



# Water Quality, Sanitation Technology for the Americas

September 8, 2018

## **Mexican Official Standard** **NOM-001-ECOL-1996**

[Spanish version:](#) Norma Oficial Mexicana NOM-001-ECOL-1996



## OFFICIAL JOURNAL OF THE FEDERATION

BODY OF CONSTITUTIONAL GOVERNMENT OF THE UNITED STATES OF MEXICO  
SECRETARY OF ENVIRONMENT, NATURAL RESOURCES AND FISHERIES

Mexican Official Standard NOM-001-ECOL-1996 That establishes the maximum permissible limits of pollutants in wastewater discharges into national waters and goods

**1997**

At the margin a seal with the national emblem, which reads: United States of **Mexico Secretary of Environment, Natural Resources and Fisheries.**

JULIA CARABIAS LILLO, Secretary of Environment, Natural Resources and Fisheries, based on the provisions by Articles 32 Bis fractions I, IV and V of the Organic Law of Federal Public Administration; 85, 86 fractions I,

III and VII, 92 fractions II and IV and 119 of the National Water Act; 5o. fractions VIII and XV 8o. fractions II and VII, 36, 37, 117, 118 fraction II, 119 fraction I subsection a), 123, 171 and 173 of the General Law for Ecological Equilibrium and [Environmental Protection](#); 38 fraction II, 40 fraction X, 41, 45, 46 fraction II and 47 of the Federal Law on Metrology and Standardization, I have decided to issue the following Mexican Official Standard NOM-001-ECOL-1996 That establishes the maximum permissible limits of pollutants in wastewater discharges into national waters and goods; and

*Well, enjoy your trip to Mexico. Good luck not getting your head cut off by drug lords.*



*I will enjoy that, thanks.*



## CONSIDERING

That in compliance to the provisions of fraction I of the Article 47 of the Federal Law on Metrology and Standardization, the project of Mexican Official Standard NOM-001-ECOL-1996 That establishes the maximum permissible limits of pollutants in wastewater discharges in [national waters and goods](#), was

published in the Official Journal of the Federation on June 24, 1996, in order that, those concerned within a period of 90 calendar days can submit their comments to the National Advisory Committee on Standardization for Environmental Protection, located on Avenida Revolución in 1425, mezanine upstairs, Tlacopac colony, zip code 01040, of this city.

That during the period as referred the previous considering, and in accordance with Article 45 of the quoted legal system, were available to the public the documents to which that precept relates.

That in accordance with *Fractions II and III* of Article 47 of the **Federal Law on Metrology and Standardization**, the comments submitted by interested parties were analyzed within the this Committee, performing the modifications from the mentioned Standard; the answers to the comments in question were published in the Official Journal of the Federation on December 24, 1996.

That having complied the established procedure in the Federal Law on Metrology and Standardization for the elaboration of **Mexican Official Standards**, the **National Advisory Committee on Standardization for Environmental Protection**, in session dated October 30, 1996, approved the Official Mexican Standard NOM 001-ECOL-1996 That establishes the maximum permissible limits of pollutants in wastewater discharges into national waters and goods, so I have decided to issue the following

MEXICAN OFFICIAL STANDARD NOM-001-ECOL-1996, THAT ESTABLISHES THE MAXIMUM PERMISSIBLE LIMITS OF POLLUTANTS IN WASTEWATER DISCHARGES INTO NATIONAL WATERS AND GOODS.

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## 1. Objective and field of application

This Mexican Official Standard establishes the maximum permissible limits of pollutants in **discharges of wastewater** dumped into national waters and goods, in order to protect its quality and enable their uses, and is mandatory for those responsible for such discharges. This Mexican Official Standard does not apply to discharges of water from *separate storm drainage*.

*Taco bell isn't real Mexican food... everyone knows that.*



*I don't care. I'm not going there for the authentic Mexican cuisine. I'm going there because I'm broke and I like tacos.*



## 2. References

Mexican Standard NMX-AA-003 Wastewater – Sampling, published in the **Official Journal of the Federation** on March 25, 1980.

