

# THE ROAD AHEAD (MID/LATE 1990's)<sup>1</sup>

## THE INDUSTRIAL DISCHARGES

Since late 1997, the efforts of the Binational Technical Committee have focused on three areas: (1) characterizing industrial discharges into the New River and the Mexicali sewage collection system; (2) planning for the new pumping plant and 840-liter per second (20-mgd) wastewater treatment facility (WWTF) for the Mexicali II area; and (3) completing the “Quick Fix” projects.

In September 1997, CH2M Hill prepared a report entitled Assessment of the Industrial Wastewater Discharges in Mexicali, Baja California, and Recommendations for the Implementation of an Industrial Pretreatment Program. A Regional Board staff registered civil engineer reviewed and summarized the report in a memorandum dated November 14, 1997, as follows:

- “...Approximately 88 different industries are discharging into what Mexico defines as ‘waters of the nation’ (e.g., open ditches, ag drains, streams, rivers, groundwaters, and coastal waters). Out of the 88, about 50 different industries/entities are believed to be discharging directly into the New River and/or its tributaries, and many of them (e.g., Hidrogenadora Nacional) have multiple discharge points. All industries discharging into the waters of the nation fall under the jurisdiction of CNA<sup>[2]</sup>. The limits applicable to these industries are contained in Mexican federal regulation NOM-001-ECOL/1996<sup>[3]</sup> and shown in the following table:

<sup>1</sup> Chapter 7 was written by Jose L. Angel, Senior Water Resources Control Engineer of the Regional Board.

<sup>2</sup> The list for these industries/entities was compiled by CH2M Hill from information provided by CNA. The list is included in the CH2M Hill report, has limited available information on the COD and TSS of the discharges, and does not include commercial facilities or privately owned medical facilities (e.g., hospitals).

<sup>3</sup> This regulation became effective in 1997 and provides a time schedule for compliance. CESP and industries discharging more than 3.0 tons/day of BOD and TSS must comply with the limits by 1/1/2000. Industries discharging between 1.2 and 3.0 tons/day of BOD and TSS must comply with the limits by 1/1/2005, and industries discharging less than 1.2 tons/day of BOD and TSS must comply by 1/1/2010.

Parameter (units)	Beneficial Use					
	Agriculture Irrigation		Urban/Public Contact		Aquatic Life Protection	
	Monthly Average	Daily Average	Monthly Average	Daily Average	Monthly Average	Daily Average
Temperature (°C)	n/a*	n/a	40	40	40	40
Grease and Oils (mg/l)	15	25	15	25	15	25
Floating materials	n/p**	n/p**	n/p**	n/p**	n/p**	n/p**
Settleable Solids (ml/l)	1	2	1	2	1	2
TSS (mg/l)	150	200	75	125	40	60
BOD <sub>5</sub> (mg/l)	150	200	75	150	30	60
Total Nitrogen (mg/l)	40	60	40	60	15	25
Total Phosphorus (mg/l)	20	30	20	30	5	10
Arsenic (mg/l)	0.2	0.4	0.1	0.2	0.1	0.2
Cadmium (mg/l)	0.2	0.4	0.1	0.2	0.1	0.2
Cyanide (mg/l)	2.0	3.0	1.0	2.0	1.0	2.0
Copper (mg/l)	4.0	6.0	4.0	6.0	4.0	6.0
Chromium (mg/l)	1	1.5	0.5	1.0	0.5	1.0
Mercury (mg/l)	0.01	0.02	0.005	0.01	0.005	0.01
Nickel (mg/l)	2	4	2	4	2	4
Lead (mg/l)	0.5	1	0.2	0.4	0.2	0.4
Zinc (mg/l)	10	20	10	20	10	20

- CH2M Hill was not able to assess how and to what extent CNA is enforcing the regulatory discharge limits. Also, baseline data regarding the inorganic and organic characteristics of many of the discharges is not available to fully assess the water quality impacts they may be causing in the New River. However, my review of the report indicates that, of the 50 entities discharging into the New River and/or its tributaries, over 65% are discharging their wastes untreated, only 21 of them (i.e., less



Figure 192 - Tula West Drain downstream of Hidrogenadora Nacional (Jan 1998)

that 50%) have waste discharge permits from CNA, and many of them are not included in the binational tours. Further, 12 of the permitted discharges (i.e., approximately 60%) are in violation of their TSS and/or COD effluent limits. Therefore, one has to conclude that the majority of the industries discharging into the New River watershed have a poor compliance record. Also, one has to

question whether an effective enforcement program is in place and being implemented to bring these industries into compliance with NOM-001-ECOL/1996.

- Approximately 180 industries are currently discharging wastes into the municipal sewage collection system<sup>[1]</sup>. These industries fall under the jurisdiction of the Direccion General de Ecologia del Estado de Baja California (DGE)<sup>[2]</sup>. The limits applicable to these industries are contained in Mexican federal regulation NOM-CCA-031-ECOL/1993 and shown in the following table:

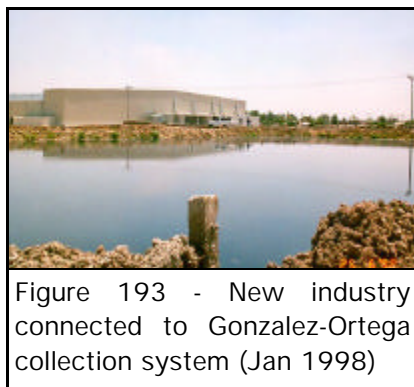


Figure 193 - New industry connected to Gonzalez-Ortega collection system (Jan 1998)

Parameter (units)	Permissible Maximum Limits	
	Daily Average	Instantaneous
Temperature (° C)		40
pH	6 - 9	6 - 9
Settleable Solids (ml/l)	5	10
Grease and Oils (mg/l)	60	100
EC (umhos/cm)	5000	8000
Aluminum (mg/l)	10.0	20
Arsenic (mg/l)	0.5	1.0
Cadmium (mg/l)	0.5	1.0
Cyanide (mg/l)	1.0	2.0
Copper (mg/l)	5.0	10.0
Chromium (mg/l)	0.5	1.0
Total Chromium (mg/l)	2.5	5.0
Fluoride (mg/l)	3.0	6

<sup>1</sup> The list for these industries is also included in the CH2M Hill report, but this list was compiled from information provided to CH2M Hill by DGE. This list includes limited available information on the inorganic and conventional pollutant characteristics of the industrial wastes, but does not include commercial facilities (e.g., restaurants and auto shops) or privately owned medical facilities (e.g., hospitals and dentist facilities).

