

DRAFT



Water Quality Analysis

Sampling Period: January - June 2018



U.S. Customs and
Border Protection

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Executive Summary

Transboundary flows originate from Tijuana and enter the United States. These flows pose a health and safety risk to the U.S. Customs and Border Protection (CBP) personnel operating in the area, as well as to those individuals apprehended in the performance of the agency's mission.

CBP is working closely with its inter-agency partners at the Environmental Protection Agency (EPA), the Department of State, the Department of Treasury, and the United States International Boundary and Water Commission (IBWC) to develop a whole-of-government approach to resolving this issue, to include robust engagement with the Government of Mexico (GoM). In order for CBP to best work with its inter-agency partners, and the GoM to develop solutions, CBP must first understand the full scope of the wastewater and hazardous flow risks within our operating area. Therefore, in January 2018, CBP began a six-month sampling and testing effort to identify the full host of potential biological and chemical contaminants that could be present in the canyon collector system. By identifying what is in the collectors, CBP and its inter-agency partners will be better positioned to assess risks to human health, develop data-driven long-term solutions, and work with the GoM to root out and address the sources of the issue. These test results will also enable CBP to determine how to most effectively protect its Agents from contaminants.

An environmental consulting firm conducted surface water sampling at multiple Tijuana transboundary flow locations along the border of the United States and Mexico between January 24th and June 26th, 2018. A total of 42 samples were collected within this period. The water quality data is provided in Appendix B.

Results

- The biological laboratory results throughout the six months show a consistently strong presence of *E. coli*, enterococcus, and coliform organisms commonly found within untreated sewage flows.
- The laboratory results indicate the presence of contaminants generally associated with industrial and agricultural activities.

1 Purpose

The purpose of this interim sampling effort is to:

- Assist the agency in understanding what is coming across the border to better inform decision makers when identifying solutions that best protect personnel.
- Provide a data-set to share with inter-agency partners, most importantly the IBWC and EPA, to aid in development of future, more in-depth sampling activities, problem definition, and waste water collection system improvements.
- To inform solutions development given the number of stakeholders interested in resolving this issue.

2 Background

The Tijuana River watershed originates in Mexico and drains a 4,465 km² area, two-thirds of which is in Mexico, into the Tijuana River National Estuarine Research Reserve; a protected coastal wetland in California that supports 400 species of birds. California lists the River and Estuary as “impaired” due to bacteria, sediment, and trash under Section 303(d) of the Clean Water Act. However, because most of the pollution originates in Mexico, California cannot address the pollution through a regulatory approach. State officials have frequently reached out to the U.S. government for assistance.

The Environmental Protection Agency (EPA) and Mexico’s Secretariat of Environment and Natural Resources (SEMARNAT) identified the reduction of bacteria, sediment, and trash into Tijuana Estuary as a top priority in the binational Border 2020 program, which was established in accordance with the 1983 La Paz Agreement (U.S. and Mexico agreement to cooperate for the protection and improvement of the environment in the border area).

Furthermore, the IBWC recently adopted a Treaty Minute to the 1944 Colorado River Water Treaty (Minute 320, signed in 2015) that specifically aims to reduce bacteria, sediment, and trash in the Tijuana River Watershed through binational collaboration. A previous IBWC Minute (Minute 283, signed in 1990) stipulates that “the Government of Mexico will assure that there are no discharges of treated or untreated domestic or industrial wastewaters into Waters of the Tijuana River that cross the International Boundary.” Compliance with Treaty Minute 283 depends largely on the frequency and duration of rainfall in the Tijuana Watershed. Flows are diverted south of the border during “dry-weather,” but cross into the U.S. during “wet-weather.”

Dry Weather. Canyons in the western portion of the Tijuana River watershed drain directly into the U.S. through culverts that run under the border fence. While most wastewater south of the border is collected and treated during dry weather, some uncollected sewage and urban runoff occasionally crosses the border. In such cases, these flows are diverted via canyon collectors for treatment at the South Bay International Wastewater Treatment Plant (SBIWTP). If these dry-weather transboundary flows are not collected in the canyon collectors, the IBWC must report the flow as a “spill” and monitor the water quality of the spill in accordance with the Clean Water Act National Pollutant Discharge Elimination System permit for the SBIWTP. Even though these dry-

weather flows through the canyons are typically collected and treated at the SBIWTP, as part of their routine duties, CBP Border Patrol Agents frequently have contact with the flows in the open-air collectors.

