial waste specified in the Schedule to the Environmental Public Health Regulations 1988.⁴⁶ Class B wastes include industrial wastes with a high organic content that is putrefiable. Class A wastes include nonputrefiable industrial wastes.

The Environmental Public Health Division of the Ministry of the Environment divides waste that is neither toxic nor hazardous into two categories according to whether such waste may be incinerated or not. Waste that may be incinerated must be brought to an incinerator, while waste that may not be incinerated must be left at a dumping ground.⁴⁷

A person producing general waste may permit only persons licensed under the Regulations to collect and transport general waste for payment. However, a person who collects and transports general waste arising from his own activities is exempt from the requirement to obtain a license.⁴⁸

The EPA also regulates public cleanliness. It provides for the construction and maintenance of public disposal facilities and establishes conditions on which waste may be accepted or rejected.⁴⁹ The Sewerage Department of the Ministry of Environment is responsible for the planning, construction, operation, and maintenance of the public sewage system in Singapore. It coordinates and controls the provision of sewage and sanitary facilities in both the private and public sectors. It is itself organized into three subdepartments: Finance and Administration, Planning and Design Construction, and Operations and Maintenance.

The EPA empowers the Commissioner of Public Health to impose systems for the collection and removal of refuse from premises and to construct receptacles and deposits.⁵⁰ Owners and occupiers of premises are also required to maintain standards of cleanliness on private streets abutting their premises,⁵¹ in addition to complying with provisions regulating noise and nuisance.⁵²

46. S 111/88, regs. 7, 8.

47. As advised by the Department of Environment.

48. S 111/88, regs. 7, 8.

49. EPA § 22.

50. *Id.* §§ 8, 10; *see also* §§ 12-21.

51. *Id.* § 6.

52. *Id.* §§ 47-49; *see also* §§ 32-42 (applicable to food establishments).

Other relevant regulations include the following: the Environmental Public Health (Control of Noise from Construction Sites) Regulations 1990;⁵³ the Environmental Public Health (Public Cleansing) Regulations 1970;⁵⁴ the Environmental Public Health (Public Cleansing Amendment) Regulations 1988;⁵⁵ the Environmental Public Health (Public Cleansing Amendment) Regulations 1989;⁵⁶ the Environmental Public Health (Food Establishments) Regulations 1973;⁵⁷ and the Environmental Public Health (Food Establishments Amendment) Regulations 1988.⁵⁸

b. The Petroleum Act

The Petroleum Act⁵⁹ deals with the import, storage, transportation, and general control of petroleum substances.

A person must be licensed to store or keep petroleum in any quantity larger than twenty cases within thirty meters of a house or building.⁶⁰ The term "petroleum" includes liquids commonly known by the names of rock oil, Rangoon oil, Burma oil, kerosene, paraffin oil, petrol, gasoline, benzoline, benzine, naphtha, and any like flammable liquid, whether a natural product or made from petroleum, coal, schist, shale, or any other bituminous substance or by-product. "Case" means a receptacle containing not more than thirty-six liters of petroleum.⁶¹

A license is required to keep "dangerous petroleum" in *any* amount within thirty meters of a house or building, or to keep quantities larger than 291 liters anywhere.⁶² "Dangerous petroleum" is defined as petroleum that has a flash point below twenty-three degrees centigrade, or such other standard as is fixed by the Minister of Home Affairs.⁶³ The Minister may issue orders applying the Petroleum Act to any flammable oil or liquid and specify the quantity of oil or liquid that may be stored without a license.⁶⁴

Licenses must specify the quantity of petroleum or dangerous petroleum that may be kept by the license holder.⁶⁵ Licenses may be

53. S 466/90. These regulations prescribe maximum levels of noise that can be emitted from a construction site.

54. S 46/68. These regulations provide for general control of waste disposal by occupiers of buildings and land.

55. S 151/88.

56. S 104/89.

57. S 330/78.

58. S 267/88.

59. CAP. 229; *see* Recitals.

60. Petroleum Act § 18.

61. *Id.* § 2.

62. *Id.* § 19.

63. *Id.* § 19.

64. *Id.* § 26.

65. *Id.* § 20.

subject to conditions.

The Petroleum Act also prohibits the transport of more than five cases of petroleum, or any quantity of dangerous petroleum, between 7:00 P.M. and 7:00 A.M. without the express permission of the Minister of Home Affairs.⁶⁶

Additionally, the Petroleum Act imposes conditions on the import, transport, and storage of petroleum on land, inland waters, and areas of the sea within its jurisdiction. For example, petroleum, including dangerous petroleum, may be imported only at designated places.⁶⁷ A vessel with dangerous petroleum on board as cargo is not permitted to enter the limits of any port without the permission of the Port Master.⁶⁸ The Petroleum Act also requires persons who wish to land or remove petroleum and dangerous petroleum to obtain permits from the Port Master.⁶⁹

c. *The Poisons Act*

The Poisons Act⁷⁰ regulates the importation, possession, and manufacture of defined poisons. The import of any "poison"⁷¹ is prohibited without a license.⁷² Substances designated in the Schedule to the Poisons Act are considered to be poisons for purposes of the act. Substances are added to, or removed from, the list from time to time by notifications placed in the Gazette.⁷³

The Pollution Control Department (PCD) is charged with reviewing applications for licenses to import, transport, store, and use hazardous chemicals controlled under the Poisons Act. The PCD prohibits the import of materials that it deems to have dangerous properties and effects. For example, except in unusual cases, a license will not be granted to import asbestos. The authority encourages the use of substitutes such as rock wool and other insulating materials in lieu of asbestos.

66. *Id.* § 16; *see also* §§ 9-12.

67. *Id.* § 3.

68. *Id.* § 5(1).

69. *Id.* § 7(1); *see also* §§ 10, 11.

70. CAP. 234.

71. As defined in the Poisons Act.

72. Poisons Act § 5.

73. *See* Poisons Act (Amendment of Schedule) Notification 1989 (S 16/89); Poisons Act (Amendment of Schedule) (No. 2) Notification 1989 (S 361/89); Poisons Act (Amendment of Schedule) Notification 1990 (S 55/90); Poisons Act (Amendment of Schedule) Notification 1991 (S 51/91).

A number of rules have been passed under the Poisons Act, including the Poisons Rules (1957)⁷⁴ and amendments to those rules, which specify forms of license applications, regulate the sale of poisons by licensed persons, and establish reporting requirements, fees, and similar matters. The Poisons (Hazardous Substances) Rules⁷⁵ apply to the storage and supply of hazardous substances defined in the Rules.⁷⁶

d. Planning and Building Control Legislation

The Planning Act⁷⁷ regulates the development of land, including buildings. No person may develop land without the written permission of the Chief Planner of the Urban Redevelopment Authority and the Director-General of Public Works.⁷⁸ The term "develop" includes building, engineering, mining, and other operations in, on, over, or under land, or the making of any material change in the use of a building or land, with certain exceptions.⁷⁹ The written permission of the competent authority is also required to carry out any works within a conservation area. "Works within a conservation area" means decorative, painting, renovation, or building works that may affect the character or appearance of a building, premises, or land in a conservation area.⁸⁰

The Building Control Act⁸¹ regulates building works. It requires that all plans for building works be approved by the Building Authority, which is the office of the Director-General of Public Works,⁸² and that a permit be obtained before approved plans for building works are carried out.⁸³ The Building Control Act also regulates structural and other features of buildings and requires builders, supervisors, and qualified persons to be appointed in various capacities in connection with such building work.⁸⁴ "Building works" include the erection, demolition, alteration, or repair of a building and the provision, extension, or alteration of any air-conditioning service, ventilating system, or fire-protection system in connection with a building. Building works include site-formation works and

74. S 94/57.

75. S 322/86.

76. *See also* amendments to the Schedule such as the Poisons (Hazardous Substances) (Amendment) Rules 1990 (S 56/90); the Poisons (Amendment No. 3) Rules 1989 (S 421/89).

77. CAP. 232.

78. These authorities are empowered by the Minister of National Development to administer the Planning Act.

79. Planning Act, §§ 10, 12.

80. *Id.* §§ 13(2), 14.

81. CAP. 29.

82. *Id.* § 6.

83. *Id.* § 7.

84. *Id.* §§ 8-11.

any other connected building operations. A "building" generally means any permanent or temporary building, including any structure or erection (whether permanent or temporary), and including any tank for the storage of any solid, liquid, or gaseous matter.⁸⁵ A certificate of statutory completion must be obtained (except in defined circumstances) prior to the occupation of a building where building works have been carried out.⁸⁶

As a matter of policy, authorities responsible for approving industrial developments under the Factories Act,⁸⁷ Planning Act, and Building Control Act are also responsible for considering the environmental impact of a proposed development or building. The Ministry of Environment, the Pollution Control Department (PCD), and other constituent departments are consulted by the planning and development departments of the Ministry of Labour and authorities responsible for approving and regulating development and building projects, to assess the impact of a proposed development or building on the environment.⁸⁸

The PCD reviews plans of new factories and other developments to determine whether the activities to be carried out at the proposed site are environmentally compatible with surrounding land use. The PCD appears to have the power to veto a proposed building or development. For example, as a matter of policy, industries that can cause accidental discharge of pollution and toxic chemicals may not be located within water catchments. In fact, any proposal for industrial activity that is judged to pose unmanageable health and safety pollution hazards will not be permitted to proceed. Approval will only be given if pollutant emissions comply with standards prescribed by the Clean Air Act⁸⁹ and other legislation, wastes can be managed and properly disposed of, and the industry is situated in a suitable industrial estate.⁹⁰

The PCD is also responsible for ensuring the installation of equipment enabling the factory to comply with the requirements of the Clean Air Act and the Trade Effluent Regulations.⁹¹ When an industrial development has been approved, the PCD will review the

85. *Id.* § 2.