<sup>2</sup> DGE is a state agency in charge of ensuring compliance with state environmental laws, including discharges of industrial wastes into the sewage collection system, which is run by CESPM.

- "• *Very few (less than 15%) of the industries discharging into the collection system implement any kind of pretreatment program prior to discharging. However, according to the CH2M Hill report, most of these industries comply with the limits specified in NOM-CCA-031-ECOL/1993. The report indicates that when DGE finds an industry out of compliance, it requests an appropriate and prompt corrective action.*
  
- "• *Data in the report indicates that the majority of the industries discharging into the collection system are involved in the agricultural industry (i.e., deal with ag chemicals), in the electronics industry, and in the manufacturing of different items out of metal. Consequently, these industries are likely to produce wastewater high in metals and organic chemicals. Neither CESPМ nor DGE have a pretreatment program for the municipal wastewater treatment facilities (WWTFs) and enough data on the physical and chemical characteristics of the discharges to assess: (1) the impact that these discharges have on the WWTFs and the New River, and (2) the overall effectiveness of NOM-CCA-031-ECOL/1993. Therefore, I agree with the report's recommendations that Mexicali (i.e., CESPМ/DGE) should implement the following for the development and implementation of a pretreatment program:*
  - "1. *Develop local rules/regulations, which provide the necessary legal authority to implement and enforce a pretreatment program for its WWTFs. These authorities may be incorporated into a single ordinance/regulation or multiple rules may be used for the necessary authority.*
  - "2. *Perform an Industrial Waste Survey (via inspections, questionnaires, review of files, review of utility records, etc., etc., etc.) to verify the list of industries which could be significant dischargers into its collection system, identify the character of the discharges, and develop an industrial waste survey data management system.*
  - "3. *Evaluate the current local limitations (i.e., NOM-CCA-031-ECOL/1993) to determine whether additional/more stringent limitations need to be developed and implemented to protect the WWTFs and O&M personnel.*
  - "4. *Evaluate the staffing and equipment needed to run a pretreatment program efficiently.*
  - "5. *Develop procedures for evaluating the compliance status of the industries discharging into the collection system and the procedures to deal with enforcement.*

- "6. Establish a committee consisting of representatives from industry, the city, environmental groups, and concerned entities, who can provide input on the development of the pretreatment program.
- "7. Develop criteria to determine the effectiveness of the program.
- "8. Develop a time schedule for developing a pretreatment program."

From August 25 to October 5, 1997, CH2M Hill monitored wastewater in the principal collectors of Mexicali, sewage treatment lagoons, water treatment plants, and New River. The objectives of the monitoring were to:

- Characterize wastewater flows for existing and proposed WWTFs, potable water prior to use and discharge to sewers, and background conditions in the New River;
- Determine toxicity of effluent from existing WWTFs; and
- Evaluate requirements for long-term sampling and analysis.

The results of the monitoring were presented in a December 1997 report entitled Flow Monitoring and Sampling and Wastewater Characterization for Mexicali, Baja California, Mexico. Tables No. A-1 through A-17 in Appendix A show the monitoring results for field parameters and conventional pollutants, for the influent into and effluent from the Zaragoza and Gonzalez-Ortega lagoons. Tables No. A-18 through A-20 in Appendix A show the monitoring results for the Xochimilco Agricultural Drain, which is considered to represent background water quality for the New River. The following four tables summarize the flow, conventional pollutant, bacterial, and toxicity monitoring results<sup>1</sup>.

Table 1 Sewage Flow Results (in mgd)			
Station Name	Average	Minimum	Maximum
Zaragoza WWTF Influent	31.67	25.28	35.26
Colector Principal	2.31	0.33	4.39
Colector Nutrimex	3.54	2.78	4.2
Villa Colonial	0.52	0.3	0.67

<sup>1</sup> Tables No. 1 through 4 have been adapted from data contained in the CH2M Hill report.

Table 2 Conventional Pollutants and Bacterial Results for Raw Sewage				
Parameter	Zaragoza Lagoons	Colector Principal	Colector Nutrimex	Gonzalez Ortega Lagoons
BOD (mg/l)	112	155	96	129
TSS (mg/l)	236	481	179	352
Total Coliform (MPN)	$1.6 \times 10^7$	$2.3 \times 10^7$	$1.7 \times 10^7$	$2.0 \times 10^7$
Fecal Coliform (MPN)	$9.2 \times 10^6$	$1.2 \times 10^7$	$7.5 \times 10^6$	$1.1 \times 10^7$

Table 3 Station No. 1-E Zaragoza Treatment Plant Effluent Acute Toxicity Bioassays (Daphnia Magna)				
Date	Concentration	Percent Survival		
	%	0 Hrs	24 Hrs	48 Hrs
9/12/97	100	100	100.00	100.00
9/22/97	100	100	100.00	90.00
9/29/97	100	100	100.00	15.00

Table 4 Station No. 2-E Gonzalez Ortega Treatment Plant Effluent Acute Toxicity Bioassays (Daphnia Magna)				
Date	Concentration	Percent Survival		
	%	0 Hrs	24 Hrs	48 Hrs
9/12/97	100	100	30	15
9/29/97	100	100	100	100

The report provides the following observations and interpretation of the above-referenced monitoring results:

- Colector Principal and Colector Nutrimex currently carry most of the flow that will be lifted by the new Pumping Plant No. 4 for discharge into the new WWTF for the Mexicali II area.
- Villa Colonial represents a typical residential subdivision and the monitoring results for this station yielded a per capita sewage contribution of 51.2 gpd or 194 liters per capita per day (lpcpd)<sup>1</sup>, which is equivalent to a water consumption of 242 lpcpd,

<sup>1</sup> This is about one-half of the typical per capita wastewater flow contribution for the United States.

which is well in line with the 257 lpcpd water consumption rate reported by CNA in its 1996 update to the Master Plan.