Wet Weather. During wet weather, storm water flows across the border in the canyons. Summer rains in the Tijuana River basin have become more frequent in recent years, causing the Tijuana River to flow across the border. Where the Tijuana River exits the continental U.S., due to the significant amount of raw sewage in the river, bacteria levels are extremely high and cause beach closures at Imperial Beach, California almost half of the year.

In recognition of the concerns outlined above, and to protect and promote agency interests, CBP is either directly executing or pushing for action from local, state, and federal stakeholders as well as the Government of Mexico (GoM), the following:

- Enhance Near-term Prevention and Mitigation of Recurring Transboundary Flows
- Identify Needed Infrastructure Investment and Enforcement
- Increase Testing and Data Gathering

3 Overview

The Tijuana River has historically received flows of contaminated surface water, most notably raw sewage coming from south of the border. Sewage spills and illicit discharges continue to originate south of the border, entering through the many canyons and culverts. These releases of contaminated water have ranged from very small to significant in size. The small releases are sometimes redirected into canyon collectors where they are subsequently treated at the South Bay IBWC sewage treatment facility in Imperial Beach. Yogurt Canyon does not have the canyon collector infrastructure necessary to capture these flows. The larger releases may overrun the catchment basins and flow freely into the Tijuana Estuary. Appendix A shows an overview of the canyon collector locations.

3.1 Scope and Objectives

Surface water samples collected during this sampling period were submitted for laboratory analysis under the following parameters:

- Volatile Organic Compounds (VOCs) (EPA Method: 8260)
- Semi Volatile Organic Compounds (SVOCs) (EPA Method: 8270)
- Metals
 - Target Analyte List (TAL) Metals (23)
 - Hexavalent Chromium
 - Chlorides
- Inorganic Chemicals
 - Chlorinated Pesticides
 - Herbicides
 - Nitrite/Nitrate
 - Sulfate/Sulfide/Sulfite

- Cyanide
- Carbonate/Bicarbonate
- Bacteria (Enviromatrix)
 - Colilert (T. Coliform + E. Coli)
 - Colilert Two Extra Dilutions
 - Enterococcus
 - Enterococcus Two Extra Dilutions

In addition, measurements of the following parameters were collected in the field by the sampling technician:

- Temperature
- Dissolved Oxygen (DO)
- pH
- Conductivity
- Oxidation reduction potential (ORP)
- Ambient Air VOC Concentration

3.2 Sampling Events

Most of the canyons experience intermittent flow, meaning there is regular water flow during the wet season (winter-spring) but, during hot summer months, the canyons are normally dry. Sampling events can either be a dry-season event, when there is no regular flow in the canyons, or a wet-season event, when there is regular flow through the canyon. To divert flow to the South Bay IBWC WWTP, canyon collectors have been installed on Smuggler’s Gulch, Goat Canyon, Canyon del Sol, Stewart’s Drain, and Silva Drain. These collectors are left open during most of the dry season to collect any transboundary flows. The South Bay IBWC WWTP NPDES Permit defines a “Spill” in the collectors as “A dry weather transboundary treated or untreated wastewater or other flow through a conveyance structure owned and operated by the United States Government into Smuggler Gulch, Goat Canyon, Canyon del Sol, Stewart’s Drain, or Silva Drain and not diverted into the canyon collector system for treatment at the Facility.” Most of the transboundary flows do not overflow the canyon collector, but liquid from transboundary flows may pool in the canyon collectors and may pose a health hazard. The sample log is provided in the table below. Sample collection was prioritized in the following order:

- Samples during dry-weather flow events or as requested (wet weather suspicious flows)
- Baseline samples during regular wet weather flows
- Samples after rain events
- Samples of pooled water

