



Town of Wellington Stormwater Master Plan May 2023 Rev Oct 2023

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Prepared for:





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May 30, 2023

Mr. Nathan Ewert, P.E.
Town of Wellington – Public Works
Project Manager
4021 Grant Ave
Wellington, CO 80549

RE: Town of Wellington Stormwater Master Plan – Master Plan Report

Dear Mr. Ewert:

ICON Engineering, Inc. is pleased to submit the Town of Wellington Stormwater Master Plan. Each outfall system within the current Town limits included in the recommended plan has been refined to a preliminary design level. Additional information is included for significant offsite flows that should be considered by upcoming development for the Ft. Collins Farms, and Saddleback developments.

We would like to acknowledge the projects team's assistance in the preparation of this study. This report could not have been prepared without input from yourself, and other members from the Town. We look forward to your comments and the concluding phases of the study.

Sincerely,
ICON ENGINEERING, Inc.

Jaclyn Michaelsen, P.E., CFM
Project Manager

Jeremy K. Deischer, P.E.
Master Plan Lead

David Crooks, EI
Project Engineer



TABLE OF CONTENTS

1.0 Introduction1

1.1 Authorization1

1.2 Purpose and Scope.....1

1.3 Planning Process1

1.4 Mapping and Surveys.....1

1.5 Data Collection.....1

1.6 Acknowledgements.....2

2.0 Study Area Description3

2.1 Project Area3

2.2 Land Use.....3

2.3 Watershed Descriptions.....4

2.3.1 Boxelder Commons.....4

2.3.2 Buffalo Creek.....4

2.3.1 Columbine Estates4

2.3.2 East Wellington (Park Meadows, The Meadows, Cottonwood Park, Wellington Downs)4

2.3.1 Knolls at Wellington South.....4

2.3.1 Old Town5

2.3.2 Sage Meadows5

2.3.1 Viewpointe5

2.3.2 Wellington Pointe5

2.4 Flood History5

2.4.1 July 30, 2021 Rainfall Event.....5

2.5 Community Engagement6

3.0 Hydrologic Analysis11

3.1 Overview11

3.2 Colorado Urban Hydrograph Procedure11

3.3 Design Rainfall.....11

3.4 Subwatershed Characteristics.....11

3.4.1 Subwatershed Delineation.....11

3.4.2 Watershed Imperviousness11

3.4.3 Length, Centroid Distance, Slope.....11

3.4.1 Depression Losses12

3.4.2 Infiltration12

3.5 Hydrograph Routing.....14

3.5.1 Roughness Coefficient14

3.5.2 Conveyance Elements.....14

3.5.3 Detention Facilities14

3.6 Previous Studies.....14

3.7 Results of Analysis.....14

4.0 Hydraulic Analysis18

4.1 Evaluation of Existing Facilities18

4.2 Existing Drainage Facilities.....18

4.3 Flooding Hazard Identification.....18

4.3.1 Old Town Flooding Hazards18

4.3.2 Buffalo Creek Subdivision Flooding Hazard18

4.3.3 East Wellington Flooding Hazards18

5.0 Alternative Analysis24

5.1 Alternative Development Process24

5.2 Criteria and Constraints24

5.3 Alternative Categories24

5.4 Alternative Hydraulics.....24

5.5 Alternative Costs.....24

5.6 Alternative Plans25

5.6.1 Old Town Alternative 1 – Combination Minor Storm Conveyance Alternative.....25

5.6.2 Old Town Alternative 2 – Combination Flood Mitigation Storm Conveyance Alternative.....25

5.6.3 Old Town Alternative 3 – 5th Street Minor Storm Conveyance Alternative26

5.6.4 Old Town Alternative 4 – 5th Street Flood Mitigation Conveyance Alternative27

5.6.5 Sveta Lane Outfall27

5.6.6 Buffalo Creek / Wellington Community Park.....27

5.6.7 GMA Alternatives.....27

5.7 Alternative Plan Cost Estimate Summary35

5.8 Evaluation of Alternatives.....37

5.8.1 Old Town Alternatives37

5.8.2 Sveta Lane Outfall37

5.8.3 Buffalo Creek / Wellington Community Park.....37

5.9 Recommended Plan37

6.0 Conceptual Design38

6.1 Plan Description38

6.2 Conceptual Design Cost Estimates.....38

6.3 Master Plan Description.....38

6.3.1 Boxelder Business Park Outfall39

6.3.2 Washington Avenue Outfall.....40

6.3.3 Garfield Avenue Outfall Inlet Improvements.....41

6.3.4 Cleveland Avenue Outfall.....42

6.3.5 3rd Street / Lincoln Avenue Outfall.....43

6.3.6 5th Street Outfall.....44

6.3.7 6th Street Outfall.....45

6.3.8 Sveta Lane Outfall46

6.3.9 Buffalo Creek / Wellington Community Park Outfall.....47

6.3.10 GMA Outfalls.....48

6.4 Prioritization and Phasing52

6.4.1 High Prioritization52

6.4.2 Medium Prioritization52

6.4.3 Low Prioritization52

6.5 Water Quality Impacts52

6.6 Operations and Maintenance52

6.7 Environmental and Safety Assessment.....53

7.0 References54

Tables

Table 1-1: Data Collected.....2

Table 1-2: Project Team.....2

Table 2-1: Stormwater Community Survey6

Table 3-1: NOAA 14 1- and 6-hour Rainfall Depth.....11

Table 3-2: Recommended Horton's equation parameters - Table 6-7 of USDCM (Reference 5).....12

Table 3-3: Percent Impervious Land Use Designations13

Table 3-4: Hydrologic Peak Flow Summary – GMA15

Table 3-5: Peak Flow Summary - Town Limits15

Table 4-1: Existing Storm Drain Infrastructure18

Table 5-1: Cost Estimate Unit Costs.....24

Table 5-2: Alternative Plan Cost Estimate Summary35

Table 5-3: Old Town Alternative 1 – Minor Storm Conveyance Cost Estimate35

Table 5-4: Old Town Alternative 2 - Flood Mitigation Conveyance Cost Estimate.....36

Table 5-5: Old Town Alternative 3 – 5th Street Minor Conveyance36

Table 5-6: Old Town Alternative 4 - 5th Street Flood Mitigation Conveyance.....36

Table 5-7: Sveta Lane Outfall Alternative Cost Estimates36

Table 5-8: Buffalo Creek / Wellington Community Park Outfall Alternative Cost Estimates37

Table 5-9: GMA Alternative Cost Estimates.....37

Table 6-1: Conceptual Design Cost Estimate Unit Costs.....38

Table 6-2: Boxelder Business Park Outfall Cost Estimate39

Table 6-3: Washington Avenue Outfall Cost Estimate.....40

Table 6-4: Garfield Avenue Outfall Inlet Improvement Cost Estimate41

Table 6-5: Cleveland Avenue Outfall Cost Estimate42

Table 6-6: 3rd Street / Lincoln Avenue Outfall Cost Estimate43

Table 6-7: 5th Street Outfall Cost Estimate44

Table 6-8: 6th Street Outfall45

Table 6-9: Sveta Lane Outfall Cost Estimate46

Table 6-10: Buffalo Creek / Wellington Community Park Cost Estimate47

Table 6-11: Master Plan Cost Estimate Summary49

Figures

Figure 2-1: Vicinity Map3

Figure 2-2: July 30, 2021 Rainfall Totals5

Figure 2-3: Study Area Map - GMA7

Figure 2-4: Study Area Map – Town Limits8

Figure 2-5: July 30, 2021 Flooding Event9

Figure 2-6: Stormwater Community Survey10

Figure 3-1: Length Weighted, Corrected Average Slope Equation USDCM Equation 6-7 (Reference 5).....12

Figure 3-2: Slope correction for streams and vegetated channels USDCM Figure 6-4 (Reference 5).....12

Figure 3-3: Hydrologic Peak Flow Summary – GMA16

Figure 3-4: Hydrologic Peak Flow Summary – Town Limits17

Figure 4-1: Existing Storm Drain Infrastructure19

Figure 4-2: HEC-RAS 2D Rain-on-mesh – GMA -10-yr.....20

Figure 4-3: HEC-RAS 2D Rain-on-mesh – Town - 10-yr21

Figure 4-4: HEC-RAS 2D Rain-on-mesh – GMA – 100-yr22

Figure 4-5: HEC-RAS 2D Rain-on-mesh – Town – 100-yr23

Figure 5-1: Old Town Alt 1 - Combination Minor Storm Conveyance Alternative.....29

Figure 5-2: Old Town Alt 2 - Combination Flood Mitigation Storm Conveyance Alternative.....30

Figure 5-3: Old Town Alt 3 – 5th Street Minor Storm Conveyance Alternative.....31

Figure 5-4: Old Town Alt 4 – 5th Street Flood Mitigation Conveyance Alternative.....32

Figure 5-5: Town Alternatives.....33

Figure 5-6: GMA Alternatives.....34

Figure 6-1: Master Plan Improvements - Old Town Improvements.....50

Figure 6-2: Master Plan Improvements - GMA Outfalls51

Appendices

APPENDIX A - PROJECT CORRESPONDENCE

APPENDIX B - HYDROLOGIC ANALYSIS

APPENDIX C - ALTERNATIVE ANALYSIS

APPENDIX D - CONCEPTUAL DESIGN INFORMATION

1.0 INTRODUCTION

1.1 AUTHORIZATION

This report was authorized by the Town of Wellington under the July 2021 agreement regarding Stormwater Master Plan Engineering Design and Construction Services, Agreement No. 211-80-4041.

1.2 PURPOSE AND SCOPE

The purpose of the study is to provide a comprehensive stormwater masterplan document for the entirety of the Town of Wellington's Growth Management Area (GMA).

Specific objectives for the study include:

- Develop a hydrologic and hydraulic analysis of the Town's GMA area.
- Identify existing stormwater problem areas and issues within the Town.
- Provide budgetary level cost estimates and prioritize the recommended improvements for inclusion in the Town's long range Capital Improvement Program list.
- Develop conceptual level design plans for highest ranked improvements.

The Town of Wellington study area is included in the Boxelder Creek Watershed, most recently studied in the Hydrologic Analysis of the Boxelder Creek / Cooper Slough Watershed by ICON Engineering in 2014 (Reference 1). The main goal of the current study is to increase the level of detail within the Town's GMA than the previous study and incorporate the ongoing development within the Town. A detailed scope of the study includes:

- Collect and review existing information from the Town including but not limited to: existing GIS database of utility infrastructure, drainage criteria, and drainage report studies for completed and ongoing developments.
- Delineate subwatershed boundaries and develop basin runoff hydrographs for each subwatershed using CUHP v 2.0.
- Develop routing for runoff hydrographs using EPA SWMM v 5.2 for the 2-, 5-, 10-, 50-, and 100-year storm events.
- Identify flooding hazards and problem areas within the Town and GMA.
- Develop a full range of stormwater alternatives to address areas of flooding, inadequate storm drainage capacity, roadway overtopping, and locations where stormwater improvements will assist community revitalization.
- Prepare a conceptual design of the selected plan for capital improvement project recommendations for short- and long-term needs. Project costs and phasing strategies will be presented such that a sequence of funding and implementation can be made.

1.3 PLANNING PROCESS

Progress meetings were held monthly throughout the project. A summary of the meetings can be found below. Minutes from the progress meetings can be found in Appendix A.

- July 28th, 2021: Project Kickoff Meeting
- August 13th, 2021: Baseline Hydrology Kickoff
- May 13th, 2022: Alternatives Analysis Kickoff Meeting
- July 19th, 2022: Town Board Meeting

1.4 MAPPING AND SURVEYS

Project mapping was based on terrain data collected by Anderson Consulting Engineers, published by FEMA in April 2013. The 2013 LiDAR data was supplemented by various development grading provided by the Town to produce a comprehensive 1-ft contour dataset. An exhibit showing the various supplemental terrain sources can be found in Appendix A.

1.5 DATA COLLECTION

Geographic Information Systems (GIS) shapefiles for existing Town utilities were provided. Additional information, including property ownership, was acquired from Larimer County GIS portal in August 2021. The Town of Wellington utility information included:

Storm Drain

- Pipes
- Structures (Manholes, Inlets, etc.)
- Development Detention and Retention Basins

Sanitary

- Pipes
- Structures
- Lift Stations

Water Distribution

- Pipes
- Structures (Hydrants, Pressure Relief Valves, Pump, System Valve, Tanks, Wells)

The previous hydrologic analysis for the study area was collected and review as part of the study. The original study was developed as part of the Hydrologic Modeling of the Existing Drainage Facilities, Boxelder Creek / Cooper Slough Basin FEMA DFIRM for Larimer County in 2006. That analysis was most recently updated in 2014 in the Hydrologic Analysis of the Boxelder Creek / Cooper Slough Watershed (Reference 1). The 2014 study included all 265 square miles of the Boxelder Creek basin, stretching from Fort Collins into Wyoming. Basins within the Wellington GMA were delineated at a macro scale, with basins generally ranging from 100 – 600 acres in size. The previous analysis utilized EPA SWMM (v 5.0.022) as both the rainfall / runoff and routing methodology.

Numerous development drainage studies were provided by the Town and reviewed as part of this study. A summary of these reports can be found below:

Table 1-1: Data Collected

Document Title	Date	Author
Drainage Design Considerations for Buffalo Creek Subdivision	May-02	Davis, Miller, & Wohnrade Civil Engineers
Final Drainage Report for Box Elder Business Park	Aug-05	The Engineering Company
Final Drainage Report for Boxelder Commons - Phase 1	Feb-06	Northern Engineering
Final Drainage Report for Columbine Estates	Aug-05	Northern Engineering
Final Drainage Report for Meridan Trust Federal Credit Union	May-18	AgProfessionals
Final Drainage Report for Park Meadows Subdivision	Dec-02	Northern Engineering
Final Drainage Report for Sage Meadows Subdivsion	Aug-16	Northern Engineering
Final Drainage Report for Sage Meadows 2nd Subdivision (Patterson Parcel)	Apr-21	Northern Engineering
Final Drainage Report for The Meadows Subdivision	Dec-02	Northern Engineering
Final Drainage Report for Wellington High School and Middle School	Jan-20	JVA, Inc. Consulting Engineers
Final Drainage Report for Wellington Pointe 1st Filing	Nov-99	Wellington Pointe LLC
Final Drainage Report for 6th Street Commercial Phase 3	Oct-06	WG Architects
Final Drainage Study for Cottonwood Park at the Meadows	Nov-05	Northern Engineering

1.6 ACKNOWLEDGEMENTS

The team members who were involved with this study are listed in Table 1-2, below.

Table 1-2: Project Team

Name	Organization	Title
Bob Gowing, P.E.	Town of Wellington	Public Works Director
Nathan Ewert, P.E.	Town of Wellington	Project Manager
Craig Jacobson, P.E., CFM	ICON Engineering	Principal
Jaclyn Michaelsen, P.E., CFM	ICON Engineering	Project Manager
Jeremy Deischer, P.E.	ICON Engineering	Master Plan Lead
David Crooks, EI	ICON Engineering	Project Engineer

2.0 STUDY AREA DESCRIPTION

2.1 PROJECT AREA

Located within the Town of Wellington and unincorporated Larimer County, the Town Growth Management Area (GMA) encompasses over 22 square miles. In general, the basin generally slopes from north to south, as runoff is conveyed to Boxelder Creek, which bisects the study area. Boxelder Creek generally flows parallel to I-25, with I-25 located east of Boxelder Creek in the upstream watershed, and crosses I-25 within Town limits. Of the total 22 square mile GMA, approximately 3.9 square miles are currently within Town limits.

Several significant hydrologic features lie within the study area including Boxelder Creek, Coal Creek, Indian Creek, North Poudre Reservoir #3, North Poudre Reservoir #4, and Boxelder Reservoir #3. Each feature was treated as an outfall location in the masterplan as the current study did not modify any effective regulatory flows along the drainageways. Federal Emergency Regulatory Agency (FEMA) floodplains are present along Boxelder Creek, Coal Creek, and Indian Creek.

Numerous irrigation canals traverse the basin, generally in a west to east direction, throughout the basin. These canals include but are not limited to: Larimer County Canal, Windsor Ditch, North Poudre Canal, and North Povore Ditch. All canals were considered to be flowing full at the time of the storm for the hydrologic analysis.

Within the Town limits, the basin is predominantly developed or has immediate plans to develop in the coming years. Land use consists of residential, commercial, and industrial areas through the Town. Existing stormwater infrastructure typically consists of grass swales, detention basins, and a combination of street conveyance and storm drain systems built as part of developments.

Outside of Town limits, the GMA is approximately 10 percent developed, primarily compromised of agricultural residential. Stormwater runoff typically is conveyed overland through private property and irrigation fields, collecting along roadside swales.

The basin is comprised of mainly Type B and C hydrologic soil group as defined by the Natural Resources Conservation Service (NRCS) (Reference 2). The latest soil information was retrieved from the NRCS Soil Survey Geographic (SSURGO) Database in August 2021. More information about the hydrologic soil groups can be found in Section 3.4.2. The distribution of soil through the study area can be found in Appendix B.

Several detention basin facilities within the study area were considered for flood reduction purposes. Each of these detention basins were constructed as part of development and detain onsite flows to meet Town criteria. No detention outside of the Town limits was included in the baseline hydrology model. Detention is anticipated on a site-specific basis for each future development to detain runoff to Town criteria.

