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## Environmental Law in Mexico

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## Environmental Law in Mexico

### Keywords

Environmental Law, Comparative Law, Organizations, United Nations, Industry

# STUDENT COMMENT

## Environmental Law in Mexico\*

Today, Mexico faces the challenge of economic growth and development to satisfy its internal economic needs as well as to become an actor in the international market. Accompanying this drive to develop are a variety of environmental impacts. Developing solutions to address Mexico's environmental issues is one of the major endeavors confronting the Mexican government, both presently and prospectively. Aside from the threat of natural catastrophes, such as earthquakes in the central and southern regions, Mexico is troubled with scarce and polluted water resources in the north, poor water quality in the central and lower south-east regions, deforestation and widespread erosion.<sup>1</sup> Significant air pollution problems exist in major cities, such as Mexico City, as well as in urban developments along the U.S./Mexico border.<sup>2</sup> The future of the Mexican economy and the welfare of the Mexican people, depends on developing solutions to Mexico's environmental problems.

This report provides a summary and analysis of the current environmental regimes existing in Mexico. It also provides a discussion of some

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\* Author's Note: Since the completion of this report, the Mexican Congress, in May, 1992, passed new legislation reducing the role of the federal environmental authorities. The legislation transformed the Secretariat of Urban Development and Ecology (SEDUE) into the Secretariat of Social Development (SEDESOL). With the transformation of SEDUE into SEDESOL under the new legislation, local authorities have greater discretion in interpreting and applying Mexico's environmental regulations. In addition, the new legislation created the National Institute of Ecology (INECO), which is directed to define federal environmental policy, set national ecological norms and conduct research. The Federal Attorney General for Environmental Protection is now charged with the enforcement of federal standards. Technical norms interpreting and applying the new environmental management and enforcement regime are pending. *Environmental Law; Building and Related Permits*, BUS. INT'L; INVESTING, LICENSING & TRADING, Oct. 5, 1992, available in LEXIS, North/South America, Mexico; *Mexico Localizes Environmental Enforcement*, BUS. INT'L; INVESTING, LICENSING & TRADING, Oct. 5, 1992, available in LEXIS, North/South America, Mexico; see *SEDUE Re-Emerges Under SEDESOL*, BUSINESS MEXICO, Sept. 1992, available in LEXIS, North/South America, Mexico.

1. U.S. CENTRAL INTELLIGENCE AGENCY, THE WORLD FACT BOOK, MEXICO, July, 1991 [hereinafter THE WORLD FACT BOOK].

2. *Id.*

of the major political efforts and legal instruments, which exist to help further Mexico's environmental management scheme.

## I. OVERVIEW

The Mexican legal system is a mixture of constitutional theory, modeled after the United States, and civil law traditions.<sup>3</sup> The constitution dates back to February 16, 1917. In Mexico, both federal and state governments promulgate laws that are subject to judicial review. Nationally, there are sixty-eight district courts and a series of appellate courts culminating with a supreme court. In the international arena, Mexico accepts the compulsory jurisdiction of the International Court of Justice with reservations.<sup>4</sup>

### A. Political Structure

Mexico is a federal republic, operating under a centralized government.<sup>5</sup> There are thirty-one states and one federal district.<sup>6</sup> Mexico has a presidential form of government.<sup>7</sup> The president is elected for six-year terms and has the power to appoint a cabinet.<sup>8</sup> The presidential cabinet is comprised of ministers who control various national ministries. The following ministries relate to environmental affairs: 1) agrarian reform, 2) agriculture and hydraulic resources, 3) energy and mines industry, 4) fisheries, 5) health, and 6) urban development and ecology.<sup>9</sup>

The national legislature is comprised of a bicameral Congress.<sup>10</sup> The Senate is the upper chamber, while the lower chamber is known as the Chamber of Deputies.<sup>11</sup> Sixty-four Senate members, two from each state

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3. *See id.*

4. *Id.*

5. *Id.*

6. *Id.* The names of the thirty-one states, along with the federal district are: Aguascalientes, Baja California, Baja California Sur, Campeche, Chiapas, Chihuahua, Coahuila, Colima, Distrito Federal, Durango, Guanajuato, Guerrero, Hidalgo, Jalisco, Mexico, Michoacan, Morelos, Nayarit, Nuevo Leon, Oaxaca, Puebla, Queretaro, Quintana Roo, San Luis Potosi, Sinaloa, Sonora, Tabasco, Tamaulipas, Tlaxcala, Veracruz, Yucatan and Zacatecas.

7. *Id.*

8. *Mexico Political Structure Table*, BUS. INT'L; COUNTRY REPORT, Feb. 26, 1992, available in LEXIS, Intlaw, North/South America, Mexico.

9. *See id.* The remaining ministries, some of which indirectly relate to environmental concerns are: 1) commerce and industrial development, 2) communications and transport, 3) comptroller general, 4) education, 5) finance and public credit, 6) foreign relations, 7) government, 8) labor and social welfare, 9) national defence, 10) navy, 11) programming and budget and 12) tourism.

In May, 1992, the Mexican government transformed the Ministry of Urban Development and Ecology (SEDUE) into the Secretariat of Social Development (SEDESOL). *Mexico Political Structure Table*, BUS. INT'L; INVESTING, LICENSING & TRADING, Oct. 5, 1992, available in LEXIS, Intlaw, North/South America, Mexico.

10. *Id.*

11. THE WORLD FACT BOOK, *supra* note 1.

plus an additional two from the federal district, hold office for six years.<sup>12</sup> The Chamber of Deputies is composed of five hundred members: three hundred members are elected directly and two hundred are elected on the basis of proportional representation.<sup>13</sup>

The same political party has been in control of the Mexican federal government since the 1920's.<sup>14</sup> However, the influence of the dominating party, known as the Partido Revolucionario Institucional, has diminished over the years.<sup>15</sup> The incumbent president, Carlos Salinas de Gortari, a member of the Partido Revolucionario Institucional, received merely 50.4 percent of the vote in 1988.<sup>16</sup>

At the regional level, each state has a governor and a local legislature. Governors are elected to serve six-year terms. Each state, acting through its respective legislature, may impose and collect taxes.<sup>17</sup>

### B. *Treaties*

In furtherance of its environmental goals and programs, Mexico has entered into bilateral and multilateral international agreements relating to environmental concerns. These agreements may be comprehensive, or specifically targeted to address a particular environmental issue.

One such multilateral agreement, the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal,<sup>18</sup> has been signed and ratified by Mexico. The Basel Convention requires exporting countries to provide advance notice of proposed waste shipments. Wastes can only be sent after the receiving country gives its consent. The receiving country must assure that wastes will be disposed of in an environmentally sound manner.<sup>19</sup>

Mexico is also a party to the 1985 Vienna Convention for the Protection of the Ozone Layer<sup>20</sup> and the Montreal Protocol On Substances that Deplete the Ozone Layer.<sup>21</sup> Likewise, Mexico is a party to several conventions relating to the prevention of marine pollution: the Convention for the Protection and Development of the Marine Environment of the

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12. *Mexico Political* - Feb., *supra* note 8.

13. *Id.*

14. *Id.*

15. *Mexico Political Structure Table*, BUS. INT'L; COUNTRY REPORT, June 21, 1991, available in LEXIS, Intlaw, North/South America, Mexico.

16. *Id.* There are five major opposing political parties: the Partido de Accion Nacional, the Partido de la Revolucion Democratica, the Partido Popular Socialista, the Partido Autentico de la Revolucion Mexicana, Partido del Frente Cardenista de Reconstruccion Nacional.

17. *Id.*

18. Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, U.N.E.P. Doc. IG.80/3, March 22, 1989, *reprinted in* 28 I.L.M. 649 (1989).

19. *Id.*

20. 26 I.L.M. 1516 (1987).

21. 26 I.L.M. 1541 (1987); 30 I.L.M. 537 (1991).

