Exhibit B

APPENDIX C

Infrastructure Analysis

KELLER ASSOCIATES

REVISED Technical Memorandum 7

TO: Andrew Parish, MIG

FROM: Peter Olsen, PE Keller Associates
Luke Tabor, EI Keller Associates

DATE: May 10, 2023

SUBJECT: **TM7 EAST ALBANY PLAN PREFERRED ALTERNATIVE – INFRASTRUCTURE ANALYSIS**

CC: Matt Hastie, MIG

1.0 INTRODUCTION

Memorandum #7 identifies non-transportation public infrastructure needs necessary to support the East Albany Plan's preferred Development Alternative. Non-transportation infrastructure includes water, sanitary sewer, and storm water infrastructure. The location and size of infrastructure are consistent with adopted standards for those facilities. Future infrastructure includes publicly provided infrastructure identified in adopted plans, with adjustments for inflation, based on input from facility providers. Costs for projects called for in master plans are included in each line item for future infrastructure. Keller Associates used existing City master plans and mapping for water, sewer, and storm water as the baseline for identifying the need for investments beyond those already planned. This evaluation only includes trunklines and larger distribution mains, and assumes all local distribution pipelines and service lines will be developed at the cost of private developers. Figure 1 shows the preferred scenario and street layout used to develop future improvements.

Cost estimates include mobilization and administration, bonding, contractor overhead and profit, prevailing wages, contingency, engineering design, bid and construction services, permitting, geotechnical investigation, surveying, environmental, and legal, administrative, and funding.

2.0 WATER UTILITIES

Water infrastructure has been updated to accommodate growth in East Albany based on the 2004 Water Facility Plan. Future infrastructure called out in the plan includes Development Driven Transmission/Distribution Projects, the Knox Butte Reservoir Project Phase 1, and the Knox Butte Reservoir Project Phase 2. Completed projects were updated based on City input. Additional mainline distribution piping is included for areas not previously evaluated and to maintain looping in the system. Looping the distribution network decreases pressure drops and dead-end pipes that become stagnant and create potential water quality complaints. Future mainlines should be in major right of ways whenever possible. Figure 2 shows future water infrastructure in the East Albany study area. Table 1 below shows projected linear feet of each pipeline size and costs for future pipelines and reservoirs.

TABLE 1 – EAST ALBANY STUDY AREA WATER COST ESTIMATE

General Improvement	Estimated Quantity	Unit	Total Cost
12-inch Water Pipe	50,343	LF	$ 32,700,000
16-inch Water Pipe	6,000	LF	$ 4,800,000
24-inch Water Pipe	12,580	LF	$ 13,300,000
Knox Butte Reservoir 1	1	LS	$ 20,600,000
Knox Butte Reservoir 2	1	LS	$ 19,600,000
		Total:	**$ 91,000,000**

* *Unit cost estimates are based on* current (2022) *construction cost data from recent Keller Associates projects.*

3.0 SEWER UTILITIES

The 2015 Wastewater Collection System Facility Plan calls out several CIP projects in the East Albany study area. Most of these projects are intended to handle peak buildout flows during a 5-year storm event. The increased residential development will increase base flows for the study area but should not have a major impact on existing or planned infrastructure. The list below summarizes Capital Improvement Projects called for in the Master Plan.

- Cox Creek Interceptor Projects
- Century Drive – Draperville Projects
- Somerset Drive Projects
- Three Lakes Road Projects
- Highway 20 Projects
- Timber Linn Projects
- Knox Butte Roads Projects
- Burkhart Creek Lift Station

Pipeline and lift station improvements for these projects are embedded into the line item costs in Table 2 on the following page. Additional sewer mainline pipes not evaluated as part of the Facility Master Plan were added based on future street layouts and zoning. Figure 3 shows future sewer infrastructure in the East Albany study area. Table 2 shows line item costs for future sewer infrastructure.