- The wastewater data from the Zaragoza lagoons can be used for a proposed expansion of these lagoons. The data from the Colector Principal, Colector Nutrimex, and Gonzalez-Ortega Lagoons can be used for the Mexicali II WWTF.
- The proposed CNA design for the Mexicali II WWTF uses a BOD<sub>5</sub> of 250 mg/l and an influent total and fecal coliform organisms of 1.0x10<sup>8</sup> and 1.0x10<sup>7</sup> MPN/100 ml, respectively. The CNA's BOD<sub>5</sub> value appears to be conservative when compared to the values obtained of 96 to 164 mg/l. The bacteria values observed at Zaragoza are about the same as the design values used by CNA for the proposed Mexicali II WWTF. However, CNA's design values are based on cold weather conditions with a lagoon temperature of 12.3 °C. Therefore, further long-term sampling is necessary to determine sewage conditions during cold weather design conditions.
- An analysis of the BOD<sub>5</sub>, COD, and TTS at various points in the sewage collection system suggests that approximately 10 mgd of water is apparently infiltrating/inflowing into the system. Accordingly, CH2M Hill recommends that a program to ascertain the sources of water and insoluble COD and TSS should be initiated because these values affect the design of wastewater treatment facilities and user fees.
- The data indicates that the Zaragoza lagoons are achieving about 80% BOD removal even though they are operating at about 50% above their design capacity and the flow pattern is short-circuiting the lagoon system.
- A comparison of the metal concentrations in the raw sewage into the Zaragoza and Gonzalez-Ortega lagoons and in the Colector Principal and Colector Nutrimex with the limits prescribed by Mexican regulations (NOM-001-ECOL/1996) for discharge into surface waters shows that all metal concentrations comply with said limits. However, a comparison with water quality objectives in the Inland Surface Waters Plan<sup>1</sup> of the State Water Resources Control Board shows that chromium, copper, lead, and selenium<sup>2</sup> fail to meet the water quality objectives. Based on this, and to

<sup>1</sup> In 1994, the California Supreme Court voided this Plan. The State Board is considering adoption of another version of the Plan in 1998 or shortly thereafter.

<sup>2</sup> The values reported for selenium are highly suspect as they are extremely high (up to 20 times the typical concentrations in water from the Colorado River, which is the source water for Mexicali). One explanation for this is that the method used to analyze the wastewater samples had a detection limit of 45 ug/l and most of the sampling results were reported as 45 ug/l when they were "non-detected."

account for seasonal variations, CH2M Hill recommends long-term monitoring for all metals for which the Regional Board or State Board has water quality objectives.

- Influent and effluent wastewater samples from the Zaragoza and Gonzalez-Ortega lagoons; wastewater samples from Colector Principal, Colector Nutrimex, Water Treatment Plants No. 1 and 2, and residential basin were “non-detect” for volatile organic constituents, persistent organic compounds, and Base/Neutral/Acid extractable compounds.
- One effluent sample from the Zaragoza lagoons and one effluent sample from the Gonzalez-Ortega lagoons showed acute toxicity. Ammonia levels in the samples was high enough to be at least partly responsible for the toxicity. Therefore, CH2M Hill recommends that toxicity testing should continue at both wastewater treatment facilities, but ammonia should be eliminated as the toxic source in the samples prior to running the bioassays.
- The water samples from the Xochimilco Agricultural Drain yielded mean values for BOD of 10 mg/l, COD of 171 mg/l, TSS of 197 mg/l, and total and fecal coliform organisms of 1600 MPN/100 ml, which compare closely with the values that the Regional Board obtained in 1972 and 1986 for the same constituents. CH2M Hill recommends long-term monitoring of this drain for heavy metals and organic constituents to accurately characterize the water quality impacts caused by discharges of waste downstream of the drain.



Figure 194 - Zaragoza lagoon (Jan 1998)

In a report entitled Mexicali Sanitation Project-- Immediate Need Projects, December 1997, IBWC reported the following benefits/improvements from the quick fixes:

*“The Collector Works and Sewer Cleaning Equipment (Quick Fixes 1 through 4, and 8): The works completed thus far have increased the reliability and capacity of the sewer infrastructure. These works have eliminated an estimated 2 million gallons of raw sewage per day*



Figure 195 - SewerVac Truck (Jul 1998)



**THE ROAD AHEAD (MID/LATE 1990'S)**

*The Industrial Discharges*



from being discharged indirectly or directly into the New River...Work on the collector system continues and further significant discharges to the River will be eliminated. It is estimated that 95% of these works will be completed by mid December 1997 (one project, the "South Collector," is ongoing and, due to unforeseen collapses of sewer pipes, is expected to be completed in 1998). The cleaning equipment has been well utilized in preparing the collectors for lining/replacement work...A 120-day video inspection was conducted on the sewerage system and additional work was identified. The cleaning equipment will continue providing service for many years, helping to clean and maintain the system, thus preventing many future bypasses of wastewater to the New River.

