

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.

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.