86. *Id.* § 20.

87. CAP. 104. *See also infra* notes 190-212 and accompanying text.

88. P. Jothieswaran, *supra* note 28, at 5.

89. CAP. 45. *See infra* notes 99-113 and accompanying text.

90. POLLUTION CONTROL DEPT., 1990 ANNUAL REPORT OF THE POLLUTION CONTROL DEPT. 2 (1991) [hereinafter POLLUTION CONTROL DEPT.].

91. 1976 S 122/76, as amended, passed under the Water Pollution Control and

plans to ensure that they incorporate pollution-control equipment that meets PCD standards. The PCD has recently finalized a Code of Practice on Pollution Control, which establishes standards for pollution-control design prerequisites in buildings.⁹² Additionally, the Building Control Division of the Ministry of National Development⁹³ must have confirmation of compliance with PCD requirements before issuing the mandatory Certificate of Statutory Completion for a building.⁹⁴

Other legislation that may incidentally have an impact on environmental matters includes the Buildings and Common Property (Maintenance) Act,⁹⁵ the Control of Imports and Exports Act,⁹⁶ the Customs Act,⁹⁷ and the Hydrogen Cyanide (Fumigation) Act.⁹⁸

2. *Environmental Regulation Regime — Air*

The Clean Air Act⁹⁹ is the primary regulator of air pollution. It requires written permission from the Director of Air Pollution Control in the Pollution Control Department (PCD) before certain premises specified in the Schedule to the Clean Air Act may be used.¹⁰⁰ Scheduled premises, which are those designated as having the propensity to cause “serious” air pollution,¹⁰¹ include premises used for:

- chemical works in which chemical products are manufactured;
- gas works in which coal, coke, or other derivatives are handled or prepared for carbonization or gasification;
- crushing, grinding, and milling works in which rocks, ores, minerals, and chemicals are processed;
- petroleum works in which crude or shell oil, crude petroleum, or related minerals are refined or reconditioned, or which store or are to store more than one hundred tonnes of chemical products, hydrocarbons, or hydrocarbon products that are toxic or produce toxic gases on burning or contact with water or air;

Drainage Act, CAP. 348. *See* discussion *infra* notes 123-33 and accompanying text.

92. Loh Ah Tuan, *Environmental Aspects on Planning and Design of Buildings* 3, 6 (Apr. 6, 1991) (paper presented to the Asia 1991 Construction: New Frontiers Conference); P. Jothieswaran, *supra* note 28, at 3, 5.

93. The Ministry is responsible for administering the Building Control Act.

94. *See* POLLUTION CONTROL DEPT., *supra* note 90, at 2.

95. CAP. 30.

96. CAP. 56.

97. CAP. 70.

98. CAP. 132.

99. CAP. 45.

100. *Id.* § 4.

101. P. Jothieswaran, *supra* note 28, at 3.

—abrasive blasting works in which equipment or structures are cleaned by abrasive blasting.¹⁰²

Applicants for permission to occupy scheduled premises are required to give details of the trade, industry, or process to be carried out on the premises, the type and seriousness of the emission, and the intended method of pollution control.¹⁰³ The Director of Air Pollution Control may refuse permission if he takes the view that the occupier is likely to cause or increase air pollution in the area.¹⁰⁴ Moreover, permission will be granted only after compliance with pollution-control requirements.¹⁰⁵ For example, written permission will be issued for blasting activities only after the construction of enclosed blasting chambers equipped with prescribed dust-removal facilities or other control measures specified by the PCD.¹⁰⁶ The location of the works is also a consideration in determining licensing conditions because prescribed pollution-control standards vary according to location.

Permission may also be granted subject to conditions requiring, among other things, the occupier to: (1) install, alter, or replace fuel-burning and other pollution-control equipment; (2) erect or alter the height or other features of any chimney through which air impurities may be discharged; (3) alter methods of operation; or (4) use a specified type of fuel to prevent air pollution.¹⁰⁷

Certain works on scheduled premises, such as the alteration of the method of operation of a trade, the installation of fuel-burning equipment, or the erection of a chimney or other works, as provided in the Clean Air Act, must also be approved by the Director of Air Pollution Control.¹⁰⁸

The Clean Air Act also prescribes the obligations and liabilities of occupiers of trade or industrial premises. They must maintain fuel-burning equipment in an efficient condition, ensure that dark smoke is not emitted into the air, and make certain that air impurities are not emitted in excess of the prescribed standards.¹⁰⁹

The Director of Air Pollution Control may serve notice to comply

102. Added to the list of scheduled premises by the Clean Air Act (Amendment of Schedule) Notification 1990 (S 32/90).

103. Clean Air Act § 4.

104. *Id.* § 4(3).

105. POLLUTION CONTROL DEPT., *supra* note 90, at 10.

106. *Id.*

107. Clean Air Act §§ 4(2), 4(3), (5).

108. *Id.* § 6(1).

109. *Id.* § 8.

with the requirements of the Clean Air Act and to provide facilities to reduce the seriousness or harmful effects of any emission. The director may also require work to be done on any industrial or trade premises where he is of the opinion that any air impurities are being or are likely to be emitted.¹¹⁰ The Minister of the Environment is empowered to order the occupier of premises to cease conducting any trade, industry, or process, or to cease operating any fuel-burning equipment.¹¹¹

Subsidiary legislation passed under the Clean Air Act includes the Clean Air (Standards) Regulations 1972¹¹² and amendments. Regulation 4 of those regulations sets forth permissible standards for concentrations of air impurities. In 1978, the regulations were amended to raise emission standards for air pollutants (with some exceptions) by 50%.¹¹³

Additional air pollution controls operate within the framework of the Road Traffic Act,¹¹⁴ the Control of Imports and Exports Act,¹¹⁵ and the Poisons Act.¹¹⁶

All gasoline-driven motor vehicles registered for the first time in Singapore after July 1, 1991, must be capable of running on unleaded gasoline.¹¹⁷ All gasoline-consuming vehicles registered after July 1, 1992, need to comply with "ECE 83" or "Japanese JIS 78" emission standards, which are more stringent than the UN Economic Commission for Europe Regulations No. 15.04 (ECE 15.04) currently applicable in Singapore.¹¹⁸ By July 1, 1991, all new diesel vehicles will be required to meet vehicle emission standards of UN Economic Commission for Europe Regulation No. 24.03 (ECE 24.03).¹¹⁹ Additionally, Singapore has sought to encourage voluntary use of unleaded gasoline by placing a lower tax on it.

Under a quota system introduced in 1990, the government issues a limited number of licenses to use chlorofluorocarbons (CFC's) and requires firms to bid for them. This is reputed to have caused a sharp

110. *Id.* § 11.

111. *Id.* § 16.

112. S 14/71.

113. Clean Air (Standards) (Amendments) Regs. 1978 (S 43/78).

114. CAP. 276.

115. CAP. 56.

116. CAP. 234.

117. The Motor Vehicles (Construction and Use) (Amendment) Rules, 1991 (S 288/91) (passed under the Road Traffic Act). *See also* Motor Vehicles (Registration and Licensing) Rules, 1972 (S 262/72).

118. MINISTRY OF ENVIRONMENT AND MINISTRY OF COMMUNICATIONS, NEW EMISSION STANDARDS FOR REGISTRATION OF PETROL-DRIVEN VEHICLES, JOINT PRESS STATEMENT (June 27, 1991).

119. Motor Vehicles (Construction and Use) (Amendment) Rules (S. 479/90). *See also* P. Jothieswaran, *supra* note 28, at 6; POLLUTION CONTROL DEPT., *supra* note 90, at 11.

drop in CFC usage.¹²⁰

The import and manufacture of nonpharmaceutical aerosols and polystyrene products containing CFC's was banned after February 5, 1991.¹²¹ This ban effectively prohibits the sale of a wide range of consumer and household products such as hair spray, furniture treatments, and insecticides that use CFC. Additionally, after January 1, 1993, new air conditioners and refrigerators using controlled CFC's may not be imported and sold in Singapore.¹²²

3. *Environmental Regulation Regime — Water*

Several statutes regulate activities potentially damaging to watercourses and waterways, including the sea and inland waters.

a. *The Water Pollution Control and Drainage Act*

The Water Pollution Control and Drainage Act (WPA)¹²³ prohibits construction works that adversely affect drainage systems (including watercourses or rivers) without the prior permission of the Director of Water Pollution Control and Drainage under the Ministry of Environment.¹²⁴ Persons who, without permission, create a drain or divert or interfere with existing drainage systems may be required to demolish, re-make, or otherwise deal with the drainage systems as directed.¹²⁵ The WPA also prohibits the construction of any works that take or intercept water from the sea or any other

120. *Singapore Changes How People Think*, BUSINESS ASIA, June 27, 1991, at 201 [hereinafter *Singapore Changes How People Think*]. See also Control of Imports and Exports, 11 Montreal Protocol, Chlorofluorocarbons Order 1989 (S 404/89). This order prohibits the import into Singapore of all "controlled substances" designated in the Control of Imports and Exports Act from any country that was not a party to the Montreal Protocol on Substances that Deplete the Ozone Layer, Sept. 17, 1987, or which require a license for their importation from any party to the Montreal Protocol. See also Control of Imports and Exports (Montreal Protocol) (Chlorofluorocarbons) (Amendment) Order 1991 (S 237/91), passed under the Control of Imports and Exports Act (CAP. 56).