**"Lift Stations, Pumping Plants and Flow Meters (Quick Fixes 5, 6 and 11):** The pumping plants...and lift stations...are a crucial part of the system. When they are out of service due to either power outages or equipment failure, this results in significant discharges of raw wastewater to the New River. The old pumps were constantly breaking down and in need of repair. The emergency standby generators were outmoded and replacement parts were difficult to obtain...These immediate need projects have reduced wastewater bypasses to the New River due to plant outages. The newly installed pumps and generators should, over the long term, prove to be far more reliable than the old units (in many cases, the existing pumps were potable water pumps not designed for this type of application). During the month of August 1997 alone, it was estimated that more than 6 million gallons of wastewater bypass to the New River were avoided, due to operation of the new emergency generators during electrical outages. The flow meters will help maintain the efficiency of the collection system.



Figure 196 - Standby generator at Pumping Plant No. 1 (Mar 1998)

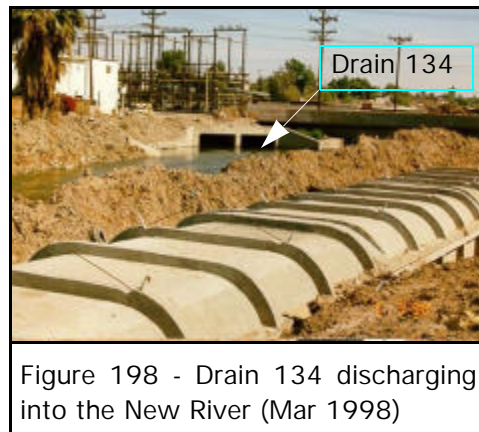


Figure 197 - Pumping Plant No. 3 (new pump in gray) (Mar 1998)

**“Ignacio-Zaragoza and González-Ortega Lagoons (Quick Fixes 7 and 9):** Over the years, sludge had accrued on the lagoon bottoms. Under normal operating conditions, an immediate improvement of effluent quality is expected after sludge is removed from [the] lagoons. However, the Ignacio-Zaragoza and Gonzalez-Ortega Lagoons are overloaded because they are processing approximately 27 million gallons per day and 4 million gallons per day, respectively, but they were designed to treat only 22 million gallons per day and less than 1 million gallons per day. In addition, one of the three primary lagoons at Ignacio-Zaragoza is currently out of service due to modifications to enhance its operation. The accumulated sludge further diminished the treatment capacity of the lagoon system by reducing the volume available for treating the wastewater. Lab analyses show that removing the accumulated sludge...has stabilized the effluent quality from the lagoons, which is preventing further water quality degradation of the New River. Further improvements in effluent and water quality are expected once the primary lagoon at Ignacio-Zaragoza becomes operational within the next few months.

**“Alamo River Diversion Weir (Quick Fix 10):** The new weir has been constructed. However, some modifications to downstream portions of the Mexicali Drain need to be completed to allow the weir to function properly. Once finished, the base flows of the Alamo River will be diverted to the New River Basin to prevent approximately 1.6 million gallons per day of transboundary discharge of polluted waters that may enter the Alamo River.

**“Drain 134:** Due to the implemented collector works, wastewater discharges to Drain 134 have been reduced. Further reductions can be expected after the longer term project work is completed.”



## MEXICALI II

Wastewater generated in the Mexicali I area will be collected by the Mexicali I sewer network and conveyed to the Zaragoza WWTF (a.k.a. Mexicali I WWTF), whereas wastewater generated by the Mexicali II area would be collected and conveyed to a proposed Pumping Plant No. 4 from which it would be pumped to the proposed Mexicali II WWTF. In a report dated December 1997, IBWC identified the following components of future sanitation projects for the Mexicali I and Mexicali II service areas:

### MEXICALI I

- Rehabilitation of 20,010 feet of sewers
- Replacement of 24,250 feet of sewer pipeline
- Construction of new sewers, pump stations and forcemains
- Rehabilitation of four lift station wet wells
- Rehabilitation of Mexicali I wastewater treatment plant
- Installation of telemetry equipment at pumping plants
- Expansion of the Mexicali I wastewater treatment plant to 30 million gallons per day

### MEXICALI II

- Construction of sewer Pumping Plant No. 4
- Construction of 31,170 feet of discharge forcemain<sup>1</sup> for Pumping Plant No. 4
- Construction of 91,370 feet of sewers
- Replacement of 6,600 feet of sewers
- Rehabilitation of two lift station wet wells



Figure 199 - Sewage force main for Mexicali II WWTF (Feb 1998)

<sup>1</sup> CNA is responsible for this project. As of December 1997, a CNA contractor had already installed approximately 1.5 miles of the force main, a 54-inch steel pipe. However, as of January 1998, the project has been on hold reportedly due to problems between CNA and its contractor.

- Construction of Mexicali II wastewater treatment plant to treat 20 million gallons per day
- Installation of telemetry equipment at pumping plants and treatment facilities

The proposed Mexicali II project has an estimated cost of \$50 million dollars. It received conditional and final certification by the BECC on December 5, 1997, and January 7, 1998, respectively. The final financing plan including Federal, State and local funds is being developed to pay for project costs.



Figure 200 - Proposed site for Mexicali II WWTF (Oct 1997)

On January 8, 1998, the Regional Board adopted an updated Clean Water Act 303(d) list<sup>1</sup>, which listed the beneficial uses of the New River as being impaired by bacteria, volatile organic constituents, nutrients, silt, and pesticides. The bacterial and VOC pollution is largely attributable to discharges of wastes in Mexicali. Also, the discharges in Mexicali are partly responsible for causing the nutrient and pesticide impairments.