A study area map, highlighting key features throughout the study area, can be found on Figure 2-3. A town limits study area map, highlighting subdivisions and outfall watersheds can be found on Figure 2-4.

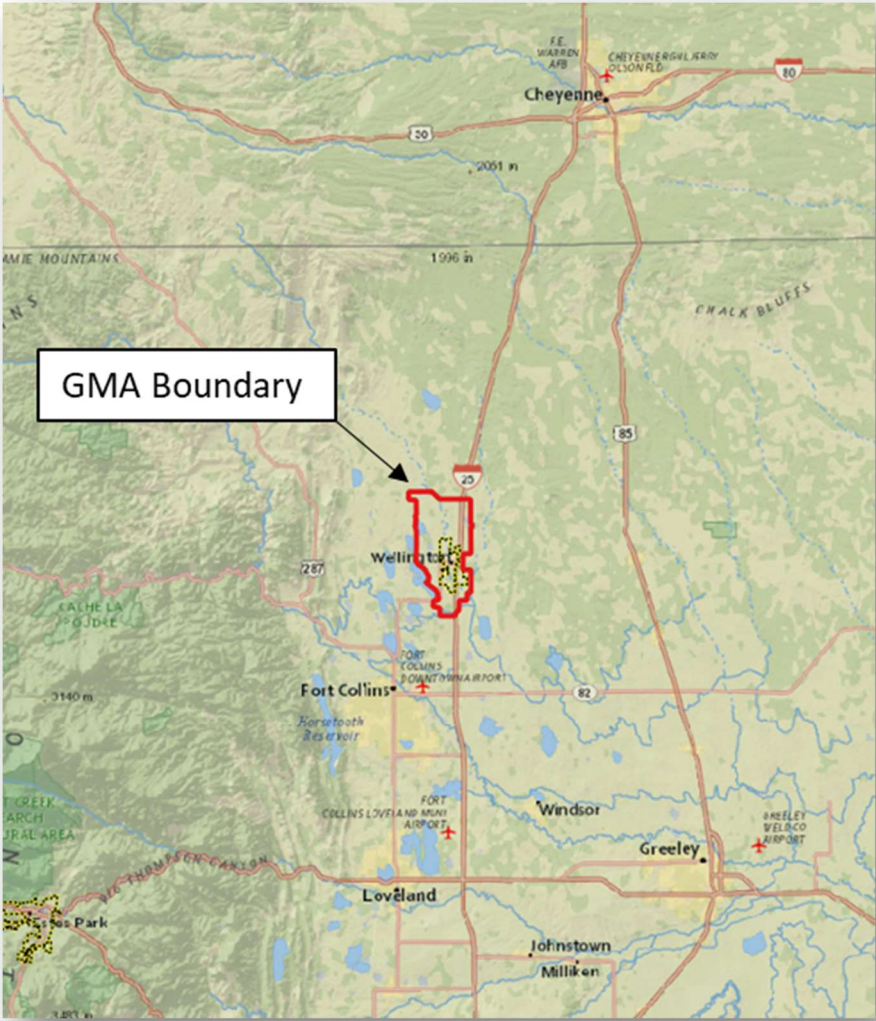


Figure 2-1: Vicinity Map

2.2 LAND USE

The basin within Town limits is predominantly developed, with no significant changes in land use anticipated in the future. Land use types include single and multi-family residential, commercial, business, and industrial.

Outside of Town limits, much of the study area is undeveloped, agricultural, and large estate residential. Small pockets of development exist in the western portion of the basin with the Poudre School District Wellington Middle-High School and La Luna Dairy.

Future land use data outside of Town Limits was obtained from the Town of Wellington Comprehensive Plan, adopted in August of 2021 (Reference 3). All future development will be required to detain post-development peak runoff to pre-development rates.

Percent impervious values were selected for each zoning classifications using Table 6-3 of the Urban Storm Drainage Criteria Manual (USDCM) and can be found in Table 3-3. Land use exhibits for the entire study area can be found in Appendix B.

2.3 WATERSHED DESCRIPTIONS

Watersheds throughout the study area were categorized based on subdivisions within the Town. A description of the drainage pattern through each subdivision is listed in the sections below. Watersheds outside of current Town limits, within the GMA area, were included in the study but were not categorized.

A study area map highlighting the key study features within the Town can be found in Figure 2-4. A study area map of the GMA can be found in Figure 2-4.

2.3.1 BOXELDER COMMONS

Boxelder Commons is located south of Jefferson Avenue, west of I-25, east of Boxelder Creek, and north of Ronald Reagan Avenue. 3rd Street bisects the subdivision, with the western half of the basin draining west to Boxelder Creek while the eastern half drains to Coal Creek. Several storm drain systems collect flow in 5th Street and discharge into the Coal Creek open channel north of Ronald Reagan Avenue.

2.3.2 BUFFALO CREEK

The Buffalo Creek subdivision, located in northwest Wellington, is bounded to the east by Boxelder Creek, south by Washington Avenue and west by CR-9. Offsite flow from the west is conveyed underneath County Road 9 and along the northern edge of the development in a grass swale. Runoff within the subdivision drains west to east, and is collected along the street corridor to storm drain systems both north and south of Stampede Drive. The storm drain systems convey flow east of Buffalo Creek Parkway into separate detention facilities located north and south of the Wellington Community Park ball fields. Both detention facilities outfall into Boxelder Creek upstream of Washington Avenue.



Two detention basins located within Wellington Community Park attenuate flow before discharging runoff into Boxelder Creek

2.3.1 COLUMBINE ESTATES

Columbine Estates, located west of I-25 at the southern Town limits, generally drains from northwest to southeast. At the time of the study, construction was underway within Columbine Estates, which was considered fully built for the study. At the southeast corner of the development a retention basin attenuates flow from both phases of the Columbine Estates development.

2.3.2 EAST WELLINGTON (PARK MEADOWS, THE MEADOWS, COTTONWOOD PARK, WELLINGTON DOWNS)

The East Wellington watershed is located east of I-25 and extends from the Town limits north of Cleveland Avenue to the southern boundary at County Road 60. The following residential developments are within the East Wellington

watershed: Cottonwood Park at the Meadows, Park Meadows, The Meadows, and Wellington Downs. In general, the watershed slopes from north to south as runoff drains to Indian Creek south of County Road 60.

Drainage features within the subdivisions include street conveyance, detention basin, and storm drain systems. The Wellington State Wildlife Area (SWA) Tributary conveys offsite flow from the state wildlife area northeast of the Town GMA to the eastern edge of Cottonwood Park at the Meadows. Storm drain infrastructure intercepts flow from the SWA Tributary and conveys flow to Cottonwood Park at the Meadows detention basin.



Development has infringed on Wellington SWA Tributary flowpath, which now terminates at the east side of Cotton Park at the Meadows

Runoff within the northern developments, Cottonwood Park at the Meadows and Wellington Downs, drain to the detention basins located in the southwest and southeast corner, respectively. Both detention basins drain to the 48-inch storm system in McClelland Road. The system continues south, discharging into a swale in the Park Meadows detention basin. Flow from the Park Meadows detention basin is conveyed south in a 36-inch storm drain along the eastern edge of The Meadows subdivision and ultimately across County Road 60 to Indian Creek. Overflows from the detention basin spill directly south onto Summer Street in The Meadows subdivision.

The southern portion of the watershed within The Meadows subdivision is conveyed along the street corridors to minor storm drain systems just south of Crittenton Lane. The storm drain systems discharge into the detention basins located just east and west of McClelland Road north of County Road 60. After flow is attenuated in the detention basins, flow is conveyed south of County Road 60 out of the watershed into Indian Creek.

2.3.1 KNOLLS AT WELLINGTON SOUTH

The Knolls at Wellington South watershed is located south of Ronald Reagan Avenue, west of I-25, north of G.W. Bush Avenue, and east of Sage Meadows and the Burlington Northern Railroad. Runoff is conveyed both southwest and northeast towards Boxelder Creek which bisects the watershed.

The Coal Creek open channel conveys flow adjacent to I-25 through several street crossings along the eastern edge of the watershed. The flow continues past the Rice Elementary detention basin before the confluence with Boxelder Creek.

South of Boxelder Creek several small storm drainage systems collect flow in the residential development. Each storm system conveys flow to a series of water quality basins both east and west of 3rd Street before discharging flow to Boxelder Creek.



Coal Creek conveys flow from the north past Rice Elementary detention basin to the confluence with Boxelder Creek just upstream of I-25

2.3.1 OLD TOWN

The Old Town watershed, centrally located within the Town limits, is bounded by Boxelder Creek to the west, I-25 to the east, Jefferson Avenue to the south and Washington Avenue to the north. Bisecting the watershed, approximately 375 acres in size, is the remnant of the historic Coal Creek alignment along 4th Street. Flows generally drain from north to south along the historic Coal Creek alignment, overtopping Cleveland Avenue, and continuing to the open channel west of 4th Street and Lincoln Avenue. The open channel passes through several private properties to the southeast to 6th Street and Jefferson Avenue. Downstream of Jefferson Avenue, flows are conveyed along the Coal Creek channel, ultimately outfalling into Boxelder Creek near Rice Elementary west of I-25.

Drainage features in the Old Town watershed primarily consist of surface conveyance within the street corridors. Undersized storm drain systems exist in Garfield Avenue, 4th Street, 6th Street, and I-25 frontage systems. The Garfield storm drain system collects flow at 4th Street and Garfield Avenue and conveys flow to the west, underneath the Burlington Northern Railroad to Boxelder Creek approximately 530 feet north of Cleveland Avenue. The 4th Street storm drain is comprised of 15-inch to 24-inch reinforced concrete pipes (RCP) intercepting flow from Cleveland Avenue south to the Coal Creek open channel just north of Lincoln Avenue.



2.3.2 SAGE MEADOWS



The Sage Meadows subdivision is bounded to the west by County Road 9, G.W. Bush Avenue to the south, Burlington North Railroad to the east, and the ViewPointe subdivision to the north. Runoff is generally conveyed to the southeast to the largest of the three detention basins located within the subdivision. Flow from the detention basins in the southeast corner is conveyed north using a lift station to Ronald Reagan Avenue. At the time of the study, the Patterson Parcel phase of the Sage Meadows development was under construction and considered fully constructed.

2.3.1 VIEWPOINTE

Located south of Jefferson Avenue, west of Burlington Northern Railroad, the Viewpointe subdivision generally drains from north to south. Offsite flow from the irrigation field to the west is collected and conveyed in a storm drain system in Adams Drive and Reagan Court. Flow is intercepted in the storm drain system in Ronald Reagan Avenue and discharges into Boxelder Creek.

2.3.2 WELLINGTON POINTE

Wellington Pointe is bounded to the north by Windsor Ditch and Washington Avenue, to the east by Boxelder Creek, to the south by Wellington West, and County Road 9 to the west. The northern portion of the watershed is conveyed through an open channel that passes underneath Man O War Drive and Mammoth Circle, discharging into Boxelder Creek. The southern half of the basin drains to the south and west into Meridian detention basin.

2.4 FLOOD HISTORY

The Federal Emergency Management Agency Flood Insurance Study (FEMA FIS, Reference 4) notes the Boxelder Creek watershed has experienced thirteen floods since 1900. On August 1, 1961 a storm between a 50-year and 100-year caused an estimated \$76,150 damage in Wellington (Reference 4). In June of 1967, two overlapping 25-year storms caused an estimated \$46,100 in damage and took four lives near Wellington (Reference 4).

2.4.1 JULY 30, 2021 RAINFALL EVENT

On the afternoon of July 30, 2021, a storm event, causing localized flooding, including damages to infrastructure and property, occurred throughout the watershed. The Community Collaborative Rain, Hail, and Snow Network (CoCoRaHS) recorded rainfall totals between 1.33 inches and 2.29 inches. The storm was indicative of a typical Front Range ‘flashy’ storm with the majority of the rainfall occurring within one hour. The point precipitation within the peak one-hour interval was between a 10-year and 50-year design storm. The spatial distribution of the CoCoRaHS reported rainfall within the Town can be found in Figure 2-2, below. Flooding photos collected by the Town can be found in Figure 2-5.

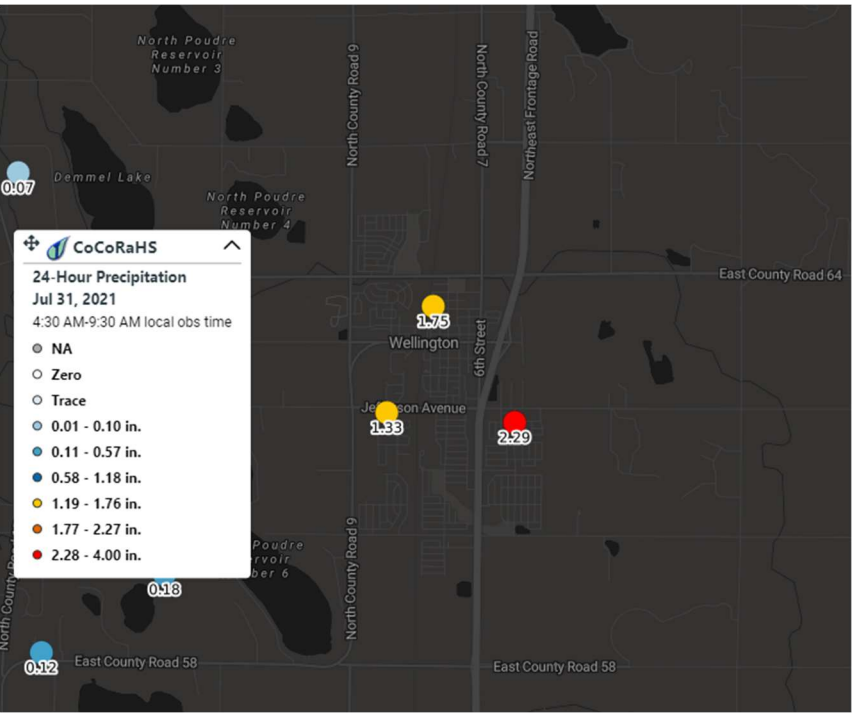


Figure 2-2: July 30, 2021 Rainfall Totals

2.5 COMMUNITY ENGAGEMENT

A stormwater survey was distributed through the Town of Wellington Community Engagement Office. Residents were asked to respond online to the following questions:

- 1. Address of Stormwater Concern
- 2. To your knowledge has a residential or commercial building at or near the address provided above ever flooded due to a rain or storm event?
- 3. At or near this location has water ever impacted the street higher than the level of concern
- 4. Comments or additional stormwater concern.

Seven responses were received from the survey. Each response can be found in Table 2-1, below. The location of each survey response can be seen in Figure 2-6.

Table 2-1: Stormwater Community Survey

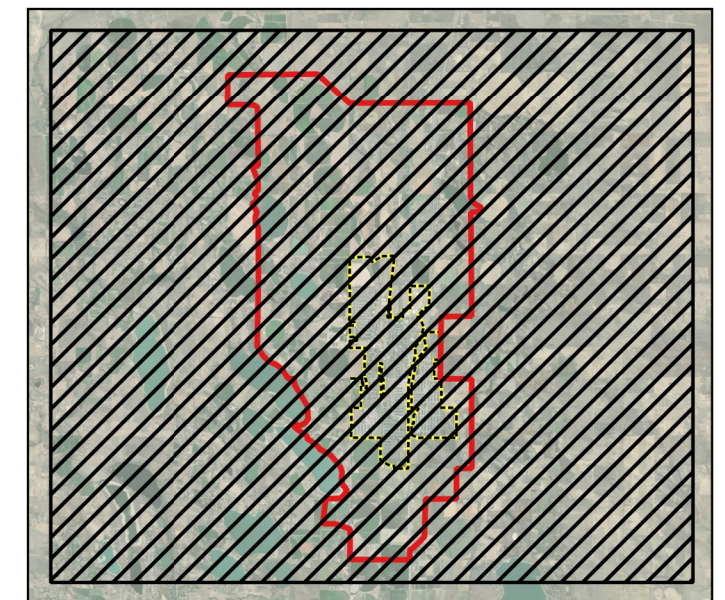
Comment Number	Location	Has a building at this location experienced flooding?	Has this location experience street flooding?	Feedback
1	S 5th Street	Yes	Yes	5th Street often floods at Roosevelt, at Lincoln Ct, and at Kennedy.
2	7851 3rd Street	No	Yes	When there is significant rainfall, water will regularly flow halfway up our front yard (8-10 feet past the curb) leaving debris and washing away our mulch from our flower beds.
3	3738 Harrison Avenue	Unsure	Yes	Not shown well in this photo, but this area collects water year round. During storms the water goes over the curb and floods my driveway, regardless of grading improvements to help mitigate this issue. My apron is breaking down and the sideways is in poor condition. On the summer it spells horrible and in the winter it is very icy. The flood waters approach my crawl space.
4	3445 Polk Circle West	Unsure	Yes	This area has been being reported for almost a year now. It holds so much water that during the winter it's an ice bridge into the sidewalk and a child was almost struck on their way to the school bus. The water is a pool days after a rain storm.
5	3255 Thundering Herd Way	Yes	Yes	Area remains flooded for the entirety of the summer resulting in a heavy mosquito population despite control efforts.
6	3214 Mammoth Circle	No	Yes	Every year we have to chip ice off of the sidewalk because it over flows. We are senior citizens and it is hard for us to do. Shoveling is one thing, but the ice is too much. Because of the way our house sits on the property, the ice does not melt.
7	Hayes Ave & Hayes Cir	Unsure	Yes	Pictures provided of frequent flooding in intersection