TABLE 2 – EAST ALBANY STUDY AREA SEWER COST ESTIMATE

General Improvement	Estimated Quantity	Unit	Total Cost	
8-inch Sewer Pipe	10,930	LF	$	4,700,000
10-inch Sewer Pipe	18,090	LF	$	8,500,000
12-inch Sewer Pipe	6,300	LF	$	3,000,000
15-inch Sewer Pipe	10,850	LF	$	6,100,000
18-inch Sewer Pipe	5,775	LF	$	3,500,000
21-inch Sewer Pipe	4,125	LF	$	2,500,000
400 GPM Lift Station	1	EA	$	1,700,000
700 GPM Lift Station	1	EA	$	2,400,000
900 GPM Lift Station	1	EA	$	2,700,000
900 GPM Lift Station	1	EA	$	2,700,000
6200 GPM Lift Station	1	EA	$	12,800,000
		Total:	**$**	**50,600,000**

* *Unit cost estimates are updated from January 2021 to current (January 2023) construction cost data using Engineering News-Record cost index 20-city average.*

4.0 STORM UTILITES

The East Albany study area consists of the entire Burkhart-Truax Basin, and parts of the Cox Creek and Periwinkle Basins (Figure 4). Build-out deficiencies include previously identified existing deficiencies plus any new deficiencies from additional runoff created by the build-out impervious surfaces. Future deficiencies were also considered for areas where new roadways are planned in the Albany Transportation System Plan. Assumed future stormwater infrastructure for this analysis comes from the 2021 Stormwater Master Plan (SWMP).

The most significant deficiencies in the Burkhart-Truax Basin occur in the storm drain system serving the residential lots bounded by Clover Ridge Road to the west, Alameda Avenue to the north, Stormy Street to the east, and Edgewater Drive to the south. This system discharges directly to Burkhart Creek roughly 300 feet upstream of the Clover Ridge Road culvert. These deficiencies are caused by a combination of insufficient pipe capacity in Breezy Way, and backwater from Burkhart Creek caused by head losses across the Clover Ridge culvert and a private culvert located 400 feet downstream of Clover Ridge Road. Other deficiencies in this model include the unimproved streets such as Century Drive, Bernard Avenue, Eleanor Avenue, Earl Avenue, Charlotte Street and Marilyn Street.

The most significant deficiencies in the Cox Creek Basin occur within the East Albany study area at the Municipal Airport and along Price Road adjacent to Timber-Linn Park. Deficiencies in Price Road are caused by backwater from Cox Creek. Deficiencies in the airport are caused by a combination of backwater from Cox Creek and Swan Lake and from local conveyance pipe deficiencies.

A majority of the Periwinkle Basin deficiencies within the East Albany study area are identified in the SWMP as transportation-based improvements. These improvements are for stormwater hydraulic capacity for new streets proposed in the Transportation System Master Plan. Increased flow in the build-out condition in Periwinkle Creek cause a propagation of existing deficiencies due to high backwater conditions causing decreased flow capacity in the trunk and collector lines.

Figure 5 shows future storm infrastructure in the East Albany study area. Table 3 shows line item costs for future sewer infrastructure by basin. For a more detailed breakdown of projects in each basin see the SWMP.

TABLE 3 – EAST ALBANY STUDY AREA STORM COST ESTIMATE

General Improvement	Total Cost	
Burkhart-Truax Basin	$	7,600,000
Cox Creek Basin	$	6,500,000
Periwinkle Basin	$	1,800,000
Albany Transportation System Plan - Stormwater Infrastructure	$	36,100,000
Total:	**$**	**52,000,000**

* *Unit cost estimates are updated from 2021 Avg. to current (January 2023) construction cost data using Engineering News-Record cost index 20-city average.*

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FIGURE 1: PREFERRED SCENARIO