Table 1: Sample Log

| Sample Period | Sample Day | Sample Date | Sample Time | Sample ID | Short Title | QA/QC | Sample Method | Sample Type | Sample Type - Field Log | Sample Location |
|---------------|------------|-------------|-------------|-----------------|-------------|-----------|------------------|-----------------------------|-------------------------------|--------------------|
| 1 | Wednesday | 01/24/18 | 16:42 | GC-012418-1 | GC | - | Dip | Wet Weather - Baseline | Baseline Sampling | Goat Canyon |
| 1 | Wednesday | 01/24/18 | 15:30 | SD-012418-1 | SD | - | Dip | Wet Weather - Baseline | Baseline Sampling | Stewart's Drain |
| 1 | Thursday | 01/25/18 | 15:00 | SD-012518-1 | SD | MS/MSD/FD | Dip | Wet Weather - Baseline | Baseline Sampling | Stewart's Drain |
| 1 | Saturday | 01/27/18 | 9:00 | GC-012718-1 | GC | - | Dip | Wet Weather - Baseline | Baseline Sampling | Goat Canyon |
| 1 | Saturday | 01/27/18 | 7:00 | SG-012718-1 | SG | - | Dip | Dry Weather - Spill/Request | Suspicious Flows (Wet Season) | Smuggler's Gulch |
| 1 | Sunday | 01/28/18 | 9:00 | YC-012818-1 | YC | - | Dip | Wet Weather - Baseline | Baseline Sampling | Yogurt Canyon |
| 1 | Sunday | 01/28/18 | 8:40 | RYC-012818-1 | RYC | - | Dip | Wet Weather - Baseline | Baseline Sampling | Yogurt Canyon Road |
| 2 | Wednesday | 02/21/18 | 15:10 | W4-022118-2 | W4 | - | Dip | Wet Weather - Baseline | Baseline Sampling | W4 |
| 2 | Thursday | 02/22/18 | 9:25 | SD-022218-2 | SD | - | Peristaltic pump | Wet Weather - Baseline | Baseline Sampling | Stewart's Drain |
| 2 | Friday | 02/23/18 | 10:35 | GC-022318-2 | GC | - | Dip | Wet Weather - Baseline | Baseline Sampling | Goat Canyon |
| 2 | Friday | 02/23/18 | 10:10 | SG-022318-2 | SG | - | Dip | Rain Event | Rain Event | Smuggler's Gulch |
| 2 | Monday | 02/26/18 | 9:50 | W4-022618-2 | W4 | - | Dip | Wet Weather - Baseline | Repeat Sampling | W4 |
| 2 | Monday | 02/26/18 | 9:20 | YC-022618-2 | YC | MS/MSD/FD | Dip | Wet Weather - Baseline | Repeat Sampling | Yogurt Canyon |
| 2 | Tuesday | 02/27/18 | 9:15 | CDS-022718-2 | CDS | - | Dip | Rain Event | Rain Event | Canyon Del Sol |
| 2 | Tuesday | 02/27/18 | 10:35 | SD-022718-2 | SD | - | Peristaltic pump | Rain Event | Rain Event | Stewart's Drain |
| 3 | Thursday | 03/15/18 | 14:15 | SD-031518-3 | SD | - | Peristaltic pump | Wet Weather - Baseline | Baseline Sampling | Stewart's Drain |
| 3 | Thursday | 03/15/18 | 13:30 | W4-031518-3 | W4 | - | Dip | Rain Event | Rain Event | W4 |
| 3 | Friday | 03/16/18 | 10:00 | GC-031618-3 | GC | - | Dip | Wet Weather - Baseline | Baseline Sampling | Goat Canyon |
| 3 | Saturday | 03/17/18 | 8:30 | SG-031718-3 | SG | - | Dip | Rain Event | Rain Event | Smuggler's Gulch |
| 3 | Monday | 03/19/18 | 8:45 | W4-031918-3 | W4 | - | Dip | Wet Weather - Baseline | Baseline Sampling | W4 |
