

UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF TEXAS
HOUSTON DIVISION

UNITED STATES,	§	CIVIL ACTION NO. 4:18-CV-3368
Plaintiff,	§	The Honorable Charles R. Eskridge III
	§	
STATE OF TEXAS,	§	
Plaintiff,	§	
	§	
and	§	
	§	
BAYOU CITY WATERKEEPER,	§	
Plaintiff-Intervenor	§	
	§	
v.	§	
	§	
CITY OF HOUSTON,	§	
Defendant.	§	

Declaration of Dr. Lauren Ross

Attachments

- Attachment 1. City of Houston Sewage Failures, Capital Improvement Projects and Poverty
- Attachment 2. City of Houston Sewage Failures, Capital Improvement Projects and Black Population
- Attachment 3. City of Houston Sewage Failures, Capital Improvement Projects and Latinx Population
- Attachment 4. City of Houston Sewage Failures, Capital Improvement Projects and Chinese Population

Introduction

1. My name is D. Lauren Ross. My address is 1405 Hillmont Street, Austin, Texas 78704.
2. I am a consulting engineer. In 2018, Bayou City Waterkeeper hired me to assist them with review of the City of Houston's self-reported sanitary sewer overflows data, as well as assess potential environmental justice implications embedded within the City's overflow data.

Qualifications

3. I have a Doctor of Philosophy degree in civil engineering from the University of Texas awarded in 1993, a Master of Science degree in civil engineering from Colorado State University awarded in 1982, and a Bachelor of Science degree in civil engineering from the University of Texas awarded in 1977 with highest honors.
4. I am a registered professional engineer in the State of Texas since 1984.
5. I have professional experience relevant to the opinions I express in this affidavit. My areas of expertise include wastewater and solid waste management and disposal, water resources engineering, water quality protection and engineering design, groundwater transport, stormwater management, erosion and sedimentation controls, statistical methods, and environmental monitoring. I have served as a testifying expert in legal proceedings regarding these matters.
6. I also have professional experience related to wastewater treatment and management requirements to meet U.S. Clean Water Act standards. I have reviewed several wastewater treatment and disposal systems and offered opinions regarding whether their operation and/or proposed operation would meet U.S. Clean Water Act standards. These systems include:
 - a. Travis County Stratus Municipal Utility District 5 wastewater system;
 - b. Hays County WCID #1;
 - c. Scenic Greens development in Travis County, Texas;
 - d. Horizon Municipal Utility District, in El Paso County, Texas;
 - e. Johnson Ranch development;
 - f. City of Wimberley, Texas;
 - g. Barton Creek West development;
 - h. City of Dripping Springs in Hays County, Texas;
 - i. Rob Roy development in Travis County, Texas;
 - j. Aqua Texas, Inc. wastewater system in Fort Bend County, Texas; and

- k. City of Liberty Hill, Texas.
7. I have also performed a regional assessment of wastewater impacts to the Edwards Aquifer. I served on the Coordination Committee to guide development of an Implementation Plan for Five TMDLs for Bacteria in Four Austin streams.
 8. I have experience with environmental justice issues. I currently serve on the City of Austin Equity Action Team. I participated in the design of the City's equity assessment tool to measure disproportionate outcomes in City departments. I serve on the City of Austin Office of Police Oversight Technical Advisory Team and reviewed the City's data, data collection processes, and public communication processes regarding disproportionate policing outcomes in Austin historically Black, Latinx, and Asian communities. I consult with Austin's Office of Sustainability's Climate Change Committee and the City of Austin Watershed Department staff on issues regarding racism and disproportionate outcomes in the provision of city services.

Methods

9. In 2018 I reviewed more than 9,000 unique records of sewage excursions or incidents associated with the City of Houston wastewater collection, treatment, and discharge system between June 2013 and June 2018. I evaluated these records to determine their associated treatment facility and any available information regarding the failure causes. I prepared a map of the number of sewage excursions and associated stream segments. All of the facilities with sewage excursions are upstream from streams identified by the Texas Commission on Environmental Quality as impaired.
10. My analysis indicates that City of Houston sanitary sewage excursions occur mostly within the collection system and are associated with either grease blockages or service lateral failures.