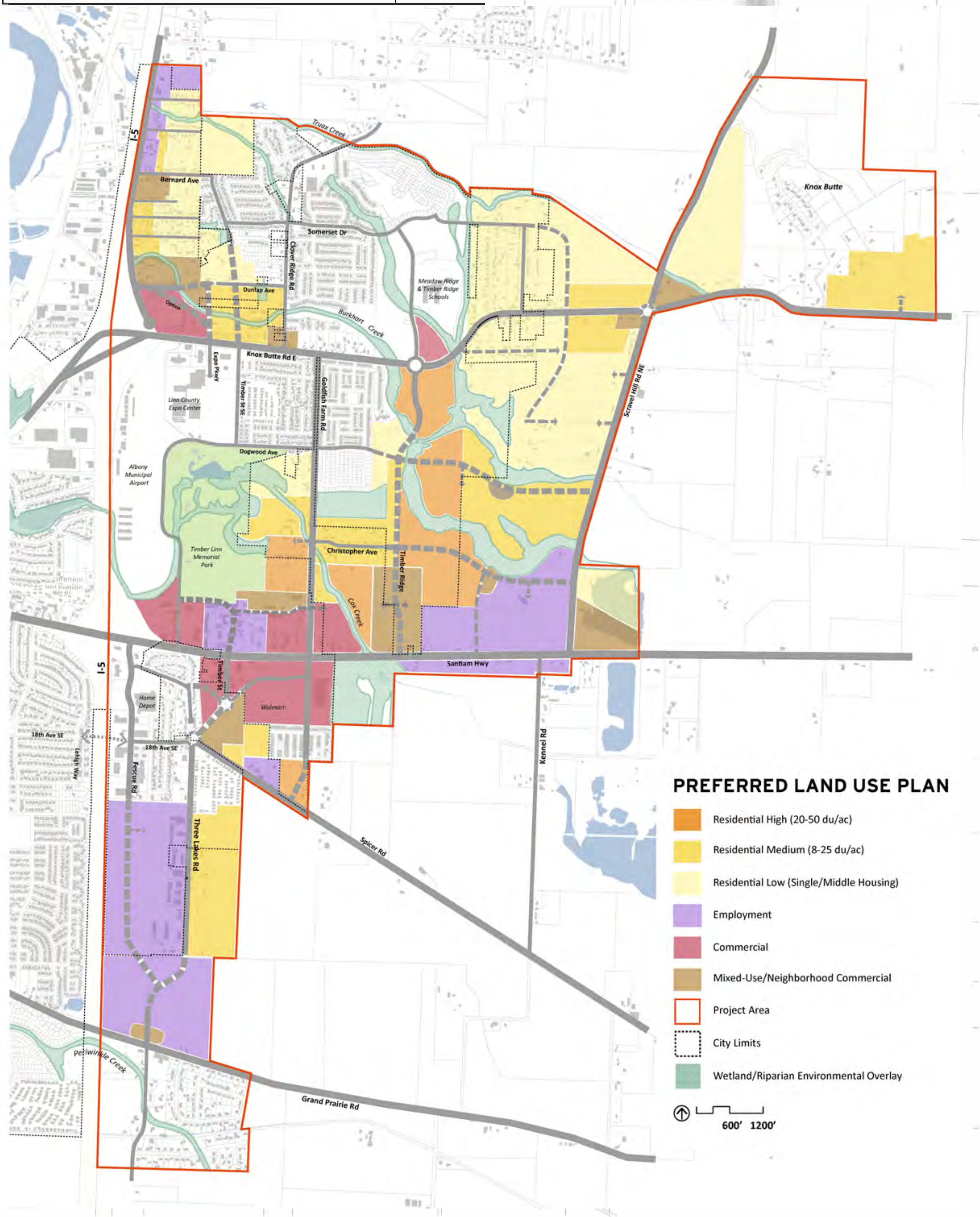

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FIGURE 2:WATER INFRASTRUCTURE

