IBWC Binational Study of the Tijuana River and Adjacent Canyons and Drains

San Diego Area Citizens Forum

November 5, 2020

Binational Water Quality Study

- One year special study of the Tijuana River and canyons.
  - Purpose of this study:
    - Gather baseline data at the transboundary locations for dry and wet weather conditions.
    - Identify higher than normal constituents and possible concerns.
    - Use information to develop future studies such as source tracking studies or further monitoring.

Saturn
River Mouth
Hollister
Dariy Mart Bridge
Smugglers Gultch 2
Silva Drain
PB-CILA
Goat Canyon 2
Stewarts Drain
Yogurt 1
Yogurt 2
Goat Canyon 1
Canon del Matadero 2
Canon Los Sauces 2
Rio Alamar
Rio TJ Above Alamar
Monitoring Sites
Tijuana River and Canyon Areas
Water and Sediment
Sediment Only
Sitios de monitoreo
Río Tijuana y Cañones
Agua y Sedimento
Solamente Sedimento

Binational Water Quality Study

- Study period: December 2018 to November 2019
- Binational study with sites in Mexico and the US.
- Canyon sites and Tijuana River at PB-CILA were split between sampling teams, all other sites were analyzed by the respective countries.
- Samples were analyzed for water and sediment for conventional, pathogens, metals, and organics.
- Rain events were sampled in December and February.
- Baseline dry weather samples collected in May.
- Canyons quarterly for water and river monthly for conventional.

Assessment of data

- Data was assessed for impacts to environment using:
  - Water quality objectives for the Tijuana River
  - Ocean Plan
  - NOM-001-SEMARNAT-1996
  - CE-CCA-001/89
- Data was also compared to typical wastewater parameters as determined by SBIWTP influent.
- 267 different parameters were analyzed.
  - 136 of the parameters were above detection limits.
  - 131 of the parameters were not detected.
- Final report and full datasets available at:

www.ibwc.gov/Organization/Environmental/Minute320.html

https://cila.sre.gob.mx/cilanorte/index.php/boletin/114-saneamiento-calidadagua

Datasets

- Detected parameters were combined into 1 dataset.
- Data was used to compare to standards and to look at trends.

