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Editor: Vince Lencioni General  
Manager  
Contributors: Claire Carranza,  
Alejandro Vega

## MEXICO WATER REPORT



### **Top Five Targeted Sectors for Industrial Discharge Enforcement**

In an attempt to provide a better understanding of the private sector industrial opportunities in the Mexican water sector, here is an analysis of the five sectors that Mexican water officials have been targeting for priority enforcement of existing water regulations. The next edition of *The Quarterly Mexico Water Report* will analyze additional sectors that deserve attention, including the construction and agriculture sectors.

### **Principal industries that generate industrial discharges**

Treatment of industrial discharges in Mexico is improving thanks in part to improved enforcement and implementation of wastewater standards, industrial water price increases and related reuse strategies, some general and sector-specific fiscal incentives, and government efforts focused on key industries. Mexican firms are required to comply with two major regulations depending on where their wastewater is discharged: NOM 001 covers discharges into federally regulated bodies of water and NOM 002 covers discharges into municipal systems. NOM 003 regulates the treatment of wastewater for agricultural, recreational, and industrial reuse. If you would like a translated copy of these standards, please contact us.

Because of high volumes of water usage and/or toxicity of discharges, Conagua (the Mexican Federal Water Commission) has identified the following five sectors as priorities for ensuring not only compliance with NOM 001 or NOM 002, but also with additional, higher standards:

- Sugar Mills
- Paper Mills
- Chemical Factories
- Petroleum and Petrochemical Factories and Refineries
- Pork Industry

In the majority of cases, these sectors are dominated by 10-20 large companies that are discharging 75-80% of the contaminants. Mexican water authorities are targeting and visiting these firms with some regularity. However, Mexican water officials have estimated that there are about 500,000 additional companies that are discharging wastewater. Only 1,387 companies are monitored for direct discharge into federal bodies of water. The great majority send their wastewater into municipal water systems that eventually flow into these federal water bodies.

### **Sugar Mills**

There are about 60 sugar mills in Mexico. One third of these are located in the state of Veracruz with the rest of the states having between one and three mills each. The technology used in these mills is 80-90 years old, very inefficient, and leads to considerable discharges of organic material. During the first half of the past decade, programs were created and enforcement was enhanced both to cut down on biochemical oxygen demand (BOD) discharges and to get companies to adopt water reuse strategies. In the majority of cases, the focus was to update the manufacturing process and reduce the need to build treatment plants at the end of the process. Reportedly, about one-third of the sector is still non-compliant with existing rules. Providing solutions to facilities in this situation, and helping the other two-thirds stay compliant, should allow for considerable business opportunities.

While Mexico remains one of the principal sugar-consuming nations of the world (per capita sugar consumption of almost 60 kg per year is double the world average), the country's sugar production industry is in decline. The sector has been hit hard by NAFTA and increased fructose imports from the United States. Mexico has the fourth highest incidence of diabetes in the world, and the current trend towards low or sugar-free products has also hurt the sector. Mexico maintains a sugar quota of 250,000 tons per year to protect the industry, although the local soft-drink industry has lobbied hard to allow for an increase in the quota. Last year's harvest was poor and adversely affected local sugar mills.

Production should go up in 2011, and there are plans to expand some production facilities, but it would be hard to characterize the industry as one of high growth and security in the future. If Mexican sugar producers hope to stay competitive they will need slow but steady improvement in harvesting techniques as well as increasing field and factory technological improvements to lower costs, improve margins, and avoid fines for non-compliance with wastewater regulations.

### **Paper Mills**

The paper industry in Mexico generates more than 64,000 direct and 235,000 indirect jobs. National paper manufacturing represents \$10.3 billion annually, equivalent to 7.1% of the Mexican manufacturing GDP and almost 5% of the industrial GDP. National paper companies manufacture about 70% of all the paper products consumed in Mexico. In terms of production and discharge volumes, about 20 companies produce virtually all of the waste product with the top 10 companies responsible for approximately 80% of the entire sector. Recycled paper is the strength of the Mexican paper industry. Mexican consumption of recycled paper is third highest in the world.

So far in 2010, paper production has increased by more than 30%, although part of this growth is the recuperation of production lost during the 2009 economic downturn. However, like in most Mexican industries, the Mexican paper industry is very dependent on the United States for all types of process inputs.

Conagua recognized that it had to step up its vigilance of the paper industry to eliminate the extensive discharge problems. As a result, Conagua created a specialized program to prioritize vigilance to ensure compliance well beyond NOM 001 and 002 levels. Unlike the sugar industry, paper manufacturing processes in Mexico are fairly modern. However, the discharges are still of

great concern and require extensive treatment plant infrastructure. Nine out of 10 of the companies that belong to the Mexican Paper Chamber have at least secondary biological treatment plants and several of them hold the somewhat exclusive Mexican Secretary of the Environment Water Quality Certification (Certificado de Calidad de Agua). Many companies in the sector have taken advantage of financial incentives that supply free water for manufacturing processes if their discharges exceed NOM 001 and 002 standards which would meet or surpass even U.S. EPA standards. While the top 10 Mexican paper companies are fully compliant with Mexican regulatory requirements, the next 10 companies, considered the medium-sized producers, need assistance to become or stay compliant. Many of the smaller producers remain non-compliant and will likely be future targets for Conagua regulatory enforcement efforts in the sector.