Stormwater Master Plan

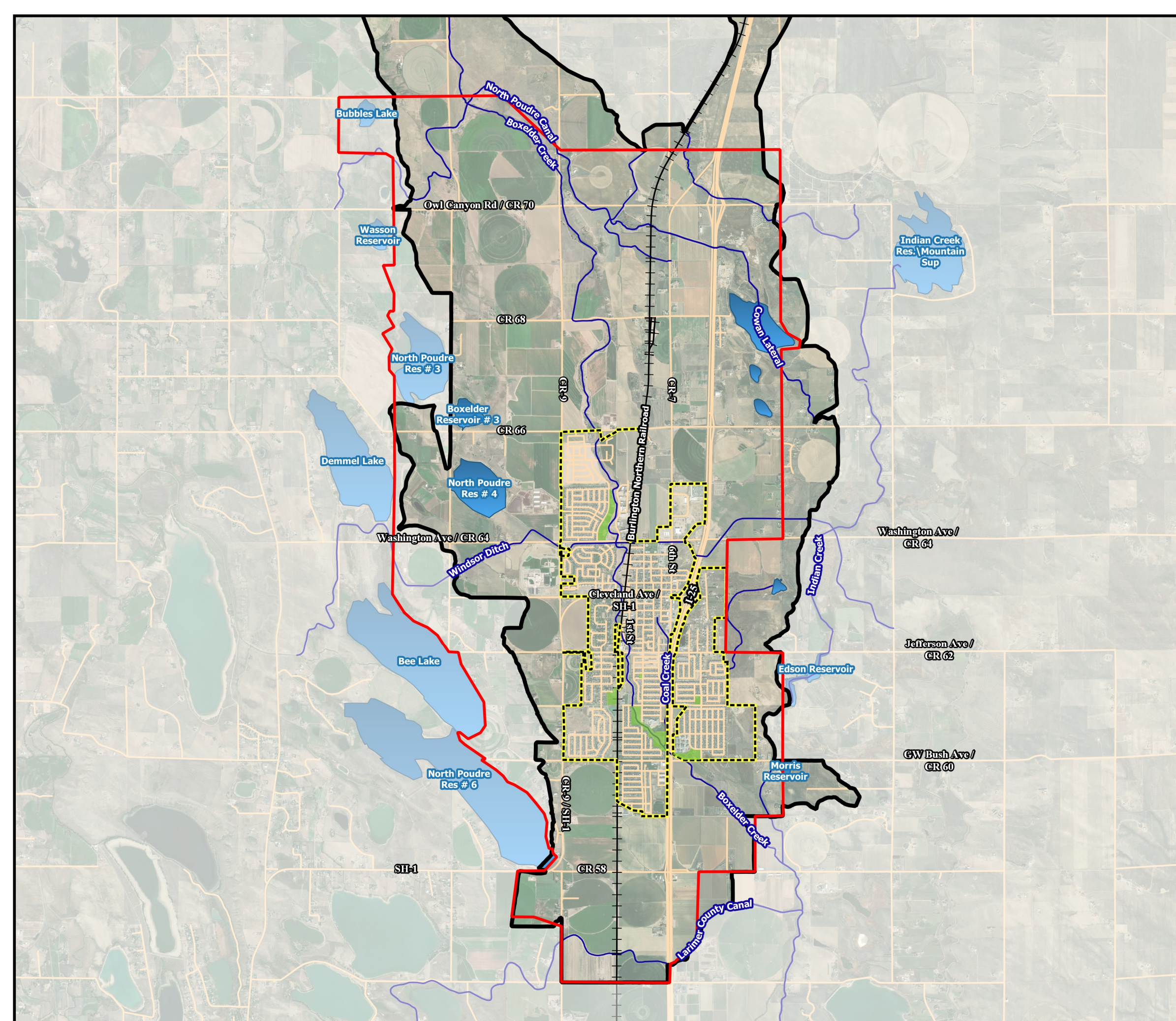
Figure 2-3

Study Area Exhibit: Growth Management Area

-  Existing Drainageway / Canal
-  Parks / Open Space
-  Town Boundary
-  Growth Management Area
-  Study Area Boundary



0 4,500 ft

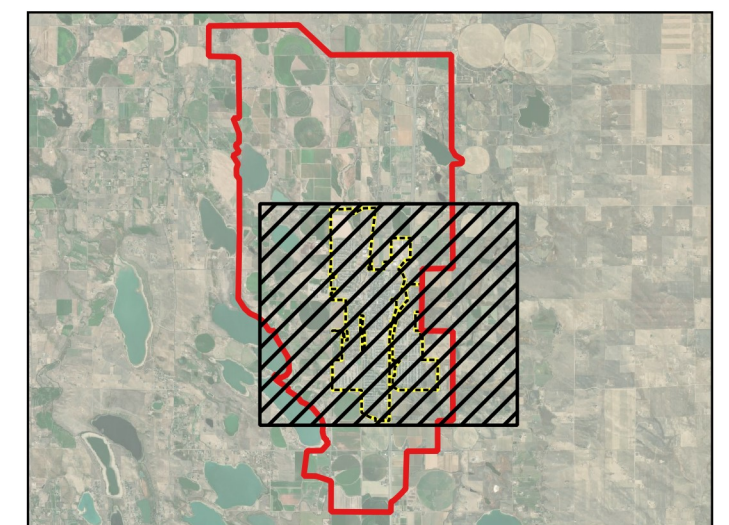



Stormwater Master Plan

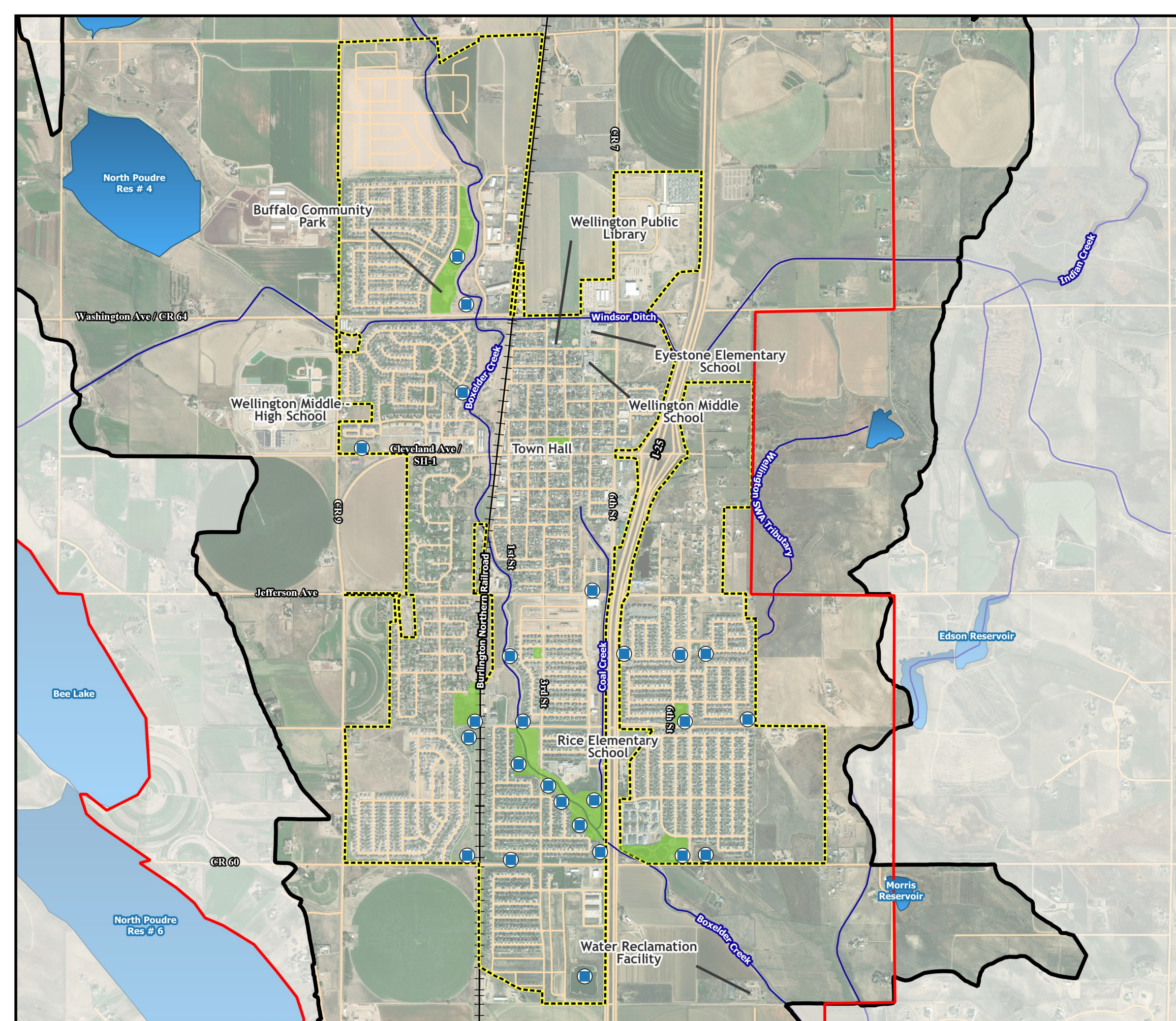
Figure 2-4

Study Area Exhibit: Town Limits

-  Existing Drainageway / Canal
-  Parks / Open Space
-  Detention / Water Quality Basin
-  Town Boundary
-  Growth Management Area
-  Study Area Boundary



0 1,800 ft

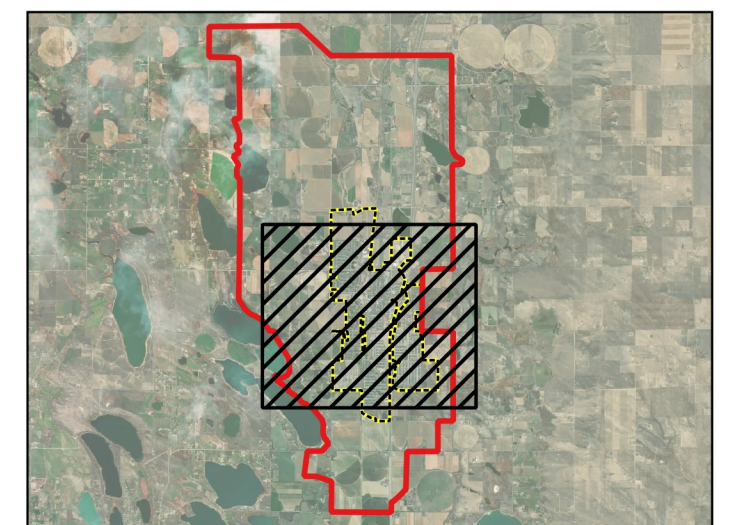



Stormwater Master Plan

Figure 2-5

Flood Documentation:
July 30, 2021

-  Existing Drainageway / Canals
-  Railroad
-  Town Boundary
-  Growth Management Area



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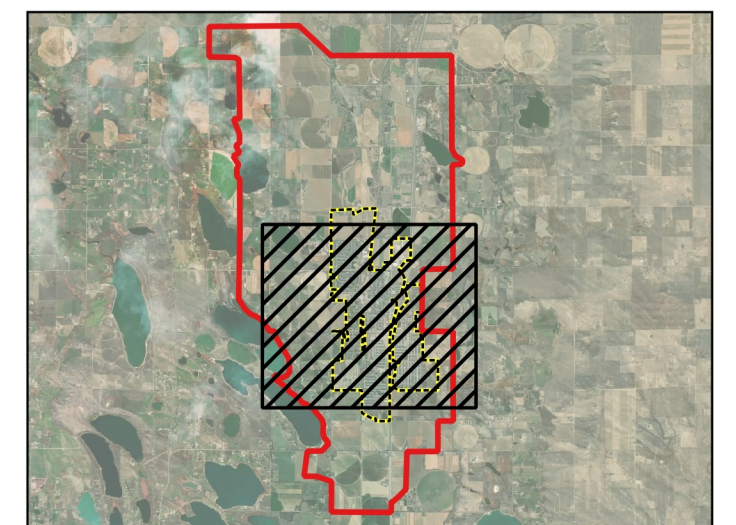
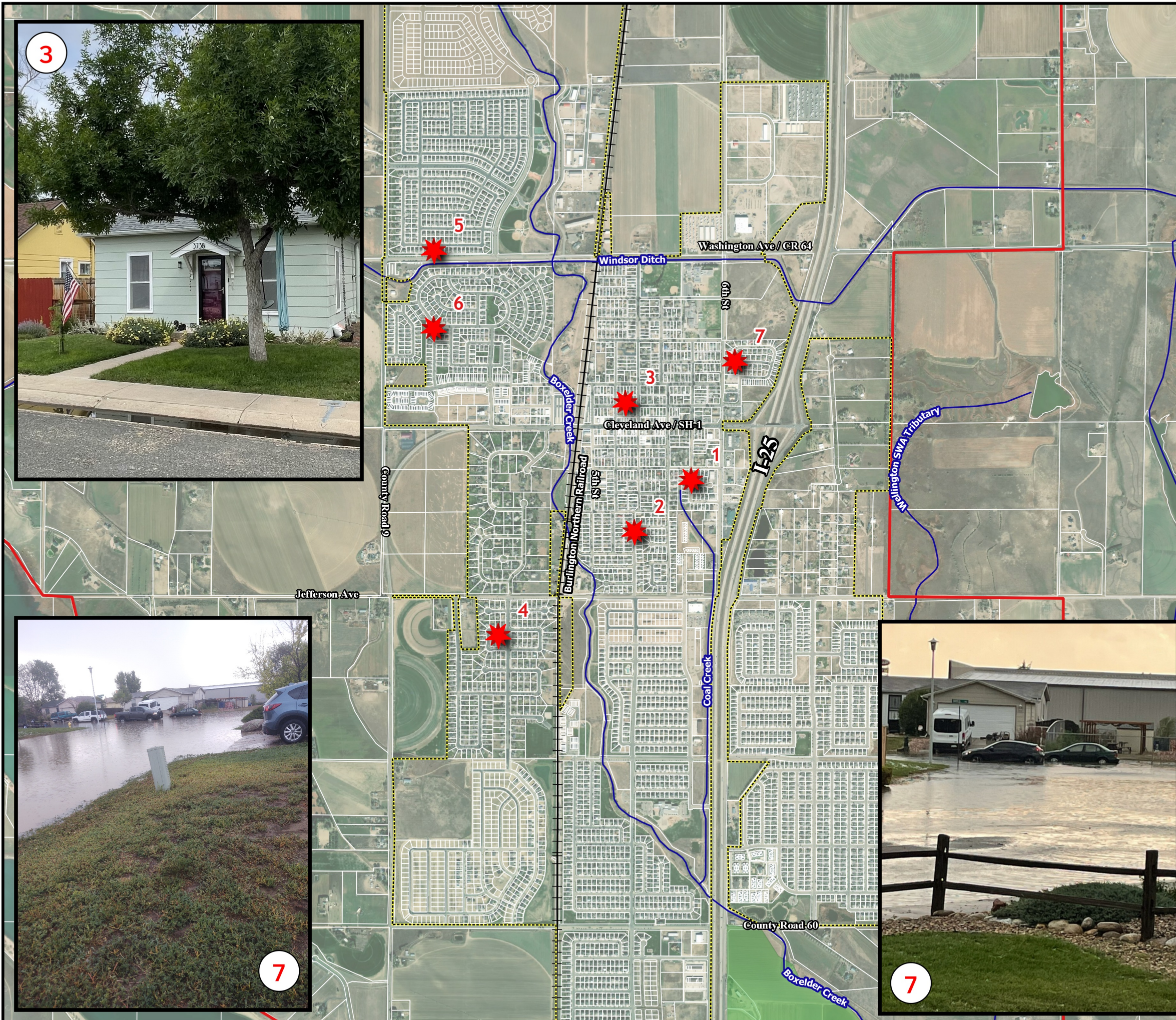



Stormwater Master Plan

Figure 2-6

Stormwater Community Engagement Survey

-  Existing Drainageway / Canals
-  Railroad
-  Town Boundary
-  Growth Management Area
-  Survey Responses



0 1,500 ft

3.0 HYDROLOGIC ANALYSIS

3.1 OVERVIEW

A new hydrologic model was prepared for the Town of Wellington and Growth Management Area. The model establishes hydrology for the 2-, 5-, 10-, 50-, and 100-year design storm frequencies. The Colorado Urban Hydrograph Procedure 2005 version 2.0.0 (CUHP) was used to develop runoff hydrographs for each subwatershed. Subwatershed hydrographs were then routed using the EPA Stormwater Management Model (SWMM) version 5.2.0 to determine discharges at each design point.

The study area was divided into 300 subwatersheds encompassing the 22.3 square mile study area. Subwatersheds were discretized to a more refined level within the Town than typical studies to assist the team in quantifying discharge at each intersection and to evaluate more frequent events. Subwatersheds throughout the study area ranged in size from an acre to 680 acres, with an average size of 40 acres. Within the Town limits, basins were discretized to average 10 acres per subwatershed. Percent imperviousness ranged from 5 percent to 95 percent impervious.