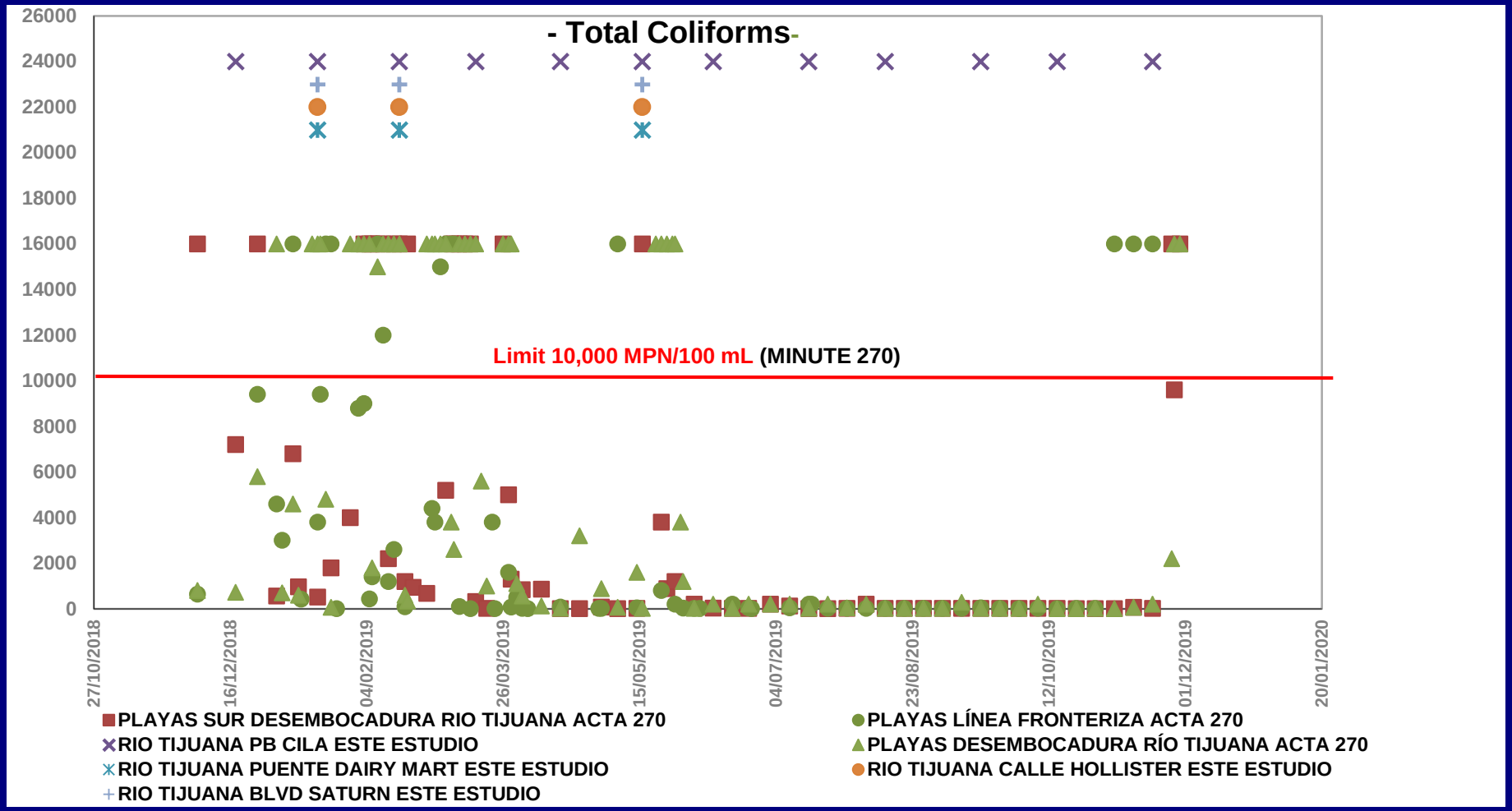
Parameter	Analyte	UNIT	Reference Standard					Silva Drain				
								USA			MÉXICO	
			Ocean Plan	TJ River WQOs	TJ Wastewater	NOM-001	CE-CCA	DEC-18	JAN-19	FEB-19	DEC-18	FEB-19
Conventional	Alkalinity (Total as CaCO3)	mg/L						NS	530	90	89.6	91.6
Conventional	Ammonia (as Nitrogen)	mg/L	6.0	0.025	50		0.01	2.1	49.5	0.7	2.1	1.4
Conventional	Bicarbonate (HCO3)	mg/L									89.6	91.6
Conventional	Biochemical Oxygen Demand (5-day) BOD	mg/L		10	379	75		NS	130.0	12.0	24.9	9.6
Conventional	Calcium	mg/L						NS	147.0	28.7	32.8	38.3
Conventional	Carbonaceous Biochemical Oxygen Demand (5-Day) CBOD	mg/L			327			34.3	245.0	<2	NS	NS
Conventional	Chemical Oxygen Demand (COD)	mg/L		120	710			240.0	560.0	78.0	181.9	94.2

Bacteria data

- Study analyzed all sites for coliforms, Camphylobacter , Cholera, Enterovirus, Enterococcus, and Norovirus.
- All sites exceeded the coliform standards however, Yogurt Canyon, had significantly lower values.
- Camphylobacter, Norovirus, and salmonella were detected.
- Cholera was not detected.