| 3 | Tuesday | 03/20/18 | 9:00 | GC-032018-3 | GC | MS/MSD/FD | Dip | Wet Weather - Baseline | Repeat Sampling | Goat Canyon |
| 3 | Wednesday | 03/21/18 | 15:30 | YC-032018-3 | YC | - | Dip | Wet Weather - Baseline | Baseline Sampling | Yogurt Canyon |
| 4 | Monday | 04/16/18 | 16:20 | W4-041618-4 | W4 | - | Dip | Wet Weather - Baseline | Baseline Sampling | W4 |
| 4 | Tuesday | 04/17/18 | 9:40 | SD-041718-4 | SD | - | Peristaltic pump | Wet Weather - Baseline | Baseline Sampling | Stewart's Drain |
| 4 | Tuesday | 04/17/18 | 10:40 | GC-041718-4 | GC | - | Dip | Wet Weather - Baseline | Baseline Sampling | Goat Canyon |
| 4 | Wednesday | 04/18/18 | 15:30 | YC-041818-4 | YC | - | Dip | Wet Weather - Baseline | Baseline Sampling | Yogurt Canyon |
| 4 | Thursday | 04/19/18 | 8:30 | W4-041918-4 (2) | W4 | MS/MSD/FD | Dip | Wet Weather - Baseline | Repeat Sampling | W4 |
| 4 | Friday | 04/20/18 | 11:30 | SD-042018-4 (2) | SD | - | Dip | Wet Weather - Baseline | Repeat Sampling | Stewart's Drain |
| 5 | Tuesday | 05/29/18 | 15:10 | W4-052918-5 | W4 | - | Dip | Pooled water | Baseline Sampling | W4 |
| 5 | Wednesday | 05/30/18 | 10:15 | YC-053018-5 | YC | - | Dip | Pooled water | Baseline Sampling | Yogurt Canyon |
| 5 | Wednesday | 05/30/18 | 11:45 | GC-053018-5 | GC | - | Dip | Wet Weather - Baseline | Baseline Sampling | Goat Canyon |
| 5 | Thursday | 05/31/18 | 11:45 | SD-053118-5 | SD | MS/MSD/FD | Peristaltic pump | Wet Weather - Baseline | Baseline Sampling | Stewart's Drain |
| 5 | Friday | 06/01/18 | 8:50 | GC-060118-5 | GC | - | Dip | Wet Weather - Baseline | Repeat Sampling | Goat Canyon |
| 5 | Monday | 06/04/18 | 10:25 | SD-060418-5 | SD | - | Peristaltic pump | Wet Weather - Baseline | Repeat Sampling | Stewart's Drain |
| 5 | Monday | 06/04/18 | 11:45 | YC-060418-5 | YC | - | Dip | Pooled water | Repeat Sampling | Yogurt Canyon |
| 6 | Wednesday | 06/20/18 | 9:20 | W4-062018-6 | W4 | MS/MSD/FD | Dip | Wet Weather - Baseline | Baseline Sampling | W4 |
| 6 | Wednesday | 06/20/18 | 12:01 | GC-062018-6 | GC | - | Dip | Wet Weather - Baseline | Baseline Sampling | Goat Canyon |
| 6 | Thursday | 06/21/18 | 11:05 | SD-062118-6 | SD | - | Peristaltic pump | Wet Weather - Baseline | Baseline Sampling | Stewart's Drain |
| 6 | Friday | 06/22/18 | 10:10 | GC-062218-6 | GC | - | Dip | Wet Weather - Baseline | Suspicious Flows (Wet Season) | Goat Canyon |
| 6 | Friday | 06/22/18 | 11:25 | YC-062218-6 | YC | - | Dip | Pooled water | Baseline Sampling | Yogurt Canyon |
| 6 | Monday | 06/25/18 | 8:40 | W4-062518-6 | W4 | - | Dip | Wet Weather - Baseline | Suspicious Flows (Wet Season) | W4 |
| 6 | Monday | 06/25/18 | 10:05 | SD-062518-6 | SD | - | Peristaltic pump | Wet Weather - Baseline | Repeat Sampling | Stewart's Drain |