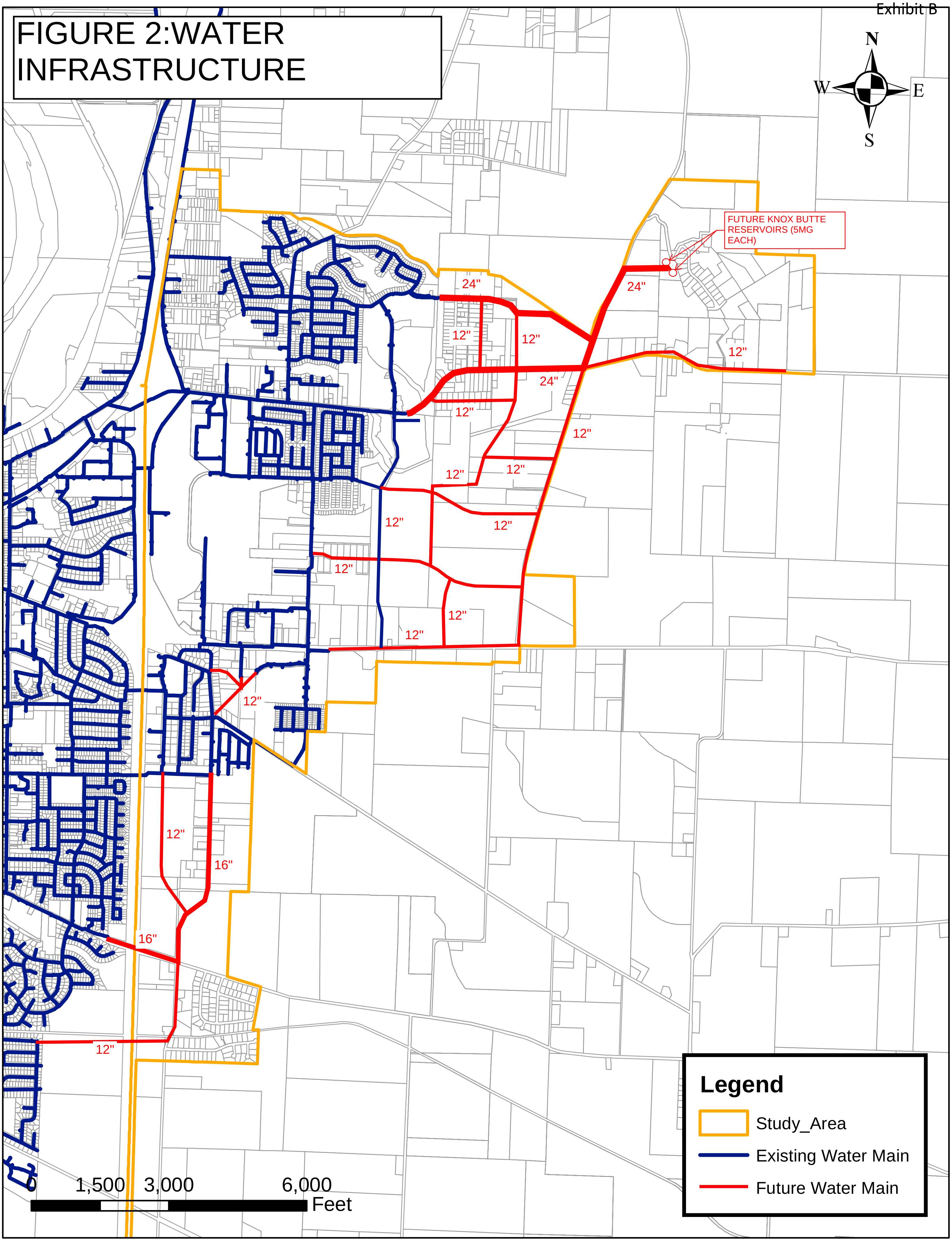

FIGURE 3:SEWER INFRASTRUCTURE