Total Coliforms

River compared to Ocean Monitoring

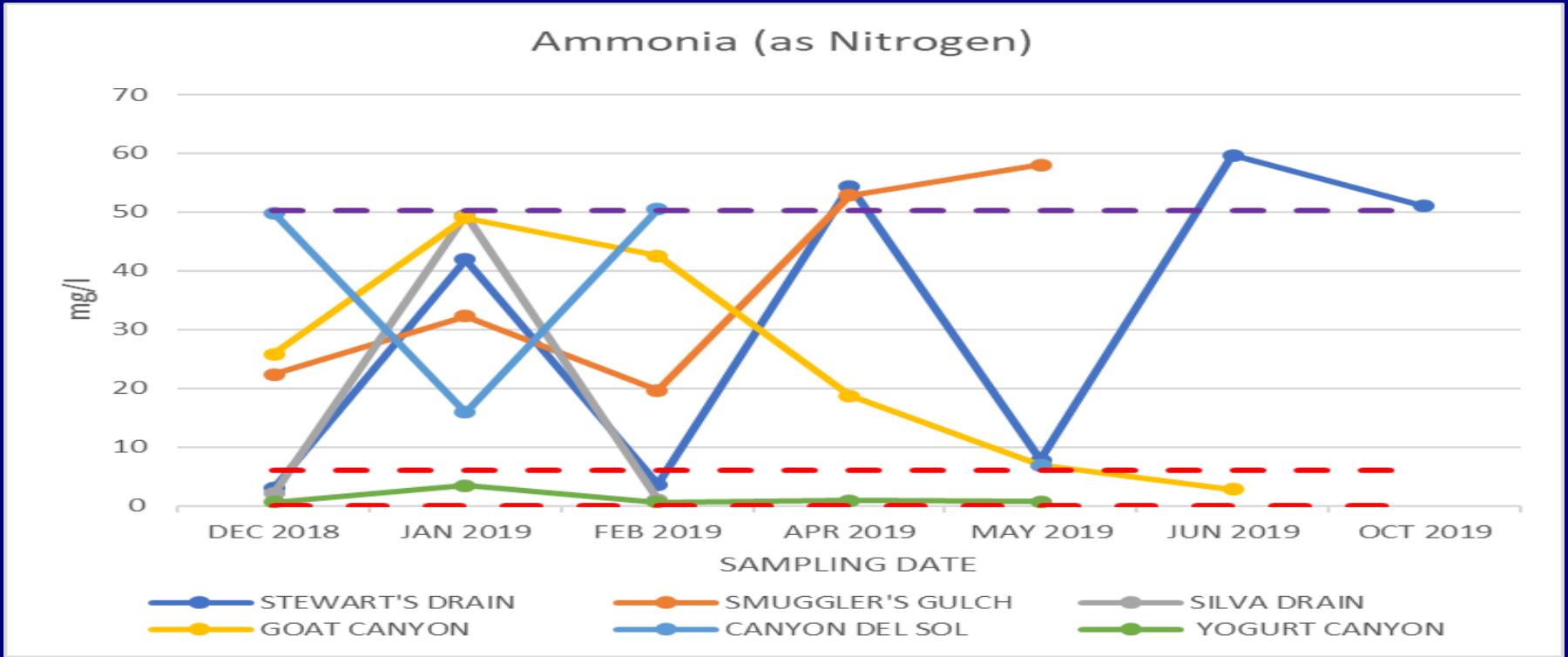


Canyons and Drains

- Stewarts Drain
- Silva Drain
- Canyon Del Sol
- Goat Canyon
- Smugglers Gulch
- Yogurt Canyon