121. Poisons Act, CAP. 234, amendment introduced as Poisons (Amendment) Rules 1991 (S 52/91).

122. See Ministry of Environment, Control on Use of CFC's as Refrigerants and Halons for Fire Fighting in Singapore, Press Release (June 17, 1991).

123. Water Pollution Control and Drainage Act (WPA), CAP. 348.

124. WPA § 2, 6; see also *id.* § 10. The Drainage Department of the Ministry of the Environment takes the view that "drainage systems" in the WPA covers all man-made and natural overground drainage systems.

125. *Id.* § 7.

place without the permission of the Director of Water Pollution Control and Drainage.¹²⁶ Additionally, the WPA regulates the construction of approved drainage works and ancillary activities.¹²⁷

The WPA also regulates the discharge of trade effluent. It prohibits discharge from any premises into public sewers without the written consent of the Director of Water Pollution Control and Drainage.¹²⁸ The term "trade effluent" is defined as any liquid produced as waste or refuse of any trade, business, or manufacture, or of any building construction.¹²⁹ The Minister of the Environment may direct an occupier of premises to cease the discharge of trade effluent and to take steps to treat effluent discharged into a public sewage system, drain, river, lake, pond, or reservoir where it is deemed dangerous to health or safety, or will cause damage to the public sewage system.¹³⁰

Industrial waste water must be pretreated to standards prescribed in the 1976 Regulations.¹³¹ The objective of the regulations is to require the collection and treatment of industrial waste to a prescribed standard prior to its discharge.¹³²

Amendments to the regulations permit the discharge of trade effluent that exceeds stipulated limits for biodegradable pollutants on payment of a tariff.¹³³

b. The Prevention of Pollution of the Sea Act

The Prevention of Pollution of the Sea Act (PPSA)¹³⁴ is intended to minimize pollution from ships, land, and apparatus used to transfer oil to or from ships. It gives effect to the International Convention for the Prevention of Pollution from Ships of 1973, as modified by the Protocol of 1978 (known as MARPOL 73/78). The PPSA came into force in January, 1991.¹³⁵

The PPSA generally prohibits the discharge of refuse, waste, trade

126. *Id.* § 13.

127. The Surface Water Drainage Regs. 1976 (S 121/76) specify where and how effluent may be discharged. The Trade Effluent Regs. 1976 (S 122/76) specify the chemical composition and standard of treatment of trade effluent discharged into public sewers.

128. *Id.* § 31.

129. *Id.* § 2.

130. *Id.* § 38.

131. Trade Effluent Regs. 1976 (S 122/76).

132. Ong Seng Eng, Water Pollution Control in Singapore 2 (Nov. 27, 1990) (paper presented at a technical seminar at the Dept. of Chemical Engineering, Nat'l Univ. of Singapore).

133. Trade Effluent (Amendment) Regs. 1977 (S 201/77); *see also* other relevant amendments including Trade Effluent (Amendment) Regs. 1981 (S 314/81) and Trade Effluent (Amendment) Regs. 1983 (S 121/83).

134. Prevention of Pollution of the Sea Act (PPSA), CAP. 243.

135. Prevention of Pollution of the Sea Act (Commencement) Notification 1991 (S 22/91).

effluent oil, oil mixtures, noxious liquid substances, and other marine pollutants from cargo or machinery spaces by any ship into Singapore waters, and by Singapore ships into any part of the sea.¹³⁶ "Oil" is defined to include crude oil, fuel oil, sludge, oil refuse, and refined products other than certain petrochemicals referenced in MARPOL 73/78. An "oily mixture" is a mixture with an oil content of fifteen parts or more in one hundred thousand parts of the mixture. A "noxious liquid substance" (NLS) means any substance proscribed by regulations as such and also subject to the provisions of Annex II of MARPOL 73/78.¹³⁷

A person proposing to export or import an NLS in bulk by ship must notify the Port Master.¹³⁸ When the PPSA or regulations prohibit the discharge of oil and other substances into the sea, those substances must be retained on board the vessel and discharged to reception facilities.¹³⁹ The PPSA also requires the reporting of any actual or probable discharges into Singapore waters of oil, oily mixtures, NLS's, or mixtures containing those substances from a place on land or an apparatus used for transferring that substance to or from a ship.¹⁴⁰

The PPSA also regulates land-based activities that could cause pollution of the sea. It prohibits an occupier of land from discharging oil or an oily mixture into Singapore waters from any place on land or from apparatus used for transferring oil to or from any ship.¹⁴¹

The Act empowers the Minister of Communications to give effect to any provisions of MARPOL 73/78 and its amendments by making regulations. A substantial number of regulations have recently been passed under the PPSA to give effect to the technical provisions of MARPOL 73/78. These include the Prevention of Pollution by Oil Regulations 1991,¹⁴² the Control of Pollution by Noxious Liquid Substances in Bulk Regulations 1991,¹⁴³ the Detergents and Equipment for Pollution Reduction Regulations 1991,¹⁴⁴ the Prevention of

136. PPSA §§ 6, 7, 10.

137. *Id.* § 2.

138. *Id.* § 9.

139. PPSA § 7, 8. For discussion of specific attributes of the PPSA, see Zafrul Alam, Singapore's New Sea Pollution Laws (June 17-18, 1991) (paper presented at Asian Shipping Forum).

140. PPSA § 15(1).

141. *Id.* § 3.

142. S 58/91.

143. S 59/91.

144. S 62/91.

Pollution of the Sea (Composition of Offences) Regulations 1991,¹⁴⁵ and the Reporting of Pollution Incidents Regulations 1991.¹⁴⁶

The regulations require that advance notice of the quantity and content of oil and chemical wastes to be discharged be provided to the Port Master and the operator of reception facilities approved by the Ministry of the Environment. The Oil Regulations also require that certain vessels and oil tankers must be inspected, surveyed, and issued with an International Oil Pollution Prevention (IOPP) Certificate if engaged on voyages to a port or place outside Singapore waters.¹⁴⁷ If within Singapore waters, they must be surveyed and issued with a Singapore Oil Pollution Prevention Certificate¹⁴⁸ and certified. Other certificates may also be required, depending on the nature of the ship, its location, and cargo.¹⁴⁹ The Reception Facilities for Pollutants Regulations 1991¹⁵⁰ require the Port Authority to ensure that the port has reception facilities. Similarly, petroleum and petrochemical terminal operators and shipyards must provide "adequate reception facilities" for oil and NLS residues, respectively.

The PPSA is inapplicable to ships owned or operated by states party to MARPOL 73/78, including the Singapore government, and used on government noncommercial service.¹⁵¹

c. The Merchant Shipping (Oil Pollution) Act

The Merchant Shipping (Oil Pollution) Act (MSA)¹⁵² gives effect to the International Convention on Civil Liability for Oil Pollution Damage, signed in Brussels in 1969. It imposes liability on the owner of a ship for damage caused by the discharge or escape of oil from the ship, including the cost of measures taken to reduce the damage.¹⁵³ Liability is limited in accordance with the relevant MSA provisions.¹⁵⁴

The MSA also specifies that ships entering or leaving any Singapore port or its territorial waters (or, in the case of a Singapore ship, any port in any country) must demonstrate that the ship is the beneficiary of prescribed insurance against liability for pollution.¹⁵⁵

145. S 63/91.

146. S 60/91.

147. Prevention of Pollution by Oil Regs. 1991 (S 58/91), reg. 9.

148. *Id.* reg. 10.

149. *See, e.g.*, Control of Pollution by Noxious Liquid Substances in Bulk Regs. 1991 (S 59/91), regs. 9, 10.

150. S 61/91.

151. PPSA § 26.

152. Merchant Shipping (Oil Pollution) Act (MSA), CAP. 180.

153. *Id.* § 3.

154. *Id.* §§ 5, 6.

155. *Id.* § 13.

The respective scopes of application of the MSA and the Prevention of Pollution of the Sea Act (PPSA) were addressed in a relatively recent Singapore court case.¹⁵⁶ The case concerned the interpretation of a predecessor of the PPSA, which adopted the International Convention for the Prevention of Pollution of the Sea by Oil (1954).¹⁵⁷ The case also considered a predecessor of the MSA, the Merchant Shipping (Oil Pollution) Act 1981.

The case arose from a compensation claim brought by the Port of Singapore Authority and others against the owner of a grounded motor oil tanker that was not carrying oil in bulk. The ship owner argued that its liability arose under the Merchant Shipping Act of 1981 (MSA) and could therefore be limited. The relevant MSA provisions were similar to current sections 3 and 4 of the MSA.¹⁵⁸ According to section 18 of the MSA, limitations on liability for contamination damage in Singapore caused by the escape of oil, as contained in the Merchant Shipping Act of 1981, will apply in circumstances other than those contemplated in section 3 of the MSA. The relevant provision of the Merchant Shipping Act of 1981 creates a "tonnage limitation" on civil liability in cases where the incident has occurred without the actual or deemed fault or privity of the person seeking the limitation. Since the vessel in question was not carrying a cargo in bulk, the ship owner contended that sections 3 *et seq.* did not apply, but that the limitations of liability under section 18 of the MSA should apply. However, compensation was sought by the defendant, Port of Singapore Authority, under a provision equivalent to section 18 of the PPSA, which imposes liability for the costs of all measures taken by the authority to remove the pollutant and prevent further damage. That provision did not limit a shipowner's liability, but was stated to be inapplicable to circumstances covered by section 3 of the MSA.