Failure to Achieve Minimum Requirements in Similar Consent Decrees

11. In October 2019 I reviewed *United States of America, State of Texas, and Bayou City Waterkeeper versus City of Houston, Texas*, Civil Action No. 4:18-cv-03368, Proposed Consent Decree. The purpose of my review was to determine whether the proposed consent decree provisions would adequately address Houston's sewage excursion problems, based on the publicly-available history of failure incidents, and furthermore, whether its provisions were consistent with technical requirements in similar recent consent decrees for similarly sized cities.

12. I compared the proposed consent decree to recent consent decrees for the Metropolitan St. Louis Sewer District, Missouri, for the City of Atlanta, Georgia, and for the Louisville and Jefferson County Metropolitan Sewer District, Kentucky. These entities treat average daily flows of 153 to 350 million gallons each day. Houston's average wastewater flows, 250 million gallons per day, is in the middle of this range. All three of these cities are more hampered than the City of Houston would be to prevent overflows because at least some part of their collection system combines sewage and storm runoff flows.
- a. Wet weather flow surges in a properly maintained and operated separate system should not be as large as surges in a combined system. Nevertheless, the City of Houston's wastewater collection, transmission, storage, and treatment is vulnerable to wet weather infiltration and inflow. The City reports numerous sewage excursions associated with wet weather. City of Houston facilities report effluent standard during wet weather conditions from rain amounts as low as a half inch. These violations include exceedances for pathogen indicators, ammonia, biochemical oxygen demand and total suspended solids.
13. Between January 1, 2016 and December 31, 2017, Houston Intercontinental Airport weather station reported 68 days with rain amounts equal to or greater than a half inch. If the City of Houston wastewater collection, transmission, storage, and treatment system is vulnerable to rain amounts this low, based on weather data for 2016 and 2017, wastewater permit violations could be expected to occur, on average, every 11 days.
14. Despite being similarly sized and despite the added challenges of a combined collection system, St. Louis, Atlanta, and Louisville and Jefferson County Metropolitan Sewer District consent decrees included many provisions that are missing from the proposed Houston consent decree. Generally, these provisions addressed:
- a. Significantly shorter time frames for compliance, with milestones ranging from one month to nine years;
 - b. Detailed facility maintenance, operations, safety, and staff training program requirements (Atlanta);
 - c. U.S. Environmental Protection Agency and state audits of implementation compliance (Atlanta);
 - d. A certification requirement for deficiency corrections (Atlanta);
 - e. Sewer flow and rainfall monitoring to evaluate infiltration and inflow (Atlanta);

- f. A written contingency and emergency sewage excursion response plan and emergency response training for City wastewater staff (Atlanta);
 - g. A requirement to notify and protect the public in the event of a sewage excursion (Atlanta); and
 - h. Receiving water body monitoring, sampling, analysis and reporting following an unpermitted discharge (Atlanta).
 - i. Any and all of these requirements would reduce the occurrence of illegal sanitary sewer excursions by the City of Houston. Nevertheless, none of them are part of the proposed consent decree.
15. In their response to comments, Plaintiffs dismissed BCWK's request for similar provisions in this consent decree as irrelevant because the other three cities are served by combined sewer systems. But none of these provisions are specific to combined sewers and each of them would significantly either enhance performance of the City of Houston's wastewater system and/or reduce the public health and community damage from sanitary sewer excursions and failures when they do happen.
16. Each of the three other consent decrees (Atlanta, St. Louis, and Louisville, Kentucky) included Supplemental Environmental Projects to mitigate community impacts from historical wastewater overflows. These provisions included: replacement, rehabilitation, or repair of private lateral lines based on income tests. Plaintiffs, in their response to comments, continued to maintain that private lateral repair and rehabilitation is exclusively the responsibility of the private owner unless the failure is caused by the City's system. Other consent decrees also mandate an advisory committee of community leaders, including representation from disproportionately impacted communities and funding for stream cleanup for streams affected by effluent limit violations or unauthorized discharges. Either and both of these mandates in other consent decrees would enhance water quality and mitigate the environmental degradation of sanitary sewer excursions.