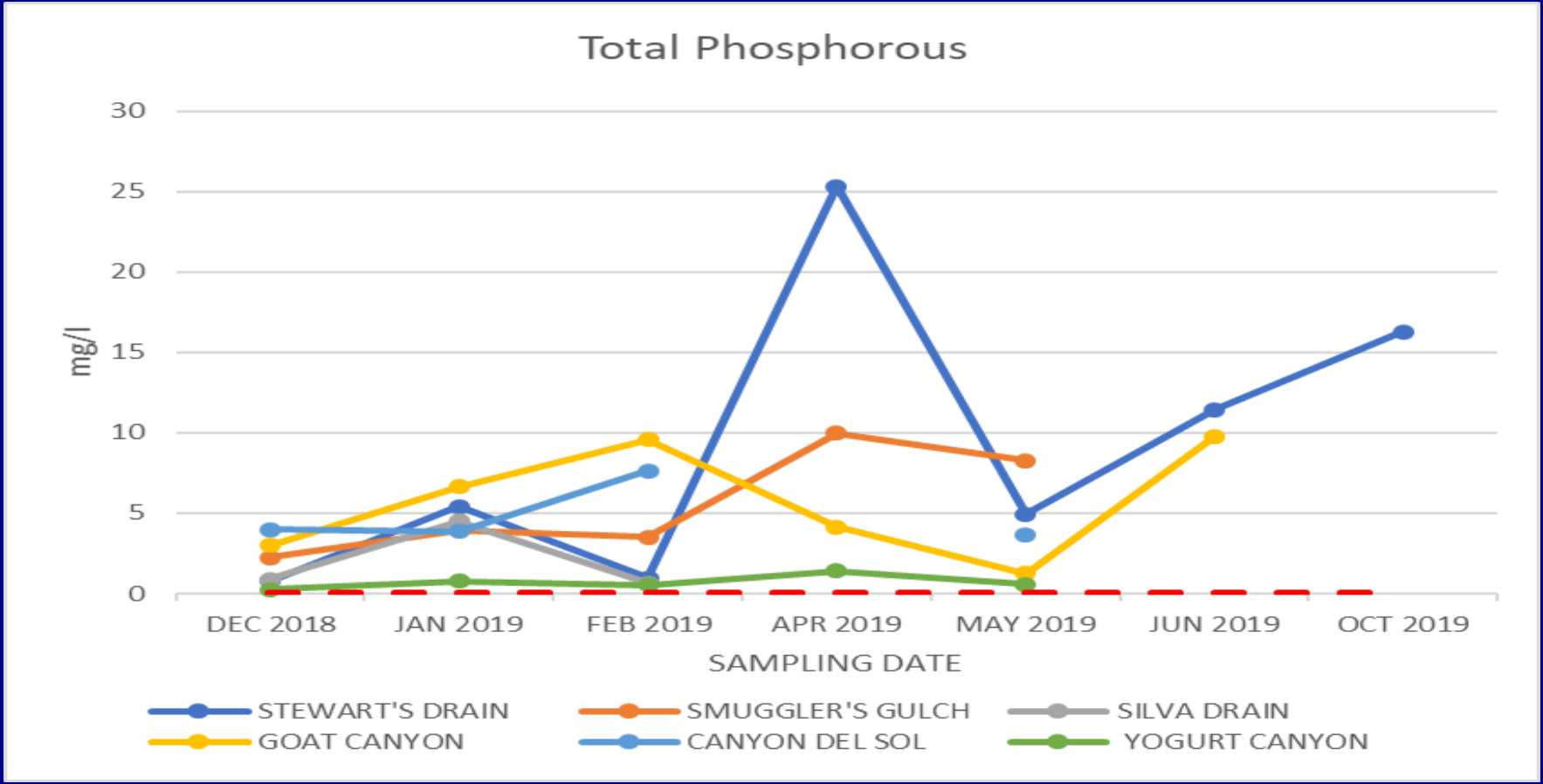
Ammonia data

- Toxic to aquatic life therefore standards are very low
- Canyon Del Sol had higher values during rain events.



Phosphorous data

- Sourced to cleaning products and fertilizers



Metals data

- Metals present in the drains are also found at similar concentrations in the Tijuana Wastewater.
- Of note are copper, nickel, and zinc which are common to the metals plating industries. But, they were detected at levels within the applicable standards in both countries.
- Absence of Cr6 was detected in most of the Canyons-Drains (maximum value found of 4.54 ppb in Silva Drain) .

Organics data

- DEHP was found at high number at all locations.
- Used in production of plastic but also leaches out during breakdown of plastics, likely sourced to solid waste in the canyons.
- Glyphosate, Carbofuran, Dalapon, Endosulfan I and II, Endrin aldehyde, and BHC-Delta .
- DDT and Aldrin were not detected in any sample from the Canyons and Drains.