The court concluded that the relevant limitation in the MSA applied to oil tankers and *not* to non-oil tankers. The court held that the owner of a motor tanker was fully liable for costs incurred in taking reasonable measures to prevent or reduce oil pollution damage under a provision equivalent to that of section 18 of the

156. See *Ventura Navigation, Inc. v. Port of Singapore Authority & Others*, Admiralty in Personam No. 343 of 1987 [1989] 3 MALAYAN L.J. 349 (High Court, Singapore, May 24, 1989).

157. Successive legislation was passed, the final version of which was the Prevention of Pollution of the Sea Act, CAP. 243. The International Convention for the Prevention of Pollution of the Sea by Oil (1954) was repealed by the PPSA.

158. See *infra* notes 294-99 and accompanying text.

PPSA.¹⁵⁹ Additionally, the court indicated that section 18 of the MSA provided for the limitation of civil liability only and could not be utilized to limit a statutory claim (such as the present claim by the Port of Singapore Authority).

4. *Environmental Regulation Regime — Toxic Industrial Waste*

Toxic industrial waste treatment and disposal is regulated primarily by the Environmental Public Health Act (EPA)¹⁶⁰ and regulations with specific application to toxic industrial waste passed under the EPA. The primary authority responsible for administration of the provisions is the Pollution Control Department (PCD).

The EPA prohibits the disposal of refuse or industrial waste in any place except an authorized public disposal facility.¹⁶¹ The occupier of any workplace where industrial waste is produced is required to store it before disposal "in a proper and efficient manner so as not to create a nuisance or to cause any risk, harm or injury to persons or animals or [where it] is likely to pollute the environment."¹⁶²

The written permission of the Commissioner of Public Health is not generally required to dispose of nontoxic industrial waste. However, the EPA prohibits the bringing of any "toxic" industrial waste to a public disposal facility without the written permission of the Commissioner.¹⁶³ The application for permission must give details of the nature and composition of the toxic industrial waste and residue.¹⁶⁴ The quantity of the waste determines in part the manner in which the PCD will require the disposal to be conducted. For example, the PCD and the Department of Industrial Health require compliance with guidelines that regulate the packaging and dumping of asbestos and other toxic waste into the ground. However, if the Commissioner of Public Health feels that the industrial waste produced in any workplace is in excessive quantities or unduly toxic, he may require the use of different methods of operation, equipment, materials, or substances.¹⁶⁵

The term "waste" includes any substance that constitutes a scrap material, effluent, or surplus substance arising from "any process," and any broken, worn out, or contaminated article or substance.¹⁶⁶ The term "industrial waste" includes any solid, liquid, or gaseous

159. See also *infra* notes 272-99 and accompanying text.

160. Environmental Public Health Act (EPA), CAP. 95.

161. EPA § 24.

162. *Id.* § 25.

163. *Id.* § 29.

164. *Id.*

165. *Id.* § 30.

166. *Id.* § 2.

waste produced in the course of any trade, business, manufacture, or building construction and includes toxic industrial waste.¹⁶⁷ "Toxic industrial waste" is defined as, among other things, any industrial waste that, owing to its nature, composition, or quantity, constitutes a danger to human health or the environment.¹⁶⁸

Substances listed in the Schedule to the Environmental Public Health (Toxic Industrial Waste) Regulations 1988¹⁶⁹ are regarded by the PCD as inclusive, but not exhaustive, of "toxic industrial waste" for purposes of the EPA and regulations. For example, asbestos wastes produced from manufacturing processes utilizing asbestos and cement or receptacles that have contained loose asbestos fiber are identified as "toxic industrial waste." Additionally, poisons listed in the schedule to the Poisons Act are also likely to be considered toxic. The PCD is the ultimate authority that determines whether waste is toxic and whether the EPA should apply in given circumstances. The PCD offers the additional guideline that toxic industrial waste is any material that, if disposed of indiscriminately, could cause damage or an imbalance to the ecosystem, environment, or people.

The 1988 EPA Regulations deal specifically with the disposal and storage of toxic waste.¹⁷⁰ They apply only to the types of toxic industrial waste listed in the Schedule appended to those regulations. Provisions include the following:

— A "generator" of toxic waste must notify the Commissioner of Public Health of any change in the type of toxic industrial waste produced in the premises and the quantity, volume, concentration, or level of waste generated in excess of that prescribed in the second column of the Schedule.¹⁷¹ A "generator" is defined as a person whose act or process produces toxic industrial waste, or whose act first causes toxic industrial waste to become subject to regulation, or the owner or person having charge, management, or control of a source of toxic industrial waste.¹⁷²

167. *Id.*

168. *Id.*

169. S 11/88.

170. See also Environmental Public (Toxic Industrial Waste) (Amendment) Regs. 1989 (S 24/89); Environmental Public Health (Toxic Industrial Waste) (Amendment No. 2) Regs. 1989 (S 197/89) and other amendments).

171. Environmental Public Health (Toxic Industrial Waste) Regs. 1988 (S 11/88), reg. 4.

172. *Id.* reg. 2.

— A generator who transports toxic waste outside the premises where generated must keep a register containing specified particulars about the toxic industrial waste generated.¹⁷³

— The use or storage of toxic industrial waste on premises is prohibited unless onsite disposal facilities are established with the permission of the Commissioner of Public Health, or a toxic industrial waste collector has been engaged to dispose of the waste.¹⁷⁴ The supply of toxic industrial waste to any unlicensed “toxic industrial waste collector” is prohibited.¹⁷⁵ A “toxic industrial waste collector” is any person who receives or accepts toxic industrial waste for storage, reprocessing, usage, treatment, or disposal.

— Regulation 34 sets forth certain requirements for storage of toxic industrial waste.

— The Commissioner may give notice requiring the removal of any toxic industrial waste from premises.¹⁷⁶

— Unless a person has the written approval of the Commissioner, he is prohibited from consigning toxic industrial waste for transfer in an amount exceeding the quantities specified in the Schedule to the regulations. Additionally, the transfer container must be designed and constructed to maintain the waste in accordance with the code of practice approved by the Commissioner.¹⁷⁷

— “Carriers” of toxic industrial waste (including carriers for own account) must comply with certain reporting and other requirements.¹⁷⁸

— The mixing of different types of toxic industrial waste or the mixing of toxic industrial waste with nontoxic industrial waste is prohibited unless the mixing is a process treatment or use of disposal approved by the Commissioner of Public Health.¹⁷⁹

— Regulations 28-32 set forth required hazard warning and labeling procedures and precautions against fire or explosion during the transport of toxic industrial waste.

The following regulations relate to licensing procedures: Environmental Public Health (Toxic Industrial Waste) (Amendment) Regulations 1988,¹⁸⁰ the Environmental Public Health (Toxic Industrial

173. *Id.* reg. 6.

174. *Id.* reg. 8.

175. *Id.* reg. 33(1).

176. *Id.* reg. 37.

177. *Id.* reg. 16.

178. *Id.* regs. 25-27.

179. *Id.* reg. 35.

180. S 305/88.

Waste) (Amendment) Regulations 1989,¹⁸¹ and Environmental Public Health (Toxic Industrial Waste) (Amendment No. 2 Regulations) 1989.¹⁸²

The Water Pollution Control and Drainage Act (WPA) also prohibits the discharge of "toxic substances" into any inland water so as to be likely to give rise to environmental hazards.¹⁸³ A "toxic substance" is defined as any trade effluent, chemical, oil, or other substance that is noxious, injurious, or polluting. The discharge of a toxic substance is deemed to give rise to an environmental hazard if the substance has been discharged in such a manner as to subject persons or animals to a material risk of death, injury, or impairment of health, or as to threaten to pollute (whether on the surface or underground) any inland water.¹⁸⁴

A person is deemed to have discharged a toxic substance into an inland water if he places the substance in a position where it is liable to fall, wash, percolate, or be blown into any water. The fact that the toxic substance is placed in containers will not by itself be taken to exclude any environmental hazard that might be expected to arise if a substance was not in containers.¹⁸⁵

Related matters, including the import, transport, and use of hazardous chemicals, are regulated under the Poisons Act and Poisons (Hazardous Substances) Rules 1986.¹⁸⁶ Additionally, imports are controlled under the Control of Imports and Exports Act,¹⁸⁷ which is administered by the Trade Development Board (TDB). A number of regulations and orders have been passed under that act to prohibit or require licenses for the import of specified products or chemicals. As a matter of policy, the TDB will approve the import of a hazardous chemical only if the PCD does not object to its import.¹⁸⁸

Additionally, from March 1992, only personnel who have passed a designated course of instruction will be permitted to navigate tankers carrying dangerous chemicals and petroleum products controlled by the Petroleum Act and Poisons Act.¹⁸⁹

181. S 24/89.

182. S 197/89 (effective Jan. 15, 1990).

183. Water Pollution Control and Drainage Act (WPA) CAP. 348, § 15(1).

184. *Id.* §§ 15(3), (4)(b).

185. *Id.* § 15(4)(1). *See also* the provisions of the WPA and regulations passed under the EPA, *supra*, which regulate the discharge of general waste and other substances into water courses and drainage systems.