Wider Caribbean Region;<sup>22</sup> the International Convention for the Prevention of Pollution from Ships,<sup>23</sup> and the 1978 Protocol to that Convention (MARPOL 73/78);<sup>24</sup> the 1972 Convention on the Prevention of the Marine Pollution by Dumping of Wastes and Other Matter (the London Dumping Convention);<sup>25</sup> and the Third United Nations Convention on the Law of the Sea (UNCLOS).<sup>26</sup> The United Nations Convention on the Law of the Sea is not yet in force, however it has been signed and ratified by Mexico.

Mexico has also signed bilateral agreements with the United States of America. The two major U.S./Mexico bilateral agreements concerning environmental protection are the Treaty for the Utilization of Waters of the Colorado and Tijuana Rivers and of the Rio Grande, known as the Water Treaty of 1944,<sup>27</sup> and the 1983 Agreement between the United States and Mexico on Cooperation for the Protection and Improvement of the Environment in the Border Area<sup>28</sup> (the La Paz Agreement) and its five annexes.<sup>29</sup>

The 1944 Water Treaty allocates the surface waters of the Rio Grande/Rio Grande between Mexico and the United States.<sup>30</sup> The 1944 Water Treaty replaced the International Boundary Commission (IBC), originally established under the 1889 International Boundary Convention, with the International Boundary and Water Commission (IBWC).<sup>31</sup> The present IBWC has greater powers to govern water usage, water quality, wastewater treatment, and conservation.

The La Paz Agreement provides for the creation of technical "annexes" concerning specific projects. Annex I addresses Tijuana/San Diego wastewater treatment facilities.<sup>32</sup> Annex II authorizes a joint emergency response team to clean up accidental oil and hazardous substance spills along the two hundred kilometer-wide joint inland international border.<sup>33</sup> Annex III governs the transboundary shipment of hazardous wastes and

22. 22 I.L.M. 221 (1983).

23. 12 I.L.M. 1319 (1973).

24. 17 I.L.M. 546 (1978).

25. 11 I.L.M. 1291 (1972).

26. U.N. Doc. A/Conf. 62/122 of Oct. 7, 1982, *reprinted in* 21 I.L.M. 1261 (1982).

27. Water Treaty of 1944, Feb. 3, 1944, U.S.-Mexico, 28 U.S.T. 7399, w/supp. protocol signed Nov. 14, 1944.

28. Aug. 14, 1983, T.I.A.S. No. 10827, 22 I.L.M. 1025 (1983).

29. U.S. ENVIRONMENTAL PROTECTION AGENCY AND SECRETARIA DE DESARROLLO URBANA Y ECOLOGIA (SEDUE), INTEGRATED ENVIRONMENTAL PLAN FOR THE MEXICO-U.S. BORDER AREA, (First Stage, 1992-1994) at A-8 (1992) [hereinafter INTEGRATED ENVIRONMENTAL PLAN].

30. Darcy Alan Frownfelter, *Water as a Natural Resource - The Regulation of Water by International Treaties*, available in LEGAL ASPECTS OF DOING BUSINESS IN MEXICO, ST. MARY'S L.J., INT'L L. SYMP. (March 6, 1992)(unpublished documents) [hereinafter *Water as a Natural Resource*].

31. INTEGRATED ENVIRONMENTAL PLAN, *supra* note 29, at A-6.

32. 26 I.L.M. 18 (1987)(signed Jul. 18, 1985).

33. 26 I.L.M. 19 (1987)(signed Jul. 18, 1985).

substances between the United States and Mexico.<sup>34</sup> Annex IV addresses copper smelters in specified border areas.<sup>35</sup> Lastly, Annex V confronts the problem of urban air pollution and allows for the identification and appraisal of specific study areas in border cities within Mexico and the United States.<sup>36</sup>

Some lesser known bilateral cooperative agreements entered between Mexico and the United States include the Agreement between the Directorate General of Natural Resources of the Ministry of Ecology and Urban Development and the U.S. Fish and Wildlife Service for Cooperation in the Conservation of Wildlife (1984);<sup>37</sup> and the Agreement between the Forest Service of Mexico and the U.S. Forest Service on Cooperation (1985).<sup>38</sup>

It is important to note that by becoming a signatory to the General Agreement on Tariffs and Trade (GATT),<sup>39</sup> Mexico displayed a commitment to the pursuit of free trade.<sup>40</sup> The recent GATT panel ruling exemplifies the fact that the international dispute resolution process can also have a substantial impact on environmental policy.<sup>41</sup> Beyond treaties and agreements dealing directly with environmental concerns, there are other avenues by which customary international law may have a direct or indirect effect on environmental issues in Mexico.

## II. ENVIRONMENTAL LAW

### General Concepts of Environmental Law in Mexico

The General Law of Ecological Equilibrium and Environmental Protection, hereinafter referred to as the General Ecology Law, became effective March 1, 1988.<sup>42</sup> The Ministry of Ecology and Urban Development of

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34. 26 I.L.M. 25 (1987)(signed Nov. 12, 1987).

35. 26 I.L.M. 33 (1987)(signed Jan. 29, 1987).

36. 29 I.L.M. 29 (1990)(signed Oct. 3, 1989).

37. INTEGRATED ENVIRONMENTAL PLAN, *supra* note 29, at A-6.

38. *Id.*

39. Oct. 30, 1947, T.I.A.S. No. 1700, 55 U.N.T.S. 194 (1950)(entered into force Jan. 1, 1948).

40. Bruce Stokes, *Greens Talk Trade*, 23 NAT'L J. 862, 863 (Apr. 13, 1991).

41. NATIONAL WILDLIFE FEDERATION, COMMENTS ON THE DRAFT REVIEW OF U.S.-MEXICO ENVIRONMENTAL ISSUES (Nov. 1991) 5, in NATIONAL WILDLIFE FEDERATION, TRADE AND THE ENVIRONMENT: INFORMATION PACKET (1991)(unpublished documents), [hereinafter COMMENTS ON THE DRAFT REVIEW].

Based upon a complaint brought by Mexico against the United States, a GATT panel held that the Marine Mammal Protection Act, (U.S. legislation), violated GATT. *General Agreement on Tariffs and Trade: Dispute Settlement Panel Report on United States Restrictions on Imports of Tuna*, 30 I.L.M. 1594, 1623 (1991); The Bureau of National Affairs, Inc., *U.S. Embargo on Mexican Tuna Violations GATT Rules Panel Finds*, 8 INT'L TRADE REP. 1288 (1991); Jessica Mathews, *Dolphins, Tuna and Free Trade*, THE WASH. POST, October 18, 1991 at A21. The complaint was provoked by a tuna embargo imposed by the United States against Mexico for indiscriminate dolphin kill.

42. General Law of Ecological Equilibrium and Environmental Protection, art. 8(V) (1988) [hereinafter General Ecology Law]. English translation found in, MEXICAN ENVIRON-

Mexico,<sup>43</sup> referred to as SEDUE, is responsible for the formulation and direction of national ecological and environmental policy. SEDUE is the major enforcement body of the General Ecology Law.

SEDUE creates and develops programs to preserve and restore the ecological equilibrium and to achieve an integrated management of natural resources.<sup>44</sup> To improve efficiency, the General Ecology Law encourages cooperation among federal, state and local governments in Mexico.<sup>45</sup> In addition, joint efforts between SEDUE and the United States Environmental Protection Agency (EPA), exist to improve environmental conditions in the border areas, as well as further within Mexico.