Yogurt Canyon

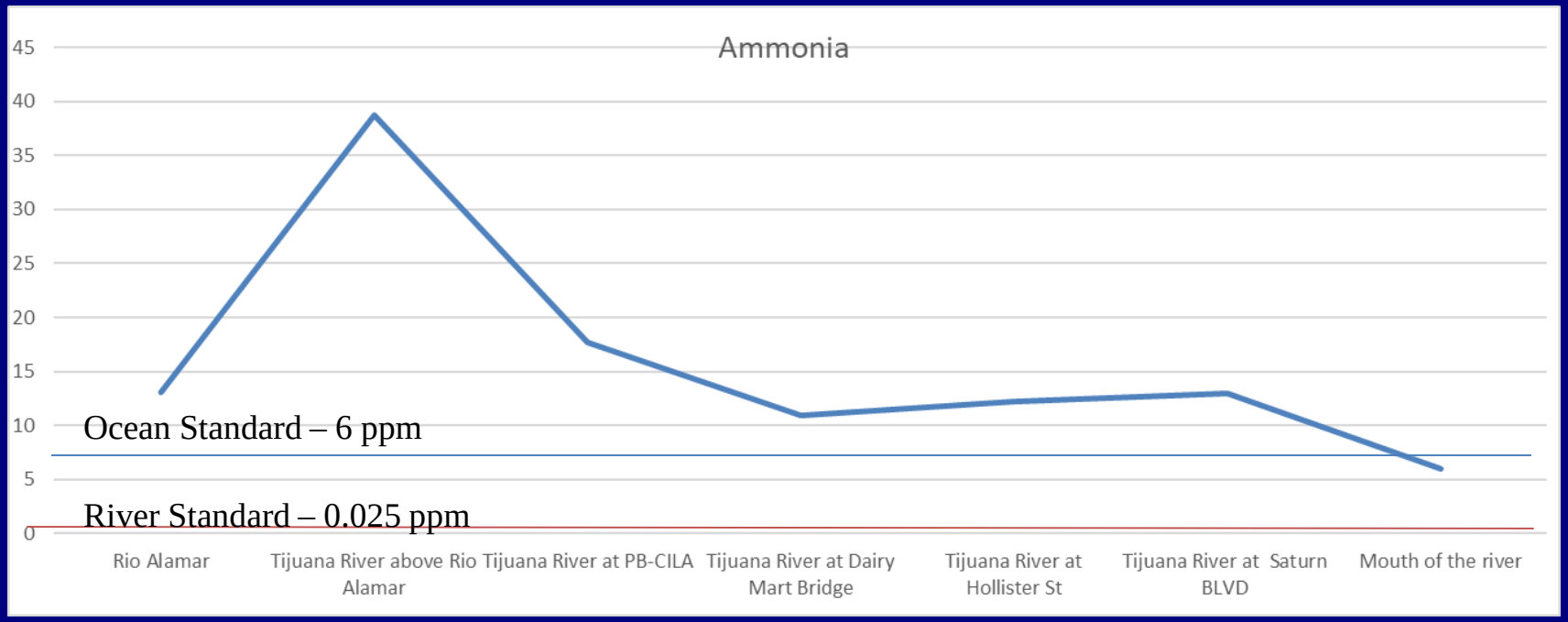
- Very low or non-detectable levels of ammonia, BOD, and phosphorous.
- Bacteria levels were above standards but significantly lower than other canyons.
- Missing indicators of untreated wastewater.
- High salinity indicating groundwater from brackish layer.
- Higher levels of manganese than other canyons. Other metals also present but lower than other canyons.