186. *See supra* notes 70-74 and accompanying text.

187. CAP. 56.

188. POLLUTION CONTROL DEPT., *supra* note 90, at 18.

189. *Id.*

5. *Environmental Regulation Regime - Special Working Condition Requirements*

The Factories Act¹⁹⁰ provides that any person who occupies or uses any premises as a factory must register the factory. The occupier will generally be issued a permit (which may be subject to certain conditions) or a certificate of registration of the factory.¹⁹¹

A written application for registration of a factory must be submitted to the Chief Inspector of Factories not less than two months before the operation of the factory. A "factory" means any premises in which:

- (a) persons are employed in manual labor in any process for, or incidental to, any of the following purposes:
 - the making of any article;
 - the altering, repairing, ornamenting, finishing, cleaning, washing, breaking up, or demolition of any article; or
 - the adapting for sale of any article; *and*
- (b) the work is carried on by way of trade over which the employer of persons employed in the premises has the right of access or control.¹⁹²

A factory also expressly includes, whether or not the premises meet the above definition: (1) premises in which the business of sorting articles is carried out preliminary to work carried on in the factory or incidentally to the purposes of the factory; (2) any premises in which the business of washing or filling bottles or containers or packing articles is carried on incidentally to the purposes of any factory; (3) any premises in which mechanical power is used in connection with the making or repair of any article incidental to a business; (4) any workplace in which, with the permission of the owner or occupier, ten or more persons carry on any work that would make the workplace a factory if the persons working therein were in the employment of the owner or occupier; (5) any premises in which articles are made or prepared incidentally to the carrying on of building operations or works of engineering construction, not being premises in which such operations or works are being carried on; (6) any premises used for storage of gas in a gasholder having a storage capacity of 140 cubic meters or more; (7) any premises in which persons are employed in, or in connection with, the generating of electrical energy for supply by way of trade, or for supply for the purpose of any industrial or commercial undertaking or of any public

190. CAP. 104.

191. *Id.* § 9.

192. *Id.* § 6.

building or public institution, or for supply to streets or other public places; (8) any premises in which mechanical power is used for the purposes of, or in connection with, a water supply, and in which persons are regularly employed; and (9) any premises in which building operations or works of engineering construction are being carried on.¹⁹³

The Factories Act also imposes basic obligations on factory occupiers and owners to control the exposure of employees to hazardous work circumstances, processes, and substances. The Factories Act requires (among numerous other obligations):

- a factory to be kept in a clean and sanitary state;
- accumulations of dirt and refuse to be removed daily and the floor of every workroom to be cleaned once a week;
- walls to be painted and cleaned at specified intervals;¹⁹⁴
- adequate ventilation;¹⁹⁵
- adequate lighting be maintained;¹⁹⁶
- elimination of overcrowding that causes risk of injury to the health of persons employed in the factory;¹⁹⁷
- compliance with prescriptions as to the placement and affixation of machinery such as electric generators, motors, lifting machinery, and other electrical installations, the maintenance of machinery, the minimum height of rooms, room space, sanitary conveniences, standards of pressure vessels, pipelines, compressors, provisions specifically applicable to gas plants, and many other provisions regulating the maintenance and working environment of a factory.¹⁹⁸

Numerous other provisions are directed at raising employee safety standards by reducing dust and fumes,¹⁹⁹ controlling poisonous substances,²⁰⁰ providing protective clothing,²⁰¹ reducing noise,²⁰² and protecting against potentially hazardous processes and substances.²⁰³

193. *Id.*

194. *Id.* § 12.

195. *Id.* § 14.

196. *Id.* § 15.

197. A factory is deemed overcrowded if it provides less than 11.5 cubic meters per employee.

198. Factories Act §§ 12-47.

199. *Id.* § 59.

200. *Id.* § 60.

201. *Id.* § 62.

202. *Id.* § 64.

203. *Id.* § 65; *see generally id.* §§ 55-72.

Employers also have common law duties to employees to provide safe working environments, some of which are given expression in the Factories Act.

The Chief Inspector of Factories (under the Ministry of Labour) must be notified of certain accidents occurring on factory premises.²⁰⁴ An occupier must also give written notice to the Chief Inspector of Factories of any change in the nature of the work for which the premises have been registered and of any structural change or any change in the layout of the factory.²⁰⁵

The Chief Inspector of Factories is empowered to make any order to an occupier of a factory to rectify any circumstance creating a risk to safety, health, and welfare of persons employed in the factory by reason of the condition of the factory or the nature of the process or work.²⁰⁶

Regulations passed under the Factories Act expand on certain of its provisions. For example, the Factories (Asbestos) Regulations 1980²⁰⁷ and amendments to those regulations regulate the use of asbestos. Other regulations include the Cleanliness of Wall and Ceilings Order 1986,²⁰⁸ the Factories (persons-in-charge) Regulations 1987,²⁰⁹ the Factories (Industrial Safety Helmets and Footwear Notification) 1987,²¹⁰ the Factories (Medical Examinations) Regulations 1985,²¹¹ and the Factories (Safety Committee) Regulations 1975.²¹²

B. Enforcement of Environmental Laws and Regulations

The Ministry of the Environment, which was formed in the early 1970s, is generally responsible for protecting and improving the environment, although other departments are responsible for the administration and enforcement of particular provisions. It has the responsibility of providing an infrastructure and institutional measures to prevent and control air and water pollution and manage wastes.²¹³

The Pollution Control Department (PCD) was formed in 1986 under the Ministry of Environment specifically to administer and develop controls for pollution control, water pollution, hazardous substances, and toxic waste. It is divided into five divisions: Planning

204. *Id.* § 51.

205. *Id.* § 9(11).

206. *Id.* § 49.

207. S 146/80.

208. S 325/86.

209. S 327/86.

210. S 289/86.

211. S 33/85.

212. S 262/75.

213. P. Jothieswaran, *supra* note 28, at 2.

and Development, Hazardous Substances & Toxic Wastes, Administration & Finance, PCD Laboratory, and Enforcement. Legislation specifically administered and enforced by the PCD includes the Trade Effluent Regulations 1976,²¹⁴ passed under the Water Pollution Control and Drainage Act (WPA). The PCD also administers and enforces the Clean Air (Standards) (Amendments) Regulations 1978²¹⁵ passed under the Clean Air Act, the Environmental Public Health (Toxic Industrial Waste) Regulations 1988, and the Poisons (Hazardous Substances) Rules 1986.²¹⁶

Provisions of the relevant legislation which create and define offences and penalties are discussed in some detail below.

In addition to the statutory penalties for breach of the relevant legislation, common law rules may provide the basis for civil actions. For example, in addition to the possibility of action based on negligence and other tortious acts, an action for private nuisance on the basis of interference with a person's use and enjoyment of land may be available. The *Rylands v. Fletcher* common law rules of liability may also be available to an injured party, depending on the circumstances.²¹⁷ Additionally, there is the possibility of founding a civil action on the basis of statutory breach.²¹⁸

Very little case law in Singapore considers any provision of the legislation referred to above. Moreover, there appears to be little case law in Singapore dealing specifically with civil actions founded on torts that have particular environmental impact. Thus, the most significant and perhaps the only manner of policing environmentally damaging activities is through the criminal enforcement machinery contained in the legislation referred to above. Generally, any breaches of the legislation are considered to be offences, which are dealt with by the criminal enforcement machinery. One exception is the MSA, although breach of some of its provisions are considered to

214. See *infra* notes 278-79 and accompanying text.

215. See *infra* notes 257-60 and accompanying text.

216. See *infra* note 310 and accompanying text. See also POLLUTION CONTROL DEPT., *supra* note 90, at 24-25).

217. *Rylands v. Fletcher*, L.R. 3 H.L. 330 (1868). This rule provides that the person who brings on his lands and collects there anything likely to do mischief if it escapes must keep it in at his peril, and if he does not do so, he is *prima facie* responsible for its escape.

218. See CLERK & LINDSELL on TORTS at ¶¶ 1401-1421 (16th ed., Sweet & Maxwell, London, 1989). Elements of such actions include: (a) the injury the plaintiff has suffered is within the ambit of the statute; (b) the statutory duty imposes a liability to civil action; (c) the statutory duty has not been fulfilled; and (d) the breach of duty has caused the injury.

be criminally actionable. Persons and companies are in fact prosecuted each year for offences committed under the legislation.²¹⁹

1. Land

a. The Environmental Public Health Act

The following are examples of offences and penalties specified in the Environmental Public Health Act (EPA)²²⁰ and its regulations.

Any person who contravenes a provision of the EPA may (where no penalty is expressly provided) be liable for a fine of up to S\$2000 and, in the case of a second and subsequent conviction, for a fine of up to S\$4000, imprisonment for up to three months, or both.²²¹ Any penalty under the Act carries with it liability for damage to government property arising from the offence.²²² There are no penalty provisions specifically applicable to the disposal and treatment of industrial waste.