Figure 201 - Discharge from Slaughterhouse (Oct 1997)

On January 8, 1998, U.S. Senator Barbara Boxer met in El Centro with Imperial Valley constituents and policy makers to discuss, amongst other topics, border infrastructure and New River pollution. During the meeting she stated that come February "...the Federal government's goal will be to issue a complete financial analysis of the next phase of the polluted river's cleanup and to secure a \$10 to \$15 million loan for the execution of that cleanup..."

During the January 12, 1998 Salton Sea symposium held in Rancho Mirage, the Regional Board Executive Officer made a presentation regarding the Salton Sea problems. His presentation included a discussion of New River pollution in Mexicali and emphasized that, while New River pollution from Mexico remains a significant problem and a top priority for the Regional Board, the main water quality problem facing the Sea is increasing salinity. He postulated that bacteria and organic loading concentrations (i.e., pollution) at the International Boundary have declined

<sup>1</sup> The Clean Water Act mandates that the Regional Board adopt a list of surface waters which are not supporting their designated beneficial uses or meeting their assigned water quality objectives. The list has to be updated periodically.

significantly over the last 20 years, while nutrient concentrations at the International Boundary have remained stable (Figure Nos. 215 and 216 and Table Nos. B-1 through B-5 in Appendix B show the trend monitoring and recent water quality data for the New River at the International Boundary).

On January 16, 1998, Newt Gingrich, the Speaker of the U.S. House of Representatives, and a bipartisan congressional delegation representing Riverside and Imperial Counties visited the Salton Sea and pledged to make the Sea's cleanup a top environmental cause for Congress. During his visit, he was briefed on Mexico's pollution of the New River.

During a January 22, 1998, binational tour of the New River in Mexicali, a Regional Board staff registered civil engineer made the following observations:

*"Pump Station No. 1 - Only Pumps No. 5 and 6 were operating at the time of the tour. Pumps No. 1 through 4 (the new Fairbanks-Morse pumps) are not operational yet...According to Mr. Soberanes, CESPM is still working on the "wiring" for the pumps. He stated that the pumps should be fully operational within one month. Also, the on-site emergency generator is not fully operational. Mr. Soberanes stated that CESPM tested the generator last month to make sure it works, but that the test blew up some electrical panels at the station. Apparently, CESPM is also working on the electrical wiring for the generator.*



Figure 202 - Pumping Plant No. 1. The new pumps are shown in gray color (Jan 1998)

*"Pump Station No. 2 - Pumps No. 1 and 3 in the upper section and Pumps No. 1 and 3 in the lower section were operating during the tour. Pump No. 2 in the upper section and Pump No. 2 in the lower section were out of service reportedly for repairs.*



Figure 203 - Bypass from Lift Station into New River (Jan 1998)

*"Right Bank Pumping Station - The station was bypassing approximately 1 million gallons per day of*

raw wastewater into the New River. [A CESPM representative] stated that CESPM was working on some of the valves and wiring at the station and that the work was expected to be complete in about two days.

*"Pump Station No. 3 - Only Pumps No. 1 and 3 were operational...Pump No. 2, the new Fairbanks-Morse pump...is not operational yet either. Also, the new flow meters have been installed, but they too are not operational yet.*

*"Gonzalez-Ortega Pump Station - This pumping station has been completely abandoned! All that remains there is the old dilapidated building...I understand that rehabilitation of this pumping station was part of the Quick Fix program.*

*"During the tour, we also visited the Tula West Drain one mile upstream and north from Highway 2. The drain at this location is being encased like the New River...the drain is being encased all the way to Highway 2 to prevent further dumping of trash and illegal discharges into it, better manage storm water runoff, and to reclaim the land that the drain currently affects...Reportedly, the project is scheduled for completion within two months. The Mexican Government is bearing the full cost of the project."*



Figure 204 - Encasement of Tula West Drain upstream of industrial area (Jan 1998)

*"The indiscriminate dumping of solid wastes (e.g., household trash and used tires) into the Tula West Drain by Highway 2, Mexicali II Principal Collector, and into the New River by the pedestrian bridge between Oaxaca and Tabasco Avenues further pollute the river...We must request that the Mexican government inform us what steps it is taking or proposes to take to permanently eliminate these discharges and to provide us with a time schedule to do so..."*



Figure 205 - New River one mile upstream of Drain 134 (Jan 1998)

*"Partially treated and untreated discharges of industrial wastewater into the New River and its tributaries continues seemingly unabated. We must request that CNA inform us what steps it is taking or proposes to take to bring these industries into compliance with Mexican laws and regulations..."*



Figure 206 - Alamo River weir (Jan 1998)

During the February 3, 1998 Binational Technical Committee (BTC) meeting in Mexicali, the U.S. section of the committee reported to have \$8.7 million available under Treaty Minute No. 294 for the construction of the new Pumping Plant No. 4, its force main, and the Mexicali II lagoon system. It also expressed a desire to review the CNA plans and specifications for these two projects for adequacy, prior to committing the money for construction. As currently designed by CNA, the Mexicali II WWTF consists of Phase I and Phase II. Phase I is based on a 20-mgd lagoon system consisting of conventional anaerobic, facultative, and maturation ponds with a total detention time of 35 days to be located in a 250-ha site. According to CNA, Phase II consists of dissolved air flotation units followed by trickling filters for a design flow of 20-mgd<sup>1</sup>. During the meeting, CNA reported that it was negotiating an agreement with the City of Mexicali for long-term maintenance of the Alamo River weir.