Tijuana River

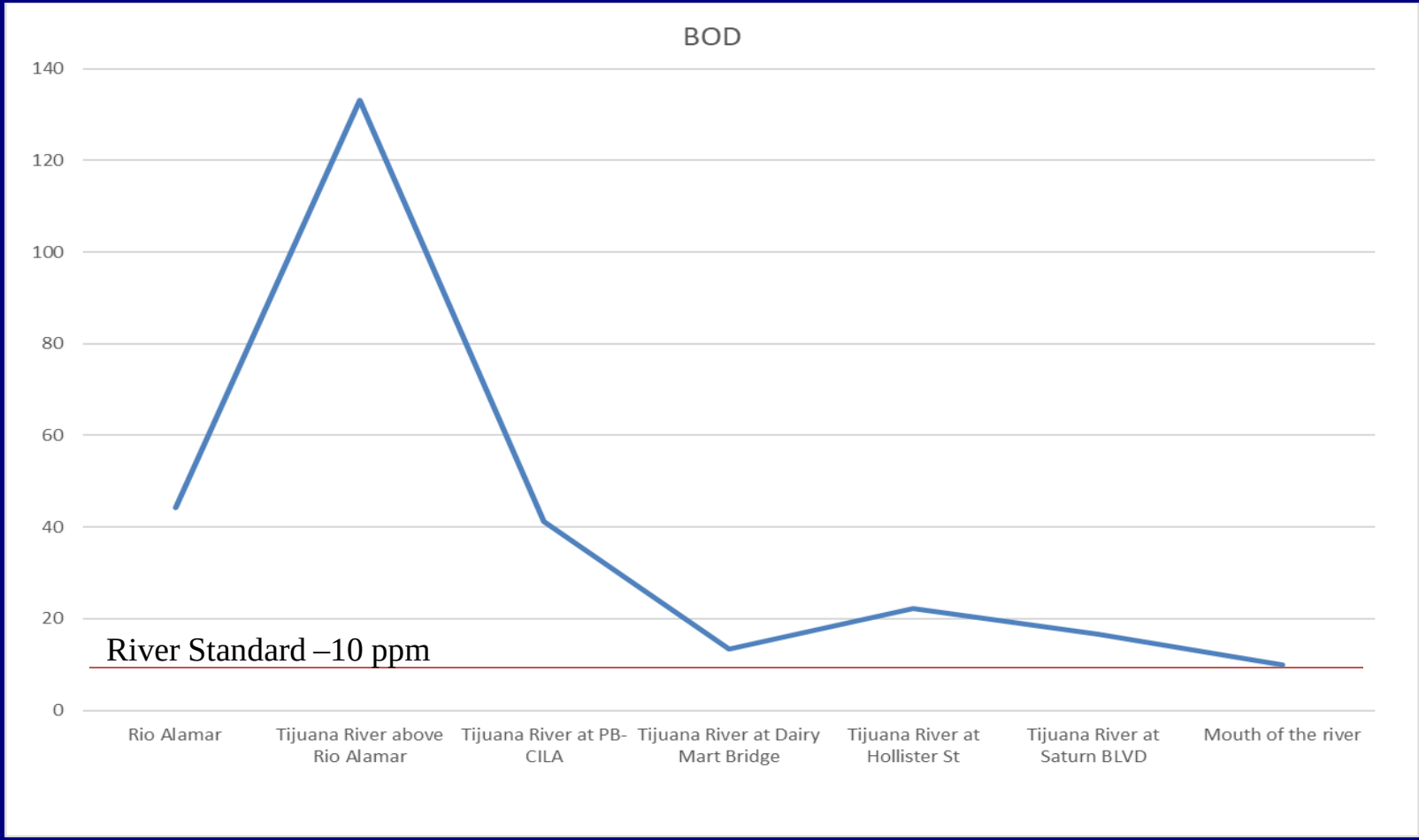
- TJ River above confluence
- Rio Alamar above confluence
- PB-CILA
- Dairy Mart Bridge
- Hollister Street Bridge
- Saturn Blvd
- Mouth of the river