Due to the level of subwatershed discretization, one minute time step between computations was utilized in CUHP. In general, the hydrologic model included storm drain systems 30-inches, or greater, in diameter; however, exceptions for pipes smaller than 30-inches were made when the flow in the storm drain system diverted flow into a different flow path than the topographic street conveyance.

3.2 COLORADO URBAN HYDROGRAPH PROCEDURE

The Colorado Urban Hydrograph Procedure translates a watershed’s response from rainfall into a runoff hydrograph that reflects peak runoff rates, volumes, and timing. CUHP is an evolution of the Snyder unit hydrograph calibrated to the Colorado Front Range using data collected by the U.S. Geological Survey. The 1982 version of CUHP was developed using data collected at seven sites along the Front Range. The previous hydrologic analysis for the study area, updated in 2014 by the City of Fort Collins, used EPA SWMM as the basis for both the rainfall and runoff routing methodology.

3.3 DESIGN RAINFALL

One- and six-hour rainfall depths were obtained from the NOAA Atlas 14 Point Precipitation Frequency Data Server for each study and location within the project area. The point precipitation values for each design storm can be found in Table 3-1. Storm duration and Depth Reduction Factors (DRFs) were chosen using Table 5-1 of the USDCM (Reference 5). A two-hour storm duration was applied with no reduced factor given that no contiguous watershed exceeded the threshold of two square miles.

Complete rainfall distributions are provided in Appendix B.

Table 3-1: NOAA 14 1- and 6-hour Rainfall Depth

Return Period	1-Hr Rainfall Depth (in.)	6-Hr Rainfall Depth (in.)
2-yr	0.856	1.29
5-yr	1.15	1.76
10-yr	1.44	2.22
50-yr	2.35	3.57
100-yr	2.83	4.26

3.4 SUBWATERSHED CHARACTERISTICS

Subwatershed characteristics for each basin delineated as part of this study are further described below and can be found in Appendix B.

3.4.1 SUBWATERSHED DELINEATION

The overall study area was divided into 300 subwatersheds encompassing the 22.3 square mile Growth Management Area. Each subwatershed was delineated using the project mapping as described in Section 1.4. Subwatersheds ranged in size from an acre to 680 acres, with an average size of 40 acres.

3.4.2 WATERSHED IMPERVIOUSNESS

Characterizations of subwatershed imperviousness were determined for existing and future land use conditions. Any future development will be required to detain post development peak discharge from the site to historic levels. Future conditions land use projections were determined from Town of Wellington Comprehensive Plan. Future development within the study area will be required to detain peak runoff to historic land use conditions. Impervious values for each Zoning classifications were selected from Table 6-3 of USDCM. These values can be found in Table 3-3. Imperviousness for each watershed was computed using the area weighted average of each land use type through GIS software. Existing subwatersheds varied from 5 percent to 95 percent impervious. Impervious values are shown for the watersheds on the impervious map in Appendix B.

3.4.3 LENGTH, CENTROID DISTANCE, SLOPE

CUHP parameters such as subwatershed length, distance to centroid, and slopes were derived for each subwatershed using the project mapping described in Section 1.4. Slopes were computed using the length-weighted, corrected average slope from Equation 6-7 and Figure 6-4 (USDCM). These equations can be found in Figure 3-1 and Figure 3-2.

$$S = \left[\frac{L_1 S_1^{0.24} + L_2 S_2^{0.24} + \dots + L_n S_n^{0.24}}{L_1 + L_2 + L_3 \dots L_n} \right]^{4.17}$$

Equation 6-7

Where:

S = weighted basin waterway slopes in ft/ft

$S_1, S_2, \dots, S_n$ = slopes of individual reaches in ft/ft (after adjustments using Figure 6-4)

$L_1, L_2, \dots, L_n$ = lengths of corresponding reaches in ft.

Figure 3-1: Length Weighted, Corrected Average Slope Equation USDCM Equation 6-7 (Reference 5)

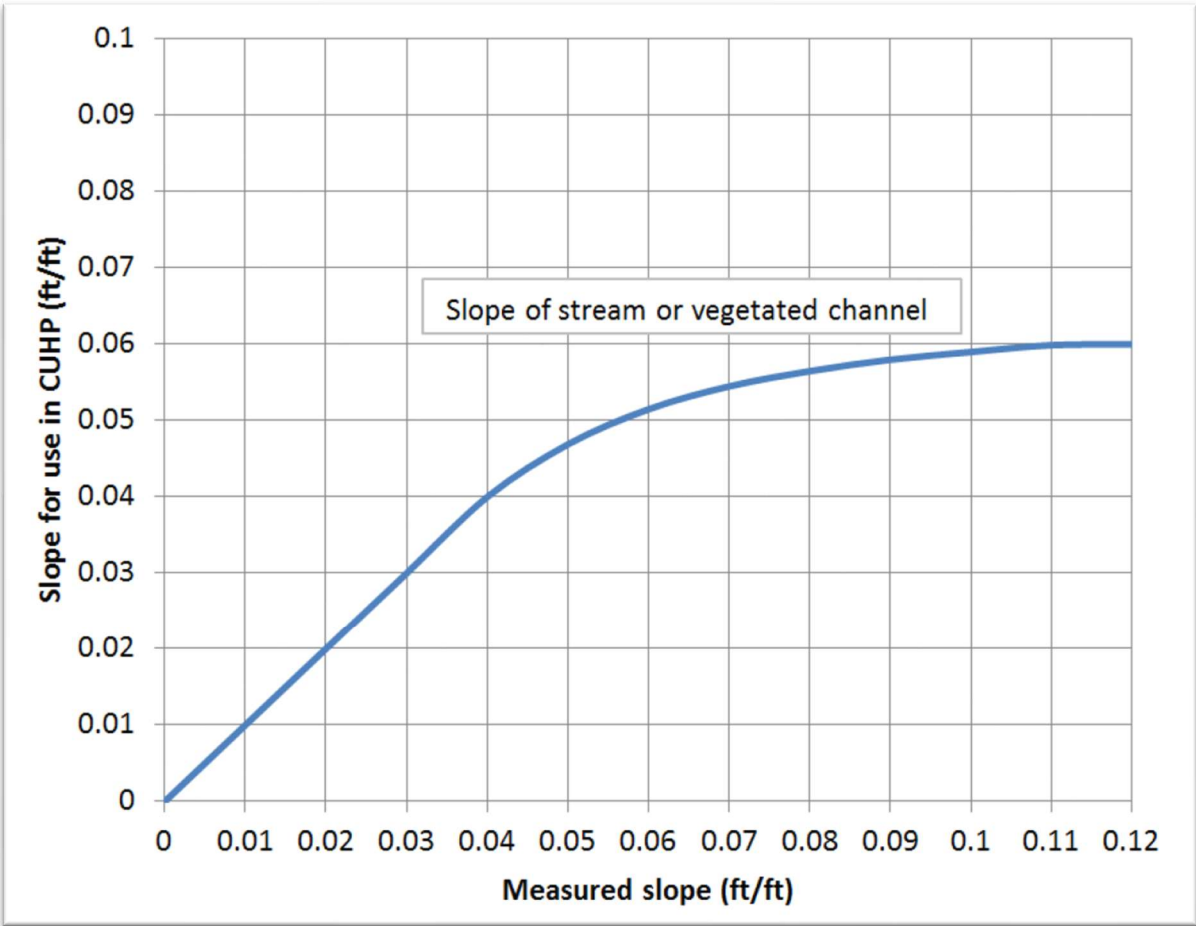


Figure 3-2: Slope correction for streams and vegetated channels USDCM Figure 6-4 (Reference 5)

3.4.1 DEPRESSION LOSSES

Depression storage loss was determined based on Table 6-6 from the USDCM. Aerial imagery was used to examine each subwatershed and apply the appropriate depression losses given the land use of the watershed. Depression losses of 0.4 for pervious area and 0.1 for impervious area were used for each subwatershed.

3.4.2 INFILTRATION

Soil data was obtained from Natural Resources Conservation Service (NRCS) web soil survey (Reference 2). Each soil classification is assigned a map unit symbol based on the soil characteristics. Map unit symbols categorization is then summarized into one of the four major soil types ranging from Type A representing well-draining soils, to Type D representing poorly-draining soils. These soil types are each assigned parameters for use in Horton’s infiltration equation. Horton’s infiltration equation initially infiltrates a high amount of runoff early in the storm, eventually decaying to a steady state constant value. Horton’s infiltration method was found to provide a balance between simplicity and a reasonable physical description of the infiltration process for CUHP (USDCM, Reference 5).

The study area is comprised of mainly Type B and C hydrologic soil groups. USDCM Table 6-7 provides Horton’s infiltration parameters for each soil type. Soil parameters were averaged on an area weighted basis for subwatersheds that contained multiple soil types. Recommended Horton’s equation parameters can be found in Table 3-2, below. The distribution of soil through the study area can be found in Appendix B.

Table 3-2: Recommended Horton’s equation parameters - Table 6-7 of USDCM (Reference 5)

NRCS Hydrologic Soil Group	Infiltration (inches per hour)		Decay Coefficient (1/sec)
	Initial	Final	
A	5.0	1.0	0.0007
B	4.5	0.6	0.0018
C	3.0	0.5	0.0018
D	3.0	0.5	0.0018

Table 3-3: Percent Impervious Land Use Designations

Jurisdiction	Zoning Classification	Zoning Description	UDFCD Zoning Classification	Percent Impervious
Wellington	A	Agricultural District	Undeveloped Areas Greenbelts, agricultural	2
	R-1	Residential District, Single-Family Rural Density	Single-family 2.5 acres or larger	12
	R-2	Residential District, Single-Family Medium Density	Single-family 0.25-0.75 acres	30
	R-3	Residential District, Single-Family Senior Housing	Single-family 0.75-2.5 acres	20
	R-4	Residential District, Multi-Family	Apartments	75
	MH	Manufactured Home Park District	Single-family 2.5 acres or less	45
	C-1	Community Commercial District	Business Suburban Areas	75
	C-2	Downtown Commercial District	Business Downtown Areas	95
	C-3	Highway Commercial District	Streets Paved	100
	LI	Light Industrial District	Industrial Light areas	80
	TR	Transitional District	Undeveloped Areas Off-site flow analysis	45
	I	Industrial District	Industrial Heavy areas	90
	P	Public District	Schools	55
	PUD	Planned Unit Development (PUD) Overlay District	Downtown Areas	95
Larimer County	O	Open	Undeveloped Areas Greenbelts, agricultural	2
	FO	Forestry	Undeveloped Areas Greenbelts, agricultural	2
	RR2	Rural Residential	Single-family 2.5 acres or larger	12
	CD	Commercial Destination	Business Suburban Areas	75
	IL	Industrial Light	Industrial Light areas	80
	IH	Industrial Heavy	Industrial Heavy areas	90

3.5 HYDROGRAPH ROUTING

EPA SWMM 5.2 was used to route each subwatershed inflow hydrograph from CUHP to design points throughout the study area. More information about aspects of the EPA SWMM model can be found below.

3.5.1 ROUGHNESS COEFFICIENT

Roughness coefficients (Manning’s n) for SWMM routing were selected using Table MD-1 from USDCM. Roughness coefficients for pipes were increased by 25% to better represent modeling conditions per USDCM criteria when using EPA SWMM.

3.5.2 CONVEYANCE ELEMENTS

Various conduit types were utilized to convey subwatershed hydrographs to each design point. Closed circular conduits were assigned to storm drain information based on GIS data. Typical street cross sections were developed as irregular transects for various right-of-way widths. Trapezoidal channel elements with varying side slopes and base widths were used to represent open channel conveyance.

An EPA SWMM routing schematic can be found in Appendix B.

3.5.3 DETENTION FACILITIES

Detention basins were accounted for peak flow reduction in the baseline hydrology model only if they were deemed hydrologically significant in size and met requirements of being publicly owned or had a drainage easement and maintenance agreement in place. Stage versus storage curves were developed using project mapping. Stage outlet curves were developed using as-built plans, where available, and supplemented by field inspection.

Inadvertent storage behind roadways and railroad embankments were not included in the hydrologic modeling as the Town cannot adequately ensure that the detention volume characteristics will remain.

3.6 PREVIOUS STUDIES

The FIS effective hydrology for the study area was originally developed using MODSWMM by Anderson Consulting in 2006. That analysis was most recently updated in 2014 in the Hydrologic Analysis of the Boxelder Creek / Cooper Slough Watershed conducted by the City of Fort Collins (Reference 1). The 2014 study included all 265 square miles of the Boxelder Creek basin, stretching from Fort Collins into Wyoming. Subwatersheds within the Wellington GMA were delineated at a macro scale, with subwatersheds generally ranging from 100 – 600 acres in size. The 2014 study utilized EPA SWMM (v 5.0.022) as both the rainfall / runoff and routing methodology.

3.7 RESULTS OF ANALYSIS

Differences in hydrologic modeling methods and level of detail can be observed comparing the current study to previous studies. Effective discharges used to establish the regulatory floodplains along Boxelder Creek, Coal Creek, or Indian Creek will not be updated with this study. As such, no direct comparisons to effective regulatory flows were made with this study.

A summary of peak flows at design points throughout each watershed can be found in Table 3-4 and Table 3-5. The locations of all key design points can be seen on Figure 3-3 and Figure 3-4. Peak discharge and inflow volumes for each

design point during all design storm frequencies for both existing and future land use conditions can be found in Appendix B.

Table 3-4: Hydrologic Peak Flow Summary – GMA

Location	Design Point	SWMMNode	Existing Land Use				
			2-yr	5-yr	10-yr	50-yr	100-yr
NW Corner of CR 6 and CR 68	GMA 1	WIL_J600	11	26	94	482	705
NW Corner of CR 6 and CR 66	GMA 2	WIL_J200	12	29	115	660	987
N of CR 64 b/t BNRR & CR 7	GMA 3	HILD_J100	4	12	94	613	930
NE Corner of CR 7 and CR 64	GMA 4	BON_J100	4	12	30	150	220
SWA Tributary at Cottonwood Park	GMA 5	UNK_D100	16	49	204	1022	1515
NW Corner of BNRR & CR 58	GMA 6	LCD_J625	12	32	83	383	721
Southern Trib into LCC	GMA 7	LCD_O1200	15	43	125	542	791

Table 3-5: Peak Flow Summary - Town Limits

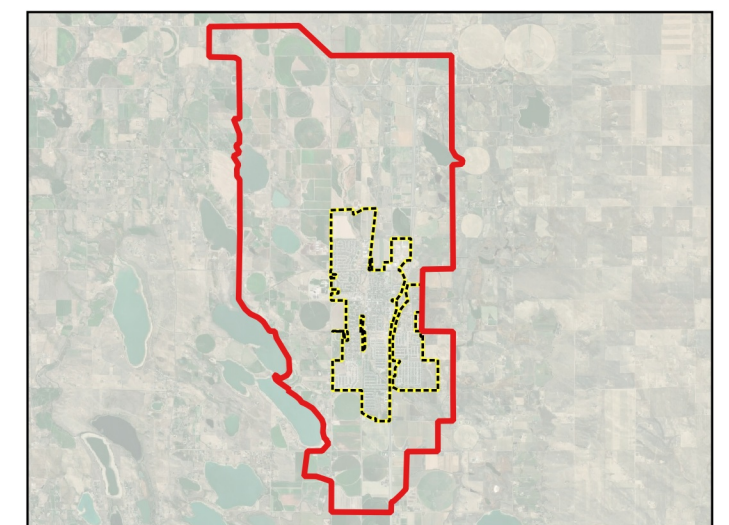
Location	Design Point	SWMMNode	Existing Land Use				
			2-yr	5-yr	10-yr	50-yr	100-yr
Buffalo Creek Pkwy & Stampede Dr	TWN 1	STD405	32	46	60	129	165
4th St & Grant Ave	TWN 2	OLT_J3150	7	16	100	627	949
4th St & Cleveland Ave	TWN 3	OLT_D2200	14	23	89	627	958
5th St & Cleveland Ave	TWN 4	OLT_J2110	29	47	61	212	323
Coal Creek at Lincoln Ave	TWN 5	STD276	19	40	80	729	1143
Coal Creek at Jefferson Ave	TWN 6	OLT_J0105	75	119	188	840	1263
Coal Creek at Ronald Reagan Ave	TWN 7	BCOM_J050	111	175	272	898	1346
Sage Meadows SE Detention	TWN 8	SME_S100	64	112	202	632	876
McClellan Road - Storm Drain	TWN 9	STD286	16	24	25	32	32
McClellan Road - Surface Flow	TWN 9	WDO_J050	0	0	0	0	11
McClellan Road Outfall	TWN 10	CPATM_B110	24	35	49	106	129
The Meadows Detention	TWN 11	MEA_S100	54	75	201	1141	1655
Cottonwood Park Spill into The Meadows	TWN 12	PME_J100	0	0	163	1036	1516