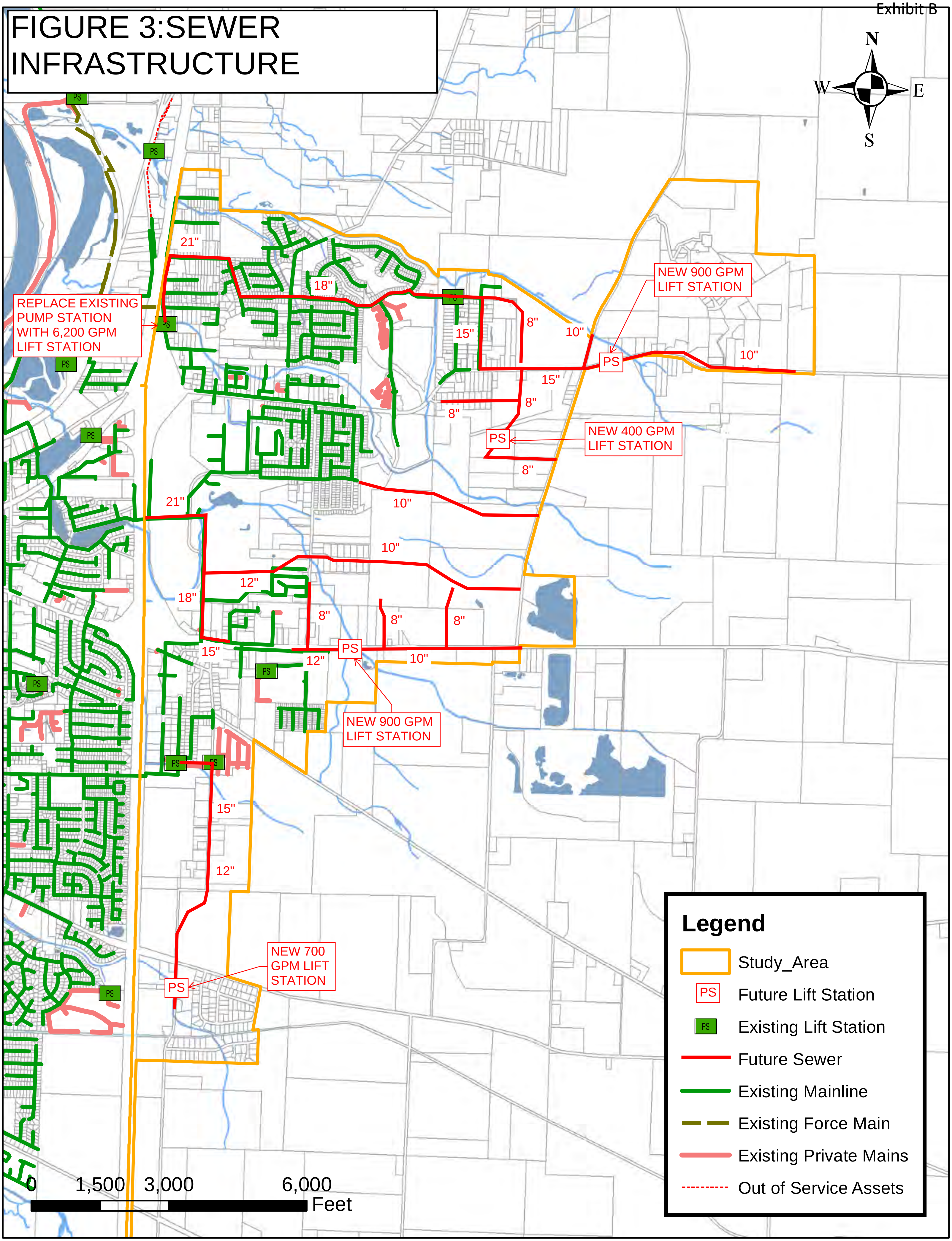

FIGURE 4: STORM BASINS