4 Initial Water Quality Observations

A total of 42 surface water samples over a period of 6 months were collected. The samples were collected during a period of one week per month. The below table shows the general water quality characteristics that were observed during sample collection.

Table 2: Initial Water Quality Observations

| Wastewater Samples Collected - Imperial Beach BPS AOR - 2018 | | | | | | | | | | | | |
|--|------------|-------------|-------------|-----------------|-----------------------------|--------------------|------------|------------|------|----------|-----------|-----------------|
| Sample Period | Sample Day | Sample Date | Sample Time | Sample ID | Sample Type | Sample Location | Temp. (°C) | Cond. (mS) | pH | ORP (mV) | DO (mg/L) | Field PID (ppm) |
| 1 | Wednesday | 01/24/18 | 16:42 | GC-012418-1 | Wet Weather - Baseline | Goat Canyon | 14.50 | 1.79 | 6.40 | 217.00 | 16.60 | 0.000 |
| 1 | Wednesday | 01/24/18 | 15:30 | SD-012418-1 | Wet Weather - Baseline | Stewart's Drain | 16.90 | 2.28 | 7.02 | 227.00 | 10.70 | 0.000 |
| 1 | Thursday | 01/25/18 | 15:00 | SD-012518-1 | Wet Weather - Baseline | Stewart's Drain | 16.30 | 1.20 | 7.20 | 220.00 | 15.90 | 0.000 |
| 1 | Saturday | 01/27/18 | 9:00 | GC-012718-1 | Wet Weather - Baseline | Goat Canyon | 10.50 | 0.93 | 7.43 | 218.00 | 13.40 | 0.150 |
| 1 | Saturday | 01/27/18 | 7:00 | SG-012718-1 | Dry Weather - Spill/Request | Smuggler's Gulch | 8.40 | 1.20 | 6.10 | 240.00 | 24.00 | 0.110 |
| 1 | Sunday | 01/28/18 | 9:00 | YC-012818-1 | Wet Weather - Baseline | Yogurt Canyon | 9.56 | 4.93 | 6.40 | 232.00 | 13.40 | 0.000 |
| 1 | Sunday | 01/28/18 | 8:40 | RVC-012818-1 | Wet Weather - Baseline | Yogurt Canyon Road | 9.68 | 1.30 | 5.75 | 236.00 | 14.70 | 0.030 |
| 2 | Wednesday | 02/21/18 | 15:10 | W4-022118-2 | Wet Weather - Baseline | W4 | 21.60 | 3.50 | 8.04 | 65.80 | 10.72 | 0.000 |
| 2 | Thursday | 02/22/18 | 9:25 | SD-022218-2 | Wet Weather - Baseline | Stewart's Drain | 16.08 | 2.40 | 7.71 | 55.30 | 5.79 | 0.000 |
| 2 | Friday | 02/23/18 | 10:35 | GC-022318-2 | Wet Weather - Baseline | Goat Canyon | 14.74 | 1.47 | 7.26 | 72.00 | 4.06 | 0.000 |
| 2 | Friday | 02/23/18 | 10:10 | SG-022318-2 | Rain Event | Smuggler's Gulch | 16.40 | 0.87 | 8.93 | 12.50 | 11.85 | 0.000 |
| 2 | Monday | 02/26/18 | 9:50 | W4-022618-2 | Wet Weather - Baseline | W4 | 23.10 | 3.54 | 8.12 | 91.00 | 9.57 | 0.000 |
| 2 | Monday | 02/26/18 | 9:20 | YC-022618-2 | Wet Weather - Baseline | Yogurt Canyon | 14.71 | 3.84 | 7.39 | 160.00 | 11.18 | 0.000 |
| 2 | Tuesday | 02/27/18 | 9:15 | CDS-022718-2 | Rain Event | Canyon Del Sol | 15.61 | 0.69 | 6.95 | 65.20 | 9.87 | 0.000 |
| 2 | Tuesday | 02/27/18 | 10:35 | SD-022718-2 | Rain Event | Stewart's Drain | 17.18 | 0.80 | 7.29 | 74.10 | 3.41 | 0.000 |
| 3 | Thursday | 03/15/18 | 14:15 | SD-031518-3 | Wet Weather - Baseline | Stewart's Drain | 23.40 | 9.92 | 7.45 | 226.00 | 0.34 | 0.000 |
| 3 | Thursday | 03/15/18 | 13:30 | W4-031518-3 | Rain Event | W4 | 21.01 | 2.18 | 7.84 | -11.80 | 7.97 | 0.000 |
| 3 | Friday | 03/16/18 | 10:00 | GC-031618-3 | Wet Weather - Baseline | Goat Canyon | 15.77 | 19.15 | 7.50 | 30.00 | 2.61 | 0.000 |