Stormwater Master Plan

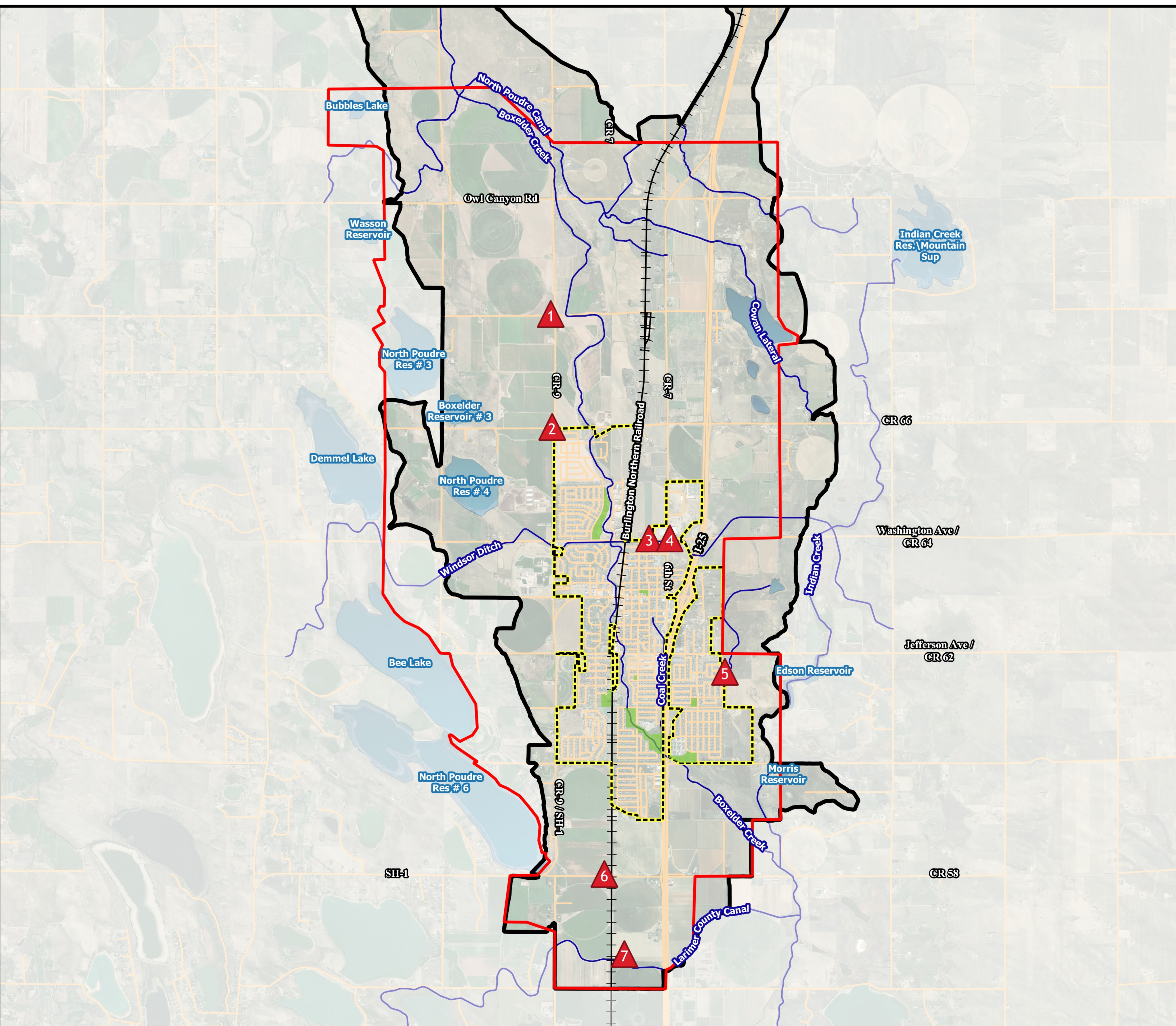
Figure 3-3

Peak Flow Summary: Growth Management Area

-  Existing Drainageway / Canal
-  Parks / Open Space
-  Detention Basin
-  Town Boundary
-  Growth Management Area
-  Study Area Boundary
-  GMA Key Design Points

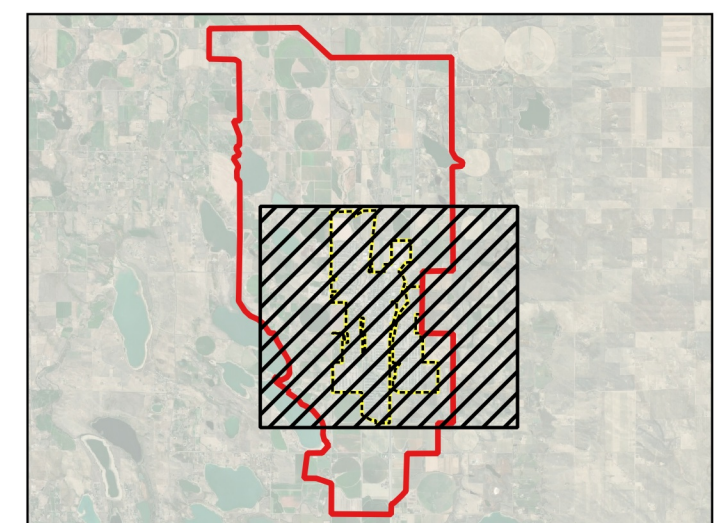


0 4,500 ft



Peak Flow Summary: Town Limits

-  Existing Drainageway / Canal
-  Parks / Open Space
-  Detention Basin
-  Town Boundary
-  Growth Management Area
-  Study Area Boundary
-  Town Key Design Points



0	1,800 ft
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4.0 HYDRAULIC ANALYSIS

New flood hazard delineations or analysis of the existing FEMA regulated floodplains within the GMA was not included in the scope of the study. FEMA regulated floodplains are present along Boxelder, Coal Creek, and Indian Creek within the GMA.

4.1 EVALUATION OF EXISTING FACILITIES

Hydraulic analysis of existing infrastructure was developed within the GMA in order to determine the capacity and approximate return periods of conveyance systems and detention basins. The baseline EPA SWMM hydrologic model was utilized when evaluating the approximate return period of conveyance for each storm drain system 36-inch and larger. A summary of existing infrastructure can be found in Table 4-1.

U.S. Army Corps of Engineers’ River Analysis System (HEC-RAS) was used to develop a rain-on-mesh 2D model to evaluate drainage patterns and surface flooding hazards throughout the GMA. The 10-, and 100-year rainfall distribution was extracted from CUHP and applied to the 2D mesh.

4.2 EXISTING DRAINAGE FACILITIES

Existing drainage structures within the GMA vary in size, shape, and material. Capacity of the existing storm drain infrastructure in the older developments are generally undersized to protect mitigation from larger storm events. Recent development infrastructure provides adequate flood mitigation to meet current Town criteria. A summary of existing infrastructure can be found in Table 4-1.

4.3 FLOODING HAZARD IDENTIFICATION

Flooding hazards are primarily resulting from lack of adequate stormwater infrastructure. Separate rain-on-mesh HEC-RAS 2D models of varying levels of detail were developed for the GMA and Old Town. The unsteady state, two-dimensional models are comprised of a mesh of elements of varying size accounting for the inadvertent storage throughout the GMA. This floodplain storage is not accounted for in the EPA SWMM model which is computed using a kinematic wave approach. This difference in modeling approach leads to discrepancies when comparing design peak flows from the EPA SWMM model and the inundation limits shown in the hydraulic analysis. Inundation limits from the RAS-2D rain-on-mesh analysis for the 2-, and 10-year events can be found on Figure 4-2 through Figure 4-5. At risk structures were identified if the depth of flooding on the structure in the rain-on-mesh modeling was greater than 6-inches in depth.

Flooding hazards were also identified through discussions with the Town staff. Frequent nuisance flooding locations were provided to the project team and categorized (low, medium, high) based on discussion with Town staff. A summary of flooding hazards can be found in **Error! Reference source not found.**

4.3.1 OLD TOWN FLOODING HAZARDS

Pluvial flooding hazards are present throughout the Old Town watershed due to a lack of existing stormwater infrastructure and development along the historic Coal Creek flow path. Local runoff is collected and conveyed in curb and gutter to the south through Old Town. The lack of a storm drain system results in flows ponding at street

intersections, overtopping curbs, and inundating structures. As flow continues to pond and overtop street centerlines, runoff continues generally south and east towards Coal Creek.

Significant flooding hazards in the Old Town basin are due to the development of Wellington along the historic Coal Creek flow path. North of Cleveland Avenue, development has infringed and limited the historic flow path resulting in flow from the north to be conveyed through street corridors to Coal Creek. Numerous structures are within the FEMA regulatory floodplain along the historic Coal Creek flow path through Old Town.

4.3.2 BUFFALO CREEK SUBDIVISION FLOODING HAZARD

Drainage hazards within the Buffalo Creek subdivision are a result of both pluvial and riverine flooding. Undersized storm infrastructure and a lack of an overflow drainage path to Boxelder Creek result in ponding in multiple intersections throughout the development. Runoff is conveyed within the storm drain system and along the street corridors from west to east ultimately to a sump location in the Buffalo Creek Parkway and Stampede Drive intersection. Riverine flooding from Boxelder Creek occurs as flow escapes the right bank upstream of Washington Avenue. Several residential homes are within the Boxelder Creek FEMA regulatory floodplain.

4.3.3 EAST WELLINGTON FLOODING HAZARDS

Flooding hazards in East Wellington are both pluvial and riverine in nature. Offsite riverine flooding hazards are present along the eastern edge of Cottonwood Park at the Meadows where the Wellington SWA Tributary ends abruptly. Development in the area has eliminated conveyance for the tributary and flows in excess of the storm system pose significant flooding hazards to the neighborhood. Overflow from the tributary pass through the development to the detention basin on private property near McClellan Road. The riverine flooding hazards combine with pluvial hazards of local runoff relying on the street corridor conveyance in major storms south into the Park Meadows and Meadows subdivisions. On the southern end of the Meadows subdivision the Boxelder Creek FEMA regulatory spans the detention basins, McClellan Road and several residential structures in the southeast corner of the Meadows subdivision.

Table 4-1: Existing Storm Drain Infrastructure

Outfall	Location	Pipe Size	Approx Pipe Capacity (cfs)	Approx. Return Period	Peak Discharge (cfs)				
					2-yr	5-yr	10-yr	50-yr	100-yr
Garfield Ave.	4th St.	36"	23	<25-YR	8	16	99	625	947
	3rd St.	48"	47	<50-YR	19	29	36	66	80
	2nd St.	48"	39	>100-YR	16	21	24	32	35
	1st St.	48"	95	>100-YR	16	22	25	31	32
4th St.	Cleveland Ave.	15"	5	<2-YR	14	23	89	627	958
	Roosevelt Ave.	24"	13	<25-YR	7	10	13	27	34
6th St.	Hayes Ave.	30"	22	<25-YR	4	12	35	174	255
	Harrison Ave.	(2) 30"	26	<25-YR	6	12	38	179	260
	Cleveland Ave.	48"	130	>100-YR	13	23	46	104	115
	Coal Creek Bus Center	48"	77	>100-YR	23	36	54	74	74
Buffalo Creek	Crossfire Dr.	36"	43	<50-YR	15	22	32	70	89
	Buffalo Creek Parkway	36"	32	<10-YR	27	41	55	124	159

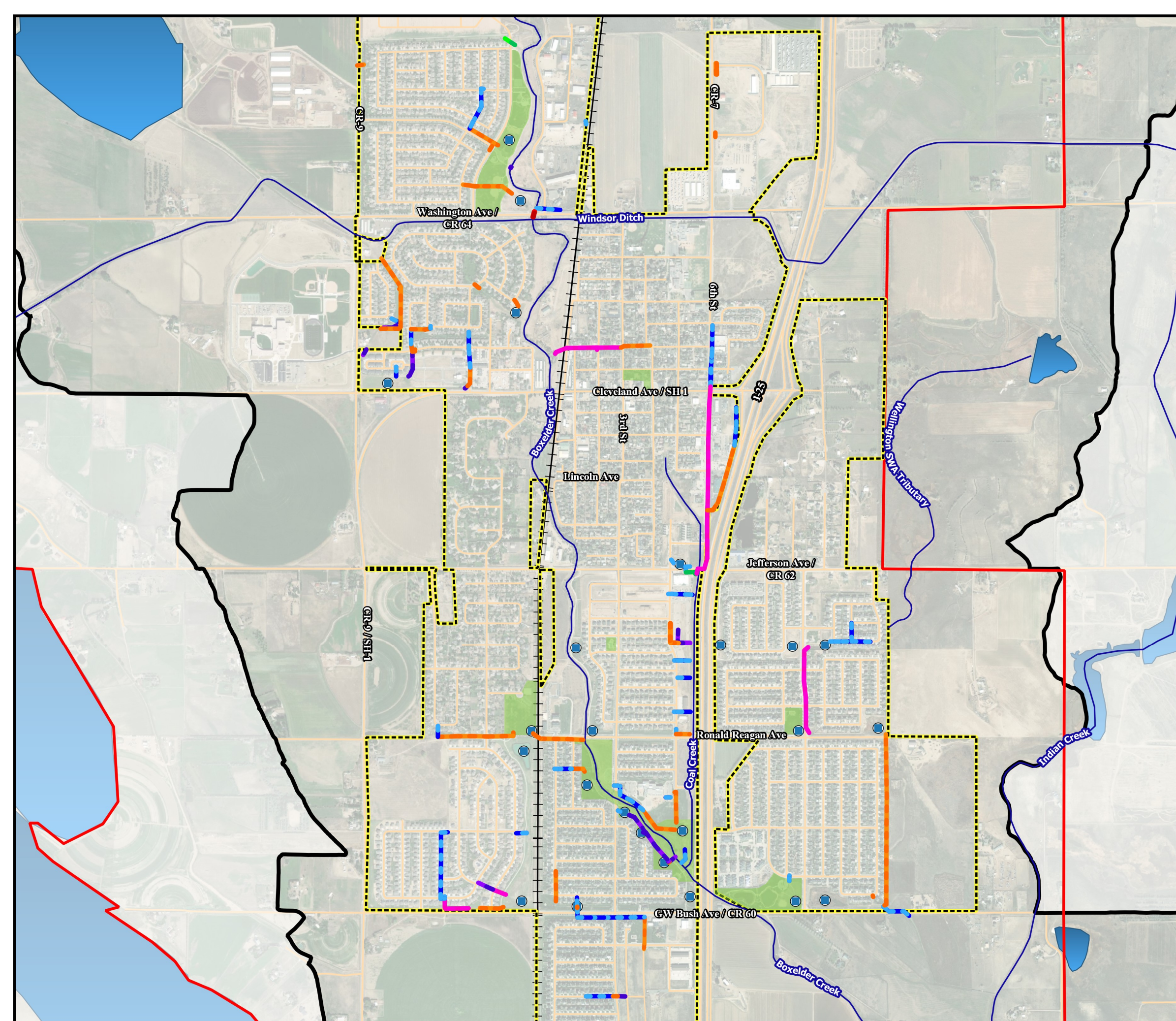
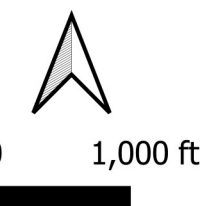
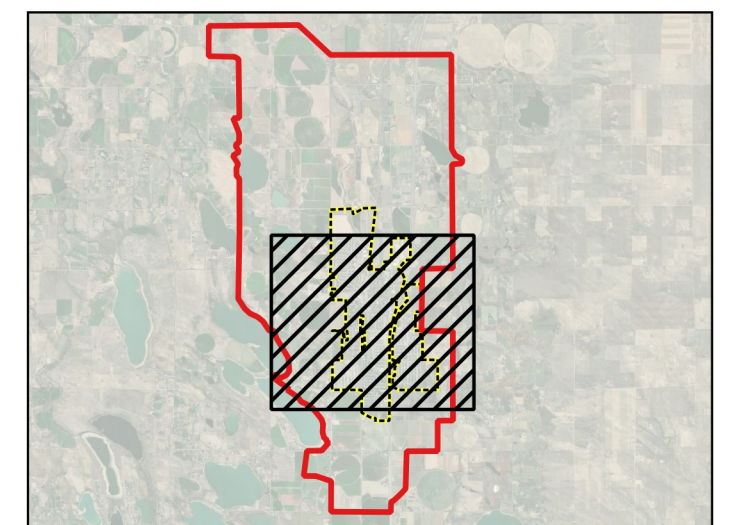
Stormwater Master Plan

Figure 4-1

Hydraulic Map: Existing Major Storm Drains

Existing Storm Pipes

- 30 inch
- 36 inch
- 42 inch
- 48 inch
- 60 inch
- 96 inch
- Existing Drainageway / Canal
- Ponds / Detention Basins
- Parks / Open Space
- Town Boundary
- Growth Management Area
- Study Area Boundary



Stormwater Master Plan

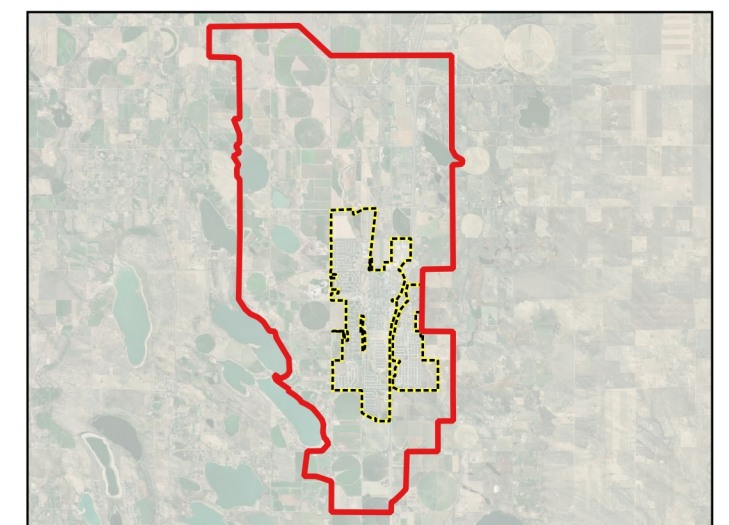
Figure 4-2

Rain-on-Grid: Growth Management Area 10-Year Storm

-  Existing Drainageway / Canal
-  Parks / Open Space
-  Town Boundary
-  Growth Management Area
-  Study Area Boundary