When any notice or order under the EPA or its regulations requiring work to be carried out by an owner or occupier is not complied with, the owner or occupier may (when no fine is specifically provided for) be liable for a fine of up to S\$2000.²²³ Alternatively, the Commissioner of Public Health may execute the works and recover expenses reasonably incurred in so doing.²²⁴

The Commissioner of Public Health may compound any offence under the EPA or its regulations by collecting from a person reasonably suspected of having committed the offence up to S\$500.²²⁵

A person who drops, scatters, or throws dirt, sand, etc., in any public place,²²⁶ may be liable to an order for the forfeiture of the vehicle used in committing the offence. Any person who, during the alteration, construction, or demolition of a building, fails to take reasonable precautions to prevent danger to persons using a public place, or who spills dirt, sand, or gravel in a public place, is also guilty of an offence.²²⁷ A person who commits an offence under sections 19 and 20 of the EPA may be arrested without warrant and liable for a fine of up to S\$1000 if convicted and, in the case of a second or subsequent conviction, for a fine of up to S\$2000.²²⁸ Offenders are also liable for cleanup costs. Offenders who fail to appear

219. POLLUTION CONTROL DEPT., *supra* note 90.

220. Environmental Public Health Act (EPA), CAP. 95.

221. *Id.* § 108.

222. *Id.* § 91.

223. *Id.* § 94.

224. *Id.* § 94(3).

225. *Id.* § 109.

226. *Id.* § 20(1).

227. *Id.* §§ 19-20.

228. *Id.* § 21.

on a relevant charge may be liable for a penalty of up to S\$2000 or a prison term of up to two months.²²⁹

Maintaining dangerous premises, construction areas, tanks, receptacles, pools, gutters, or watercourses, or allowing the emission of dust, fumes, vapors, gases, heat, or smells is a "nuisance" dealt with summarily under the EPA.²³⁰

The Regulations passed under the EPA also contain offence and penalty provisions. The EPA 1988 Regulations provide that a person who contravenes any EPA provisions may be liable for a fine of up to S\$2000 and for a further fine of up to S\$100 for each day or part thereof during which the offence continues after conviction.²³¹

A party found guilty of contravening the Environmental Public Health (General Waste Collection) Regulations 1989 may be liable for a fine of up to S\$20,000 and (in the case of a continuing offence) for a further fine of up to S\$100 for every day during which the offence continues after conviction.²³²

b. Petroleum Act

The occupier of any place in which dangerous petroleum is kept in contravention of section 19 of the Petroleum Act²³³ or in contravention of the conditions of a license may be liable on conviction for a fine of up to S\$500 for every day during which the dangerous petroleum is kept.²³⁴

The occupier of any place in which petroleum is kept in contravention of section 18 of the Petroleum Act²³⁵ or in contravention of the conditions of a license may be liable for a fine of up to S\$200 for every day during which the petroleum is kept.²³⁶

The master of a vessel carrying petroleum or dangerous petroleum, and other specified individuals who fail to notify the Port

229. *Id.* § 21(7).

230. *Id.* §§ 43-44.

231. Environmental Public Health (Toxic Industrial Waste) Regs. (S 11/88), reg. 41.

232. Environmental Public Health (General Waste Collection) Regs. 1989, reg. 18.

233. CAP. 229. Section 19 prohibits the storage of specified volumes of dangerous petroleum without a license.

234. Petroleum Act § 19(2).

235. Section 18 prohibits altogether the storage of petroleum exceeding a specified amount.

236. Petroleum Act § 18(2).

Master of specified particulars relating to the petroleum, may be liable for a fine of up to S\$500.²³⁷ A person who brings a vessel carrying dangerous petroleum into a Singapore port without the Port Master's permission may be liable for a fine of up to S\$2000 and forfeiture of the dangerous petroleum.²³⁸

Any person who lands petroleum or dangerous petroleum without a permit may be liable for a fine of up to S\$500.²³⁹ Any person who transports dangerous petroleum in a larger quantity than eighteen liters within the port limits without a permit may be liable for up to S\$1000.²⁴⁰ Any person who transports dangerous petroleum in certain amounts after the designated times may be liable for a penalty of up to S\$500.²⁴¹

Failure to load or carry petroleum or dangerous petroleum in breach of the conditions and restrictions of the Petroleum Act and rules under that act could cause the owner, charterer, master, and other designated persons to be liable for a fine of up to S\$4000.²⁴²

A person who commits a breach of any of the provisions of the Petroleum Act for which no penalty is specifically provided will be liable on conviction for a fine of up to S\$2000.²⁴³

Rules made under the Petroleum Act impose fines for any breach of up to S\$2000 for each offence and, in the case of a continuing offence, S\$100 per day.²⁴⁴

c. Poisons Act and Rules

Any person who contravenes the Poisons Act²⁴⁵ may be liable for a fine of up to S\$10,000, imprisonment for up to two years, or both. The poison used to commit the offence may be forfeited.²⁴⁶ Offences under any rules passed under the Poisons Act may attract a fine of up to S\$5000, imprisonment for up to two years, or both.²⁴⁷

d. Planning and Building Control Legislation

A person who contravenes Planning Act²⁴⁸ requirements to obtain development approval may be liable for a fine of up to S\$3000 and a further fine of up to S\$100 for every day during which the offence

237. *Id.* § 6.

238. *Id.* § 5(4).

239. *Id.* § 7.

240. *Id.* § 13.

241. *Id.* § 14(3).

242. *Id.* § 11.

243. *Id.* § 29.

244. *Id.* § 28(3).

245. CAP. 234.

246. Poisons Act § 16.

247. *Id.* § 20(2).

248. CAP. 232.

continues after conviction.²⁴⁹ Similar penalties apply to the carrying on of works in a conservation area without the written permission of the relevant authority.²⁵⁰ In specified circumstances, a tax known as a development charge may be levied.²⁵¹

Persons who fail to obtain the Building Authority's approval when necessary for the plans or operation of building works may be liable for a fine up to S\$50,000, imprisonment for up to one year, or both. A further fine of up to S\$1000 will be imposed for each day during which the offence continues after conviction.²⁵² Persons who fail to comply with any term, condition, or approval of plans or building works may be liable to a fine of up to S\$10,000, imprisonment for up to six months, or both. A further fine of up to S\$500 will be imposed for each day during which the offence continues after conviction.²⁵³

Regular inspection is carried out by government authorities in factories and other industrial developments to ensure that pollution-control equipment is operated and maintained in accordance with the prescribed standards and that the business otherwise complies with relevant pollution-control standards.²⁵⁴ The Environmental Public Health Act (EPA) confers wide investigative powers on government agents.²⁵⁵ In fact, 65,167 inspections or surveillances were carried out at industrial premises in 1990 by the Pollution Control Department (PCD).²⁵⁶

2. Air

The Clean Air Act (CA)²⁵⁷ provides that a person who uses combustible materials or fuel-burning equipment prohibited by the Minister of the Environment²⁵⁸ is guilty of an offence and liable for up to S\$10,000. In the case of a continuing offence, a fine of up to S\$500 will be imposed for every day during which the offence continues after conviction.²⁵⁹ An occupier of any industrial oil-trade premises who fails to cease operation of that industry or of fuel-burning

249. Planning Act § 10.

250. *Id.* § 13.

251. *Id.* § 32.

252. Building Control Act, CAP. 29, § 5(3).

253. *Id.* § 18(1).

254. Loh Ah Tuan, *supra* note 92, at 2, 4.

255. Environmental Public Health Act (EPA), CAP. 95, §§ 87 et seq.

256. See POLLUTION CONTROL DEPT., *supra* note 90, at 3, 26. See also Loh Ah Tuan, *supra* note 92, at 2, 4.

257. CAP. 45.

258. *Id.* § 15.

259. *Id.* § 24.

equipment as ordered by the Minister may be liable for a penalty of up to S\$10,000, imprisonment of up to three months, or both.

The penalty for breach of regulations passed under the CA is a maximum of S\$5000 and, in the case of a continuing breach of the regulations, a penalty not exceeding S\$200 for every day during which the offence continues after conviction.²⁶⁰

The Minister of Trade and Industry (Control of Importation, Exportation) may provide for the absolute or conditional prohibition of any goods.²⁶¹ The orders provide that persons who contravene them may be liable for a fine of up to S\$10,000 or three times the value of the goods in respect of which the offence was committed, or for a second or subsequent offence, S\$20,000 or four times the value of the goods. A prison term of between twelve months and (for a second or subsequent offence) two years may also be imposed.²⁶²

Any person who makes a false declaration on any certificate, undertaking, or document may be liable for a penalty of up to S\$10,000, imprisonment for up to twelve months, or both.²⁶³ There is also a provision for the imposition of penalties of up to S\$2000, imprisonment of up to six months, or both.²⁶⁴

Persons who violate the Control of Imports and Exports (Montreal Protocol) (Chlorofluorocarbons (CFC's)) Order (1988),²⁶⁵ with respect to the import of "controlled substances" (including CFC's) specified by the Control of Imports and Exports Act or orders passed under that act, may be liable for a fine of up to S\$10,000, imprisonment for up to twelve months, or both. In the case of a second or subsequent offence, persons may be liable for a fine of up to S\$20,000, imprisonment for up to two years, or both may be imposed.²⁶⁶

Penalties for breach of the Road Traffic Act²⁶⁷ and licensing regulations range between maximum fines of S\$500 and S\$3000 and up to six months' imprisonment, or both.²⁶⁸

In 1990, the Pollution Control Department (PCD) conducted 793 source testings of gaseous emission, fuel samplings, and smoke observations. In 0.6% of the tests conducted, the factory or industry failed to meet the standards. Offenders deemed to have grossly violated the standards were prosecuted.²⁶⁹ World Health Organization

260. *Id.* § 26.

261. Control of Imports and Exports Act, CAP. 5b, § 3.

262. *Id.*

263. *Id.* § 23.

264. *Id.* §§ 24(4); 25(2).