| 3 | Saturday | 03/17/18 | 8:30 | SG-031718-3 | Rain Event | Smuggler's Gulch | 13.58 | 0.44 | 7.92 | 30.80 | 10.96 | 0.003 |
| 3 | Monday | 03/19/18 | 8:45 | W4-031918-3 | Wet Weather - Baseline | W4 | 16.46 | 31.82 | 7.72 | 130.90 | 12.73 | 0.030 |
| 3 | Tuesday | 03/20/18 | 9:00 | GC-032018-3 | Wet Weather - Baseline | Goat Canyon | -14.01 | 14.50 | 7.76 | 22.50 | 4.42 | 0.089 |
| 3 | Wednesday | 03/21/18 | 15:30 | YC-032018-3 | Wet Weather - Baseline | Yogurt Canyon | 21.92 | 42.28 | 7.89 | 17.80 | 18.80 | 0.000 |
| 4 | Monday | 04/16/18 | 16:20 | W4-041618-4 | Wet Weather - Baseline | W4 | 22.04 | 3.27 | 7.71 | 347.00 | 10.26 | 0.000 |
| 4 | Tuesday | 04/17/18 | 9:40 | SD-041718-4 | Wet Weather - Baseline | Stewart's Drain | 24.50 | 1.93 | 7.95 | 317.40 | 5.52 | 0.000 |
| 4 | Tuesday | 04/17/18 | 10:40 | GC-041718-4 | Wet Weather - Baseline | Goat Canyon | 19.93 | 1.75 | 7.94 | 321.80 | 0.67 | 0.000 |
| 4 | Wednesday | 04/18/18 | 15:30 | YC-041818-4 | Wet Weather - Baseline | Yogurt Canyon | 25.78 | 4.48 | 7.86 | 283.20 | 12.90 | 0.000 |
| 4 | Thursday | 04/19/18 | 8:30 | W4-041918-4 (2) | Wet Weather - Baseline | W4 | 21.60 | 3.16 | 7.88 | 339.10 | 10.00 | 0.000 |
| 4 | Friday | 04/20/18 | 11:30 | SD-042018-4 (2) | Wet Weather - Baseline | Stewart's Drain | 24.10 | 2.26 | 7.59 | 164.10 | 1.92 | 0.000 |
| 5 | Tuesday | 05/29/18 | 15:10 | W4-052918-5 | Pooled water | W4 | 23.96 | 2.91 | 7.83 | 178.30 | 7.84 | 0.000 |
| 5 | Wednesday | 05/30/18 | 10:15 | YC-053018-5 | Pooled water | Yogurt Canyon | 20.37 | 5.05 | 7.66 | 215.00 | 8.02 | 0.000 |
| 5 | Wednesday | 05/30/18 | 11:45 | GC-053018-5 | Wet Weather - Baseline | Goat Canyon | 22.63 | 1.36 | 7.92 | 184.20 | 5.54 | 6.000 |
| 5 | Thursday | 05/31/18 | 11:45 | SD-053118-5 | Wet Weather - Baseline | Stewart's Drain | 27.83 | 1.84 | 8.92 | 209.10 | 17.50 | 0.000 |
| 5 | Friday | 06/01/18 | 8:50 | GC-060118-5 | Wet Weather - Baseline | Goat Canyon | 22.27 | 1.52 | 7.90 | 192.00 | 8.60 | 0.000 |
| 5 | Monday | 06/04/18 | 10:25 | SD-060418-5 | Wet Weather - Baseline | Stewart's Drain | 29.06 | 1.93 | 8.73 | 189.30 | 14.08 | 0.000 |
| 5 | Monday | 06/04/18 | 11:45 | YC-060418-5 | Pooled water | Yogurt Canyon | 23.15 | 5.04 | 7.90 | 220.00 | 8.45 | 0.000 |
| 6 | Wednesday | 06/20/18 | 9:20 | W4-062018-6 | Wet Weather - Baseline | W4 | 23.17 | 3.11 | 7.53 | - | 2.31 | 0.007 |
| 6 | Wednesday | 06/20/18 | 12:01 | GC-062018-6 | Wet Weather - Baseline | Goat Canyon | 23.18 | 1.28 | 7.76 | - | 4.90 | 0.015 |
| 6 | Thursday | 06/21/18 | 11:05 | SD-062118-6 | Wet Weather - Baseline | Stewart's Drain | 28.20 | 1.81 | 8.90 | 52.80 | 13.40 | 0.010 |
| 6 | Friday | 06/22/18 | 10:10 | GC-062218-6 | Wet Weather - Baseline | Goat Canyon | 22.32 | 1.88 | 7.89 | -146.80 | 2.29 | 0.002 |
| 6 | Friday | 06/22/18 | 11:25 | YC-062218-6 | Pooled water | Yogurt Canyon | 23.31 | 4.93 | 7.86 | 36.10 | 4.00 | 0.002 |
| 6 | Monday | 06/25/18 | 8:40 | W4-062518-6 | Wet Weather - Baseline | W4 | 27.73 | 2.61 | 7.67 | 27.90 | 0.50 | 0.000 |
| 6 | Monday | 06/25/18 | 10:05 | SD-062518-6 | Wet Weather - Baseline | Stewart's Drain | 29.43 | 1.82 | 8.73 | 59.10 | 13.26 | 0.000 |