Max Flow Depth

-  < 3"
-  3" - 6"
-  6" - 12"
-  1' - 1.5'
-  1.5' - 2'
-  2' - 5'
-  > 5'



0 4,500 ft

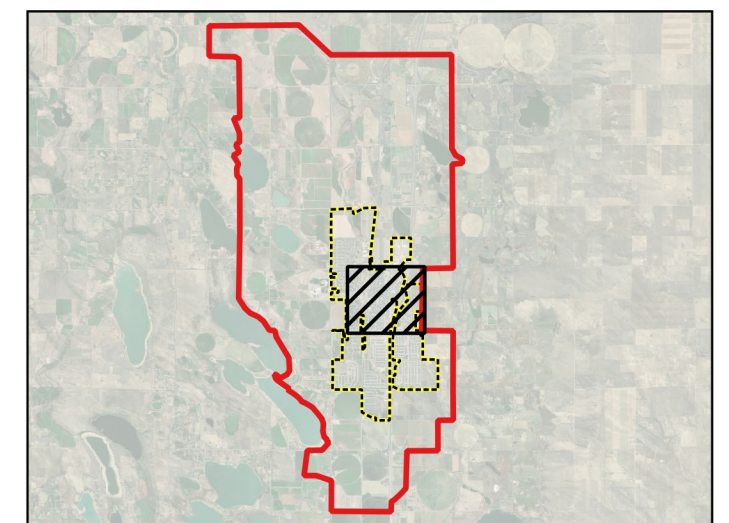


Stormwater Master Plan

Figure 4-3

Rain-on-Grid: Old Town Limits 10-Year Storm

-  Existing Drainageway / Canal
-  Detention Basin
-  Parks / Open Space
-  Well_OLT_Clip_Boundary
-  Town Boundary
-  Growth Management Area
- Building Footprints
 -  0" - 3" Flood Innundation
 -  3" - 1.4' Flood Innundation
- Max Flow Depth
 -  < 3"
 -  3" - 6"
 -  6" - 12"
 -  1' - 1.5'
 -  1.5' - 2'
 -  2' - 5'
 -  > 5'



0 600 ft




Stormwater Master Plan

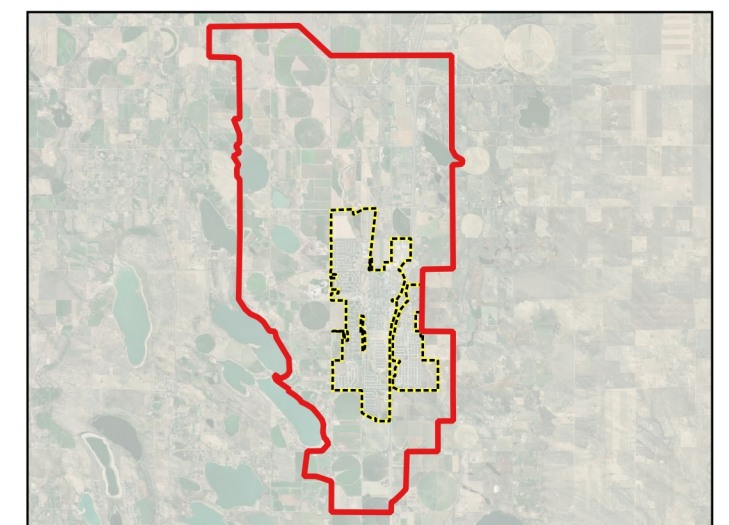
Figure 4-4

Rain-on-Grid: Growth Management Area 100-Year Storm

-  Existing Drainageway / Canal
-  Parks / Open Space
-  Town Boundary
-  Growth Management Area
-  Study Area Boundary

Max Flow Depth

-  < 3"
-  3" - 6"
-  6" - 12"
-  1' - 1.5'
-  1.5' - 2'
-  2' - 5'
-  > 5'



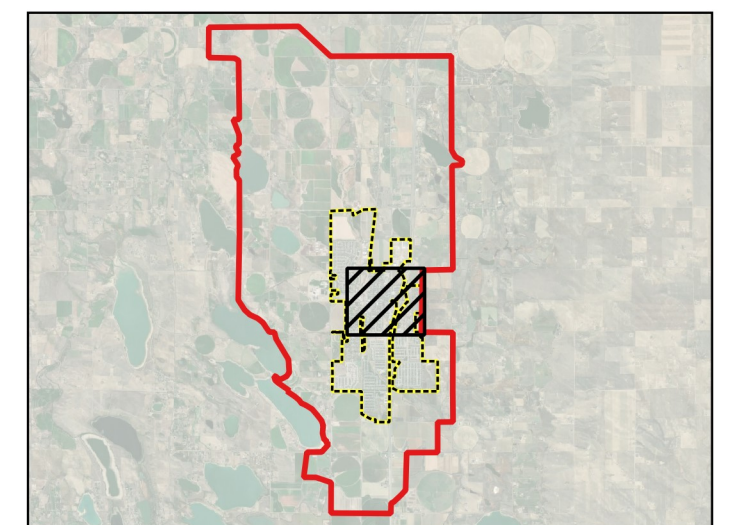
0 4,500 ft

Stormwater Master Plan

Figure 4-5

Rain-on-Grid: Old Town Limits 100 Year Storm

-  Existing Drainageway / Canal
-  Detention Basin
-  Parks / Open Space
-  Well_OLT_Clip_Boundary
-  Town Boundary
-  Growth Management Area
- Building Footprints
 -  0" - 3" Flood Innundation
 -  3" - 1.5' Flood Innundation
- Max Flow Depth
 -  < 3"
 -  3" - 6"
 -  6" - 12"
 -  1' - 1.5'
 -  1.5' - 2'
 -  2' - 5'
 -  > 5'



0 600 ft




5.0 ALTERNATIVE ANALYSIS

5.1 ALTERNATIVE DEVELOPMENT PROCESS

An Alternative Analysis was completed to develop flood mitigation solutions for the problem areas identified in the previous section. Goals for mitigation focused on, at a minimum, providing storm drainage capacity meeting the current drainage criteria for the Town of Wellington, and solutions to reduce flooding on insurable structures. Consideration was also given to separate stormwater base flows for the irrigation canals within the current Town limits and the GMA.

Design criteria and alternative category selection was reviewed at periodic progress meetings with Town staff. Further discussion of each alternative plan is provided below, along with review of the project benefits and costs for applicable options.

5.2 CRITERIA AND CONSTRAINTS

As noted above, goals for the baseline alternative were to provide storm drainage capacity to currently meet the 2-year design storm, the minor storm as outlined in the *Standard Design Criteria and Standard Construction Requirements* (Reference 6).

All alternatives were proposed to stay within the right-of-way and no property acquisition is proposed for the vast majority of the improvements. One exception is Sveta Lane, where an easement or property acquisition is proposed along Coal Creek to implement the proposed storm drain outfall.

5.3 ALTERNATIVE CATEGORIES

For each flooding hazard, multiple alternatives were evaluated in the initial screening process including:

- Improve storm drain infrastructure to convey minor storm (2-yr) runoff
- Provide additional protection by intercepting runoff exceeding the minor storm (10-yr)
- Separate stormwater runoff base flow from irrigation canals
- Reducing runoff volume through the implementation of Low Impact Development (LID) techniques

5.4 ALTERNATIVE HYDRAULICS

Each alternative was developed using EPA SWMM to determine the necessary pipe sizes to meet the desired alternative criteria. The rain-on-mesh HEC-RAS model was used to estimate the reduction in flooding potential throughout the basin.

5.5 ALTERNATIVE COSTS

Cost estimates were developed for each alternative using data obtained from MHFD’s master planning cost estimate spreadsheet UD-MP Cost, CDOT construction information, and recently constructed projects.

Inlet quantities were calculated assuming an inlet capacity of 3 cfs per inlet. Each lateral from inlets to the storm drain trunk was assumed to be 50 feet in length.

It was assumed that railroad crossings would be installed through a guided auger bore or guided pipe ram using a steel casing for conveyance rather than a steel casing and then inserting an RCP pipe. An estimate of \$1,200 per linear foot.

Water and Sanitary main utility information was obtained from the Town in a GIS database. All other utility relocation and coordination, including water and sanitary service adjustments, was assumed to be included in the percent of capital costs described below.

General project costs were assigned based on the following percentages of capital costs: Dewatering (2%), Mobilization (5%), Traffic Control (2%), Utility Coordination / Relocation (10%), and Stormwater Management / Erosion Control (5%).

The following additional project costs calculated as a percent of Capital Improvement Costs were obtain from Mile High Flood District UD-MP Cost for: Legal / Administrative (5%), Contract Admin / Construction Management (10%), and Contingency (25%). The cost for Engineering was modified from the MHFD default value of 15% to 20%

An overview of unit costs can be found in Table 5-1, below.

Table 5-1: Cost Estimate Unit Costs

Bid Item	UNIT	Unit Cost	Bid Item	UNIT	Unit Cost
18-INCH RCP	LF	\$150	48-INCH FES	EA	\$12,000
24-INCH RCP	LF	\$180	60 W x 38 H FES	EA	\$15,000
30-INCH RCP	LF	\$215	24-INCH FLAPGATE	EA	\$14,000
42-INCH RCP	LF	\$275	36-INCH FLAPGATE	EA	\$17,000
36-INCH RCP	LF	\$251	FLAT TOP MANHOLE, 8 FT DIA	EA	\$10,500
48-INCH RCP	LF	\$300	CONCRETE HEADWALL, WINGWALL, AND HANDRAIL	EA	\$15,000
60-INCH RCP	LF	\$400	TYPE 13 COMBINATION SINGLE IN	EA	\$6,000
66-INCH RCP	LF	\$525	TYPE R INLET, 5 FT	EA	\$7,500
72-INCH RCP	LF	\$650	TYPE R INLET, 10 FT	EA	\$8,600
45 W x 29 H HERCP	LF	\$275			
60 W x 38 H HERCP	LF	\$325	WATERLINE LOWERING	EA	\$5,500
4' W x 4' H RCBC	LF	\$1,200	WATERLINE LOWERING (16")	EA	\$8,500
4' W x 3' H RCBC	LF	\$1,100	CONCRETE COLLAR	EA	\$1,400
6' W x 3' H RCBC	LF	\$1,600	REMOVE EX ASPHALT	SY	\$7
7' W x 3' H RCBC	LF	\$1,750	REMOVE EX CURB AND GUTTER	LF	\$10
7' W x 4' H RCBC	LF	\$1,800	ASPHALT PAVING (6" DEPTH)	SY	\$40
8' W x 4' H RCBC	LF	\$2,000	CONCRETE CURB AND GUTTER	LF	\$60
9' W x 4' H RCBC	LF	\$2,150			
10' W x 3' H RCBC	LF	\$2,250	RAILROAD BORING (RCP)	LF	\$1,200
10' W x 4' H RCBC	LF	\$2,325	RAILROAD BORING (RCBC)	LF	\$20,000
24 INCH FES	EA	\$5,500	MISC EARTHWORK - CUT AND HAUL OFFSITE	CY	\$35
36-INCH FES	EA	\$10,500			
42-INCH FES	EA	\$11,750			

5.6 ALTERNATIVE PLANS

Alternative plans were developed for each flooding hazard area classified as High Priority during the flooding hazard identification, which can be found on **Error! Reference source not found.**

5.6.1 OLD TOWN ALTERNATIVE 1 – COMBINATION MINOR STORM CONVEYANCE ALTERNATIVE

The Old Town Alternative 1 – Combination Minor Storm Conveyance proposed to protect the Old Town Wellington area from Washington Avenue south to Jefferson Avenue to a 2-year level of protection. Design of each component has assumed upstream improvements are implemented in conjunction with one another. Further analysis is needed to ensure the remaining outfalls still achieve mitigating the 2-year design storm.

An overview of this alternative can be found in Figure 5-1.

5.6.1.1 WASHINGTON AVENUE OUTFALL

The Washington Avenue Outfall intercepts flow along the historic Coal Creek alignment upstream of Washington Avenue and the Windsor Ditch. The tributary area of the proposed outfall system includes over 1250 acres, extending as far north as County Road 70 and east to I-25.

The proposed improvements will protect Old Town by intercepting runoff north of Washington Avenue before flow can overtop the Windsor Ditch towards Eyestone Elementary School, Wellington Public Library, and downtown Wellington. Alternative 1 proposes a 36-inch at 0.25% slope to collect the 2-year design storm from the Bonfire Detention at northeast corner of 6th Street / CR 7 and Washington Avenue. Additional collection is proposed on the north side of Washington Avenue between 3rd Street and 4th Street. The storm drain increases in size to a 36-inch RCP pipe downstream of the collection point before passing underneath the Burlington Northern Railroad discharging into Boxelder Creek just upstream of the Windsor Ditch crossing. The 2-year peak discharge into Boxelder Creek is approximately 13 cfs.

5.6.1.2 GARFIELD AVENUE OUTFALL INLET IMPROVEMENTS

An additional inlet is proposed at Garfield Avenue and 3rd Street to intercept storm runoff before it continues south to Cleveland Street. During the 2-year design storm, an additional 5 cfs will be intercepted into the existing 48-inch storm drain system which currently possesses excess capacity.

5.6.1.3 CLEVELAND AVENUE OUTFALL

The Cleveland Avenue Outfall has a tributary area of approximately 14 acres north of Cleveland Avenue west of 3rd Street. Runoff is collected near Centennial Park at 3rd Street and Harrison Avenue south to Cleveland Avenue and west to Boxelder Creek.

The proposed outfall is comprised of an 18-inch RCP from 3rd Street and Harrison Avenue south to Cleveland Avenue. At Cleveland Avenue the system increases in size to 24-inch turning west, collecting stormwater runoff along Cleveland at the 3rd Street, 2nd Street, and 1st Street intersection. West of 1st Street the storm drain system crosses the Burlington Northern Railroad and discharges into Boxelder Creek south of Cleveland Avenue. The peak 2-year discharge of the proposed improvements is 8 cfs.

5.6.1.4 3RD STREET / LINCOLN AVENUE OUTFALL

The 3rd Street / Lincoln Avenue Outfall collects stormwater from as far north as Cleveland Avenue, as far west as 2nd Street, as far south as Lincoln Street, and far east as 5th Street. Runoff from the south side of Cleveland Avenue not collected in the Cleveland Avenue Outfall is intercepted by an 18-inch RCP which continues south along 3rd Street to Lincoln Street. The system increases to a 24-inch RCP at Lincoln Street with flows intercepted at 2nd Street, 3rd Street, and 4th Street before flow is discharged to the Coal Creek channel east of 4th Street. The 2-year peak discharge from the 3rd Street / Lincoln Avenue Outfall with all Alternative 1 storm drain improvements in place is 5 cfs.

5.6.1.5 5TH STREET OUTFALL

The 5th Street Outfall proposes a storm drain system ranging in size from 30-inch to 42-inch from Cleveland Avenue south to Kennedy Avenue and ultimately discharges flow southwest into Coal Creek. The storm outfall will intercept approximately 16 acres of direct flow area bounded by Cleveland Avenue to the north, Kennedy Avenue to the south, 5th Street to the west and 6th Street to the east. In addition to the direct flow area, the proposed improvements collect runoff that exceeds the existing 6th Street storm drain system. The 2-year peak discharge into Coal Creek is 42 cfs.

5.6.1.6 6TH STREET OUTFALL

The 6th Street Outfall intercepts stormwater runoff from as far west as 4th Street, as far east as 6th Street, north to Washington Avenue and south to Cleveland Avenue. The proposed storm drain improvements will collect runoff that is not currently intercepted by the existing 6th Street Outfall and will provide a 2-yr design storm protection to the northeast portion of Old Town.

Proposed improvements begin in the northeast corner of Old Town at 6th Street and Grant Avenue. A 24-inch RCP is proposed south along 6th Street to Garfield Avenue where the system increases in size to a 30-inch RCP. The proposed system turns west along Harrison Street, intercepting additional flow and increasing in size to a 36-inch RCP. At 5th Avenue, the system turns south and discharges into the 5th Street Outfall. The proposed storm drain system intercepts the 2-yr flow along 6th Street, eliminating the need for the undersized driveway culverts present in the area and increases the level of protection that the existing 6th Street storm drain can provide.

5.6.1.7 MAE CT OUTFALL

The Mae Court Outfall proposed improvements will intercept runoff within the southwest portion of Old Town, bounded by Cleveland Avenue to the north, Boxelder Creek to the west, 3rd Street to the east and Jefferson to the south. The existing storm drain will be replaced along a similar alignment from 3rd Street west to Box Elder to provide an additional level of protection and meet alternative goals of intercepting the 2-year design storm.