Ammonia

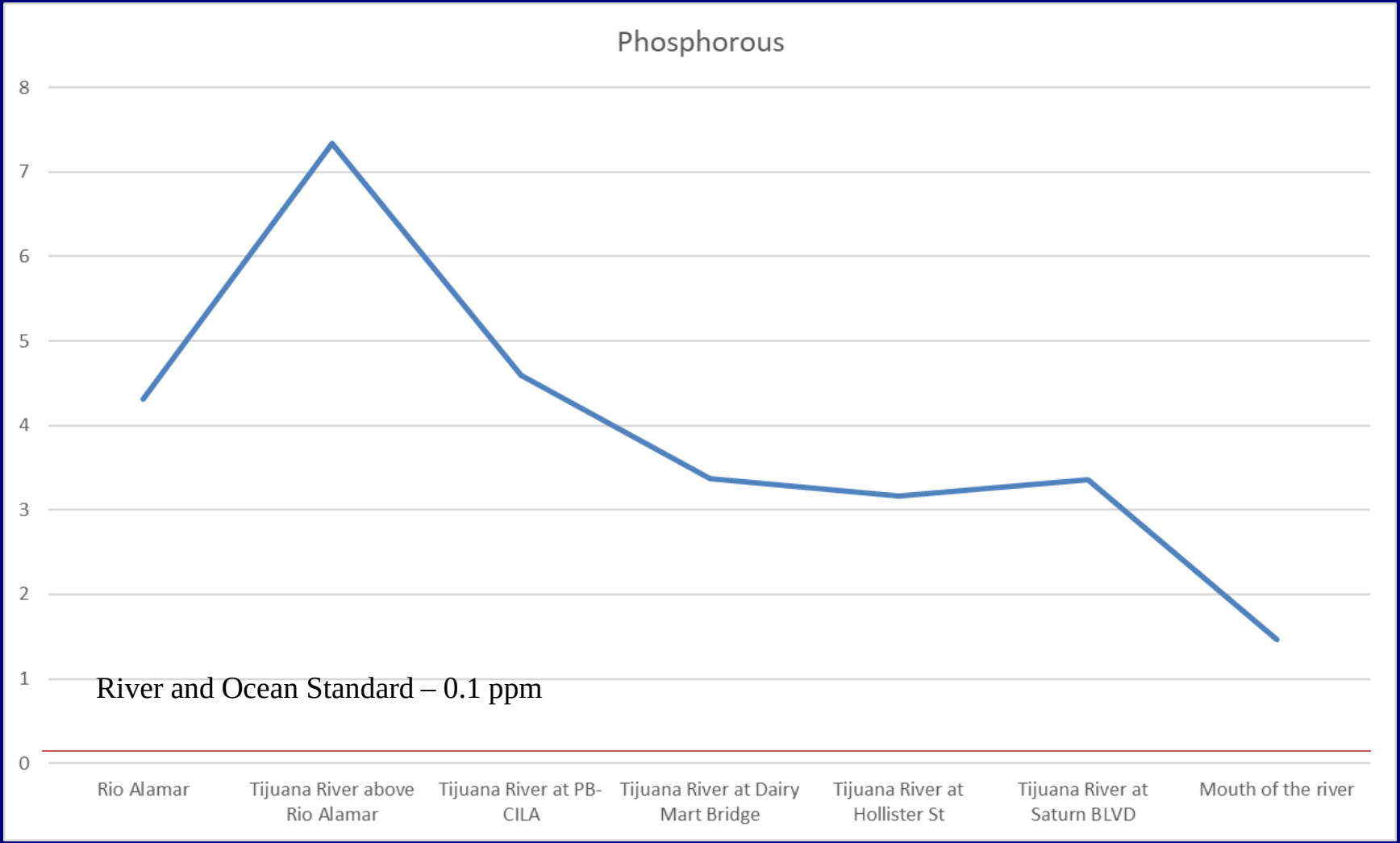
- Rio Alamar has lower numbers than TJ River.
- Declines downstream



BOD


BOD
140
120
100
80
60
40
20
0
River Standard –10 ppm
Rio Alamar
Tijuana River above Rio Alamar
Tijuana River at PB-CILA
Tijuana River at Dairy Mart Bridge
Tijuana River at Hollister St
Tijuana River at Saturn BLVD
Mouth of the river

Phosphorous



Metals data

- Metals present in the river showed higher values in the Rio Alamar for some metal.
- Metals present of note are copper, nickel, and zinc which are common to the metals plating industries. But, they were detected at levels within the applicable standards in both countries.
- There was no detections of Hexavalent Chromium in the river samples.

Organics data

- DEHP was found at high number at all locations.
- Trihalomethanes likely sourced to chlorine from WWTP.
- Common pesticides were present such as Dalapon and Glyphosate.
- There was no detections of DDT or Aldrin in the river samples.

Recommendations

- Development of a routine monitoring program.
- Infrastructure improvement projects.
- Pretreatment measures to reduce metals and organics.
- Solid waste control.
- Source tracking.
- Yogurt Canyon study.