Failure to Address Bayou City Waterkeeper Comments

17. I reviewed the responses prepared by the Plaintiffs to Bayou City Waterkeeper's comment letter in Case 4:18-cv-03368 Document 42-1 Appendix A-4 Response to Comment submission. Responses in this document either do not address or else misconstrue many of the comments in Section IV and Section V(9) and (10) of Bayou City Waterkeeper's letter. Bayou City Waterkeeper's unaddressed comments include these:

- a. **(IV-1) Data purporting to support consent decree is incomplete.** The consent decree lacks transparency in that it only generally identifies root cause analyses as its basis for prioritizing projects. This lack of specificity prevents any outside review and assessment of whether the City’s overflows will be adequately addressed under its provisions. Based on the data that is provided, such as the data in Appendix E, the consent decree appears incomplete. Even as it misconstrues the comment, the United States does not respond to it. Rather than discuss the sources of data informing the consent decree, the United States discusses the consent decree’s injunctive relief measures.
- b. **(IV-2) The prioritization matrix misses key factors, does not give sufficient information about other factors like floodplains, and does not explain how it is used.** In response to this comment, the United States references sewer basins but discloses no information about these basins; asserts that floodplain data will be used but again provides no information about how it will be used; and asserts that impacts on environmental justice communities need not be included as a prioritization factor because the consent decree incidentally prioritizes some low-income communities of color in other ways.
- c. **(IV-3) Early Action Projects must be completed more quickly than 10 years.** The United States responds that the consent decree requires the City to complete approximately 78.4 percent of the Early Action Projects by 2025; approximately 16.6 percent Early Action Projects are scheduled to be completed from 2028 to 2030. A time frame of ten years to complete projects defined as “early action” makes the term meaningless.
- d. **(IV-4) The length for compliance is too long.** The United States simply responds that a 15-year timeline is sufficient.
- e. **(IV-5) The draft consent decree does not fully address known causes of pollution.** The United States points generally to the broader injunctive methods that the consent decree will pursue. With regard to Appendix E, the United States responds that “Appendix E identifies the types of exceedances, the root causes, and the implemented remedial measures. But, as stated earlier, Appendix E does not represent the only set of remedial measures directed at addressing effluent exceedances at the City’s WWTPs.

Consent Decree Fails to Acknowledge and Address Disproportional Impact of Sanitary Sewer System Failures on Houston's Black, Latinx, Chinese-American, and Low-Income Communities.

18. Patterns of disproportionately frequent overflows in poor, Black, Latinx, and Asian communities and the preponderance of wastewater-related capital improvement projects in white and higher-income communities, merit an environmental justice component in the Consent Decree.
19. On behalf of Bayou City Waterkeeper and in collaboration with Naomi Walker, a graduate student at Texas Southern University pursuing a degree in Urban Planning and Environmental Policy with a focus on Sustainability and Natural Resources, I evaluated whether City of Houston sanitary sewer overflows occurred disproportionately more frequently in Houston's poor and racially-diverse communities. I also examined how planned Capital Improvement Projects relate to these overflows and to the wealth and racial demographics of Houston neighborhoods.
20. At my direction, Ms. Walker collected, analyzed, and mapped sewage overflow data for the City of Houston to understand sewage leak patterns. Working together, we analyzed the nexus between private and public sewage overflows for the City of Houston, current and future Capital Improvement Projects, and Houston's socioeconomic and demographic geography.
21. Ms. Walker obtained and processed these data, at my instruction:
 - a. Obtained sewage overflow data from the City of Houston's 2018 Wastewater Work Order Reports. Separated Suspected Private Sanitary Sewer Overflow and Suspected Public Sanitary Sewer Overflow incidents.
 - b. Obtained Capital Improvement Project (CIP) data from Bayou City Waterkeeper. Bayou City Waterkeeper obtained the CIP data from City of Houston public information requests. Bayou City Waterkeeper organized CIP projects by Houston City Council districts and extracted CIP projects related to the City's sewer system.
 - c. Obtained the 2018 Social Vulnerability Index GIS shapefile from the Centers for Disease Control and Prevention for Texas. These data were used as the base map for City of Houston Sewage Failures, Capital Improvement Projects and Poverty
 - d. Obtained Houston demographic data from the 2010 Census. Converted demographic data to percentage using the standard Demographic Percentage formula $[(\text{Target Demographic}/\text{Total Population}) * 100]$. Organized the demographic data by race and ethnicity. Demographic data

for racial populations were included if the population for that demographic group was over 20% of a given area. Mapped the following:

- i. Percent Black or African American Population by census tract
 - ii. Percent Vietnamese Population by census tract
 - iii. Percent Chinese Population by census tract
- e. Obtained Houston Hispanic Population data from online ESRI ArcPRO. Mapped Houston's 2019 Hispanic population percent by zip code.
- f. Obtained and mapped Houston's major streets from online ESRI ArcPRO. Our maps, included as Attachments 1 to 4 to this affidavit, demonstrate the disproportionate burden on low-income and Person of Color communities from the City of Houston sanitary sewage excursions. These maps also demonstrate that the City's CIP sewer and wastewater projects, based on the number of projects, are under-allocated in the communities most affected by these excursions.
22. Based on this analysis, I conclude that there is an unbalanced nexus between Houston CIP wastewater project allocation and sewage overflows. Low income and POC neighborhoods are burdened by a disproportionately large number of sewage leaks with fewer project solutions to reduce or eliminate community health and quality of life consequences. This relationship demonstrates a pattern of disproportionate impacts and an environmental injustice issue that merits Consent Decree measures to remedy.

Failure to Address Sanitary Sewer Overflows from Suspected Private Lateral Lines

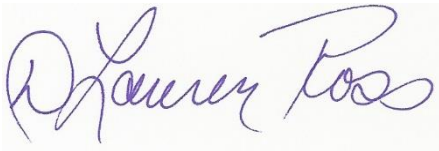
23. Private laterals are underground pipes that connect residences or businesses to a main sewer line. When private laterals age, they face the same problems as municipally owned sewer infrastructure. They degrade, crack, are infiltrated by floodwaters, and are broken by plant and tree roots.
24. Private lateral degradation leads to sewage leaks as well as sewage back-ups into private residences and businesses. This release of untreated wastewater and potential pathogens into waterways, streets, homes, and businesses increases health risks. As wastewater from private laterals overflows into local bayous, creeks, streams, and bays, it contaminates bodies of water fed by the waterways and creatures/plants coming in contact with the polluted water. Repairs to sewer laterals can be extremely expensive and unaffordable for low and middle-income families, meaning that damaged laterals are left unrepaired. The consent decree ignores this reality. It is inadequate because it simply requires the City to notify the property owner that it must call a plumber or face penalties without

Declaration of Dr. Lauren Ross, Ph.D., P.D.

considering the realities of access to resources and the ability to pay for expensive repairs.

25. Both Houston’s proposed CIP projects and this consent decree fail to address either public health risks or environmental degradation from private lateral sewage excursions. Unfortunately, the City’s data do not expressly identify overflows from private laterals versus those from the publicly owned system. Ms. Walker reviewed narrative data in the City’s records to identify which overflows appear to have occurred from private laterals. Because the City’s data is unclear, however, and consequent uncertainties in our distinctions, these excursions are indicated on the maps as overflows associated with “suspected private lines.
26. Of 1,061 City of Houston overflow records, 279 appear to have occurred from private laterals. Although the reliability of this number is limited by the City’s ambiguous record-keeping, Attachments 1 through 4 illustrate a clear discrepancy between suspected private lateral overflow densities and the City’s allocated CIP projects. Particularly in the southwest Houston, communities with lower incomes and higher proportions of Black, Latinx, and Chinese American residents apparently experience more frequent private lateral overflows within any area. The City of Houston considers private sewer lateral repair and/or remediation to be the sole responsibility of the home or business owner. To protect human health and downstream water quality, however, the City of Houston must address private sewer lateral repair and remediation assistance, particularly for low-income and historically under-served communities.
27. I declare under penalty of perjury that the foregoing is true and correct and that my opinions are founded on sound science and professional engineering practices.