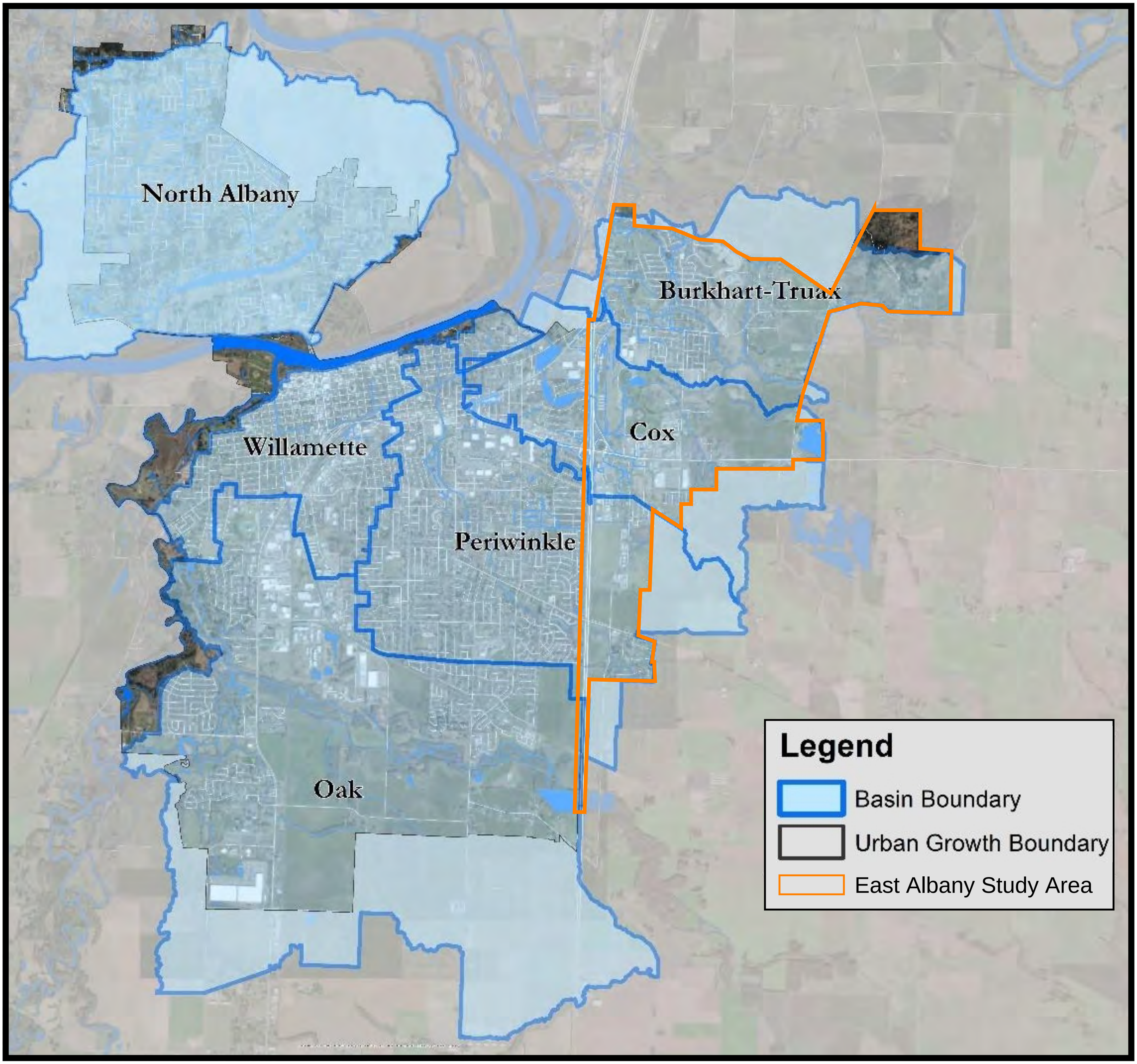

FIGURE 5: STORM INFRASTRUCTURE