On February 4, 1998, members of the BTC attended a workshop at the University of California-Berkeley concerning Advanced Integrated Pond Systems (AIPS) wastewater unit treatment processes. The purpose of the workshop was to explore the potential to use AIPS as the main unit treatment process in the Mexicali II WWTF, and the workshop included a tour of the AIPS at St. Helena WWTF in St. Helena, California. AIPS occupy less area and are capable of handling slug loads better than conventional facultative lagoons. The U.S. BTC section formally recommended to the Mexican section to use AIPS as the main unit treatment process for the Mexicali II WWTF. It also recommended a number of modifications to the design of the new Pumping Plant No. 4 and the its sewage force main. During the meeting, a Regional Board staff registered civil engineer expressed concerns that, even though about 1.5 miles of force main have already been installed, neither geotechnical nor chemical analyses (e.g, differential settlement and soil corrosivity) have been performed on the soils affected by the force main. Further, the staff engineer expressed concerns about the lack of a transient analysis for the force main and pumping plant.

<sup>1</sup> At several BTC meetings, USEPA and Regional Board/State Board staff have expressed serious reservations about the use of trickling filters in Phase II.

A March 1998 IBWC report entitled Mexicali II Wastewater Treatment Facilities Present Worth Analysis compared the construction, operation, and maintenance costs of the proposed CNA lagoon system against the costs of the U.S. recommended AIPS for both Phase I and Phase II of the Mexicali II WWTF. The report shows a savings of about \$1.0 million dollars in construction costs if AIPS were to be used instead of the CNA proposed pond system for Phase I. However, for Phase II of the WWTF, it showed a savings of over \$5.0 million dollars in construction and over \$500,000/year in O&M if AIPS were to be used. This notwithstanding, CNA expressed reservations about the AIPS recommendation, but conceptually agreed to the new pumping plant and force main recommendations.

On February 25, 1998, The Sonny Bono Memorial Salton Sea Restoration Act<sup>1</sup> was introduced in the U.S. House of Representatives. The draft legislation would appropriate \$300 million dollars to implement a project to restore the Sea's beneficial uses. It would also appropriate \$2 million dollars for and provide an exemption from the CWA permitting requirements to discretionary wetland projects to cleanup agricultural drainage from Imperial Valley and New River water. About one week later, U.S. Senators Barbara Boxer and Dianne Feinstein introduced similar legislation in the U.S. Senate, but their proposed legislation did not address the wetland projects.

A Regional Board staff memorandum for the March 3, 1998 binational tour of the New River contains the following observations:

*"Hidrogenadora Nacional continues to discharge wastes into the drain evidently without regard for unsightly conditions or adverse water quality impacts it may create...its outlet line located about 0.51 miles north from Highway 2, was discharging approximately 5 lps of steamy, greasy wastewater with a milky-brown tint into the drain...Further, at approximately 10 feet south from the outline, someone evidently dumped a black oil-like substance on the left bank of the drain. The substance extended from just below the top of the embankment all the way down to the water line in the drain and covered approximately 50-60 square feet of embankment..."*

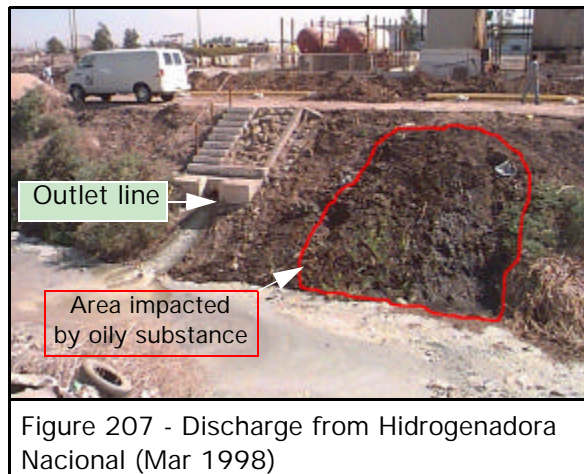


Figure 207 - Discharge from Hidrogenadora Nacional (Mar 1998)

<sup>1</sup> The Act was a bipartisan tribute to the late U.S. Representative Sonny Bono, who championed cleanup of the Salton Sea. Mr. Bono died in a skiing accident on January 5, 1998.



*"The [Jardines Del Lago Lift Station]...was bypassing approximately 1 million gallons per day of raw wastewater into the New River. [CESPM stated it] was working on some of the valves and wiring at the station and that the work was expected to be complete in two days at the most. No U.S. agency, and in particular IBWC, received prior notification about the bypass.*

*"...dumping of solid wastes (e.g., household trash and used tires) into the New River and its tributaries continues. Wire fences along both sides of the banks of the New River by Oaxaca Avenue has somewhat mitigated the indiscriminate dumping...we must continue to request the...removal of the solid wastes from the waterways, proper disposal of the wastes, and documented periodic maintenance of the waterways.*

*"The [Gonzalez-Ortega and Zaragoza lagoons] continue to be organically and hydraulically overloaded and suffering from short-circuiting. We should request an expert evaluation of the existing lagoon distribution systems, configuration, and O&M to determine whether short-term, cost-effective measures (e.g., enhanced O&M) can be implemented to improve effluent quality.*



Figure 208 - Gonzalez-Ortega primary lagoon (Mar 1998)

*"The on-going bypasses of raw sewage and partially treated wastewater through Drain 134, Nutrimex, Colector Principal, and the above-mentioned storm drains and pipes are unacceptable. We must continue to press the Mexican government to make their permanent and prompt elimination the highest priority. CESPM is eliminating bypasses of municipal wastewater into the New River and its tributaries, planning ahead for the need of a pre-treatment program for the industries that discharge into its collection system, and making progress in eliminating raw sewage overflows from its collection system and pumping stations. While the progress at times seems slow, it is progress nevertheless. Completion of all quick fixes and construction of the new wastewater treatment facilities will abate New River pollution at the International Boundary. However, these efforts are significantly undermined by the fact that Mexican industries and businesses continue to discharge partially treated and untreated wastewater directly into the New River and its tributaries at will. Until these industries are brought into full compliance with Mexican laws and regulations, the New River at the International Boundary will continue to be significantly polluted.*

*"Sadly, the Alamo weir continues to overflow into the U.S....According to CILA,*

*CNA was supposed to implement an operation and maintenance program to prevent the overflows, but it has not done so. The weir itself is now in jeopardy because the concrete around it is being washed away by the overflows..."*

On March 25, 1998, Regional Board staff accompanied USEPA Deputy Administrator Fred Hansen, IBWC Commissioner John Bernal, USEPA Region IX Administrator Felicia Marcus, and representatives of CILA, CNA, and CESPM on a tour of the Mexicali sanitation project. The tour covered Pumping Plant No. 2, the proposed site for the Mexicali II WWTF, and the industrial area by the Tula West Drain and Highway 2 in Mexicali. The purpose of the tour was to show aspects of the sanitation program being implemented (e.g., quick fixes) to address New River pollution, the unprecedented and on-going industrial growth in Mexicali, and how much work is still needed to address and prevent New River pollution.