SEDUE enforces the General Ecology Law through the issuance of Technical Ecological Norms, NTEs.<sup>46</sup> NTEs are separately issued regulations which establish ecological standards, including criteria, procedures, tests, and facility requirements.<sup>47</sup> Private or public activities which may cause ecological imbalance, or those that may exceed the limitations provided for in the relevant NTE standards are subject to environmental impact evaluation.<sup>48</sup> Thus, the assessment of possible environmental effects must be provided for in the form of an environmental impact statement (EIS) prior to authorization by SEDUE, or by other appropriate state or local agencies.<sup>49</sup> This EIS must provide risk assessments of proposed or modified activities along with preventive and corrective measures to mitigate adverse environmental impacts.<sup>50</sup>

The proposed North American Free Trade Agreement, NAFTA, will likely attract more investment in the country of Mexico. Indeed that is what is hoped for by some. The government of Mexico must therefore

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MENTAL DOCUMENTS, August 1991, (unpublished documents), provided by the World Environment Center [hereinafter MEXICAN ENVIRONMENTAL DOCUMENTS].

For a background analysis of environmental policy in Mexico, leading up to the present regulatory regime, see Stephen P. Mumme, C. Richard Bath & Valerie J. Assetto, *Political Development and Environmental Policy in Mexico*, 23 *LATIN AM. RES. REV.* 7 (1988).

43. Secretaria De Desarrollo Urbano Y Ecologia.

44. General Ecology Law, *supra* note 42, art. 8(V).

45. *Id.* art. 4. Because concurrent jurisdiction exists over most environmental and ecological matters, federal, state and local governments are encouraged to cooperate.

46. *Id.* art. 8.

47. *Id.* arts. 36-37.

48. *Id.* arts. 28-35.

49. *Id.* art. 28. In addition to jurisdiction over environmental impact evaluations, the evaluation of the following specific areas are reserved to SEDUE:

- 1) federal public works; 2) hydraulic works, general communication ways, oil pipelines, gas pipelines, and coal chutes; 3) chemical, petrochemical, steel, paper, sugar, liquor, cement, automotive, and electrical generation and transmission industries; 4) exploration, extraction, treatment and refining of mineral and non-mineral substances reserved to the Federal Government; 5) federal tourism development; 6) installations for treatment, storage, or elimination of hazardous residues, and of radioactive residues; and 7) use of forests and tropical jungles and of species whose regeneration is difficult.

*Id.* art. 29(I-VII).

50. *Id.* art. 34.



continue to establish and strengthen enforcement powers of the appropriate environmental protection agencies. Increased economic activity will place an increased burden on the environment. A sound and responsive environmental regime must exist throughout Mexico. The negative environmental behavior patterns, exhibited by many "maquiladora" industries along the U.S.-Mexican border, must not spread to areas of Mexico where environmental enforcement is weak or non-existent.<sup>51</sup>

#### A. Air

The General Ecology Law announces that "[a]ir quality must be satisfactory in all human settlements and in all regions of the nation; and . . . [e]missions of pollutants into the atmosphere . . . must be reduced and controlled to assure air quality satisfactory for the welfare of the population and ecological equilibrium."<sup>52</sup> SEDUE may issue NTEs to control, reduce, or avoid air pollution. These standards should specify permissible levels of emission by pollutant, require the installation of control equipment, establish air quality monitoring systems, establish certification standards, set vehicle emission standards, and establish vehicle testing procedures.<sup>53</sup>

The General Ecology Law requires state and local governments to create and implement procedures "to prevent and control air pollution on property and zones within state jurisdiction."<sup>54</sup> In addition, these authorities shall apply general atmospheric protection criteria by enacting decrees and provisions which designate zones for polluting industries. The installation of emission control equipment shall be required as appropriate.<sup>55</sup>

State and local governments are also required to inventory fixed sources of pollution, establish auto emission verification systems, establish air quality monitoring systems, and regulate emissions from public transportation, excluding federal transportation. In combination, these provisions require authorities to take all preventive measures necessary to avoid environmental risk due to air pollution. The General Ecology Law authorizes states and local governments to enact measures for the enforcement of state environmental laws, including the imposition of sanctions.<sup>56</sup>

All emitters of pollutants into the atmosphere must observe these state and local provisions, along with subsequent regulations. The release of emissions containing hazardous residues or materials may only occur

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51. See *infra* notes 184-202 and accompanying text for discussion of the Maquiladora Program in Mexico.

52. General Ecology Law, *supra* note 42, art. 110(I) & (II). The prevention and control of air pollution is addressed in articles 110-116.

53. *Id.* art 112.

54. *Id.* art. 112(I).

55. *Id.* art. 112(III).

56. *Id.*

with prior authorization from SEDUE. In addition, the General Ecology Law requires that authorities create zones where industrial uses are suitable adjacent to residential areas.<sup>57</sup>

The issuance of technical norms or standards for the control of air pollution has occurred since 1988. This action was prompted as a result of severe air pollution problems experienced by a number of cities within Mexico.<sup>58</sup> The essential information and standards contained in these NTEs is provided in the following discussion.

1. Air Pollution Ecological Technical Norms<sup>59</sup>

a. Initial automobile emission standards<sup>60</sup>

Gasoline engines emit pollutants into the atmosphere by inefficient or incomplete combustion of the air-gasoline mixtures in the cylinders. Air quality is thereby reduced in the affected area. Maximum permissible air emissions prevent significant changes in air quality.

This technical norm sets the maximum permissible levels of carbon monoxide and hydrocarbons generated by internal combustion engines using gasoline fuel. "The standards are issued by public order, in the interest of society, and are to be observed by the users of automobiles."<sup>61</sup> These auto emissions standards are set as a function of the year the engine was manufactured.<sup>62</sup>

b. Emission standards for newly manufactured gas powered vehicles<sup>63</sup>

Auto emission standards for new gasoline powered vehicles have been issued by the Secretary of Urban Development and Ecology. These stan-

57. *Id.* arts. 113 & 114.

58. See generally, *Battling Pollution in Mexico City*, 1991 International Reports - a division of IBC USA (Publications) Inc. Mexico Service, June 5, 1991, available in LEXIS, Intlaw, North/South America, Mexico 2.

59. Translations of Mexico's Air Pollution Ecological Technical Norms are available in MEXICAN ENVIRONMENTAL DOCUMENTS, *supra* note 42.

NOTE: The concentrations and units of measurement presented in the forthcoming tables, correspond to the levels as presented in the above referenced documents.

60. NTE-CCAT-003/88.

61. *Id.* art. 2.

62. *Id.* art. 4.

Year	Maximum Permissible Emission Levels	
	CO (% volume)	HC (ppm)
*1979 and before	6.0	700
1980 - 1986	4.0	500
1987 and later	3.0	400

\* In areas located at 1500 meters above sea level, the maximum levels for cars made before 1979 are 5.5 CO and 650 HC.

63. NTE-CCAT-004/88.

dards do not apply to agricultural tractors, motorcycles, vehicles weighing less than 400 kg or more than 3,000 kg.<sup>64</sup> With regard to the application of the standard, definitions are provided for the following terms: year, model, automobile, basic chassis, line, engine, gross weight, manufacturing plant, front platform, drive train, and commercial vehicle. A year model is defined as "[t]he period between November 01 of one year, and October 31 of the next year."<sup>65</sup>

Article Four of this technical norm provides tables setting the maximum auto exhaust emission levels for hydrocarbons, carbon monoxide and nitrogen oxide. Table 1 establishes further emission standards for future automobiles.<sup>66</sup> Additional tables provide the standards for commercial vehicles over 2,727 kg gross weight.

c. Automobile inspections<sup>67</sup>

This standard establishes the equipment characteristics and testing procedures for the inspection of gasoline powered motor vehicle emissions. Federal, state and municipal authorities must verify that motor vehicle emissions do not exceed the maximum permissible levels by establishing inspection centers.<sup>68</sup>

This ecological standard sets forth appropriate tests and specific procedures. The standard further provides that the present technical norm should be publicly displayed at all inspection centers, whether public or private.<sup>69</sup>

d. Stationary sources<sup>70</sup>

This standard establishes "maximum permissible levels of emission in the atmosphere of particulates, Carbon Monoxide [(CO)], Sulfur Dioxide [(SO<sub>2</sub>)], and Nitrogen Oxides [(NO<sub>x</sub>)] generated by diesel stationary sources, when the combustion gases are not in direct contact with the process materials."<sup>71</sup> Operating diesel stationary sources emit pollutants such as CO, SO<sub>2</sub>, NO<sub>x</sub> and particulates. These pollutants may then react

64. *Id.* art. 1.

