

CASQA BACTERIA SEMINAR 2026:

Wastewater-Stormwater: Potential Interactions and Sources



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PRESENTATION OUTLINE

1. A little recent history
2. Notable interaction milestones
3. Exfiltration workshopping
4. Low hanging fruit we should be picking
5. Next steps discussion



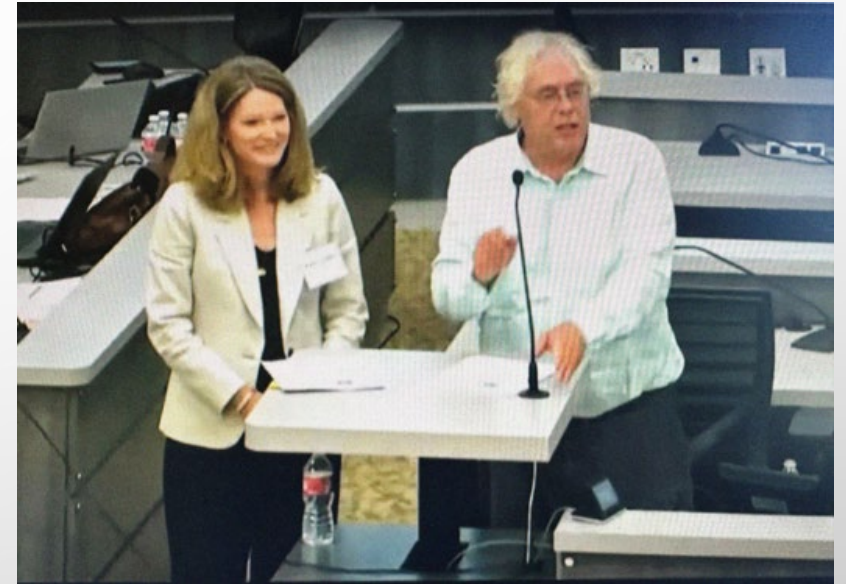
A LITTLE RECENT INTERACTION HISTORY

1. 2006 SSS WDR
 - Map showing applicable stormwater conveyance facilities
2. 2022 SWRCB & CASQA Bacteria Summit
 - The wastewater corner
3. 2022 Revised SSS WDR
 - Map showing applicable stormwater conveyance facilities
 - Collaborate with stormwater agencies for spill responses
4. 2024 Stormwater & Wastewater Collaboration Roadmap
5. 2025 San Diego River Watershed Investigative Order Report
6. 2026 SMC & CASA Workshop on Exfiltration



INTERACTION MILESTONES

1. 2022 SWRCB & CASQA Bacteria Summit
 - <https://www.casqa.org/resources/water-quality-priorities/bacteria>
 - The wastewater corner
2. 2022 Revised SSS WDR
 - Collaborate with stormwater agencies for spill responses
 - Map showing applicable stormwater conveyance facilities plus more
 - Prioritize bacteria-related impairment on 303(d) list
 - SERP – coordination with stormwater agencies
3. 2024 Stormwater & Wastewater Collaboration Roadmap
4. 2026 SMC & CASA Workshop on Exfiltration

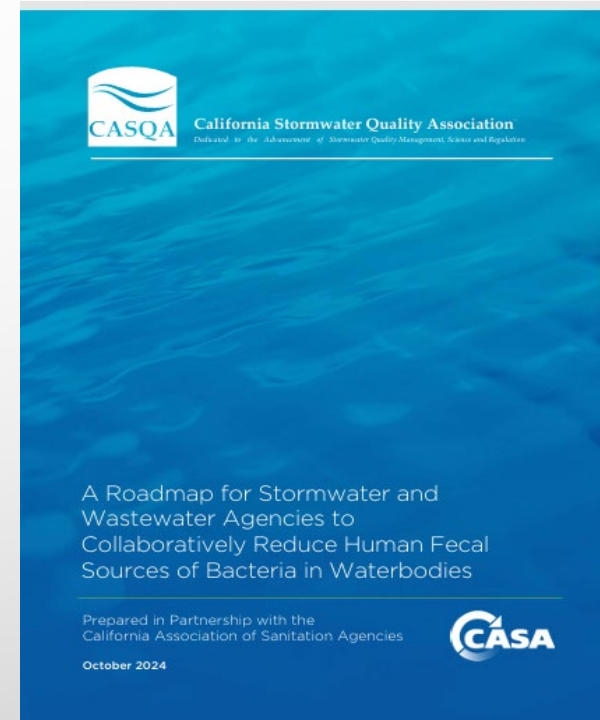


INTERACTION MILESTONES (CONTINUED)