5.6.2 OLD TOWN ALTERNATIVE 2 – COMBINATION FLOOD MITIGATION STORM CONVEYANCE ALTERNATIVE

The storm drain improvements proposed in Old Town Alternative 2 – Combination Flood Mitigation reduce flooding hazards in Old Town up to a 10-year design level. Each outfall system proposed in Alternative 1 is included in Alternative 2 and includes additional conveyance to meet alternative goals (10-yr). All components are design to be constructed in combination. If one selected outfall is not included, further analysis is needed to ensure the remaining outfalls still achieve mitigating the 10-year design storm.

An overview of the proposed improvements can be found in Figure 5-2. Plan and profile exhibits for Old Town Alternative 2 can be found in Appendix C.

5.6.2.1 WASHINGTON AVENUE OUTFALL

The Washington Avenue Outfall intercepts flow along the historic Coal Creek alignment upstream of Washington Avenue and the Windsor Ditch. The tributary area of the proposed outfall system includes over 1250 acres, extending as far north as County Road 70 and east to I-25.

At the northeast corner of 6th Street / CR-7 and Washington Avenue, a 5-foot wide by 3-foot tall reinforced concrete box culvert (RCBC) intercepts the 10-year design flow of 30 cfs. An additional 100 cfs is proposed to be intercepted between 4th Street and 3rd Street north of Washington Avenue. The proposed improvements increase in size to a 10-foot wide by 4-foot tall RCBC to convey the peak discharge of 130 cfs underneath the Burlington Northern Railroad and discharge into Boxelder south of Washington Avenue.

5.6.2.2 GARFIELD AVENUE OUTFALL INLET IMPROVEMENTS

The existing Garfield Avenue storm drain system ranges in size from 36-inch RCP to 48-inch from 4th Street west to Boxelder Creek. During the 10-year design storm, the existing system has excess capacity. Several new inlets are proposed along the existing alignment at 2nd Street, 3rd Street, and 4th Street to maximize the existing infrastructure and allow smaller infrastructure for the downstream improvement, Cleveland Avenue Outfall.

5.6.2.3 CLEVELAND AVENUE OUTFALL

The Cleveland Avenue Outfall begins at 3rd Street and Harrison Avenue northwest of Centennial Park. The proposed improvements for the 14-acre tributary watershed range in size from 24-inch RCP to 36-inch RCP to help mitigate flooding hazards along Cleveland Avenue. The peak discharge during the 10-year design storm of 17 cfs passes underneath the Burlington Northern Railroad before discharging into Boxelder Creek south of Cleveland Avenue.

5.6.2.4 3RD STREET / LINCOLN AVENUE OUTFALL

The proposed 3rd Street / Lincoln Avenue Outfall improvements have a tributary area of approximately 27 acres south of Cleveland Avenue. Stormwater not intercepted by the Cleveland Avenue Outfall will be intercepted and conveyed south along 3rd Street in a 24-inch RCP. Additional runoff is collected at the McKinley Avenue, Roosevelt Avenue, and Lincoln Avenue intersections where the system increases in size to a 36-inch RCP and turns east to convey flow to the Coal Creek open channel east of 4th Street.

5.6.2.5 5TH STREET OUTFALL

Similar to Alternative 1, the 5th Street Outfall intercepts direct flow from a tributary area of 16 acres as well as offsite flow from the 6th Street Outfall. The proposed improvements range in size from 36-inch at Cleveland Avenue to a 38-inch tall by 60-inch wide horizontal elliptical reinforced concrete pipe at Kennedy Avenue. The storm drain system has a 10-year peak discharge of 60 cfs into the Coal Creek open channel west of Kennedy Avenue.

5.6.2.6 6TH STREET OUTFALL

The proposed 6th Street Outfall collects runoff from northeast Old Town, intercepting runoff in addition to the existing 6th Street Outfall. The system collects flow from Wilson Avenue along 6th Street south at each intersection before turning west at Harrison Avenue. The proposed system provides a 10-yr level of protection to the area, with the

improvements turning south at 5th Street, crossing Cleveland Avenue and discharging into the proposed 5th Street Outfall.

To intercept the 10-year design storm along 6th Street a 36-inch storm drain is proposed from Grant Avenue to Hayes Avenue. The system increases in size to a 42-inch RCP as the proposed system turns west along Harrison Avenue to 5th Street. A 48-inch RCP will intercept the 10-yr discharge as the system outfalls into the 5th Street Outfall south of Cleveland.

5.6.2.7 MAE CT OUTFALL

The Mae Court Outfall will intercept flow from the southwestern portion of Old Town and ensure runoff is intercepted before posing flooding hazards to adjacent subdivisions to the south. The proposed improvements will collect flow from as far west as Boxelder Creek, as far east as 3rd Street, as far south as Jefferson Avenue, and as far north as Cleveland Street. The 18" storm drain system will provide additional protection for Old Town by collecting flow along 3rd Street at Mae Court and convey flow west to Boxelder Creek.

5.6.3 OLD TOWN ALTERNATIVE 3 – 5TH STREET MINOR STORM CONVEYANCE ALTERNATIVE

Old Town Alternative 3 proposes two major storm drain outfalls to mitigate the majority of flooding hazards in Old Town for the 2-year design storm. In contrast to previous alternatives where a series of six outfalls were proposed, Alternative 3 proposes improvements along Washington Avenue and 5th Street to intercept the majority of stormwater runoff in Old Town.

An overview of the proposed improvements can be found in Figure 5-3.

5.6.3.1 WASHINGTON AVENUE OUTFALL

The proposed Washington Street Outfall extends from CR-7 / 6th Street to the east to Boxelder Creek to the west. The storm drain improvements will intercept flow along the historic Coal Creek flow path, totaling nearly 1250 acres of tributary area.

At the northeast corner of County Road 7 / 6th Street and Washington Avenue, a 36-inch RCP intercepts the 2-year design flow of 8 cfs. Just west of 5th Street, north of Washington Avenue, the storm drain system increases in size to a 42-inch RCP where the system collects an additional 5 cfs. Improvements continue west to outfall into Boxelder Creek with a 2-year peak discharge of 13 cfs.

5.6.3.2 5TH STREET OUTFALL

The 5th Street Outfall proposes a new outfall along 5th Street throughout Old Town to intercept the minor storm. Stormwater runoff is intercepted at each intersection from the Coal Creek open channel west of Kennedy Drive north to Grant Street.

At the upstream end of the proposed improvements, laterals extend east and west of 5th Street to intercept a combined flow of 15 cfs from 4th Street and 6th Street. The proposed 30-inch RCP continues south with proposed inlets at each intersection increasing flow in the storm drain system to 17 cfs just north of Cleveland Avenue. At Cleveland Avenue, an additional 2 cfs is intercepted as the 36-inch RCP continues south. The proposed improvements increase in size from 36-inch to 42-inch RCP before the storm outfalls into the Coal Creek open channel with a peak discharge for the 2-year design storm of 42 cfs.

5.6.4 OLD TOWN ALTERNATIVE 4 – 5TH STREET FLOOD MITIGATION CONVEYANCE ALTERNATIVE

The 5th Street flood mitigation alternative includes both the Washington Avenue Outfall and 5th Street Outfall alignments as proposed in Alternative 3 and provides additional flood mitigation to the Town by increasing both outfalls to a 10-year design storm capacity.

An overview of the proposed improvements can be found in Figure 5-4.

5.6.4.1 WASHINGTON AVENUE OUTFALL

The historic Coal Creek flow path extends from Washington Avenue north to County Road 70. Nearly 1250 acres of tributary area will be intercepted north of Washington Avenue, before runoff can overtop the Windsor Ditch and pose flooding hazards to Old Town.

The proposed improvements at the upstream end of the project consist of a 5-foot wide by 3-foot tall box culvert at the CR-7 / 6th Street and Washington Avenue intersection to convey flow from the Bonfire development. The system increases in size to a 10-foot wide by 4-foot-tall box culvert to convey the 10-year peak discharge of 130 cfs west to Boxelder Creek.

5.6.4.2 5TH STREET OUTFALL

The 5th Street Flood Mitigation Outfall will mitigate 10-year design storm flooding hazards in Old Town along 5th Street from Kennedy Avenue to the south and Grant Avenue to the north. Laterals along Grant Avenue to the east and west converge at 5th Street and convey flow downstream in a 42-inch RCP. The proposed storm drain system intercepts 33 cfs along Cleveland Avenue before continuing south in a 48-inch RCP. Inlets are proposed at each intersection south as the system increases to a 60-inch RCP before discharging into the Coal Creek channel with a peak 10-year discharge of 110 cfs.

5.6.5 SVETA LANE OUTFALL

The Coal Creek channel originates between 4th Street to the west, 6th Street to the east and Roosevelt Avenue to the north. The channel conveys flow from existing storm outfalls at Kennedy Avenue on both east and west sides of the channel and the 4th Street storm drain. The Sveta Lane proposed improvements will provide conveyance in 6th Street from approximately 280 feet north of Sveta Lane to south of Jefferson Avenue where the Coal Creek channel reemerges.

Property acquisition or a drainage easement will be required on the southeast corner of 7837 6th Street to construct the drainage improvements for all alternatives of the Sveta Lane Outfall.

5.6.5.1 SVETA LANE OUTFALL ALTERNATIVE 1 – MINOR STORM CONVEYANCE ALTERNATIVE

The minor storm conveyance alternative at Sveta Lane proposes to intercept the 2-year design storm in the Coal Creek channel north of Sveta Lane and convey flow in a storm drain system in 6th Street to the south. Any flows in excess of the 2-year design storm will continue along the historic flow path through private property west of 6th Street.

Alternative 1 proposes a 48-inch RCP down 6th Street to convey the 2-year design storm of nearly 50 cfs. At the 6th Street and Jefferson Avenue intersection, the system intercepts the existing 6th Street 48-inch outfall. The proposed Sveta Lane Outfall increases in size to a 60-inch RCP crossing Jefferson Avenue to the south, where the improvements outfall into Coal Creek with a 2-year peak discharge of 75 cfs.

5.6.5.2 SVETA LANE OUTFALL ALTERNATIVE 2 – FLOOD MITIGATION CONVEYANCE ALTERNATIVE

Alternative 2 at Sveta Lane provides additional flood mitigation by intercepting the 10-year peak discharge from the Coal Creek channel. Flows exceeding the 10-year design storm will continue along the historic flow through public property overtopping Sveta Lane and Jefferson Avenue.

The proposed 66-inch RCP conveys the 10-year peak discharge of 164 cfs from approximately 280 feet north of Sveta Lane to Jefferson Avenue. At Jefferson Avenue, the storm drain system intercepts the existing 6th Street storm drain system. The combined runoff, totaling 182 cfs, outfalls into the Coal Creek open channel in the 72-inch RCP.

5.6.6 BUFFALO CREEK / WELLINGTON COMMUNITY PARK

Alternatives within the Buffalo Creek subdivision aim to mitigate flooding hazards of nuisance ponding and flooding near the Buffalo Creek Parkway and Wild West Lane intersection. The tributary area is generally bounded by Wellington Community Park to the east, Stampede Drive to the north, Washington Avenue to the south and County Road 9 to the west.

No alternatives were pursued that included replacing the existing storm drain along the current alignment, through the ball fields, due to the construction disruption proposed improvements would pose.

5.6.6.1 BUFFALO CREEK / WELLINGTON COMMUNITY PARK ALTERNATIVE 1 – MINOR STORM CONVEYANCE ALTERNATIVE

Alternative 1 proposes a parallel 36-inch storm drain system to extend from the southern detention basin in Wellington Community Park to the Buffalo Creek Parkway and Wild West Lane intersection. At the upstream extent of the proposed improvements, several inlets are proposed on each side of Buffalo Creek Parkway to ensure flow is intercepted into the storm drain system. East of Buffalo Creek Parkway in Wellington Community Park, the storm drain system is proposed south around the ballfield, east underneath the trail to the detention basin. The existing system would remain in place east of Buffalo Creek Parkway to provide additional protection in larger storms.

5.6.6.2 BUFFALO CREEK / WELLINGTON COMMUNITY PARK ALTERNATIVE 2 – FLOOD MITIGATION CONVEYANCE ALTERNATIVE

Alternative 2 flood mitigation conveyance proposes a 48-inch RCP east of Buffalo Creek Parkway to convey the 10-year design storm to the existing southern detention basin in Wellington Community Park. Additional inlets and intersection improvements will ensure existing flooding hazards of nuisance ponding in the intersection is mitigated up to the 10-year design storm. East of Buffalo Creek Parkway, the storm drain alignment turns south to convey flow around the southern ball field. As with Alternative 1, the existing storm drain that conveys flow through the plaza of the ball fields will remain in place and provide additional flood mitigation with this alternative.

5.6.7 GMA ALTERNATIVES

Several alternatives were developed outside of current Town limits to help planning for future growth within the Growth Management Area (GMA). Each alternative is described further in the sections below.

An overview of these improvements can be found in Figure 5-6.

5.6.7.1 GMA ALTERNATIVES – COUNTY ROAD 68

North of County Road 68, an outfall channel is proposed to intercept runoff from the north and safely convey flow to Boxelder Creek. The existing flow path overtops County Road 68 just west of County Road 6 and continues south to the sump location west of Buffalo Creek subdivision. The proposed channel conveys flows east, crossing County Road 68 before discharging into Boxelder Creek. An easement will be required for the proposed improvements and should be incorporated into future development site plans north of County Road 68.

5.6.7.2 GMA ALTERNATIVES – COUNTY ROAD 66

Similar to the County Road 68 improvements, an open channel just north of County Road 66 proposes to intercept runoff and discharge to Boxelder Creek before the flows continue south and pose flooding hazards to existing subdivisions. The proposed outfall channel should be implemented as development occurs north, as the current alignment would require property acquisition and easements.

5.6.7.3 GMA ALTERNATIVES – MERIDIAN POND OUTFALL

The Meridian Pond Outfall proposes to convey discharge from the northeast corner of County Road 6 and County Road 62 south to Jefferson Avenue before turning east to Boxelder Creek. The improvements mitigate flooding hazards for the detention facility by providing formalized conveyance and eliminating the reliance on the irrigation ditches as storm conveyance. Once the downstream outfall is in place, modifications to the detention basin outlet will allow the facility to function more efficiently.

At the time of this study, CDOT is currently proposing improvements to the County Road 6 and County Road 62 intersection. No detailed proposed improvements have been included in this study for the Meridian Pond Outfall as the final configuration of the intersection is unknown at this time. The downstream channel is shown on private property and should be considered as development occurs in the area.

5.6.7.4 GMA ALTERNATIVES – SAGE MEADOWS OUTFALL

The Sage Meadow Outfall proposes to mitigate flooding hazards by eliminating the reliance on the lift station that currently drains the subdivision to the north. An outfall proposed south, through the upcoming Fort Collins Farms and Sipes development will allow the subdivision to drain without reliance upon the lift station. No detailed plans for the Sage Meadows Outfall were developed as at the time of this study neither Fort Collins Farms nor Sipes development had available information on site plans to incorporate an outfall alignment. Consideration must be given to any allowable discharge rate into the Larimer County Canal from the Sage Meadows subdivision.

Alternatives were evaluated east along GW Bush Avenue to Boxelder Creek but determined to be infeasible due to necessary grades to drain the existing detention basin.

5.6.7.1 GMA ALTERNATIVES - EAST WELLINGTON OUTFALL

The East Wellington Outfall proposes to convey flow from the Wellington State Wildlife Area Tributary south to Indian Creek. The existing open channel, which conveys flow to the eastern side of the Cottonwood Park at the Meadows, has a tributary area of approximately 1550 acres. The existing open channel ends just east of the development and a 30-inch storm drain conveys baseflows to the detention basin located just east of McClellan Drive. Flow in excess of the existing storm drain system pond in the backyards of Cottonwood Park at the Meadows before spilling onto Dunes

Street in Park Meadows Estates. The overflow continues south from Park Meadows Estates detention basin into The Meadows creating flooding hazards along Summer Street in The Meadows.

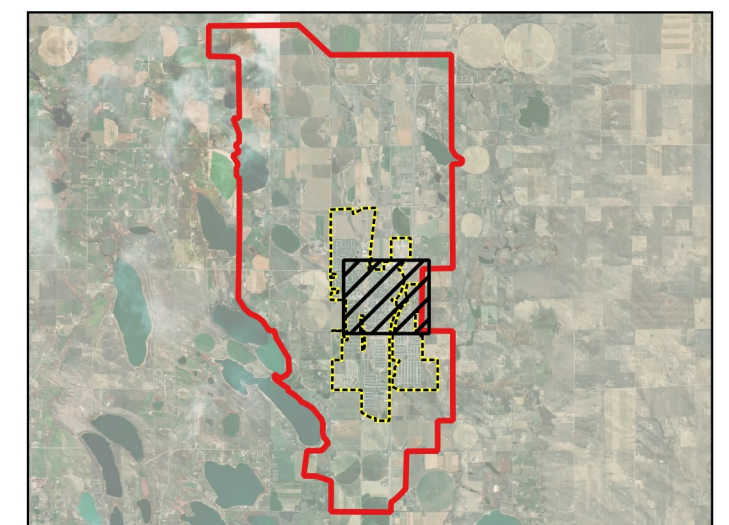
Alternatives were developed to provide an outfall for the SWA Tributary along the east side of East Wellington. The proposed outfall should be incorporated into any site plan for development east of the adjacent neighborhoods. The outfall is proposed to cross County Road 60 before discharging flow into Indian Creek.