65. *Id.*

66. *Id.*

Table 1. Automobiles

Year model of vehicle	Maximum Permissible Emission Levels (g/km)*		
	HC	CO	NO <sub>x</sub>
1989	2.00	22.00	2.30
1990	1.80	18.00	2.00
1991-92	0.70	7.00	1.40
1993 and later	0.25	2.11	0.62

\* g/km = grams of contaminant per kilometer.

67. NTE-CCAT-013/89

68. *Id.*

69. *Id.* art. 14.

70. NTE-CCAT-005/88.

71. *Id.* art. 1.

with other chemicals at a site forming other contaminants with greater toxic properties. Emissions then lead to a deterioration in the surrounding air quality.

Definitions of the following terms are listed: combustion, diesel, combustion equipment, stationary source, combustion process, combustion start-up operation, blow-out operation, and critical zone. In particular, a stationary source is defined as "[a]n establishment, which is involved in industrial, commercial, or service operations, or processes, or activities which do, or may, generate contaminating emissions in the atmosphere." A critical zone is defined as "[a]n atmospheric zone in which, because of its topographic and meteorological characteristics, [a] high concentration of pollutants are registered, or are difficult to disperse."<sup>72</sup>

This standard also governs daily start-up and blow-out operations. It provides that the maximum permissible levels of emissions may be exceeded for a time period no greater than 15 minutes, 3 times a day for each. Quantitative measurement procedures shall be established with the corresponding Official Mexican Standards, or in particular cases, those "issued by the competent authorities."<sup>73</sup>

e. Emissions of solid particulates from stationary sources<sup>74</sup>

Factors considered in setting the maximum emission levels of solid particulates from stationary sources include: the location of the stationary sources, technological developments which reduce pollution, the modification of industrial processes technologies, and the installation of control equipment.<sup>75</sup> These standards exclude those solid particulates generated by calcification furnaces of the cement industry, and by combustion processes.<sup>76</sup> In addition to the definitions of stationary source and critical zone, gas flow is defined as "a quantity of gas, flowing through an area during a certain time period." The standard provides the maximum permissible emissions levels of solid particles in the atmosphere, generated

72. *Id.* art. 3.

73. *Id.* art. 6.

Contaminants	Maximum Permissible Emission Levels*	
	Critical Zones (Kg/m3)	Rest of the country (Kg/m3)
Particulates	.260	.300
CO	.600	.665
SO <sub>2</sub>	17.000	34.000
**NO <sub>x</sub>	2.700	3000

\* The maximum permissible levels from diesel combustion processes are expressed in "kilograms of contaminants per cubic meter of diesel, consumed at 298 degrees K (25 degree C)," referred to as Kg/m3.

\*\* Nitrogen oxides are expressed as nitrogen dioxide.

74. NTE-CCAT-009/88.

75. *Id.*

76. *Id.* art. 1.

by stationary sources, according to the flow of gases.<sup>77</sup>

f. Emission levels from stationary sources using fuel oil<sup>78</sup>

These standards were set in consideration of the following factors: only fuel oil is used during combustion processes, the degree of optimization of the processes, the actual control technologies, and possible alternative high quality fuels.<sup>79</sup> The maximum emission levels were set for particulate matter, CO, SO<sub>2</sub>, and NO<sub>x</sub>, generated by stationary sources solely utilizing fuel oil. The standards apply only "when combustion gases are not in direct contact with process materials."<sup>80</sup>

Similar definitions to those given in the previously referenced NTE for stationary sources are provided. Of relevance, fuel oil is defined as a "[c]ombustible substance, obtained as a residual in crude oil refining, and which satisfies the established quality control specs."<sup>81</sup>

The maximum contaminant levels from oil combustion processes are expressed in "kilograms of contaminants per cubic meter of diesel, consumed at 298 degrees K (25 degree C),"<sup>82</sup> and are referred to as Kg/m<sup>3</sup>. The maximum permissible levels may be exceeded during start-up and blow-out, for a period of time not to exceed 15 minutes, 3 times a day.<sup>83</sup>

A reference is made to equipment with combustion capacity in excess of 106 x 10<sup>-9</sup> joules/hr, and provides that the maximum levels may be exceeded only during start-up operations, in periods no longer than 7 hours, and for no more than 2 times per year.

77. *Id.* art. 4.

Maximum Permissible Emission Levels

*Gas flow in the source (m <sup>3</sup> /min)	Critical zones (Mg/m <sup>3</sup> )	Rest of the country (Mg/m <sup>3</sup> )
5	1536	2304
10	1148	1722
20	858	1287
500	326	489
1000	166	249
10000	63	95
50000	32	48

\* Please note that the above table only provides a selection of those particular gas flows listed in NTE-CCAT-009/88. Please refer to the standard for a complete listing, and for the extrapolation formula. A formula is provided to calculate the maximum levels for gas flows but is not listed in the table.

78. NTE- CCAT-007/88.

79. *Id.*

80. *Id.* art. 1.

81. *Id.* art. 3.

82. *Id.* art. 4.

83.

g. Maximum emissions from coal burning thermoelectric stations<sup>84</sup>

This standard establishes maximum emissions from coal burning thermoelectric stations of particulates, carbon monoxide, sulfur dioxide, and nitrogen oxides.<sup>85</sup> Coal is defined as a “[s]olid combustible material, which carbon content varies from 10 to 90% in weight.”<sup>86</sup>

h. Procedure for measuring carbon monoxide<sup>87</sup>

This ecological standard provides for an official procedure for monitoring and detection of carbon monoxide in the atmosphere. The standard mandates that “federal, state, and municipal officials, responsible for [the establishment] and operation of the manual systems for air quality monitoring and carbon monoxide concentration measurements” observe its requirements.<sup>88</sup> Among its technical requirements, the standard directs that designated stations use a “non-dispersive photometer” method to measure the amounts of carbon monoxide in the atmosphere.<sup>89</sup>

i. Procedure for measuring suspended particulate matter<sup>90</sup>

This standard provides the official procedure for determining the concentration of suspended air particles. Suspended particles are defined as “any solid or liquid particles, dispersed in the atmosphere, with diameter up to 100 [micrometers] in a form of dust, vapor, metal particles,

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Contaminants	Maximum Permissible Emission Levels	
	Critical Zones Kg/m <sup>3</sup>	Rest of the country Kg/m <sup>3</sup>
Particulates	4.240	6.740
CO	.600	.660
SO <sub>2</sub>	57.000	95.000
*NO <sub>x</sub> (i)	6.600	6.600
(ii)	8.000	8.000

\* Nitrogen oxides are expressed as nitrogen dioxide.

(i) For combustion capacity up to 106 x 10<sup>-9</sup> joules/hr.

(ii) For combustion capacity greater than 106 x 10<sup>-9</sup> joules/hr.

84. NTE-CCAT-006/88.

85.

Maximum Permissible Emission Levels	
Contaminants	Kg/m <sup>3</sup> *
Participants	3.600
CO	0.270
SO <sub>2</sub>	51.300
**NO <sub>x</sub>	10.000

\* Kg/m<sup>3</sup> = Kilograms of contaminants per cubic meter of coal, in dry form.

\*\* NO<sub>x</sub>, expressed as nitrogen dioxide.

86. *Id.* art. 3.

87. NTE-CCAT-001/88.

88. *Id.* art. 5.

89. *Id.* art. 4.