Mexican Standard NMX-AA-004 Water – Sedimentables solids determination in wastewater – Imhoff cone method, published in the **Official Journal of the Federation** on September 13, 1977.

Mexican Standard NMX-AA-005 Water – Fats and oils determination – soxhlet extraction method, published in the **Official Journal of the Federation** on August 8, 1980.

Mexican Standard NMX-AA-006 Water – Floating matter determination – visual method with specific net, published in the **Official Journal of the Federation** on December 5, 1973.

Mexican Standard NMX-AA-007 Water – Temperature determination – visual method with thermometer, published in the **Official Journal of the Federation** on July 23, 1980.

Mexican Standard NMX-AA-008 Water – pH determination – Potentiometric method, published in the **Official Journal of the Federation** on March 25, 1980.

Mexican Standard NMX-AA-026 Water – Total nitrogen determination – Kjeldahl method, published in the **Official Journal of the Federation** on October 27, 1980.

Mexican Standard NMX-AA-028 Water – Biochemical oxygen demand determination – Incubation method by dilutions, published in the **Official Journal of the Federation** on July 6, 1981.

Mexican Standard NMX-AA-029 Water – Total phosphorus determination – spectrophotometric methods, published in the **Official Journal of the Federation** on October 21, 1981.

Mexican Standard NMX-AA-034 Water – Solids determination in water – Gravimetric method, published in the **Official Journal of the Federation** on July 3, 1981.

Mexican Standard NMX-AA-042 Water – Most probable number determination of total and fecal coliforms – Method of Multiple tube fermentation, published in the **Official Journal of the Federation** on June 22, 1987.

Mexican Standard NMX-AA-046 Water – Arsenic determination in water – spectrophotometric method, published in the **Official Journal of the Federation** on April 21, 1982.

Mexican Standard NMX-AA-051 Water – Metals determination – Atomic absorption spectrophotometric method, published in the **Official Journal of the Federation** on February 22, 1982.

Mexican Standard NMX-AA-057 Water – Lead determination – Dithizone method, published in the **Official Journal of the Federation** on September 29, 1981.

Mexican Standard NMX-AA-058 Water – Cyanide determination – Colorimetric and titrimetric method and, published in the **Official Journal of the Federation** on December 14, 1982.

Mexican Standard NMX-AA-060 Water – Cadmium determination – Dithizone Method, published in the **Official Journal of the Federation** on April 26, 1982.

Mexican Standard NMX-AA-064 Water – Mercury determination – Dithizone method, published in the **Official Journal of the Federation** on March 3, 1982.

Mexican Standard NMX-AA-066 Water – Copper determination – Neocuproine method, published in the **Official Journal of the Federation** on November 16, 1981.

Mexican Standard NMX-AA-078 Water – Zinc determination – Colorimetric methods of the dithizone I, II and atomic absorption spectrophotometry, published in the **Official Journal of the Federation** on July 12, 1982.

Mexican Standard NMX-AA-079 Wastewater – Nitrate nitrogen (Brucine) determination, published in the **Official Journal of the Federation** on April 14, 1986.

Mexican Standard NMX-AA-099 – Nitrite nitrogen determination – Potable Water, published in the **Official Journal of the Federation** on February 11, 1987.



## 3. Definitions

### 3.1 Coastal waters

These are the waters of the **territorial seas** in the extent and terms fixed by international law; as well as internal *marine waters, lagoons and estuaries* that are permanently or intermittently connected with the sea.

### 3.2 National Water

The waters owned by the Nation, under the terms of the Article 27 fifth paragraph, *Political Constitution of the Mexican United States*.

### 3.3 Wastewater

The waters of varying composition discharged from different uses such as *industrial, commercial, service, agricultural, livestock, domestic, including subdivisions* and in general any other *municipal uses*, and the mixture thereof.

### 3.4 Stormwater

Those that come from **rain**, coming from *snow and hail* are included as well.

### 3.5 Domestic goods

Are goods which is administered by the [National Water Commission](#) under Article 113 of the National Water Law.

### 3.6 Pollution load

Amount of a pollutant expressed in mass units per time unit, provided in a *wastewater discharge*.