In April 1998, the Baja California State Legislature began holding hearings on the encasement project of the New River<sup>1</sup>. The following are excerpts from an April 30, 1998, article in the *La Voz de la Frontera*, Mexicali's main newspaper, regarding an April 29, 1998, hearing in which SAHOPE's Secretary appeared before the State legislature committee investigating the project and reported the following:

- The river is being encased from the Mexican customs offices (i.e., from the border) to Xochimilco Lake at a cost of \$102,795,729 pesos (approximately \$12.8 million dollars), and that the State would not pay any additional money for the project;
- The design is based on a hydraulic capacity of 26 cubic meters per second (approximately 920 cfs), which is what was recommended by CNA<sup>2</sup>;



Figure 209 - New River by Pumping Plant No. 2 (Jun 1998)

<sup>1</sup> Throughout 1998, the College of Engineering at the Universidad Autonoma de Baja California, as well as other political and scientific institutions in Mexicali have raised questions about the hydraulic capacity, project bid/award process, method of payment for the contractors in charge of building the project, and actual merits of the encasement for the New River in Mexicali. Speculation by some Mexican engineers is that the project was grossly under-designed.

<sup>2</sup> Questions about the hydraulic capacity began right after tropical storm Nora in August 1997. The storm caused severe flooding in Mexicali and generated about 20 cubic meters per second (700 cfs) in 24 hours. Consequently, the flow of the New River outside the encasing was reportedly five to ten times what was conveyed by the encasing.

- The project was awarded to the contractor who was solvent and could guarantee the best price and financial arrangement, complete the job in a timely manner, as well as reclaim the most area within the floodplain of the river;
- The State owes approximately \$1.2 million dollars to the contractors. He reported the debt would be paid in money (i.e., cash); and
- The encasement will be accessible for maintenance.

On May 12, 1998, the Citizen's Congressional Task Force on the New River met at the Imperial Valley College to discuss two proposed wetland projects in Imperial Valley to treat agricultural drain wastewater runoff and water from the New River. During the meeting, Regional Board staff provided an overview of the sanitation problems and 'quick fix' projects. Regarding industrial discharges of waste into the New River in Mexicali, the Imperial County Deputy District Attorney stated that *"...until the specific industries are identified, nothing will improve, and [that if maquiladoras with U.S. ownership are discharging into the New River,] they should be brought to the United States and prosecuted under American laws."*

During the May 19, 1998, BTC meeting in Imperial, CNA officially declined the United States' recommended use of AIPS for the Mexicali II area, but conceptually agreed to the following modifications to enhance the design of the pumping plant for the Mexicali II WWTF:

- Provide submersible pumps and motors in dry pits as protection against flood damage and as an alternative to close, connected vertical centrifugal pumps;
- Provide a soil odor treatment system as an alternative to no odor control or ventilation of the influent area;
- Cover influent channels with checkered plates to prevent odors from escaping as an alternative to no covering;
- Provide containment for diesel tanks as an alternative to no containment; and
- Provide an electrical bus as an alternative to cables.

Regarding the force main, CNA agreed to modify the design of the force main so that the main includes a "pig launching station"<sup>1</sup> for cleaning access as an alternative to no cleaning access. It also

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<sup>1</sup> A "pig cleaning station" simply provides easy access for cleaning a force main using a polly-pig cleaning device.

agreed to provide splitter boxes and pipes for flow control as an alternative to open channels with slide gates in the lagoon distribution system.

## THE QUICK FIXES--PHASE II?

On June 12, 1998, a subgroup of the BTC met in Mexicali to discuss the status of the quick fixes and the protocol to bring the fixes to a satisfactory conclusion. It was reported by SAHOPE that essentially all quick fixes were 100% complete, except for minor details at Pumping Plants No. 1, 2, and 3. In response, the U.S. BTC subgroup section stated that:

- The flow meters at Pumping Plants No. 1, 2, and 3 had not been calibrated yet;
- The flow recorders at said plants were not operational;
- The flow meter for Pump No. 5 at Pumping Plant No. 1 and the flow meter for Pump No. 3 in the upper level of Pumping Plant No. 2 were "measuring flow" when they were not on;
- The water pressure at Pumping Plant No. 3 was inadequate to ensure proper lubrication of the two new pumps simultaneously;
- The electrical wiring for the new pumps and lubrication system at Pumping Plant No. 3 was incomplete, and, consequently, the pumps were being operated manually; and
- The Alamo River weir was still spilling wastewater into the U.S.