90. NTE-CCAT-002/88.

among others."<sup>91</sup> The procedure utilizes a high volume sample.<sup>92</sup> The standard is to be observed by federal, state and municipal officials, responsible for establishing and operating the air quality monitoring systems where suspended particles are found.<sup>93</sup>

## B. *Water*

Greater treatment of wastewater is needed for the maintenance of the overall water quality within Mexico. The quantity of water is limited. The border areas of northern Mexico are developing at a rate which far exceeds the development of water resources and treatment facilities. Polluted waters severely limit the "sustainability" of fresh and ground water resources. In addition, depleted and polluted water resources have a negative impact on wildlife.

The water resources in the Rio Grande/Rio Bravo basin area are comprised of surface water and ground water.<sup>94</sup> The basin's water resources are considered to be international or transboundary in nature. The 1944 Water Treaty allocates the surface waters in the Rio Grande/Rio Bravo basin; however, there is no international agreement or treaty to regulate transboundary groundwater supplies. Supplies for water on both sides of the border are limited. In particular, medium range forecasts indicate that demands will exceed the water supply in the Rio Grande/Rio Bravo basin.

The General Ecology Law encourages the rational use of water resources in a manner that protects aquatic ecosystems and equilibrium.<sup>95</sup> Article Eighty-nine of the General Ecology Law requires that a National Hydraulic Program be formulated. It compels officials to create criteria and standards for the protection of the physical environment, as well as for the protection of human health and consumption.<sup>96</sup> The standard directs that environmental impact studies shall be performed, and that restoration of aquatic ecosystems shall occur as is feasible.<sup>97</sup>

SEDUE, the Ministry of Agriculture and Hydraulic Resources, and the Ministry of Fisheries manage and regulate water resources. SEDUE is authorized, under the General Ecology Law, to issue technical norms for the control of surface, groundwater and marine water pollution.<sup>98</sup>

The General Ecology Law contemplates a comprehensive water regu-

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91. *Id.* art. 3.

92. *Id.* art. 5.

93. *Id.* art. 2.

94. *Water as a Natural Resource*, *supra* note 30, at 3.

95. General Ecology Law, *supra* note 42, art. 88.

96. *Id.*

97. *Id.* art. 95.

98. *Id.*; U.S. Environmental Protection Agency, Office of General Counsel, Office of Enforcement, Mexican Environmental Laws, Regulations and Standards - Preliminary Report of EPA Findings, revised June 19, 1991, 13, 14, (unpublished document), [hereinafter Mexican Environmental Laws].

latory system, implemented by regulations.<sup>99</sup> Although the system is not fully developed, wastewater discharges should occur only when authorized.<sup>100</sup> Unpermitted discharges may lead to penalties or closures.<sup>101</sup>

The National Water Commission is a decentralized agency of the Ministry of Agriculture and Hydraulic Resources.<sup>102</sup> It is charged with the distribution, management, care, and conservation of water throughout Mexico.<sup>103</sup> Its responsibilities include the operation, maintenance and development of the necessary infrastructure for the support of water resource systems.<sup>104</sup>

### C. *Natural Resources & Energy*

#### 1. Soil

The General Ecology Law promotes rational land and soil use.<sup>105</sup> It protects soil from degradation and erosion and mandates that land use methods be modified to minimize deleterious effects on the environment. Accordingly, the law supports farming methods which promote or restore ecological equilibrium.<sup>106</sup>

The General Ecology Law provides ecological criteria and direction for soil protection programs and authorizes the development of a national land system. Tax incentives may be given for ecologically sensitive forestry activities, including the "establishment and expansion of forest plantations, and works for the protection of forest soil."<sup>107</sup>

Title IV of the General Ecology Law discusses environmental protection and contains provisions regarding the protection and control of soil.<sup>108</sup> It provides criteria to prevent soil pollution, with specific regard to the control and disposal of solid waste, the regulation of urban development, as well as the use of pesticides, fertilizers and toxic substances in the environment. These criteria authorize the issuance of technical norms in these areas.<sup>109</sup>

#### 2. Mining

Mining has been an economically important activity in Mexico for

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99. Mexican Environmental Laws, *supra* note 98, at 3, 14.

100. *Id.* at 14-16.

101. *Id.* at 15.

102. MEXICAN ENVIRONMENTAL DOCUMENTS, *supra* note 42, at 623.

103. *Id.* at 623-25.

104. *Id.* at 625-28.

105. General Ecology Law, *supra* note 42, arts. 98-107.

106. *Id.* art. 99. Listings of registered pesticides is provided in MEXICAN ENVIRONMENTAL DOCUMENTS, *supra* note 42, at 486.

107. General Ecology Law, *supra* note 42, art. 107.

108. *Id.* arts. 134-44.

109. *Id.*



centuries.<sup>110</sup> In fact, metals were mined prior to the arrival of the Spanish in the 16th century.<sup>111</sup> Mining activities are subject to federal jurisdiction in Mexico.<sup>112</sup> Article 27 of the Mexican Constitution establishes that all mineral resources belong to the Mexican Nation.<sup>113</sup> Extraction may occur only through federal concessions to Mexican individuals, to corporations incorporated under Mexican laws, or to foreign individuals who agree not to invoke the protection of their government with regard to their concessions.<sup>114</sup> A subsequently enacted law, the Regulatory Law of Constitutional Article 27 in Mining Matters, is more restrictive than the Constitution, and prohibits foreign individuals from holding mining concessions.<sup>115</sup> To prevent and control the harmful effects of exploration or extraction of non-renewable natural resources, the General Ecology Law mandates the issuance of technical standards by SEDUE.<sup>116</sup> These standards should provide for the protection of water, so that it may be put to other uses. Additionally, these standards should provide for protection of the soil so that reclamation may occur and for the protection of flora and fauna.<sup>117</sup> Standards should designate the proper location for the placement of discarded ore, ore sweepings and slag from mining operations.<sup>118</sup>

### 3. The National Energy Modernization Plan of 1990-1994<sup>119</sup>

The Mexican Energy Plan is "integral, realistic and reaches beyond the time horizon of the present administration."<sup>120</sup> The plan serves as an important guideline in the development and modernization of Mexico.<sup>121</sup> It is national in scope and operates under the three major National Accords which form the framework of Mexico's modernization endeavors: the Accord for Expansion of Democratic Life, the Accord for Economic Recovery with Price Stability, and the Accord for Productive Improvement of the Standard of Living.<sup>122</sup>

The Energy Plan is the responsibility of the Federal Public Administration, yet requires the participation of state and municipal governments, coordinated with private sectors.<sup>123</sup> The plan considers the development of all of Mexico's energy resources, both primary and secondary.

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110. Rodrigo Sanchez-Mejorada Velasco, *Foreign Investment in Mining in Mexico*, 23 ST. MARY'S L.J. 821 (1992).

111. *Id.*

112. *Id.* at 823.

113. *Id.*

114. *Id.* at 823-824.

115. *Id.* at 824.

116. General Ecology Law, *supra* note 42, arts. 108-109.

117. *See id.*

118. *Id.* art. 108(III).

119. MEXICAN ENVIRONMENTAL DOCUMENTS, *supra* note 42, at 197.

120. *Id.* at 200.

121. *See id.* at 199.

122. *Id.*

123. *Id.* at 201.

The program sets forth five guiding priorities: productivity, conservation and efficient energy use, the financing of development and expansion of supply, diversification of resources, and increased participation in the world market.<sup>124</sup>

#### 4. Oil

The National Energy Plan states that the hydrocarbon reserves within the Mexican Energy Sector rank eighth in the world.<sup>125</sup> With regard to the production of petroleum and derivative products, Mexico is sixth in the world.<sup>126</sup> Foreign investors seek direct access to these reserves, although Mexican legislation precludes them. Therefore, investment in the development of the Mexican oil industry must be done with caution. Accident mitigation and safety standards should be designed to minimize damage to the environment and health, both on-shore and off-shore. Factories that process petrochemical derivatives directly from raw materials, must be registered with the ministry controlling energy and mines.<sup>127</sup>

#### 5. Nuclear energy

With respect to nuclear energy, the General Ecology Law demands that government authorities monitor the exploration, and exploitation of the use of nuclear minerals, nuclear fuels, and nuclear energy.<sup>128</sup> The nuclear industry, and activities related thereto, should be managed and conducted in accordance with appropriate standards for nuclear and radioactive installations. These standards should assure physical safety in and around nuclear or radioactive installations, so that risks to human health are avoided and preservation of ecological equilibrium is maintained. Accordingly, environmental impact assessments are required with respect to nuclear energy development.<sup>129</sup>

#### D. Preservation

Title III, Chapter 1 of the General Ecology Law recognizes the need for endangered species identification and range protection, especially along the developing border regions.