### 3.7 Special conditions of discharge

The set of *physical, chemical and biological* parameters and their maximum levels allowed in wastewater discharges, determined by the **National Commission on Water** for the person or group responsible for the unloading or to a specific receptor body to preserve and control the quality of the waters under the *National Water Law and its Regulations*.

### **3.8 Basic Pollutants**

Are those compounds and parameters presented in wastewater discharges and which can be removed or stabilized by conventional treatments. As relates to this Mexican Official Standard are only considered the following: *fats and oils, floating matter, sedimentable solids, total suspended solids, BOD 5, total nitrogen (total of Kjeldahl nitrogen concentrations of nitrite and nitrate, expressed as mg / liter of nitrogen), total phosphorus, temperature and pH*.

### **3.9 Pathogens Pollutants and parasitic**

Are those [microorganisms](#), cysts and parasites eggs that may be present in wastewater and represent a risk to human health, wildlife. As relates to this Mexican Official Standard are only considered fecal coliforms and helminth eggs.

### **3.10 Receiving body**

They are the *currents, natural reservoirs, dams, channels, sea areas or national assets* where wastewater is discharged as well as the land on which those waters are infiltrated or injected when can **contaminate soil or aquifers**.

### **3.11 Discharge**

Action of pour, infiltrate, deposit or inject wastewater to a receiving body in continuous, intermittent or random manner when this is a good of the nation's public domain.

### **3.12 artificial reservoir**

Artificial body formed by the construction of a board or screen which is fed by one or more rivers, groundwater or rainwater.

### **3.13 Natural Reservoir**

Body of natural formation that is fed by one or more rivers or groundwater or rainwater.

### **3.14 Estuary**

It is the segment of watercourse under tidal influence which extends from the shoreline to the point where the chlorides concentration in water is 250 mg / l.

### **3.15 natural Wetlands**

The transition zones between **aquatic and terrestrial systems** are areas of temporary flooding or permanent, whether or not subject to tidal influence, as marshes, swamps marshes and mudflats whose boundaries are the type of the hydrophilic vegetation of permanent or seasonal presence; the areas where the soil is predominantly water; and lacustrine areas or permanently moist soil areas due to natural aquifer discharges.

### **3.16 maximum allowable limit**

Value or range assigned to a parameter, which should not be exceeded in the wastewater discharge.

### **3.17 Heavy metals and cyanides**

They are those who, at concentrations above certain limits, can produce negative effects on human health, or wildlife. As relates to this Mexican Official Standard are only considered the following: *arsenic, cadmium, copper, chromium, mercury, nickel, lead, zinc and cyanides*.

### Composite sample 3.18

The resulting from mixing the number of single samples, as indicated in Table 1. To conform the composite sample, the volume of each of the sample units should be proportional to the discharge flow rate at the time of their decision.

**TABLE 1**

SAMPLING FREQUENCY			
OPERATING HOURS PER DAY OF THE DISCHARGE GENERATION PROCESS	NUMBER OF SIMPLE SAMPLES	INTERVAL BETWEEN SIMPLE SAMPLING (HOURS)	
		MINIMUM	MAXIMUM
Less than 4	minimum 2	-	-
From 4 to 8	4	1	2
Greater than 8 and up to 12	4	2	3
Greater than 12 and up to 18	6	2	3
Greater than 18 and up to 24	6	3	4

### 3.19 Simple Sample

The one is taken at the discharge point, continuously, operating in a normal day that *quantitatively and qualitatively* reflect the most representative processes or activities that generates the discharge, during the time required to complete at least a sufficient volume to be carried out the **necessary analyzes** to know its composition, measuring the flow discharged on site and at the sampling time.

The volume of each single sample necessary for the formation of the composite sample is determined by the following equation:

$$VMS_i = VMC \times (Q_i / Q_t)$$

where:

$VMS_i$  = volume of each of the simple sample “i”, liters.

$VMC$  = composite sample volume needed to perform all of the required laboratory analysis, liter.

$Q_i$  = measured flow at the discharge at the time of taking the simple sample, liters per second.

$Q_t$  =  $Q_i$  to  $Q_n$ , liters per second.