Summary

- Wastewater indicators at all sites except Yogurt Canyon.
  - Bacteria, Ammonia, Phosphorous, BOD
- River exhibits same indicators but diluted from WWTP effluent. Canyon collectors capture dry weather whereas river reaches ocean.
- DEHP from plastics.
- Metals from industrial plating.
- https://ibwc.gov/Organization/Environmental/Minute320.html

International Boundary and Water Commission
United States Section

https://ibwc.gov/Treaties_Minutes/Minutes.html

IBWC Minutes

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Minutes between the United States and Mexican Sections of the IBWC

Printer Friendly List of Minutes | Minutes 1 - 179 | Minutes by Project | Treaties

Minute Number	Title - Approvals	Date and Place Signed
324	Location, Demarcation and Monumentation of the International Boundary Line on the New Bridge and Demolition of the Old Bridge Over the Rio Grande Between Tornillo, Texas and Guadalupe, Chihuahua. Approvals: United States - April 13, 2018 Mexico - April 10, 2018	04/10/2018 El Paso, Texas
323	Officials with the International Boundary and Water Commission, United States and Mexico, today announced the conclusion of a new Colorado River Agreement, Minute 323, "Extension of Cooperative Measures and Adoption of a Binational Water Scarcity Contingency Plan in the Colorado River Basin." Joint Report of the Principal Engineers with the Implementing Details of the Binational Water Scarcity Contingency Plan in the Colorado River Basin (See Report) Minute 323 Workgroup Reports Approvals: United States - September 27, 2017 Mexico - September 27, 2017	09/21/2017 Cd. Juarez, Chih.
322	Extension of the Temporary Emergency Delivery of Colorado River Water for Use in Tijuana, Baja California Updated Joint Report of the Principal Engineers to Facilitate Emergency Delivery of Colorado River Water for Use in Tijuana, Baja California (See Report) Approvals: United States - January 27, 2017 Mexico - February 3, 2017	01/19/2017 El Paso, Texas
321	Official Means of Identification of Vehicles and Other Equipment Crossing the International Boundary on Official Business of the Commission or of Either Section. Approvals: United States - January 27, 2017 Mexico - February 3, 2017	01/19/2017 Cd. Juarez, Chih.
320	General Framework for Binational Cooperation on Transboundary Issues in the Tijuana River Basin. This Minute marks the first Commission agreement focused on sediment and trash problems in the Tijuana River Basin, and establishes a framework of binational cooperation to address these issues. The agreement will benefit residents of both countries living in the Tijuana River Basin in the area of San Diego, California-Tijuana. View the Minute 320 Site Approvals: United States - October 5, 2015 Mexico - October 5, 2015	10/5/2015 Tijuana,Baja California

9:43 AM

International Boundary and Water Commission
United States Section

cila.sre.gob.mx/cilanorte/index.php/boletin/114-saneamiento-calidadagua

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El Acta 320 de la CILA intitulada "Marco General para la Cooperación Binacional en los asuntos transfronterizos de la Cuenca del Río Tijuana" de fecha 5 de octubre de 2015, es un acuerdo internacional que posibilita la atención de México y los Estados Unidos, en un marco de cooperación, de la problemática ambiental de la cuenca del Río Tijuana, principalmente la relacionada con el control de azolves, de residuos sólidos y la calidad del agua.

Por medio de este acuerdo se constituyó un Grupo Base Binacional (GBB) que incorpora, además de representantes de la Comisión, autoridades federales, estatales, locales y de las ONG's de ambos países. Este grupo se reúne frecuentemente y, con base en las actividades y reuniones de los Grupos de Trabajo Binacionales conformados por el mismo GBB para la atención y seguimiento de los asuntos transfronterizos prioritarios en la cuenca del Río Tijuana (Calidad del Agua, Sedimentos y Residuos Sólidos), recomienda a ambos gobiernos medidas de cooperación estructurales y no estructurales para atender los aspectos de preocupación, y asimismo define las estrategias para su implementación.

- **Informes y Publicaciones en el marco del Acta 320:**

- **Estudio Binacional de la Calidad del Agua del Río Tijuana y Cañones Adyacentes**
  - Resultados Detectados en el Río Tijuana y Cañones Adyacentes