5 Analytical Results

The laboratory results data is provided in Appendix B.

6 Conclusion

6.1 Contaminant Results

The sample results were compared to the Regional Screening Levels (RSL) for tap water developed by the EPA. The RSLs are not cleanup standards. Screening the RSL values against the six month sampling results was used to help identify areas, contaminants, and conditions that require further study or analysis. The presence of contaminants in the transboundary flows confirms that point and non-point discharges either due to storm water events, or illicit discharges are entering the United States. The below table shows the highest concentrations of contaminants across all locations that exceeded the RSL values during the six months of sampling.

Table 3: Highest Concentration of Contaminants Found Across All Locations

| Volatile Organic Compounds | | | | | |
|---------------------------------|------------------------------|--|--------------------|---------------------------|------------------------|
| Analyte | Highest Concentration (µg/L) | EPA Regional Screening Level (tapwater) (µg/L) | Location | Date | Event Type |
| Bromodichloromethane | 2.3 | 0.13 | Goat Canyon | 5/30/2018 | Wet Weather - Baseline |
| Chloroform | 2.2 | 0.22 | Goat Canyon | 5/30/2018 | Wet Weather - Baseline |
| Dibromochloromethane | 5 | 0.87 | W-4 | 4/19/2018 | Wet Weather - Baseline |
| 1,4-Dichlorobenzene | 5.3 | 0.48 | Stewart's Drain | 2/27/2018 | Rain Event |
| Trichloroethene | 1.4 | 0.49 | Stewart's Drain | 2/27/2018 | Rain Event |
| Bromoform | 14 | 3.3 | W-4 | 2/26/2018 | Wet Weather - Baseline |
| | | | | | |
| | | | | | |
| Semi-Volatile Organic Compounds | | | | | |
| Analyte | Highest Concentration (µg/L) | EPA Regional Screening Level (tapwater) (µg/L) | Location | Date | Event Type |
| Bis(2-ethylhexyl) phthalate | 25 | 5.6 | Goat Canyon | 5/30/2018 | Wet Weather - Baseline |
| 1,2-Diphenylhydrazine | 0.54 | 0.078 | Stewart's Drain | 6/21/2018 | Wet Weather - Baseline |
| Benzidine | 49 | 0.00011 | Goat Canyon | 2/23/2018 | Wet Weather - Baseline |
| | | | | | |
| | | | | | |
| Metals | | | | | |
| Analyte | Highest Concentration (µg/L) | EPA Regional Screening Level (tapwater) (µg/L) | Location | Date | Event Type |
| Uranium | 30 | 4 | W-4 | 02/26/2018, 04/16/2018 | Wet Weather - Baseline |
| Cyanide, Total | 5.4 | 1.5 | Stewart's Drain | 1/24/2018 | Wet Weather - Baseline |
| Arsenic | 37 | 0.052 | Yogurt Canyon Road | 1/28/2018 | Wet Weather - Baseline |
| Chromium | 110 | 100 | Yogurt Canyon Road | 1/28/2018 | Wet Weather - Baseline |
| Cobalt | 45 | 6 | Yogurt Canyon Road | 1/28/2018 | Wet Weather - Baseline |
| Manganese | 3900 | 430 | Yogurt Canyon | 6/22/2018 | Pooled water |
| Vanadium | 310 | 86 | Yogurt Canyon Road | 1/28/2018 | Wet Weather - Baseline |
| Iron | 110000 | 14000 | Yogurt Canyon Road | 1/28/2018 | Wet Weather - Baseline |
| Aluminum | 72000 | 20000 | Yogurt Canyon Road | 1/28/2018 | Wet Weather - Baseline |
| Antimony | 22 | 7.8 | Stewart's Drain | 1/25/2018 | Wet Weather - Baseline |
| Lead | 75 | 15 | Smuggler's Gulch | 3/17/2018 | Rain Event |
| Hexavalent Chromium | 40 | 0.035 | Stewart's Drain | 6/21/2018 | Wet Weather - Baseline |
| | | | | | |
| | | | | | |
| Pesticides | | | | | |
| Analyte | Highest Concentration (µg/L) | EPA Regional Screening Level (tapwater) (µg/L) | Location | Date | Event Type |
| 4,4'-DDD | 0.031 | 0.032 | Smuggler's Gulch | 2/23/2018 | Rain Event |
| 4,4'-DDT | 0.27 | 0.23 | Smuggler's Gulch | 2/23/2018 | Rain Event |
| Aldrin | 0.014 | 0.00092 | Canyon Del Sol | 2/27/2018 | Rain Event |
| | | | | | |
| | | | | | |
| Herbicides | | | | | |
| Analyte | Highest Concentration (µg/L) | EPA Regional Screening Level (tapwater) (µg/L) | Location | Date | Event Type |
| MCP | 770 | 16 | Stewart's Drain | 1/24/2018 | Wet Weather - Baseline |
| MCPA | 240 | 7.5 | Stewart's Drain | 5/31/2018 | Wet Weather - Baseline |