Areas within Mexican territory may be designated as protected natu-

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124. *Id.* at 203.

125. *Id.* at 199. A National Wildlife Federation report ranks Mexico's petroleum deposits as second only to Saudi Arabia's. National Wildlife Federation, *Environmental Concerns Related to a United States-Mexico-Canada Free Trade Agreement*, (Nov. 27, 1990), at 9, in NATIONAL WILDLIFE FEDERATION, TRADE AND THE ENVIRONMENT: INFORMATION PACKET (1991)(unpublished documents) [hereinafter *Environmental Concerns*].

126. MEXICAN ENVIRONMENTAL DOCUMENTS, *supra* note 42, at 199.

127. *Id.* at 632.

128. General Ecology Law, *supra* note 42, art. 154.

129. *Id.*

ral areas under the General Ecology Law.<sup>130</sup> Protected natural areas, under federal jurisdiction, are classified as biosphere preserves, special biosphere preserves, national parks, national marine parks, natural monuments, areas for the protection of natural resources, areas for the protection of flora and fauna, urban parks, and zones subject to ecological conservation.<sup>131</sup> The latter two classifications are subject to state and/or municipal jurisdiction.<sup>132</sup> This section also provides for a degree of public participation: "[i]n the establishment, administration and development of protected natural areas . . . the residents thereof shall participate . . . in order to encourage integrated development of the community and assure protection of the ecosystems."<sup>133</sup>

Biosphere preserves are areas greater than 10,000 hectares which: 1) contain at least one or more ecosystems that have not been significantly altered by human activity; and 2) contain at least one unaltered zone and inhabited by endemic, threatened, or endangered species.<sup>134</sup> Activities to preserve the ecosystems, such as scientific and ecological educational research, may be authorized.<sup>135</sup> Uses which may alter the ecosystem may be limited or prohibited. The creation of new population centers is prohibited within a biosphere preserve, however buffer zones can be established for communities located within the preserve area at the time of its establishment.<sup>136</sup>

Chapter 1 also establishes "special biosphere preserves" which are similar to biosphere preserves, yet contain fewer numbers of endemic, threatened or endangered species. As a result, such areas are inappropriate for consideration as biosphere preserves.<sup>137</sup>

The General Ecology Law and the Forestry Law govern the creation of national parks.<sup>138</sup> Factors considered in designating a park area are scenic beauty, the scientific, educational or recreational values of an area, the existence of nationally important flora or fauna, and the suitability for tourism development. These parks may be utilized by the public for research, education, recreation, tourism, and activities related to preservation of the natural resources and ecosystems contained therein. Forestry uses may also be allowed when SEDUE determines that the area in question is ecologically suitable.<sup>139</sup>

National marine parks are established in marine zones and may in-

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130. *Id.* art. 44. (The articles relating to protection of natural areas are located in the General Ecology Law, Title 2.)

131. *Id.* art. 46.

132. *Id.* arts. 55-56.

133. *Id.* art. 47.

134. *Id.* art. 48.

135. *See id.*

136. *Id.*

137. *Id.* art. 49.

138. *Id.* art. 50.

139. *Id.*

clude beaches and federal maritime land contiguous zones.<sup>140</sup> Within these areas, activities related to preservation, education, research, and recreation are allowed. The General Ecology Law, the Federal Fisheries Law, the Federal Sea Law, international legal standards and other applicable laws may authorize the use of natural resources in these areas.<sup>141</sup>

The General Ecology Law and the Forestry Law direct the establishment of natural monuments.<sup>142</sup> Natural monuments contain one or more natural elements of national significance which are deemed worthy of protection. These elements may be of historical, aesthetic, scientific or unique value.<sup>143</sup>

#### E. *Hazardous Activities and Hazardous Waste*

SEDUE seeks to ensure that hazardous activities occur only in designated zones.<sup>144</sup> Highly hazardous activities are listed in the federal Diario Oficial.<sup>145</sup> Those engaging in highly hazardous activities must submit accident prevention plans corresponding to the applicable regulations, in order to receive approval by federal regulatory authorities. State and local governments shall regulate those activities not designated as highly hazardous.<sup>146</sup>

Mexico's listing of hazardous wastes is similar to the procedure established in the United States.<sup>147</sup> Standards for the regulation of hazardous materials are found in Articles 150 to 153 of the General Ecology Law. Like hazardous activities, hazardous materials are identified and listed in the federal Diario Oficial. Testing procedures for the identification and characterization of such wastes are similar to those of the United States.

The use and disposal of hazardous materials and hazardous residues must comply with the technical standards established by SEDUE.<sup>148</sup> Imports and exports of these substances are to be tracked, regulated and subjected to compliance guarantees. Furthermore, hazardous substances generated from primary materials brought into Mexico for industrial use, under the temporary import system, are to be returned to the country of origin.<sup>149</sup> Thus, these standards, including limited disposal and recycling methods, require maquiladora industries to transport hazardous wastes

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140. *Id.* art. 52.

141. *Id.*

142. *Id.* art. 51.

143. *Id.*

144. General Ecology Law, *supra* note 42, arts. 145-49.

145. *Id.* art. 146.

146. *Id.*

147. A detailed description of Mexico's hazardous waste management program may be found in, MEXICAN ENVIRONMENTAL DOCUMENTS, *supra* note 42, section V, at 282-485.

148. General Ecology Law, *supra* note 42, art. 152.

149. *Id.* art. 153.

and residues over the border to the United States.<sup>150</sup>

Sadly, only a small portion of hazardous waste generated on the Mexican side of the border is actually being transported back over to the United States for proper disposal;<sup>151</sup> instead, illegal dumping of hazardous wastes occurs. Despite the existence of a cradle-to-grave tracking system, this policy is not being effectively implemented in Mexico. Illegal dumping of hazardous waste is controversial in Mexico. Poor management techniques in and around maquiladora industries are having a severe and irreversible impact on health and the surrounding environment.

According to existing laws, generators of hazardous waste must submit reports on all movement of hazardous wastes to SEDUE every 6 months. Specifically, a generator must notify SEDUE when the generator is unable to send the appropriate forms documenting a treatment, storage or disposal facility. All facilities must reduce the volume of hazardous waste which they generate, and apply physical, chemical or biological treatment.<sup>152</sup> Violators of hazardous materials regulations are subject to sanctions.

#### F. *Miscellaneous*

In addition to those areas discussed above, the General Ecology Law authorizes the issuance of standards for the prevention and control of pollution by noise, vibrations, thermal energy, lighting, odors and visual pollution.<sup>153</sup> Emission limits are set by SEDUE, in consideration of the health standards as determined by the Secretariat of Health.

### III. IMPLEMENTATION

#### A. *Enforcement mechanisms and procedures*

Mexico's environmental laws are enforced through the use of inspection and oversight procedures.<sup>154</sup> Non-compliance can result in administrative or criminal charges.<sup>155</sup> Administrative violations are infractions, and are subject to sanctions ranging from fines, varying degrees of closure, to an administrative arrest of up to 36 hours.<sup>156</sup> Appeals may be made through appropriate procedures.<sup>157</sup>

Criminal charges, sentences and fines may be imposed for prior viola-

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150. See *infra* notes 184-202 and accompanying text for discussion of the Maquiladora Program in Mexico.