2024 Stormwater & Wastewater Collaboration Roadmap

Highlights:

- Sharing mapping and data resources
- Prioritizing management measures
- Joint Project Planning
- Proactive Corrective Actions
- Integrated Communication Framework
- Joint Training
- *Check it out...*



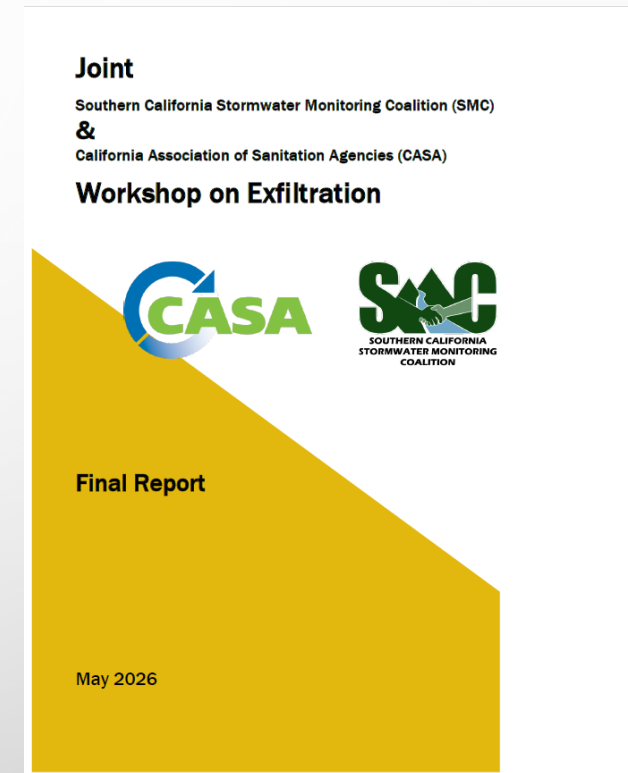
<https://www.casqa.org/resources/water-quality-priorities/bacteria>

INTERACTION MILESTONES (CONTINUED)

2026 SMC & CASA Workshop on Exfiltration

Outcomes:

- Intense evaluation of small catchments with a probability of exfiltration.
- Explain the subsurface transport mechanism by which sewage that has exfiltrated from sewers travels underground to a downstream waterbody.
- *Develop a joint stormwater-wastewater action plan providing managers with actionable, coordinated steps to take when exfiltration is detected in a watershed*