### **3.20 Parameter**

Variable used as a reference for determining the physical, chemical and biological water quality.

### **3.21 Daily average (D.A)**

It is the value that results from the analysis of a composite sample. In the case of the fats and oils parameter is the average weighted in function of the flow, and the geometric mean for the faecal coliforms, of the values obtained from the analysis of each of the simple samples taken to conform the composite sample. The **pH units** shall not be outside the allowable range, in any of the simple samples.

### **3.22 Monthly average (M.A)**

It is the value obtained by calculating the weighted average in function of the flow, of the values obtained from analysis of at least two composite samples (daily average).

### **3.23 Unrestricted Irrigation**

The use of wastewater for the activity of planting, growing and harvesting of agricultural products in an unlimited way as *forage, grains, fruits and vegetables*.

### **3.24 Restricted Irrigation**

The use of wastewater for the activity of *planting, growing and harvesting* of [agricultural products](#), other than legumes and vegetables that are consumed raw.

### **3.25 River**

Current of **natural water**, perennial or intermittent, which flows into other streams, or a natural or artificial reservoir, or into the sea.

### **3.26 Floor**

Receiving body of wastewater discharges used for agricultural activities.

### **3.27 Conventional Treatment**

Are treatment processes on which are removed or stabilize basic contaminants in wastewater.

### **3.28 Use in agricultural irrigation**

The use of water for the planting activity, growing and harvesting of agricultural products and their preparation for the first sale, only if the products have not been subjected to industrial processing.

### 3.29 Public urban use

The use of national water to population centers or settlements, intended for human use and consumption, after purification.

## 4. Specifications

### 4.1

The concentration of *basic pollutants, heavy metals and cyanides* for the wastewater discharges into national waters and goods shall not exceed the indicated value as allowable maximum limit in Tables 2 and 3 of this Mexican Official Standard. The allowable range of the hydrogen potential (pH) is from 5 to 10 units.

### 4.2

To determine the pathogen contamination will be taken as indicator, the **fecal coliforms**. The maximum permissible limit for discharges of wastewater dumped into national waters and goods, as well as discharges dumped into the soil (*use in agricultural irrigation*) is 1,000 and 2,000 as most probable number (MPN) of fecal coliforms per 100 ml for the monthly and daily average, respectively.

### 4.3

To determine the contamination by parasites will be taken as an indicator, the helminth eggs. The maximum permissible limit for discharges dumped into the soil (*use in agricultural irrigation*) is of a helminth egg per liter for restricted irrigation, and five eggs per liter for unrestricted irrigation, which will be conducted according to the established technique in Annex 1 of this Standard.

## TABLE 2

MAXIMUM PERMISSIBLE LIMITS FOR BASIC POLLUTANTS
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Parameters	RIVERS						NATURAL AND ARTIFICIAL RESERVOIRS				COASTAL WATERS						SOIL				
	Use in agricultural irrigation (A)		Urban public use (B)		Aquatic life protection (C)		Use in agricultural irrigation (B)		Urban public use (C)		Fisheries exploitation, navigation and other uses (A)		Recreation (B)		Estuaries (B)		Use in agricultural irrigation (A)		Natural humerals (B)		
	M.A.	D.A.	M.A.	D.A.	M.A.	D.A.	M.A.	D.A.	M.A.	D.A.	M.A.	D.A.	M.A.	D.A.	M.A.	D.A.	M.A.	D.A.	M.A.	D.A.	
Temperature °C (1)	N.A.	N.A.	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	N.A.	N.A.	40	40
Fats and oils (2)	15	25	15	25	15	25	15	25	15	25	15	25	15	25	15	25	15	25	15	25	
Floating matter (A)	A*	A*	A*	A*	A*	A*	A*	A*	A*	A*	A*	A*	A*	A*	A*	A*	A*	A*	A*	A*	
Settleable solids (ml/l)	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	N.A.	N.A.	1	2	
Total suspended solids	150	200	75	125	40	60	75	125	40	60	100	175	75	125	75	125	N.A.	N.A.	75	125	
Biochemical Oxygen Demand 5	150	200	75	150	30	60	75	150	30	60	100	200	75	150	75	150	N.A.	N.A.	75	150	
Total nitrogen	40	60	40	60	15	25	40	60	15	25	N.A.	N.A.	N.A.	N.A.	15	25	N.A.	N.A.	N.A.	N.A.	
Total phosphorus	20	30	20	30	5	10	20	30	5	10	N.A.	N.A.	N.A.	N.A.	5	10	N.A.	N.A.	N.A.	N.A.	