151. *Hazardous Waste from U.S.-Owned Plants in Mexico Dumped Illegally, Panel Told*, 14 INT'L ENV'T REP. CURRENT REP. (BNA) 656, Dec. 4, 1991.

152. Mexican Environmental Laws, *supra* note 98, at 17.

153. General Ecology Law, *supra* note 42, arts. 155-56.

154. *Id.* arts. 161-169.

155. *Id.* art. 160.

156. *Id.* arts. 171-75.

157. *Id.* arts. 176-81.

tions or flagrant criminal behavior.<sup>158</sup> The imposition of state and local penalties is also authorized.<sup>159</sup> In addition to these enforcement measures, "denunciations" may be brought by any member of the public before federal or local authorities, pursuant to approved procedures.<sup>160</sup> The authorities are directed to investigate these allegations.

Overall, SEDUE's enforcement mechanisms have stiffened. In 1991, SEDUE began requiring bonds for firms not in compliance with environmental regulations.<sup>161</sup> The bond must equal the cost of installing pollution abatement equipment.<sup>162</sup> Subsequent findings of non-compliance can lead to forfeiture of the bond.<sup>163</sup>

Mexican environmental review is still lacking. Procedures for meaningful public participation in the development of environmental policies should be formulated. Furthermore, community "right-to-know" laws do not exist in Mexico.<sup>164</sup> In the United States, such laws require industry disclosure of hazardous substances and toxic emissions on an annual basis.<sup>165</sup> Public awareness of known or potential hazards should be encouraged by the Mexican government.

The National Program for Environmental Protection (1990-1994), broadly sets out basic environmental programs to be accomplished within Mexico during the 1990s.<sup>166</sup> Under this decree, ecological and environmental efficiency is established as a national priority.<sup>167</sup> The program provides objectives, strategies, goals, and announces guidelines, in the form of stages, for execution.<sup>168</sup>

## B. *Border Plan*

The Mexico-U.S. Border has been identified as an area warranting special study and cooperative efforts. Through the joint efforts of the U.S. EPA and the SEDUE of Mexico, a plan has been formulated for the protection of human health and environmental ecosystems. The binational International Boundary and Water Commission, has contributed to the

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158. *Id.* arts. 182-87.

159. *Id.* art. 188.

160. *Id.* arts. 189-94.

161. *Companies Face New Environmental Scrutiny*, BUS. INT'L; BUS. LATIN AM., Nov. 4, 1991, available in LEXIS, Intlaw, North/South America, Mexico, [hereinafter *New Environmental Scrutiny*]; *Environmental Law; Building and Related Permits*, BUS. INT'L; INVESTING LICENSING & TRADING, Sept. 1, 1991, available in LEXIS, Intlaw, North/South America, Mexico.

162. *Id.*

163. *Id.*

164. Andres Ochoa-Bunsow, (of the law firm of Baker & McKenzie Abogados, S.C.), *Brief Summary of Mexico's Environmental Laws and Regulations*, in MEXICAN ENVIRONMENTAL DOCUMENTS, *supra* note 42, at 910.

165. *Id.*

166. MEXICAN ENVIRONMENTAL DOCUMENTS, *supra* note 44, at 674.

167. *Id.*

168. *Id.* at 685-86.

formulation and development of the plan known as the Integrated Environmental Plan for the Mexico-U.S. Border Area.<sup>169</sup>

The border plan was developed as the result of a joint Presidential directive. The directive was issued in the form of a communique by President Carlos Salinas de Gortari, of the United Mexican States, and President George Bush, of the United States of America.<sup>170</sup> The plan is based upon the foundation laid out by the 1983 Agreement between the United States of America and the United Mexican States on Cooperation for the Protection and Improvement of the Environment in the Border Area, (often referred to as the La Paz Agreement).<sup>171</sup>

The border plan recognizes that environmentally based sustainable development is necessary for continued growth in the border area.<sup>172</sup> This development must include the participation of industry and border area communities. The border plan is part of an active environmental planning process that is not intended to become stagnant. It is a "dynamic, binational document that will be revised and expanded as new information is developed, as implementation of solutions evolves, and as further experience is gained in working together to achieve common goals."<sup>173</sup> The next review and revision of the plan is scheduled to occur in 1994.<sup>174</sup>

The border area is defined as an area 100 kilometers (62 miles) on each side of the U.S./Mexico border. Targeted areas include 15 pairs of "sister cities," located within the Mexican states of Baja California, Sonora, Chihuahua, Coahuila, Nuevo Leon and Tamaulipas; and California, Arizona, New Mexico and Texas, in the United States. Border Plan Facts<sup>175</sup> provides a brief synopsis of the proposed plans for these sister cities, including cooperative enforcement strategies, new initiatives, cooperative planning, training, and education and proposals to increase citizen and state/local government participation.

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169. INTEGRATED ENVIRONMENTAL PLAN, *supra* note 29.

170. The communique stated:

The Presidents emphasized the need for ongoing cooperation in the area of environmental protection. Both Presidents instructed the authorities responsible for environmental affairs of their countries to prepare a comprehensive plan designed to periodically examine ways and means to reinforce border cooperation in this regard, based on the 1983 Bilateral Agreement. Such a mechanism should seek ways to improve coordination and cooperation, with a view to solving the problems of air, soil, and water quality and of hazardous wastes. State and municipal authorities of both governments and private organizations in both countries should participate in such tasks as appropriate.

*Id.* at I-1.

171. *See supra* note 28.

172. INTEGRATED ENVIRONMENTAL PLAN, *supra* note 29, at I-2.

173. *Id.* at I-4.

174. *Id.*

175. *Border Plan Facts*, available as a composite brochure from the U.S. EPA and SEDUE (Feb. 1992).

C. *State and Local Environmental Law - Chihuahua (an example)*

Mexican states are encouraged to develop and enforce their own environmental legislation.<sup>176</sup> Mexico has received \$88 million from the World Bank to assist in the decentralization of SEDUE.<sup>177</sup> Decentralization will help reduce the amount of federal bureaucratic "red tape."

As an example of local environmental legislation, the Ecological Law for the State of Chihuahua<sup>178</sup> mirrors the General Ecology Law, promulgated at the federal level. The objective of the Chihuahuan law is to preserve and restore ecological equilibrium and environmental protection.

Chihuahua's environmental statute provides for concurrent jurisdiction at the state and municipal levels. It also provides for the creation of a State Ecology Commission (La Comision Estatal de Ecologia). At the local level, the law requires each municipality to have a Municipal Ecology Committee (Un Comite Municipal de Ecologia) for local coordination and implementation. Public participation is encouraged through the promotion of educational programs, special interest groups, and the dissemination of information.<sup>179</sup>

Title III of the state law announces principles of ecological policy, and the instruments or standards for implementation. This section of the law essentially parallels the federal law, absent provisions for the issuance of ecological technical standards.

Title IV addresses the preservation and restoration of ecological equilibrium and natural resource conservation. Therein are provisions for the determination, registry, and management of protected natural areas within the local jurisdiction; guidelines for preservation and restoration of ecological equilibrium; and provisions for the rational use of water resources. Title V discusses the subject of environmental protection. It provides for the regulation of air pollution; water pollution and pollution of aquatic ecosystems; noise, vibrations, thermal energy and lighting; visual pollution and protection of the atmosphere.

Title VI governs the regulation of activities capable of noxious effects. The areas specifically addressed for regulation are hazardous activities, mineral extraction, municipal services, and non-hazardous solid wastes.

Title VII is unique to state law. It addresses the protection of non-

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176. *Plan to Decentralize Enforcement of Environmental Law Described by Chirinos*, 14 INT'L ENV'T REP. CURRENT REP. 624 (Nov. 20, 1991).