<https://www.sccwrp.org/cross-sector-agreement-reached-to-study-exfiltration/>

SMC & CASA Workshop on Exfiltration

Small Catchments

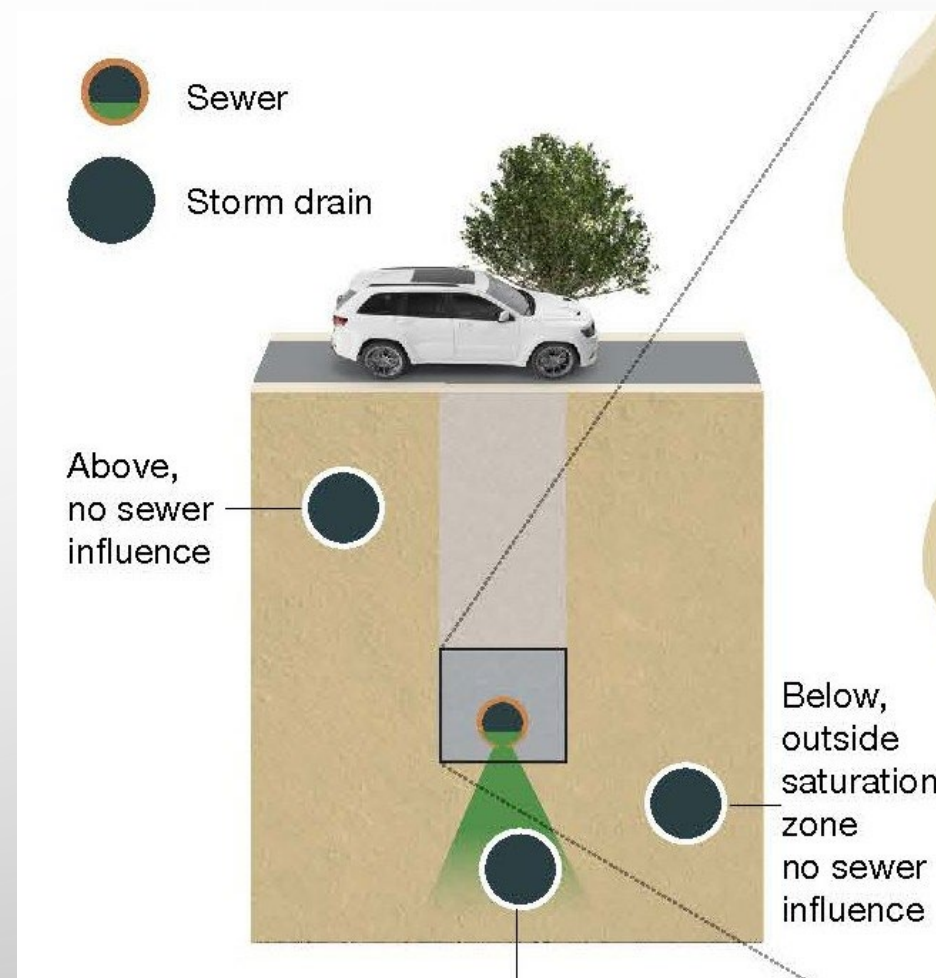
- Intensive investigations at a limited number of small catchments.
- Ideally sites with volume loss from previous studies and/or ideal sites based on mapping and risk factors.
- Could include many investigation methods:
 - Volume loss from sewer test(s)
 - Human fecal markers
 - Soil moisture/marker testing adjacent to sewer
 - Biofilm testing in soils



SMC & CASA Workshop on Exfiltration (CONTINUED)

Subsurface Transport

- Assess how and to what extent exfiltrated sewage can enter an MS4 or receiving water.
- Could include:
 - Sampling in storm drains and groundwater
 - Time series sampling for sewer markers during wet weather
 - Dye studies
 - Soil and groundwater sampling



SMC & CASA Workshop on Exfiltration (CONTINUED)

Stormwater-Wastewater Action Plan

- Strengthen relationship with Stormwater and Sewer agencies
- Communication to include regulatory agencies
- Provide practical guidance for:
 - Human waste source investigation triggers
 - Source investigation procedures
 - Abating human sources into MS4s