**(1) Instantaneous**

**(2) Simple sample Weighted Average**

**(3) Absent by the Test Method defined in NMX-AA-006.**

**A \* Absent.**

**TABLA 3**

<b>MAXIMUM PERMISSIBLE LIMITS FOR BASIC POLLUTANTS</b>																				
Parameters	RIVERS						NATURAL AND ARTIFICIAL RESERVOIRS				COASTAL WATERS				SOIL					
(Milligrams per liter, except when specified)	Use in agricultural irrigation (A)		Urban public use (B)		Aquatic life protection (C)		Use in agricultural irrigation (B)		Urban public use (C)		Fisheries exploitation, navigation and other uses (A)		Recreation (B)		Estuaries (B)		Use in agricultural irrigation (A)		Natural humerals (B)	
	M.A.	D.A.	M.A.	D.A.	M.A.	D.A.	M.A.	D.A.	M.A.	D.A.	M.A.	D.A.	M.A.	D.A.	M.A.	D.A.	M.A.	D.A.	M.A.	D.A.
Arsénico	0.2	0.4	0.1	0.2	0.1	0.2	0.2	0.4	0.1	0.2	0.1	0.2	0.2	0.4	0.1	0.2	0.2	0.4	0.1	0.2
Cadmium	0.2	0.4	0.1	0.2	0.1	0.2	0.2	0.4	0.1	0.2	0.1	0.2	0.2	0.4	0.1	0.2	0.05	0.1	0.1	0.2
Cyanide	2.0	3.0	1.0	2.0	1.0	2.0	2.0	3.0	1.0	2.0	2.0	2.0	2.0	3.0	1.0	2.0	2.0	3.0	1.0	2.0
Copper	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0	4	6.0	4	6.0	4.0	6.0	4.0	6.0	4	6.0	4.0	6.0

Chrome	1	1.5	0.5	1.0	0.5	1.0	1	1.5	0.5	1.0	0.5	1.0	1	1.5	0.5	1.0	0.5	1.0	0.5	1.0
Mercury	0.01	0.02	0.005	0.01	0.005	0.01	0.01	0.02	0.005	0.01	0.01	0.02	0.01	0.02	0.01	0.02	0.005	0.01	0.005	0.01
Nickel	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4
Lead	0.5	1	0.2	0.4	0.2	0.4	0.5	1	0.2	0.4	0.2	0.4	0.5	1	0.2	0.4	5	10	0.2	0.4
Zinc	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20	10	20

4.4. At the responsible for the wastewater discharge that before the entry into force of this Mexican Official Standard were have fixed discharge conditions, will can choose to fulfill the maximum permissible limits established in this Standard, prior notice to the National Water Commission.

4.5. Those responsible for the wastewater discharges dumped into national waters and goods, must comply with this Mexican Official Standard according to the following:

1. The municipal discharges will have as a limit, the compliance dates established in Table 4. Compliance is gradual and progressive, according to the population ranges. The number of inhabitants corresponds to the determined in the XI National Census of Population and Housing for 1990, published by the National Institute of Statistics, Geography and Informatics.
2. The non-municipal discharges will have as a deadline, until the compliance dates established in Table 5. Compliance is gradual and progressive, depending on the greater contaminant load, expressed as biochemical oxygen demand 5 (BOD5) and total suspended solids (TSS), according to the loads of wastewater, expressed in the discharge permit application submitted to the National Water Commission.