177. *Id.*

178. *Ley Ecologica Para El Estado De Chihuahua*, contained in Folleto Anexo Periodico Oficial No. 86, October 26, 1991, provided by the law firm of Bryan, Gonzalez Vargas y Gonzalez Baz, S.C. (document in Spanish). At the time of this writing, four of the six Mexican border states have enacted state environmental laws. INTEGRATED ENVIRONMENTAL PLAN, *supra* note 29, at A-13. These laws have not yet resulted in the promulgation of regulations pursuant to them.

179. *Id.* art. 16.



smokers from cigarette smoke. It establishes blanket prohibitions in specified places, and the designation of non-smoking areas in certain establishments. Finally, Title VIII authorizes measures for control and sanctions. The mechanisms parallel those of the federal legislation, with the exception of the order of criminal activities.

#### IV. PRACTICAL CONSIDERATIONS

##### A. *Trade and the Environment*

Linking economic growth to environmental protection in Mexico is a means to ensure that protection measures are implemented.<sup>180</sup> Theoretically, increased trade can lead to increased investment within Mexico, thereby bolstering the economy. Economic growth, in turn, can lead to greater means by which to promote environmental enforcement.<sup>181</sup> Economic growth can also foster increased environmental efficiency in industry.<sup>182</sup>

Some advocates call for the integration of trade and environmental issues for the promotion of sustainable development.<sup>183</sup> These advocates do not view the promotion of trade measures as anti-environment. Instead, they view trade as a means to develop and implement environmental protection.

This position is not a cure-all to Mexico's environmental problems. The intersection of economic activities with that of environmental concerns, may be viewed as a measure of checks and balances. Sustainable development and a healthy global economy are considered interrelated. Therefore, expenditures for pollution prevention in Mexico must exceed funds allocated for pollution clean-up.

##### B. *Maquiladora Program*

The environmental and social problems of Mexico are exacerbated within the "maquiladora" zones or regions.<sup>184</sup> The maquiladora zones are predominantly located along the U.S.-Mexican border where thousands of maquiladora industries thrive.<sup>185</sup> Historically, environmental regulation within the areas has been lax.<sup>186</sup> Precisely how the maquiladora industries

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180. COMMENTS ON THE DRAFT REVIEW, *supra* note 41, at 3.

181. *Questions and Answers about the North American Free Trade Area*, 1991 National Trade Data Bank, available in LEXIS, Intlaw, AM [hereinafter *Questions and Answers*].

182. *Id.*

183. COMMENTS ON THE DRAFT REVIEW, *supra* note 41, at 1; see also Stewart Hudson, *Trade, Environment, and the Pursuit of Sustainable Development*, (Nov. 1991) 1, available in NATIONAL WILDLIFE FEDERATION, TRADE AND THE ENVIRONMENT: INFORMATION PACKET (1991)(unpublished documents).

184. Michael Satchell, *Poisoning the Border*, U.S. NEWS & WORLD REP., May 6, 1991, at 32.

185. *Id.*

186. *Id.*

will be transformed by the advent of free trade is still uncertain.<sup>187</sup>

A maquiladora is a Mexican corporation operating under an approved Maquila Program.<sup>188</sup> Maquila programs are approved by the Mexican Secretariat of Commerce and Industrial Development (SECOFI).<sup>189</sup> Maquiladoras benefit from foreign investment and relaxed customs treatment.<sup>190</sup>

Maquiladoras are export-oriented.<sup>191</sup> Production at a maquiladora plant varies from the simple assembly of goods, to the manufacture of a product from start to finish using imported raw materials.<sup>192</sup> Only under special conditions, may the end products remain in Mexico.<sup>193</sup>

There is generally no limitation in choosing the location of a maquiladora.<sup>194</sup> The only exceptions are that no new facilities may be established in the urban areas of Mexico City, Guadalajara, or Monterrey.<sup>195</sup> These restrictions exist due to the already overburdening industrialization and congestion in these areas.<sup>196</sup> Any other existing state restrictions are imposed due to environmental concerns based on the type of industry.<sup>197</sup>

Maquiladoras must comply with strict environmental laws and regulations.<sup>198</sup> All industrial companies must have operating licenses from SEDUE.<sup>199</sup> New maquiladora plants and expanding facilities must file an environmental impact statement with SEDUE for the implementation of new processes or new construction.<sup>200</sup> Permits for the discharge of waste water and air emissions are required.<sup>201</sup> As mentioned previously, companies that use hazardous materials must obtain "special manifests" for the handling of these materials and wastes.<sup>202</sup>

187. For a general discussion of the maquiladora program from an economic and historical perspective, see Cheryl Schechter & David Brill, Jr., *Maquiladoras: Will The Program Continue?*, 23 ST. MARY'S L.J. 697 (1992).

188. Bryan, Gonzalez Vargas y Gonzalez Baz, S.C., *Manufacturing in Mexico, The Mexican In-Bond (Maquila) Program: The Most Commonly Asked Questions*, (January, 1992), in LEGAL ASPECTS OF DOING BUSINESS, ST. MARY'S L.J., INT'L L. SYMP. (March 6, 1992) (unpublished documents), provided by St. Mary's University School of Law, [hereinafter *Manufacturing in Mexico*].

189. *Id.*

190. *Questions and Answers*, *supra* note 181.

191. *Id.*

192. *Manufacturing in Mexico*, *supra* note 188, at 1.

193. *Id.* at 8; see *Questions and Answers*, *supra* note 181.

194. *Manufacturing in Mexico*, *supra* note 188, at 1.

195. *Id.*

196. *Id.*

197. *Id.*

198. *Id.* at 9.

199. *Id.* at 8.

200. *Id.*

201. *Id.*

202. *Id.* 8-9.

### C. *Special Concerns*

The infrastructure of the border area is inadequate for water treatment and distribution.<sup>203</sup> Before the border area can survive the onslaught of economic development resulting from the proposed Free Trade Agreement, a water treatment and distribution infrastructure must be developed. Similarly, the infrastructure for the disposal of solid and hazardous wastes must be developed. Landfills such as hazardous waste containment areas and recycling plants do not exist in many areas of Mexico.<sup>204</sup> Technology that works well in the United States, e.g., wet scrubbers, may not be practical in Mexico where water resources are scarce.<sup>205</sup> Pollution control and abatement technologies must always be adapted or suited to the local environment and economy.<sup>206</sup>

### V. THE FUTURE

The government of Mexico has resolved to strengthen the enforcement of environmental law within its borders. Such a position is meant to send a strong message to investors and developers already operating within the country, and to those who would venture to start up new businesses. The overall business climate in Mexico has already improved as a result of President Salinas' economic modernization program.

The proposed Free Trade Agreement, expected to come into effect on January 1, 1994, will assuredly bring economic growth to Mexico. Yet, environmental destruction and neglect will not be condoned. Future investors will have to respond to what the Mexican government hopes will become a stronger environmental regime.

This report has furnished an overview of the environmental law that already exists in Mexico. The promulgated regulations provide the teeth for enforcement of both general and specific laws. The detail and strength of these new laws as seen in the air pollution and hazardous waste fields are indicators of the future. The Mexican government intends to strengthen and develop environmental regulations in Mexico, including improvement of pollutant monitoring and tracking systems.

Although historically environmental enforcement in Mexico has been lax, manufacturers and businesses should anticipate stricter environmental protection and enforcement. Would-be entrepreneurs are encouraged to consult the federal Diario Oficial and with local Mexican governmental authorities for recently promulgated laws and regulations affecting their current or prospective businesses within a particular locality.

As it presently stands, with the recent changes in environmental enforcement, businesses operating within the U.S.-Mexico border areas and

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203. *U.S., Mexico Take On Border Pollution*, WALL ST. J., Feb. 25, 1992, at B1.

204. *New Environmental Scrutiny*, *supra* note 161.

205. *Id.*

206. *Id.*

Mexico City are under the heaviest scrutiny for compliance with environmental law and regulations.

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