SMC & CASA Workshop on Exfiltration

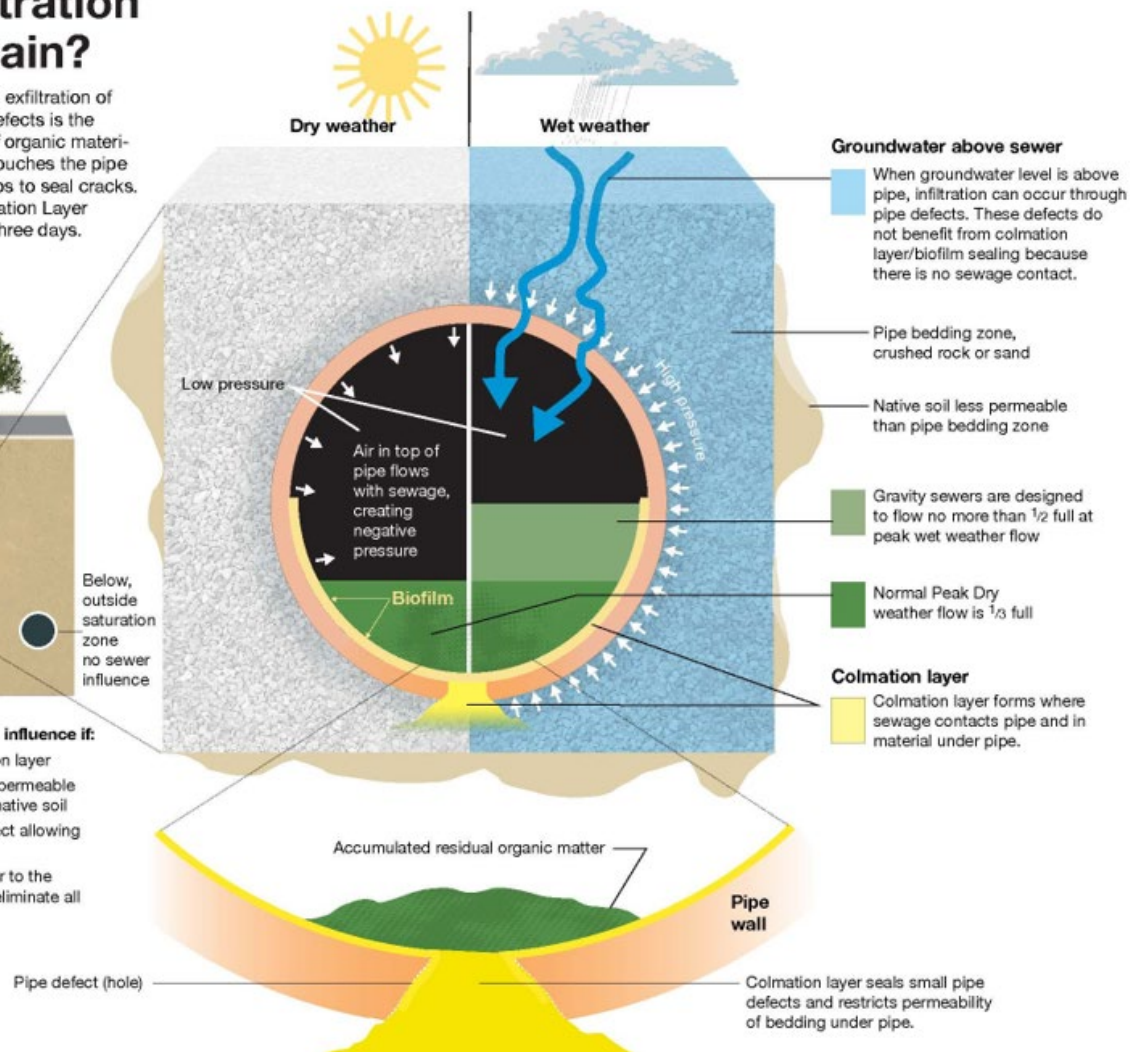
Sewer exfiltration to storm drain?

One of the primary barriers to exfiltration of sewage through small pipe defects is the Colmation Layer: a mixture of organic materials that form where sewage touches the pipe called a Colmation Layer, helps to seal cracks. After pipe cleaning, the Colmation Layer mostly re-establishes within three days.



Inside saturation zone, potential influence if:

- Sewer leak overcomes colmation layer
- and sewer migrates from more permeable trench zone to less permeable native soil
- and storm drain pipe has a defect allowing sewage into the pipe
- and the distance from the sewer to the storm drain is short enough to eliminate all natural treatment



ACTION PLAN - STARTED:

2022 REISSUED SSS WDR



Main Elements:

- Not a NPDES Permit
- Prohibits Spills
- Regular Reporting on CIWQS
- Sewer System Management Plan (SSMP)



SEWER SYSTEM MANAGEMENT PLAN (SSMP)

1. Goal
2. Organization
3. **Legal Authority***
4. **Operation And Maintenance Program***
5. Design And Performance Provisions
6. **Spill Emergency Response Plan***
7. Sewer Pipe Blockage Control Program
8. **System Evaluation, Capacity Assurance and Capital Improvements***
9. Monitoring, Measurement and Program Modifications
10. Internal Audits
11. Communication Program