6.2 Biological Results

The six month averages for Total coliform, enterococcus, and Escherichia coli (E. coli) were compared to the San Diego Region Basin Plan Water Quality Objectives (Contact Recreational

Values). Total coliform, E. coli, and enterococci bacteria are used to indicate the likelihood of pathogens of fecal origin in surface waters. Their presence in the transboundary flows confirms that untreated sewage flows is entering the United States. The table below shows the six month averages at each location.

Table 4: Average Biological Result At Each Location

| Biological | | | | | | | | |
|------------------------------------|-----------|---------|---------|---------|--------|---------|---------|--|
| Type | Locations | | | | | | | San Diego Region Basin Plan Water Quality Objectives (Contact Recreational Values) |
| | GC | RYC | SD | SG | YC | W4 | CDS | |
| Average Total coliform (MPN/100mL) | 1891379 | 242000 | 2179909 | 1767000 | 401393 | 1106756 | 2420000 | 1000 |
| Average E. coli (MPNU/100 mL) | 1715127 | 1550000 | 1652636 | 1648333 | 587 | 274675 | 2420000 | 200 |
| Average Enterococcus (MPN/100mL) | 860600 | 160000 | 929091 | 660000 | 1481 | 561411 | 500000 | 33 |

6.3 Limitations

- This sampling effort contract had limited ability to react and sample isolated discharge events outside of the dates pre-determine to conduct sampling.
- The data is limited to surface water sampling and did not evaluate soil geology.
- The detection of contaminants and their concentrations in surface water cannot exclusively determine the potential risk to human health and the environment.

6.4 Conclusion

- The biological data tells us that transboundary flows are untreated domestic discharges which includes E. coli, total coliform, and enterococcus exceedances typical to sewage flow.
- There are uncontrolled discharges occurring from industrial and agricultural uses originating from Mexico and the Tijuana River.

6.5 Next Actions

- Perform an additional six months of sampling to include both surface water and soil sampling in response to storm water events, illicit discharges, and releases due to infrastructure failures.
- Share the data results with inter-agency partners, non-governmental organizations, and the public for awareness.
- Use the data to inform health and safety measures to ensure CBP personnel can effectively perform their duties.
- Continue to work with inter-Agency partners and the Government of Mexico to identify solutions to prevent or mitigate recurring transboundary flows.