### **Chemical Factories**

The Mexican chemicals industry, like the Mexican sugar industry, is dealing with the challenge of trying to upgrade process technologies from the 1920s and 1930s to become more efficient and comply with Mexican environmental regulatory standards. At the same time, this industry resembles the paper industry, in that 80% of production and discharges are generated by 10-20 companies, and their solutions require treatment plant infrastructure. In fact, the larger manufacturers tend to have activated carbon and tertiary rather than secondary treatment systems to deal with solvent, hormone, and other BOD discharges, with solvents being the top problem. A secondary problem that both these companies and water authorities are dealing with is the cleaning of the aquifers that have been heavily and historically polluted by chemical company discharges. Conagua maintains specialized programs to ensure that chemical companies surpass NOM 001 and 002 standards and assist in the rehabilitation of aquifers affected by historic company discharges.

The 230 companies in the Mexican Chemical Chamber represent close to 90% of the sector's production and discharges. This association also includes the great majority of companies that manufacture chemicals for water treatment. According to Conagua officials, the majority of the problematic companies in the segment are found in and around the Valley of Mexico (including Tlaxcala) and in the state of Veracruz.

Annually, the Mexican chemical industry manufactures over \$17 billion of product annually, which represents close to 12% of the manufacturing GDP and 8.5% of the industrial GDP of the entire country. Prior to the economic crisis in 2008, annual investment in the industry was more than \$1 billion per year. While there is some growth potential for this segment, the chemical industry is considered to be somewhat depressed, losing 20% of its production during the economic crisis. Pre-crisis production levels are not expected to be reached until late 2011 or possibly late 2012.

### **Petroleum and Petrochemical Factories and Refineries**

The Mexican petroleum and petrochemical industries face similar challenges as the general chemical industry, with the greatest problems being solvents and toxicity. The important difference is that there are only four private petrochemical companies in all of Mexico, located in Veracruz, northern Tamaulipas (Poza Rica), and Chihuahua, while Pemex (the state-owned petroleum producer) operates eight petrochemical complexes and 39 petrochemical plants throughout the country.

Pemex has almost 7,000 wells and 400 production fields, over 230 marine platforms, 11 gas refineries, and six oil refineries, making it one of the most important worldwide oil companies. It is the third-largest oil-producing company and 11th largest in oil sales. Mexico ranks 6th in oil production, 12th in natural gas production, 13th in oil refining capacity, and 17th in oil reserves. In 2009, Pemex invested over \$20 billion (100% more than in 2005) with over \$2 billion destined for refinery infrastructure (65% more than 2005). Total Pemex sales in 2009 were \$87 billion although production, currently at 2,600 barrels per day, has fallen annually since 2005 with a 14% decrease from 2005 to 2009.

Conagua officials say that Pemex has been targeted for enforcement during the last few years and that it will remain a priority target for the foreseeable future. While it appears that Pemex has the financial resources necessary to obtain technology and equipment to remain compliant, this point of view is a bit too simplistic. There are several important limitations when considering Pemex business and its ability to obtain technology and equipment to remain compliant with wastewater regulations. The vast size and nature of its facilities makes Pemex infrastructure expenditures expensive. Since revenue from Pemex funds approximately one-third of the federal government's expenditures, there are a lot of demands for the revenue generated by the firm. Pemex does not always have the liquidity or funds to meet these required expenses so readily. While Pemex might be generating significant revenue, it is also accumulating significant debt and little in the way of profits. It should not be overlooked that since Pemex is generating so much revenue for the federal government, it is unclear to what extent Pemex wastewater violations are conveniently overlooked. Doing business with Pemex is complicated, often requiring the right contacts, because it is part of a large bureaucracy.

## **Pork Industry**

The Mexican pork industry produces over 1.1 billion tons of product each year. The states with the most production are Sonora (20%, principal export state), Jalisco (19%, no exports), Guanajuato (9%, no exports), Puebla (9%, no exports), and Yucatan (8%, important exporter).

Production has been flat over the last few years (2009 production figures are equal to 2006 figures) and increased demand has been met by imports during the last five years. Imports grew from 25% of total sales in 2003 to 33% in 2009. While growth might be limited in the sector, discharge problems are extensive and therefore despite low growth it appears that there will be a need and probably a demand for equipment and services for this sector for many years.

The sector has serious discharge and waste problems, compounded by its small and decentralized nature. Conagua is stepping up its enforcement of this decentralized sector despite the rural enforcement challenges and has established a specialized program to monitor this relatively unsophisticated industry.

Several other segments are also important consumers of equipment and services for water treatment such as food and beverage (including bottling, baking, and dairy), metalworking, cement, pharmaceuticals, textiles, hotel/restaurant, and construction. The next edition of *The Quarterly*

*Mexico Water Report* will deal with these sectors plus the challenges faced by the agricultural sector, which represents only 4% of GDP but where over 83% of Mexican water resources are consumed. Conagua increased funding for agricultural-related wastewater and infrastructure projects by 60% in 2010 recognizing the need to address both the high water consumption and pollution/discharge issues of this large and often highly inefficient sector.