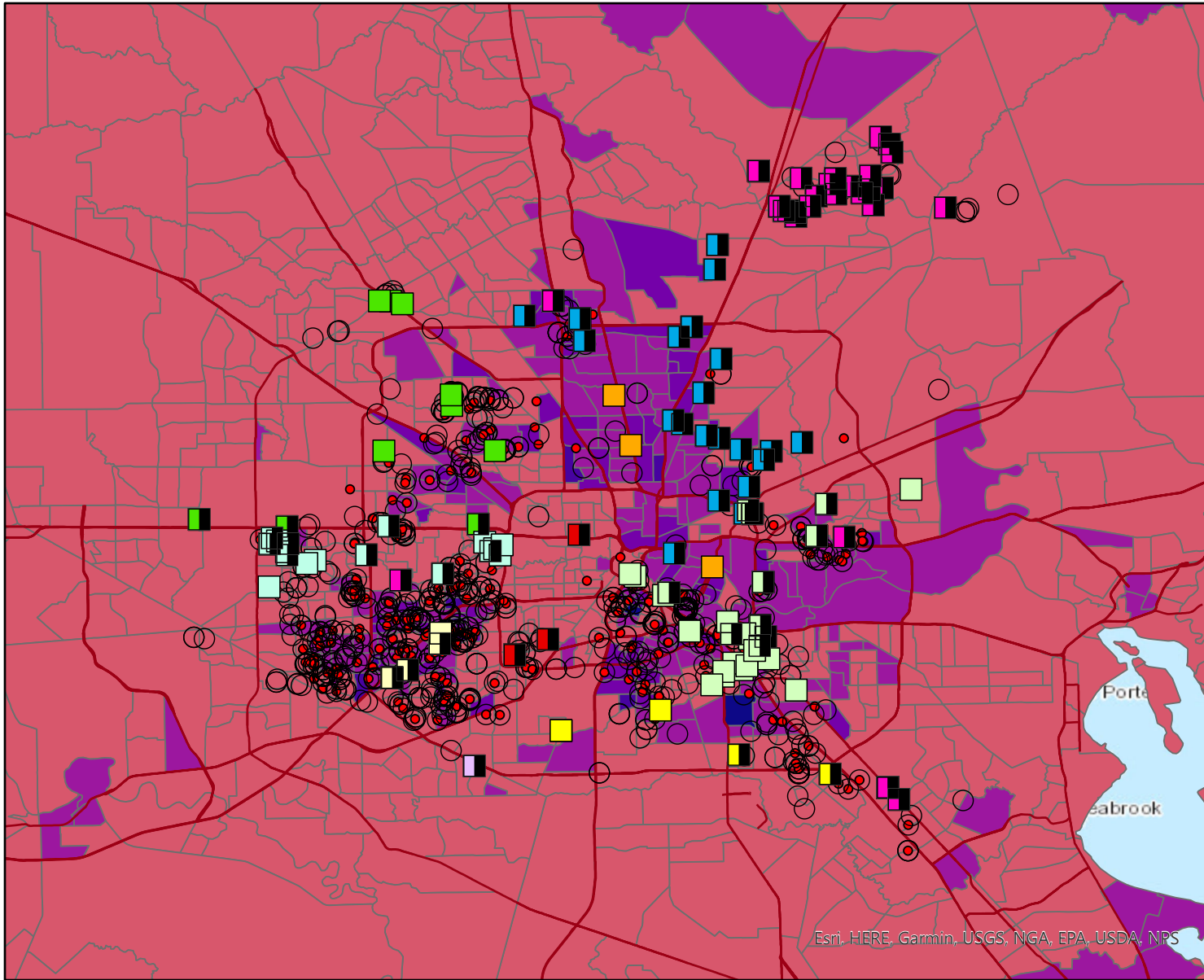
Executed on September 4, 2020



D. Lauren Ross

City of Houston

Sewage Failures, Capital Improvement Projects and Poverty



- Overflow or other discharge (suspected private line)
- Overflow or other discharge
- Houston Streets

Percent Poverty

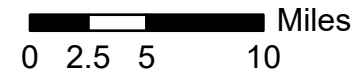
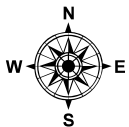
- 0% - 23%
- 24% - 37%
- 38% - 47%
- 48% - 62%
- 63% - 100.0%

Council District CIP Projects

- District A
- District B
- District C
- District D
- District E
- District G
- District H
- District I
- District J
- District K
- Hurricane Harvey Related Projects