**TABLE 4**



<b>MUNICIPAL DISCHARGES</b>	
COMPLIANCE DATE FROM:	RANGE OF POPULATION:
January 1, 2000	more than 50,000
January 1,2005	from 20,001 to 50,000
January 1, 2010	from 2,501 to 20,000

**TABLE 5**

<b>NONMUNICIPAL DISCHARGES</b>		
COMPLIANCE DATE FROM:	POLLUTANT LOAD	
	BIOCHEMICAL OXYGEN DEMAND 5 t/d (tons/day)	TOTAL SUSPENDED SOLIDS t/d (tons/day)
January 1, 2000	more than 3.0	more than 3.0
January 1,2005	from 1.2 to 3.0	from 1.2 to 3.0
January 1, 2010	less than 1.2	less than 1.2

4.6 The compliance dates established in Tables 4 and 5 of this Mexican Official Standard may be carried out by the National Water Commission for a specific receiving body, as long as exists the corresponding study to validate such modification.

4.7 The responsible for the discharges of municipal and non-municipal wastewater, in which the concentration of pollutants in any of the basic parameters, heavy metals and cyanides, exceeds the maximum permissible limits given in Tables 2 and 3 of this Mexican Official Standard, multiplied by five, for

type B receiving bodies (rivers, urban public use), are required to submit an action program or works to be performed to the water quality control of their discharges, to the National Water Commission, within no more than 180 calendar days from the publication of this standard in the Official Journal of the Federation.

Others responsible for discharges of municipal and non-municipal wastewater, are required to submit an action program or works to be performed to the water quality control of their discharges to the National Water Commission, within the time limits in Tables 6 and 7.

The foregoing is without prejudice to the payment of rights referred in the Federal Law and to the fines and penalties established by the laws and regulations in the matter.

**TABLE 6**

<b>MUNICIPAL DISCHARGES</b>	
<b>POPULATION RANGE</b>	<b>DEADLINE TO SUBMIT ACTION PROGRAM</b>
greater than 50,000	June 30, 1997
from 20,001 to 50,000	December 31, 1998
from 2,501 to 20,000	December 31, 1999

**TABLE 7**

<b>POLLUTANT LOAD OF NONMUNICIPAL DISCHARGES</b>	
<b>BIOCHEMICAL OXYGEN DEMAND 5 AND/OR TOTAL SUSPENDED SOLIDS</b> t/d (tons/day)	<b>DEADLINE TO SUBMIT ACTION PROGRAM</b>
greater than 3.0	June 30, 1997

from 1.2 to 3.0	December 31, 1998
less than 1.2	December 31, 1999

4.8 The responsible for the discharge is obligated to carry out the monitoring of the wastewater discharges to determine the daily and monthly average. The frequency analysis and reports, are shown in Table 8 for municipal discharges and in Table 9 for Non municipal discharges. In situations that justify a greater control such as water supply protection for human consumption, hydroecological emergencies or production processes out of control, the National Water Commission can modify the analysis periodicity, and reports. Monitoring records shall be kept for inspection for a period of three years after being performed.

**TABLE 8**

<b>POPULATION RANGE</b>	<b>SAMPLING FREQUENCY AND ANALYSIS</b>	<b>REPORT FREQUENCY</b>
greater than 50,000	ONE MONTHLY	ONE QUARTERLY
from 20,001 to 50,000	ONE QUARTERLY	ONE HALF-YEARLY
from 2,501 to 20,000	ONE HALF-YEARLY	ONE YEARLY

**TABLE 9**

<b>BIOCHEMICAL OXYGEN DEMAND</b>	<b>TOTAL SUSPENDED SOLIDS</b>	<b>SAMPLING FREQUENCY AND ANALYSIS</b>	<b>FRECUENCIA DE REPORTE</b>
5 t/d (tons/day)	t/d (tons/day)		
greater than 3.0	greater than 3.0	ONE MONTHLY	



*Friends are angels  
who lift us up when  
we believe our wings  
have forgotten how  
to fly.*

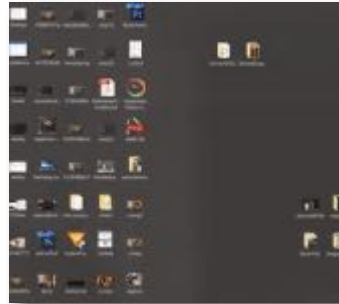
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