265. S 425/89.

266. Reg. 7.

267. CAP. 276.

268. *Id.*

269. POLLUTION CONTROL DEPT., *supra* note 90, at 11, 26.

Standards and the air-quality standards of the United States Environmental Protection Agency are used as guidelines to assess the quality of ambient air in Singapore.²⁷⁰

3. Water

a. Water Pollution Control and Drainage Act

Offences and penalties under the Water Pollution Control and Drainage Act (WPA)²⁷¹ include the following:

— A person who fails to comply with an order to erect or remove a building or other structure, or to execute any other work under the WPA, may be liable for a fine of up to S\$200 for every day of noncompliance with the order. The person in default may also be required to pay the cost of executing the works required.²⁷²

— The occupier of premises is liable for the discharge of any trade effluent into public sewers without the required consent and for a fine of up to S\$5000.²⁷³ A person who fails to notify the Director of Water Pollution Control and Drainage of the unauthorized passage of any trade effluent into a public sewage system may be liable for a fine of up to \$500.²⁷⁴

— An occupier who fails to comply with an order to cease the discharge of trade effluent or to cease or amend processes or works may be liable for a fine of up to S\$10,000, imprisonment of up to three months, or both. The occupier is also liable for a fine of up to S\$1000 for every day during which the offence continues after conviction.²⁷⁵

— Where a person fails to comply with a notice or order under the WPA or any regulations requiring any act to be done, that person will (where no fine is expressly provided for) be liable for a fine of up to S\$5000.²⁷⁶

— Any person who contravenes any provisions of the WPA or regulations for which no penalties are expressed may be liable for a fine of up to S\$5000 or imprisonment for up to three

270. *Id.* at 4. See also *id.* at 5-8 for report on levels of particulate matter in the ambient air and the results of air analysis performed in Singapore.

271. CAP. 348.

272. *Id.* § 33(3).

273. *Id.* § 31(5).

274. *Id.* § 31(6).

275. *Id.* § 38(2).

276. *Id.* § 59.

months. In the case of a continuing offence, a further fine of up to S\$100 will be imposed for every day during which the offence continues after conviction.²⁷⁷

Regulations passed under the WPA impose penalties of between S\$1000 and S\$5000 for offences, plus S\$100 for each day in which the violation continues, imprisonment for up to six months, or both.

The Pollution Control Department (PCD) administers and enforces the WPA and the Trade Effluent Regulations 1976.²⁷⁸ In addition to new factories, seventy-one existing factories generating acidic effluent and alkaline wastes were required to install continuous monitoring instruments to monitor the pH of the effluent discharged. Nineteen factories were prosecuted in 1990 for discharging acidic effluent into sewers.²⁷⁹

b. Prevention of Pollution of the Sea Act and Merchant Shipping Act

Offences and penalties under the Prevention of Pollution of the Sea Act (PPSA)²⁸⁰ include the following:

— Where any oil or oily mixture is discharged into Singapore waters from any place on land or from apparatus used for transferring oil to or from any ship, an occupier of the relevant place on land or a person in charge of the apparatus, may be liable for a fine of between S\$500 and S\$500,000, imprisonment for up to two years, or both.²⁸¹

— A person who deposits any oil, oily mixture, refuse, garbage, plastics, waste matter, noxious liquid substance, or other pollutant into Singapore waters may be liable for a fine of up to S\$10,000, imprisonment for up to two years, or both.²⁸²

— The master, owner, and agent of a ship from which refuse, garbage, trade effluent, or other pollutants are discharged into Singapore waters may be liable for a fine of up to S\$10,000, imprisonment for up to two years, or both.²⁸³ Where that discharge is oil or an oily mixture, the penalty could increase to a S\$500,000 fine (with a minimum S\$500 fine), a maximum prison term of two years, or both.²⁸⁴

277. *Id.* § 63.

278. S 122/76.

279. *See* POLLUTION CONTROL DEPT., *supra* note 90, at 14, 15, 26.

280. CAP. 243.

281. *Id.* § 3.

282. *Id.* § 4.

283. *Id.* §§ 6, 10.

284. *Id.* § 7; *see also* § 8.

— The failure to report an actual or probable discharge into Singapore waters of an oily mixture, noxious liquid substance, or mixture containing such substances by an occupier of a place or the relevant person in charge of apparatus may attract liability for a fine of up to S\$5000.²⁸⁵

Penalties include the detention of any vessel which discharges pollutants into Singapore waters, including waters outside Singapore waters that drift or flow into Singapore waters,²⁸⁶ or which contravenes the requirements of the PPSA or any regulations.²⁸⁷ The Director of the Marine Department or the Port Master can also deny a ship entry to the port if it does not comply with the PPSA or the regulations.²⁸⁸

Additionally, when any oil, oil mixture, or noxious liquid substance is discharged from a ship into Singapore waters or into the sea outside Singapore waters and the pollutant subsequently flows into Singapore waters, the owner of the ship will be liable for the costs of any subsequent remedial measures reasonably taken by the appointed authority.²⁸⁹

The Regulations also prescribe penalties for offences. Offences punishable under specified provisions of the PPSA such as sections 5, 6(1), 9, 10(1), 11(6), 14(1), 14(2), 14(3), 15(4), 16, 22(3) and 24(1), regulation 11 of the Prevention of Pollution by Oil Regulations,²⁹⁰ regulations 8(1), (2) and 9(2) of the Reception Facilities Regulations 1991²⁹¹ and the Detergents and Equipment for Pollution Reduction Regulations 1991²⁹² may be compounded for a sum of up to S\$2000 under the Prevention of Pollution of the Sea (Composition of Offences) Regulations 1991.²⁹³

The regulations also contain penalty provisions, breach of which, depending on the particular regulation, attracts a maximum fine of S\$5000 to S\$10,000 or imprisonment for one to two years.

Subject to expressed limitations, the Merchant Shipping (Oil Pollution) Act (MSA)²⁹⁴ provides that a shipowner has liability for any

285. *Id.* § 16.

286. *Id.* § 23.

287. *Id.* § 23.

288. *Id.* § 23.

289. *Id.* § 18(1).

290. S 58/91.

291. S 61/91.

292. S 62/91.

293. S 63/91.

294. Merchant Shipping (Oil Pollution) Act (MSA), CAP. 180.

damage caused in Singapore by contamination resulting from the discharge or escape of any oil. He is also liable for the cost of any measures reasonably taken after the discharge to prevent or reduce damage and damage caused in Singapore by the measures taken.²⁹⁵ Although the MSA's primary objective is to impose civil liability for oil pollution damage and the costs of measures for removing or reducing the pollutants, the MSA also contains the following offence provisions:

— The master or owner of a ship that enters or leaves or attempts to enter or leave a port or territorial waters without a certificate evidencing compulsory insurance against liability for pollution may be liable for a fine of up to S\$200,000.²⁹⁶

— Where the Singapore Port Authority or the Director of the Marine Department has reasonable cause to believe that oil has been discharged or has escaped from any ship, that the owner of the ship has incurred a liability for compensation or damages under the MSA, and that the damage only affects the area of Singapore, the ship may be detained until satisfactory security is deposited for that damage.²⁹⁷ If a ship is detained under the MSA and the ship proceeds to sea prior to its release, the master and owner may be liable for a fine of up to S\$50,000 or imprisonment for up to two years.²⁹⁸ A person may also be arrested without warrant for any offence he is reasonably believed to have committed.²⁹⁹

4. Toxic Waste

The Water Pollution Control and Drainage Act (WPA)³⁰⁰ provides that every person who discharges or permits to be discharged into any inland water any "toxic substance" likely to give rise to environmental hazards is guilty of an offence and liable, on conviction for a first offence, for a fine of up to S\$10,000, imprisonment for up to six months, or both. A person committing a second or subsequent offence is liable for imprisonment for a term of not less than one month and not more than one year and a fine of up to S\$20,000.³⁰¹

Where a person has been convicted of a third offence for the unauthorized discharge of toxic waste, the Minister of the Environment

295. *Id.* § 3. See also *supra* notes 152-59 and accompanying text.

296. MSA § 23(6).

297. *Id.* § 20(1).

298. *Id.* § 20(2).

299. *Id.* § 21.

300. CAP. 348.

301. *Id.* § 15(1).

may direct that person to cease indefinitely from the operation causing discharge.³⁰²

Any person who contravenes any of the provisions of the Environmental Public Health Act (EPA)³⁰³ may (where no penalty is expressly provided) be liable for a fine of up to S\$2000, and in the case of a second and subsequent conviction, for a fine of up to S\$4000, imprisonment for up to three months, or both.³⁰⁴ Breach of EPA provisions requiring the written permission of the Commissioner of Public Health for the disposal of toxic industrial waste may attract liability under this provision. Failure to comply with a notice from the Commissioner of Public Health to alter the method of operation or process used, to alter devices, to use other materials, or to take such other steps as may be directed to reduce the quantity or toxicity of waste, may attract a penalty of up to S\$2000.³⁰⁵ A person who incurs any penalty under the Act will also be liable for any damage caused to government property³⁰⁶ and for the costs of executing works pursuant to a notice if the person fails to comply.³⁰⁷

Any person who contravenes the 1988 EPA Regulations may be liable for a fine of up to S\$2000 and for a further fine of up to S\$100 for every day during which the offence continues after conviction.³⁰⁸

The Pollution Control Department (PCD) administers legislation dealing with the import, transport, storage, sale, and use of hazardous substances. The PCD frequently conducts ad hoc road checks to ensure compliance with conditions imposed on the transport, packaging, route, and transport time of hazardous substances exceeding quantities specified under the Poisons (Hazardous Substances) Rules.³⁰⁹ It also makes spot checks of factories and other industrial locations. Factories generating acidic or alkaline wastes are required to install monitoring instruments.³¹⁰

302. *Id.* § 15(2).