The Mexican BTC subgroup section agreed to address the above-mentioned issues. The subgroup as a whole identified the following potential/candidate projects for inclusion in a Phase II of the Quick Fix Program:

- Verification of adequate construction and post-grouting liner integrity of the sewer collector quick fix projects that used high-density polyethylene (HDPE) pipe and were subsequently grouted;
- Field evaluation to assess existing conditions and the need for proper grouting of the 32-inch HDPE liner along Av. Jose Maria Michelena, the 18-inch HDPE liner along the International Border crossing, and the 32-inch liner along Av. Licenciado Francisco Primo De Verdad;
- Improvements to headwork bar screens and ventilation systems at Pumping Plants No. 1, 2, and 3;
- Provide "water hammer" protection at Pumping Plant No. 3;
- Change the electrical wiring of the emergency power generation system to govern all six pumps at Pumping Plant No. 1;

- Conduct a study to identify a long-term solution to the Alamo River overflows;
- Conduct a study to eliminate wastewater discharges from Drain 134 into the New River; and
- Conduct a study to define a project to improve the effectiveness and operation of the Right Bank and Left Bank sewer collectors near the International Boundary.

During the June 26, 1998 BTC meeting, the full BTC agreed to include the above-mentioned projects in Phase II of the Quick Fix Program and asked CH2M Hill to develop cost estimates for the projects<sup>1</sup>.

In a letter dated July 9, 1998 addressed to USEPA, and pursuant to the CWA 303(d) list adopted by the Regional Board in January 1998, the Regional Board Executive Officer expressed the Regional Board's commitment to draft total maximum daily load recommendations (TMDLs)<sup>2</sup> for New River at the International Border. The Executive Officer proposed to work jointly with USEPA, the IBWC, and appropriate Mexican agencies in preparing an implementation plan. Upon successful completion of the draft TMDLs, he recommended that adoption be pursued via a Minute treaty agreement with Mexico. He added that successful implementation of the TMDLs for New River at the International Boundary would greatly increase the cooperation the Regional Board receives from the Imperial Valley agricultural community in implementing TMDLs to address pollution within the Salton Sea watershed.

In a letter dated July 16, 1998, and as a follow-up to the September 1997 report prepared by CH2M Hill on industrial discharges (see page 7-1), the Regional Board requested to IBWC to schedule a special Binational New River Tour to determine the extent of direct discharges of industrial wastewater into the New River in Mexicali. The purpose of the tour would be to "visit" those industries which were not part of the monthly binational tours, but that were identified by CH2M Hill as discharging wastes into the New River and/or its tributaries. The letter transmitted a list, which identified about 50 industries of concern. IBWC responded to the Regional Board request on July 28, 1998. IBWC agreed that the tour was necessary and stated that it would be making arrangements with the Mexican government to conduct the tour.

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<sup>1</sup> As of the date of this report, while Mexico remains committed to participate in the funding of these projects, USEPA has not been able to match that commitment. Meanwhile, raw sewage discharges from Drain 134, sewage overflows from collectors close to the International Border, and the Alamo weir, to name a few, continue to be a significant problem.

<sup>2</sup> TMDLs are numeric limits/goals that are developed for impaired surface waters. The purpose of the TMDLs is to allocate allowable loadings to non-point and point-source pollution sources to restore the beneficial uses of the impaired waters.



Following the July 1998 Binational tour of the New River, the Regional Board Executive Officer and a staff engineer noted the following observations in a memorandum dated August 5, 1998:

*"The westernmost primary basin at the Mexicali I wastewater treatment system has been drained and, work was underway on the new distribution system. Effluent from the lagoons was green and no particular problems were noted.*

*The Gonzalez-Ortega lift station is fully operational. At Pumping Plant No. 3, CESPMP began building a cistern to provide sufficient water pressure to the new pumps' lubrication system. The cistern should be finished within one week. At the time of the tour, all three pumps were operational, and the plant operator reported that the pumps now operate in automatic mode. Reportedly, the flow meters at this plant have been calibrated, but the total flow recorder is still not operational. At Pumping Plant No. 1, one pump was down because of a bad shaft. Currently, this is not a problem since the four new pumps/motors are much more than adequate to handle the load. At Pumping Plant No. 2 everything was in good shape except for one of the old pumps which was down, the flow meters which need to be calibrated, and the flow recorder which is still not operational. Mr. Aranda, the contractor in charge of the work at the pumping plants, stated that his crew and a representative from the meter's manufacturer would take care of the problems with the flow meters and recorders this week. The noted problems notwithstanding, the overall conditions at these three pumping plants were judged to be better than ever. Except for potential corrosion problems, failure is not anticipated at these pump stations for at least the next few years, if proper pump/motor maintenance is accomplished. No problems were noted in the Pumping Plant No. 26 sector of the river. Apparently, quick-fix projects have been successful in stemming spills of raw sewage in this area.*

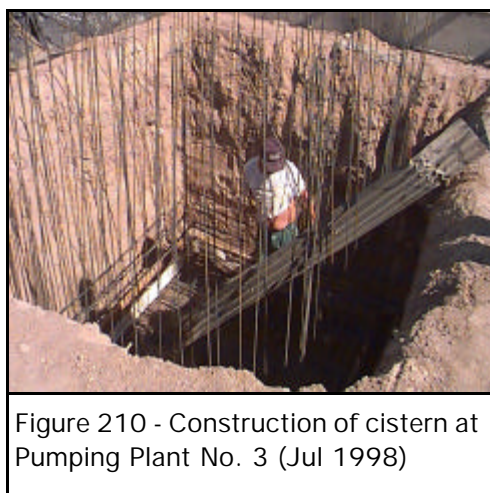


Figure 210 - Construction of cistern at Pumping Plant No. 3 (Jul 1998)



Figure 211



Figure 212



Figure 213

Figure Nos. 211 through 213: In clockwise direction, Pumping Plants No. 1, 2, and 3 (Jul 1998)

*"A major recent bypass of raw sewage from the South Collector to the New River has been eliminated, at least for the most part. The bypass occurred because of a collapsed line. The efforts by Mexico to deal with this problem in expedient fashion are commendable considering the magnitude of the problem and resources needed (e.g., over \$120,000 dollars) to deal with the problem."*



Figure 214 - South Collector repairs underway (Jul 1998)