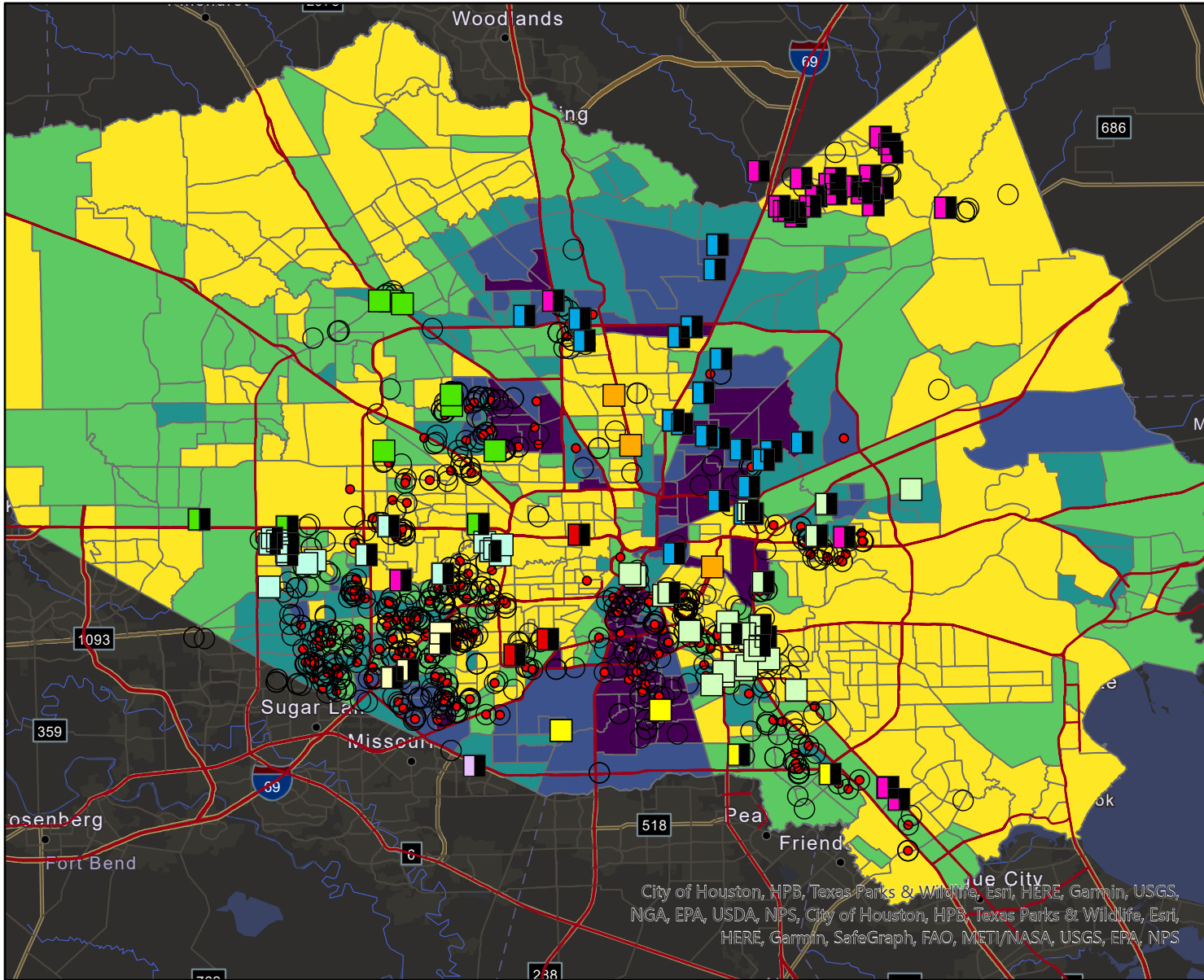
Capital Improvement Project (CIP) data obtained directly from the City of Houston project.
Suspected Private and Public sewage overflow data obtain directly from the City of Houston 2018-2019 work order logs.
Demographic data (excluding Latinx Population) obtained from the 2010 Census Bureau.
Latinx Population data was obtained from the published Online ArcGIS portal.
Houston Streets data obtained from the Published Online ArcGIS Portal.

Esri, HERE, Garmin, USGS, NGA, EPA, USDA, NPS



City of Houston

Sewage Failures, Capital Improvement Projects and Black Population



- Overflow or other discharge (suspected private line)
- Overflow or other discharge
- Houston Streets

Percent of Black Population

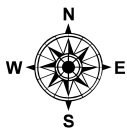
- 0 - 9.7%
- 9.8 - 23.1%
- 23.2 - 39.4%
- 39.5 - 63.3%
- <94.7%

Council District CIP Projects

- District A
- District B
- District C
- District D
- District E
- District G
- District H
- District I
- District J
- District K
- Hurricane Harvey Related Projects