303. CAP. 95.

304. *Id.* § 108.

305. *Id.* § 94.

306. *Id.* § 91.

307. *Id.* § 94(3).

308. Environmental Public Health (Toxic Industrial Waste) Regs. (S 11/88), reg.

41.

309. S 322/86.

310. See also POLLUTION CONTROL DEPT., *supra* note 90, at 15, 17.

5. *Special Working Condition Requirements*

The Ministry of Labour and various subdepartments, such as the Factory Registration Safety and Accidents section, have responsibility for administering the provisions of the Factories Act³¹¹ dealing with workplace standards and safety. Fire safety aspects of the Factories Act are administered by the Fire Safety Bureau of the Ministry of Home Affairs. The Factories Act contains (among others) the following offence and punitive provisions:

— Any person who occupies or uses any premises as an unregistered factory is guilty of an offence and liable on conviction for a fine of up to S\$5000, imprisonment for up to six months, or both. In the case of a continuing offence, the person is subject to a fine of up to S\$500, imprisonment for seven days, or both for every day during which the offence continues after conviction.³¹²

— A person who fails to give the prescribed notice of a change in the nature of the operations for which the premises have been registered, or of any structural change or change in the layout of the factory, may be liable for a fine of up to S\$3000.³¹³

— Any person who sells, lets on hire, or acts as agent of the seller or hirer of any machine driven by mechanical power for use in a factory in Singapore that does not comply with the requirements of the Factories Act³¹⁴ may be liable for a fine of up to S\$5000.³¹⁵

IV. FINAL ANALYSIS — PERCEIVED SUCCESSES AND DEFICIENCIES OF SINGAPORE'S ENVIRONMENTAL LEGAL REGIME

Industrial and trade premises are routinely checked for compliance with air and emission standards. The Pollution Control Department (PCD) also conducts frequent inspections to ensure compliance with effluent treatment and disposal standards. The PCD and its subdepartments regularly monitor air and inland and coastal waters to assess the adequacy of control programs.³¹⁶

Government policy statements and press releases reflect the view that pollution prevention measures, including enforcement and monitoring policies, have achieved success in protecting the environment. The PCD has assessed the quality of inland waters as good and has

311. CAP. 104.

312. *Id.* § 9(1).

313. *Id.* § 9(11).

314. *Id.* § 25 (Section 25 sets forth the requirements of the Factories Act relative to machines driven by mechanical power).

315. *Id.* § 25(2).

316. P. Jothieswaran, *supra* note 28, at 4.

concluded that coastal waters meet standards for recreational use. According to the PCD, air pollution in Singapore is also well under control and within internationally accepted standards, and air pollution has in fact been reduced to below 1986 levels.³¹⁷ Singapore also boasts a considerable sewage and refuse disposal and treatment infrastructure.³¹⁸

There has been highly publicized government awareness of the need for environment protection (which one writer has coined a "new obsession"). That awareness, which has also been manifested in intensive publicity campaigns such as the "green campaign" to educate industries and the general public, has become particularly acute in 1990 and 1991. A National Council on the Environment was set up in November 1990 with the objective of transforming Singapore into "an island nation inhabited by an environmentally conscious people with an environmentally friendly lifestyle amid clean, green, and healthy surroundings".³¹⁹

Singapore is a significant oil refinery and petrochemical center, with most refineries located on offshore islands adjacent to Singapore proper. It is also a site for other industries which produce significant amounts of trade effluent and toxic waste. Government departments responsible for development and building approval and control processes actively encourage the placement of petrochemical and waste-generating industries in industrial estates. As can be expected, industry has also been the target of private and organizational marketing and publicity efforts propounding the adoption of more sophisticated oil spill contingency plans, geographical information systems recording the scope and location of fishing areas, migratory bird routes, coral enclaves, and similar matters.³²⁰

The author is aware that a number of European and other firms that sought to sell current, more advanced, state-of-the-art pollution-control equipment in use by companies in oil and gas industries in the North Sea to the oil and gas development sectors (including refineries) in Singapore and other areas in the region met with limited success in 1989. On balance, however, there appears to have been a

317. POLLUTION CONTROL DEPT., *supra* note 90, at 10.

318. P. Jothieswaran, *supra* note 28, at 1, 4, 5; *see also* POLLUTION CONTROL DEPT., *supra* note 90, at 9.

319. *Singapore Changes How People Think*, *supra* note 120, at 200.

320. *See* Conference Proceedings, 4th ASEAN Council on Petroleum, Nov. 14-16, 1989, and, in particular, papers presented on "Environment & Training" subtopics.

positive response to the "green campaign" from the public and industry. The Singapore Chemical Industry Council (SCIC) is, according to one report,³²¹ propagating a "Responsible Care" program with the objective of educating industries on the safe treatment of hazardous waste. This type of program was apparently initiated in North America. Additionally, several major oil companies are reputed to be enhancing environmental protection schemes. British Petroleum, Mobil Oil, Esso, and Shell have assisted the Ministry of Environment in producing educational literature on protecting the environment. The author is also aware that some U.S. firms require Singapore-based operations to reflect the minimum standards applicable to their industrial sites in the United States, even if this may impose higher standards on Singapore operations than required by Singapore law. A further indicator of the success of the industry-directed "green campaign" is a report that certain firms are totally eliminating the use of chlorofluorocarbons in their manufacturing process. Du Pont is purportedly investing \$40 million in environmental protection facilities,³²² mainly to cover the cost of building environmentally friendly incinerators to transform hazardous organic waste into harmless ash. There are indicators that the government will give industry incentives to increase investment in environmental control devices, which are not necessarily required by law. The specific nature of those incentives remains to be seen.

The government also projects an active interest at regional and international levels in achieving pollution control and environmental protection and conservation.³²³ On January 5, 1989, Singapore acceded to the Vienna Convention of the Ozone Layer and the Montreal Protocol on Substances that Deplete the Ozone Layer. The government's intent is to reduce the consumption of ozone-depleting substances to 1987 levels and then further to 80% and 50% of 1987 levels by 1993 and 1998, respectively.³²⁴

However, there would seem to be some matters for concern, notwithstanding the extensive publicity campaigns and positive views on the success and capabilities of the pollution and environmental-control regime. The penalties for contravention of environmental-protection legislation such as the EPA, the Clean Air Act, the WPA, and other legislation referred to above, appear to be too low to create maximum deterrence — certainly by United States standards. The

321. *Singapore Changes How People Think*, *supra* note 120, at 206-07.

322. *Id.* at 201.

323. See Ministry of Environment, Second Meeting of ASEAN Seminar on the Environment (press release June 19, 1991); see also Ministry of Environment, *World Environment Day*, (press release June 5, 1991); see also POLLUTION CONTROL DEPT., *supra* note 90, at 22-23.

324. MINISTRY OF COMMUNICATIONS AND INFORMATION, *supra* note 1, at 197-98.

government has not, to the knowledge of the author, publicized or manifested any plans to increase penalties, or commented on its perception of the adequacy of the penalties.

Additionally, the effectiveness of legislation such as the PPSA and MSA is self-limiting. Liability for measures taken to reduce the contaminating effects of pollution by oil tankers (and, accordingly, the deterrence factor) may be substantially reduced by the limitations set forth in the MSA.

Furthermore, Singapore's environmental protection scheme is limited in scope to its territory, air space, and territorial sea. These are relatively small by any standards. Although it has banned ozone-depleting products and taken other measures to combat pollution of its territorial sea, the efficacy of these measures is naturally limited. For instance, given its size and location, Singapore is vulnerable to pollution that may have been caused by the discharge of a pollutant into the sea outside its territorial waters. The PPSA technically covers cases where oil or noxious liquid substances are discharged from a ship into Singapore waters or into any part of the sea outside Singapore waters when the oil or other mixture subsequently flows into Singapore waters. The owner or other responsible person may be liable for the costs of measures reasonably taken to remove that substance and other offences specified in the PPSA. However, even assuming that difficulties of proof of source were resolved, provisions of the PPSA can only be effectively enforced where the authorities acquire physical jurisdiction and control over the offender.

Notwithstanding the obvious limitations, Singapore's status as one of the largest ports in the world and the reputation of the Singapore Port Authority and other government authorities for efficiency and effective policing provide Singapore with the capability and potential for enforcing its own water-pollution control standards and those of the international community reflected in conventions such as MARPOL 73/78.

The critical issue is whether the standards and the penalties for violation of those standards, including those contained in other legislation mentioned above, are high enough. Perhaps the answer is that many of the standards are the results of concerted efforts at an international level to obtain minimum worldwide standards for pollution control³²⁵ and represent, at least for the moment, the best balance between economic and environmental conservation objectives.

325. *I.e.*, MARPOL 78/78, the International Convention on Civil Liability for Oil Pollution Damage (signed in Brussels in 1969), and Protocol of 1976.

In the final analysis, it must be conceded that Singapore has made significant efforts to protect the environment, control pollution-generating activities, and to dictate environment conservation to both industry and the general public as a critical objective in the course of continuing industrialization. On balance, the means and the results are positive.