**Stormwater Coordination Requirements
(not including storm event resilience)*



SSS WDR STORMWATER COORDINATION REQUIREMENTS

1. LEGAL AUTHORITY

- **Collaborate with storm sewer agencies** to coordinate emergency **spill responses**, ensure **access to storm sewer systems** during spill events, and **prevent unintentional cross connections** of sanitary sewer infrastructure to storm sewer infrastructure;

4. OPERATION AND MAINTENANCE PROGRAM

- An up-to-date **map(s) of the sanitary sewer system**, and procedures for maintaining and providing State and Regional Water Board staff access to the map(s). The map(s) must show gravity line segments and manholes, pumping facilities, pressure pipes and valves, and **applicable stormwater conveyance facilities** within the sewer system service area boundaries.

SSS WDR STORMWATER COORDINATION REQUIREMENTS (CONTINUED)

6. SPILL EMERGENCY RESPONSE PLAN

- Implement pre-planned coordination and collaboration with storm drain agencies and other utility agencies/departments prior, during, and after a spill event;



SSS WDR STORMWATER COORDINATION REQUIREMENTS (CONTINUED)

8.1 System Evaluation and Condition Assessment

- Prioritize the condition assessment of system areas that:
 - Hold a high level of environmental consequences if vulnerable to collapse, failure, blockage, capacity issues, or other system deficiencies;
 - Are located in or within the vicinity of surface waters, steep terrain, high groundwater elevations, and environmentally sensitive areas;
 - Are within the vicinity of a receiving water with a bacterial-related impairment on the most current Clean Water Act section 303(d) List

Q: WHERE DO WE START?

A: MAPPING

Scoring matrix-based:

- 19 of 507 (4%) sewer pipe segments above storm drain
- 12 of 19 (2%) also cross storm drain
- 6 of 12 (1%) also have defect
- 2 of 6 (0.3%) also in sandy soil (highest rating)

Site ID	Spatial Relationship				Ground Water					Sewer Pipe Priority Rating					Storm Drain Pipe Priority Rating					Soil Priority Rating			FINAL SCORE	Rank
	Vert. Dist.	Horz. Dist	Avg	Total	In Valley?	Swr Depth	Vert. Dist.	Avg	Total	Flow Depth	Defect	EMA	Avg	Total	SD Mat'l	Size	Age	Avg	Total	Perm. (in/hr)	Avg	Total		
116	5	1	3.0	9.0	3	3	5	3.7	3.7	1	0	0	0.3	1.7	2	3	2	2.3	2.3	3	3.0	6.0	22.7	8
176	5	3	4.0	12.0	3	2	5	3.3	3.3	2	2	0	1.3	6.7	2	5	2	3.0	3.0	1	1.0	2.0	27.0	3
223	5	3	4.0	12.0	3	1	5	3.0	3.0	1	0	0	0.3	1.7	2	5	2	3.0	3.0	1	1.0	2.0	21.7	10
225	5	2	3.5	10.5	3	2	5	3.3	3.3	2	0	0	0.7	3.3	2	5	2	3.0	3.0	1	1.0	2.0	22.2	9
257	4	3	3.5	10.5	3	1	5	3.0	3.0	1	2	0	1.0	5.0	3	3	2	2.7	2.7	1	1.0	2.0	23.2	7
277	5	3	4.0	12.0	3	1	5	3.0	3.0	1	2	0	1.0	5.0	2	3	2	2.3	2.3	1	1.0	2.0	24.3	5
302	5	3	4.0	12.0	1	1	5	2.3	2.3	0	3	0	1.0	5.0	2	2	2	2.0	2.0	1	1.0	2.0	23.3	6
333	5	3	4.0	12.0	3	2	5	3.3	3.3	2	4	0	2.0	10.0	3	4	3	3.3	3.3	3	3.0	6.0	34.7	1
368	5	1	3.0	9.0	3	2	5	3.3	3.3	1	4	0	1.7	8.3	4	1	3	2.7	2.7	1	1.0	2.0	25.3	4
590	4	3	3.5	10.5	1	1	5	2.3	2.3	1	3	1	1.7	8.3	3	2	2	2.3	2.3	3	3.0	6.0	29.5	2

THANK YOU!



LET'S TALK NEXT STEPS...

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