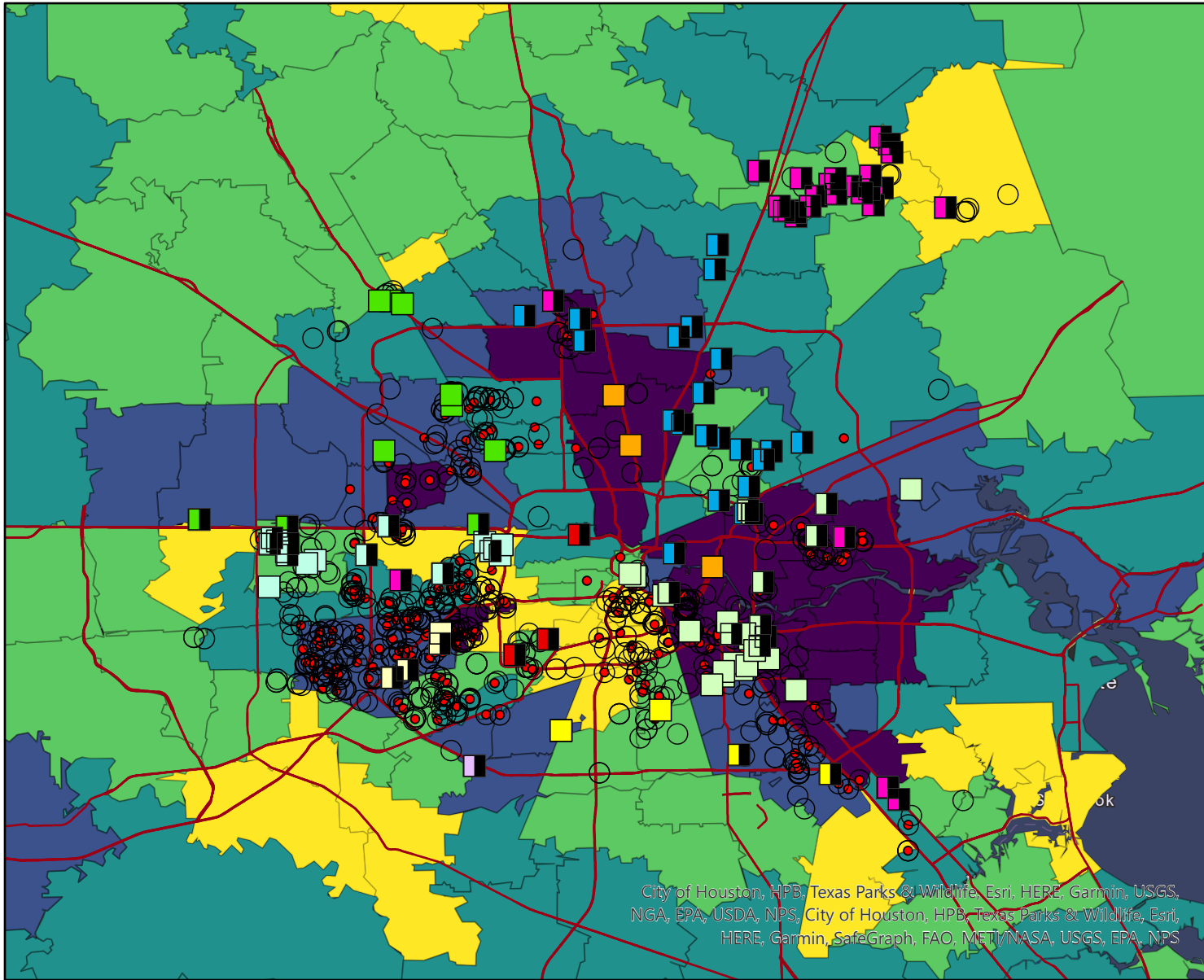
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City of Houston

Sewage Failures, Capital Improvement Projects and Latinx Population



- Overflow or other discharge (suspected private line)
- Overflow or other discharge
- Houston Streets

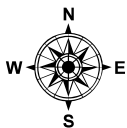
Percent of Latinx Population

- 0% - 17.68%
- 17.69% - 30.32%
- 30.33% - 45.25%
- 45.26% - 67.59%
- <95.62%

Council District CIP Projects

- District A
- District B
- District C
- District D
- District E
- District G
- District H
- District I
- District J
- District K
- Hurricane Harvey Related Projects

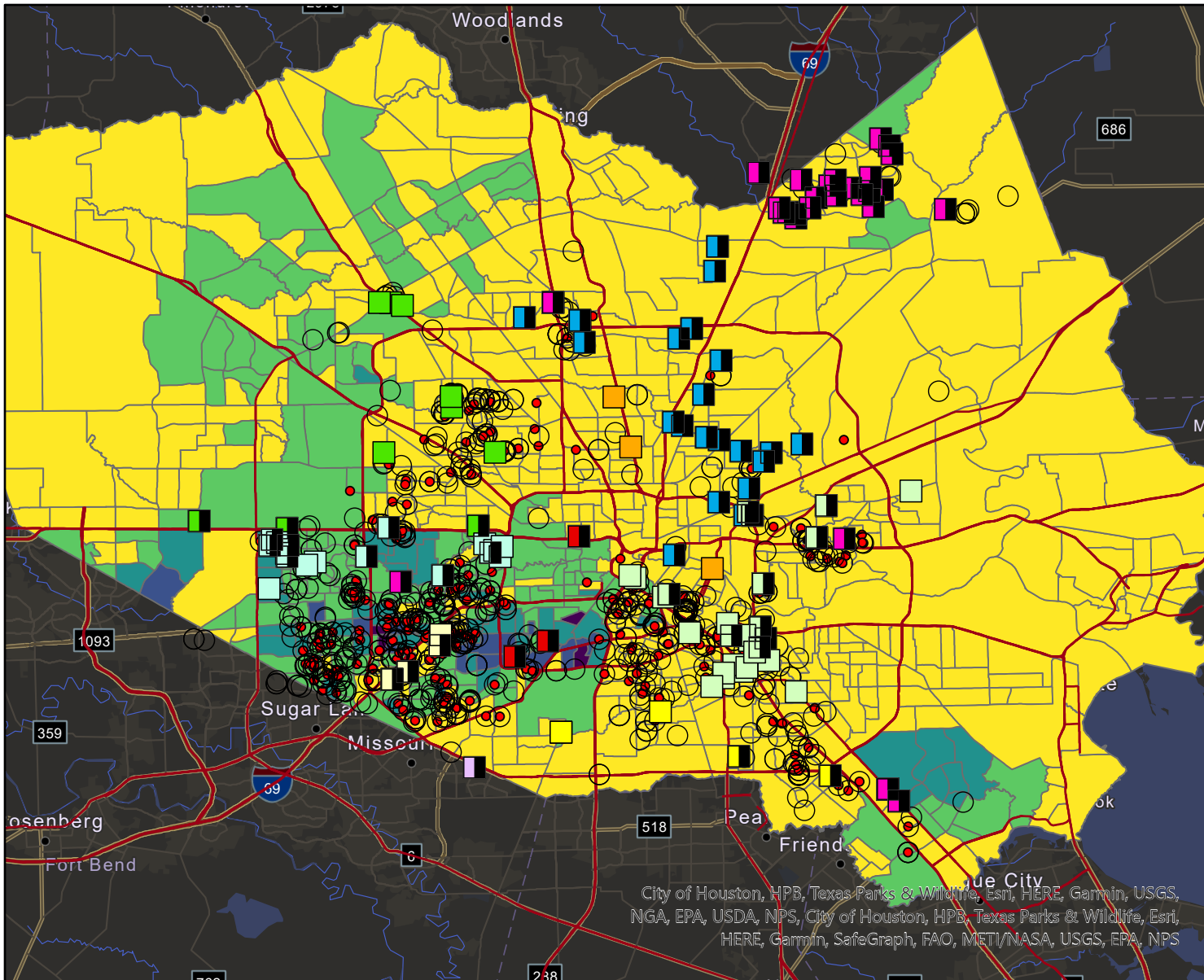
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Declaration of Dr. Lauren Ross

City of Houston

Sewage Failures, Capital Improvement Projects and Chinese Population



● Overflow or other discharge (suspected private line)

○ Overflow or other discharge

— Houston Streets

Percent of Chinese Population

0% - 1%

2% - 6%

7% - 13%

14% - 23%

<24%

Council District CIP Projects

District A

District B

District C

District D

District E

District G

District H

District I

District J

District K

Hurricane Harvey Related Projects

Capital Improvement Project (CIP) data obtained directly from the City of Houston project.

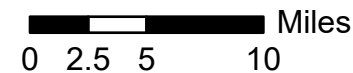
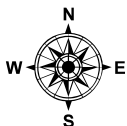
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