Stormwater Master Plan

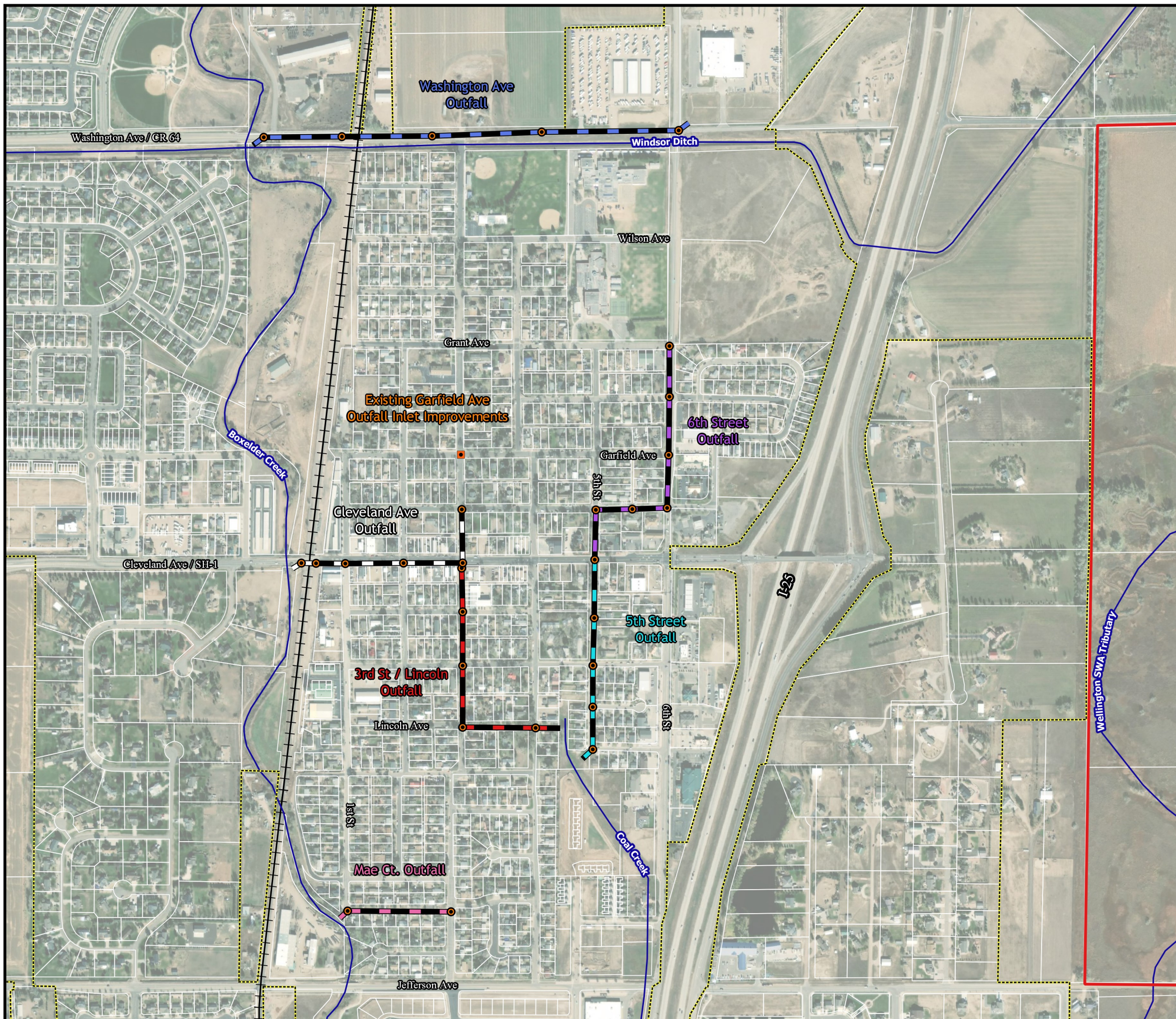
Figure 5-1

Alternative Analysis: Old Town Alt 1 - Minor Storm Conveyance

-  3rd St / Lincoln Proposed Storm Pipe
-  5th St Proposed Storm Pipe
-  6th St Proposed Storm Pipe
-  Cleveland Ave Proposed Storm Pipe
-  Mae Ct Proposed Storm Pipe
-  Washington Ave Proposed Storm Pipe
-  Proposed Manhole
-  Proposed Inlets on Existing Storm Outfall
-  Existing Drainageway / Canals
-  Railroad
-  Town Boundary
-  Growth Management Area



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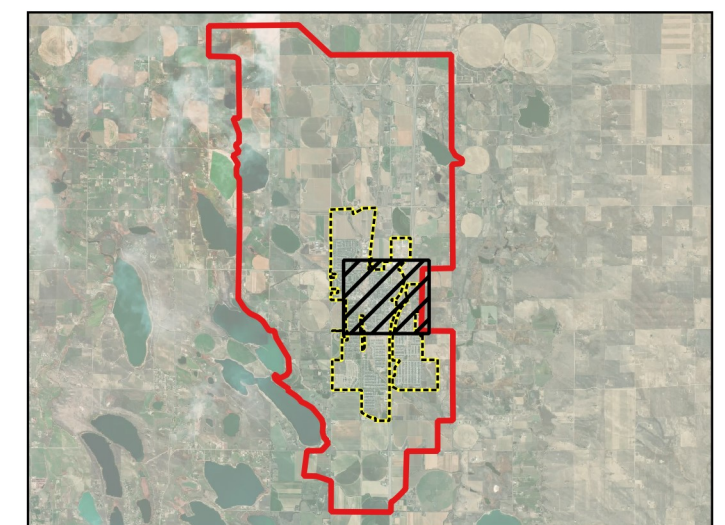



Stormwater Master Plan

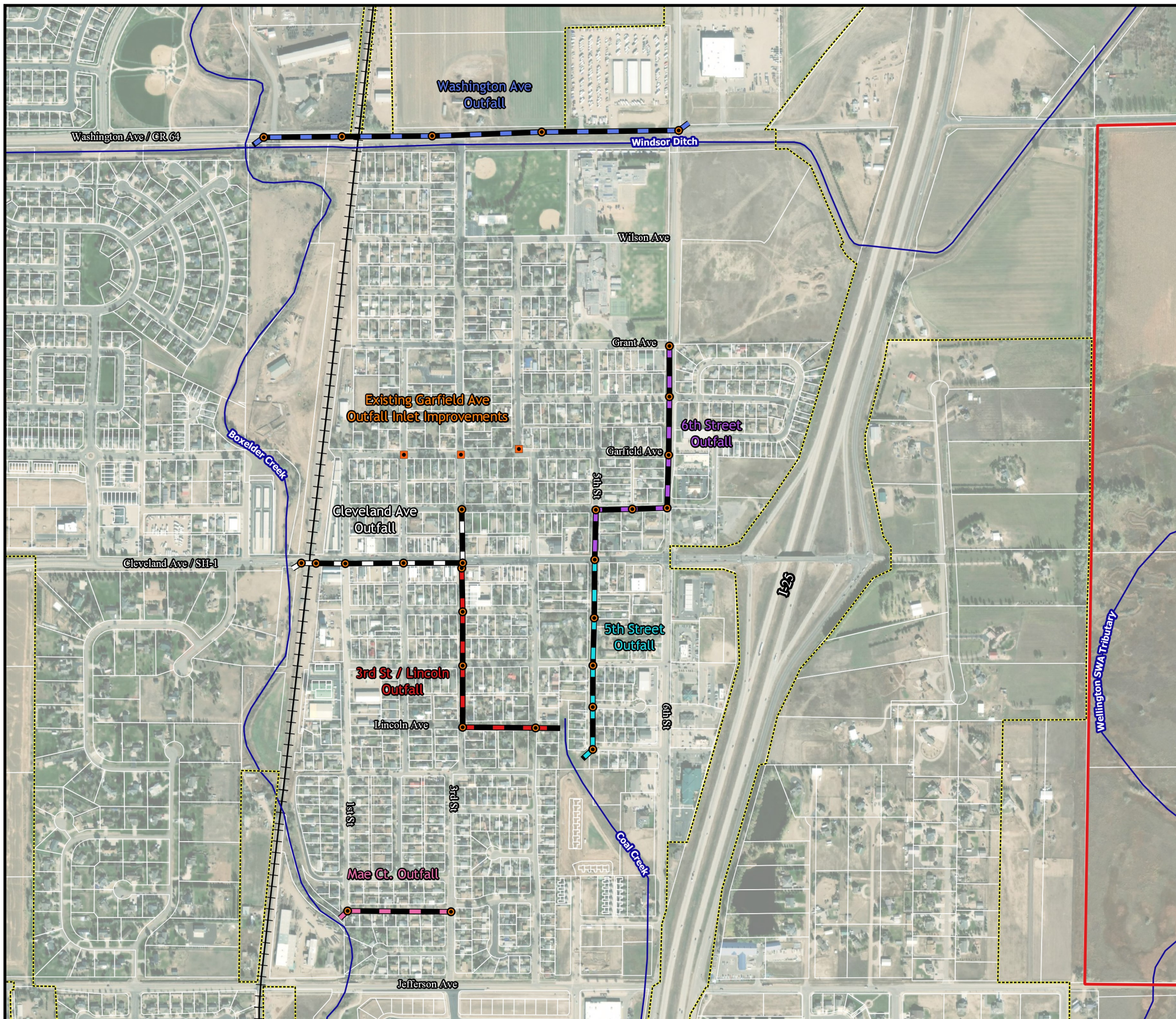
Figure 5-2

Alternative Analysis: Old Town Alt 2 - Flood Mitigation Conveyance

-  3rd St / Lincoln Proposed Storm Pipe
-  5th St Proposed Storm Pipe
-  6th St Proposed Storm Pipe
-  Cleveland Ave Proposed Storm Pipe
-  Mae Ct Proposed Storm Pipe
-  Washington Ave Proposed Storm Pipe
-  Proposed Manhole
-  Proposed Inlets on Existing Storm Outfall
-  Existing Drainageway / Canals
-  Railroad
-  Town Boundary
-  Growth Management Area



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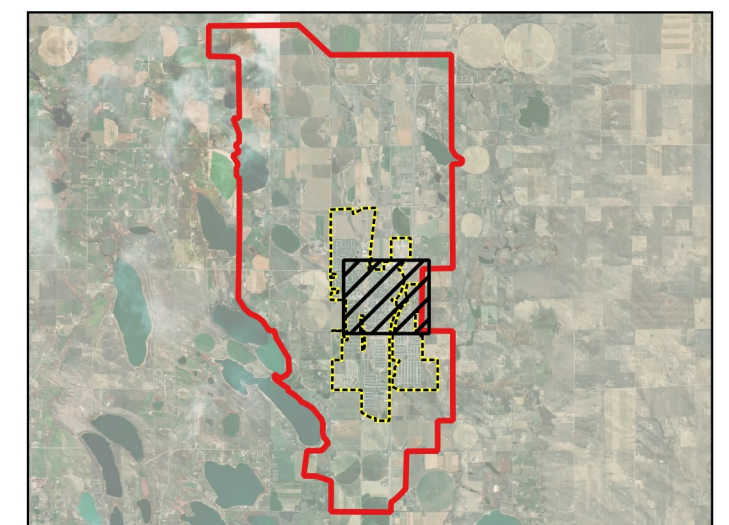



Stormwater Master Plan

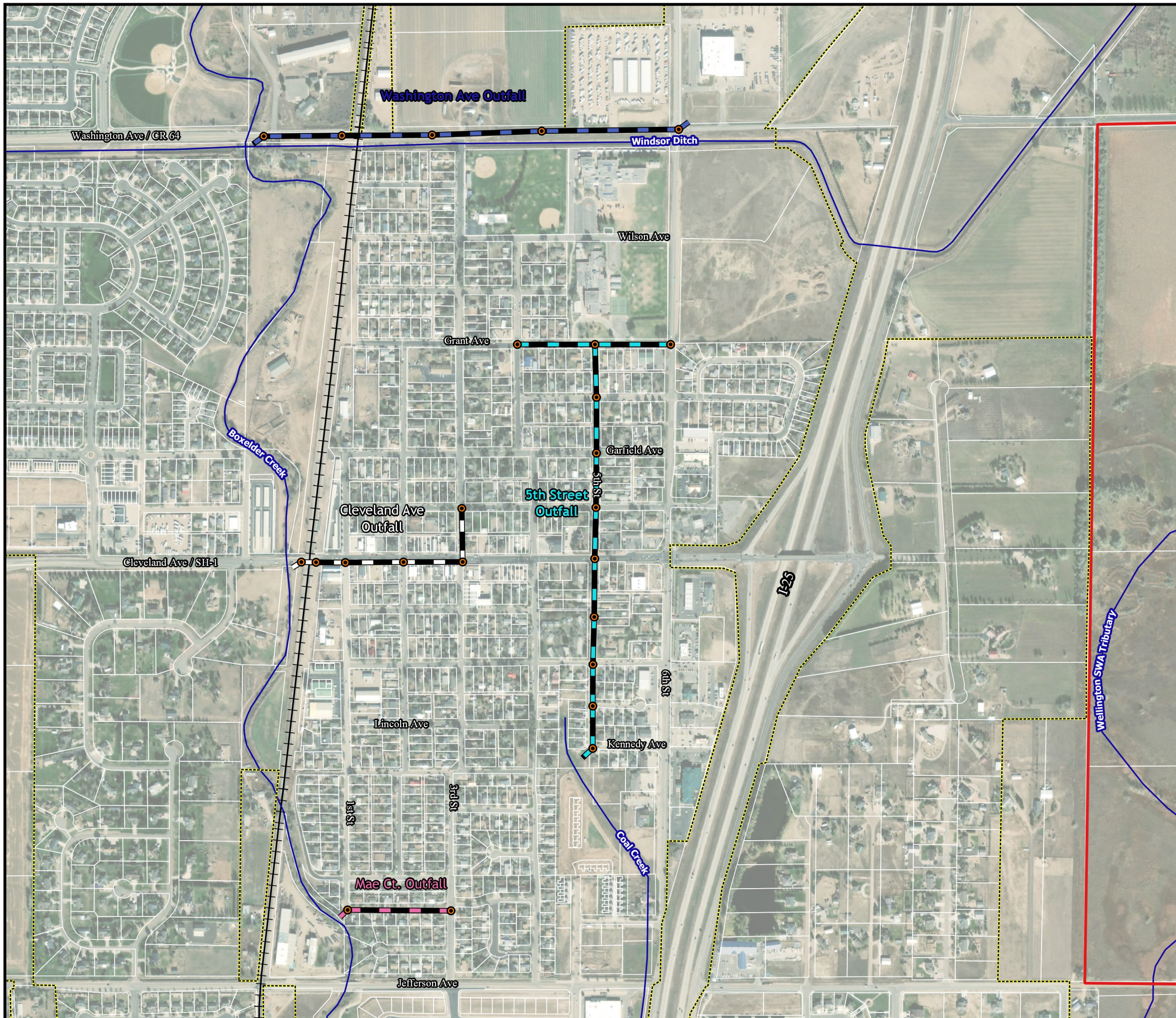
Figure 5-3

Alternative Analysis: Old Town Alt 3 - Minimum Storm Conveyance

-  5th St Proposed Storm Pipe
-  Cleveland Ave Proposed Storm Pipe
-  Mae Ct Proposed Storm Pipe
-  Washington Ave Proposed Storm Pipe
-  Proposed Manhole
-  Proposed Inlets on Existing Storm Outfall
-  Existing Drainageway / Canals
-  Railroad
-  Town Boundary
-  Growth Management Area



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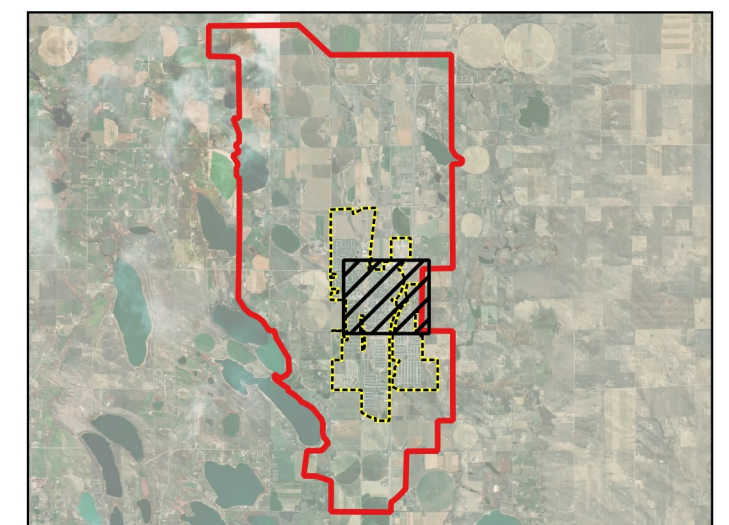



Stormwater Master Plan

Figure 5-4

Alternative Analysis: Old Town Alt 4 - Flood Mitigation Conveyance

-  5th St Proposed Storm Pipe
-  Cleveland Ave Proposed Storm Pipe
-  Mae Ct Proposed Storm Pipe
-  Washington Ave Proposed Storm Pipe
-  Proposed Manhole
-  Proposed Inlets on Existing Storm Outfall
-  Existing Drainageway / Canals
-  Railroad
-  Town Boundary
-  Growth Management Area



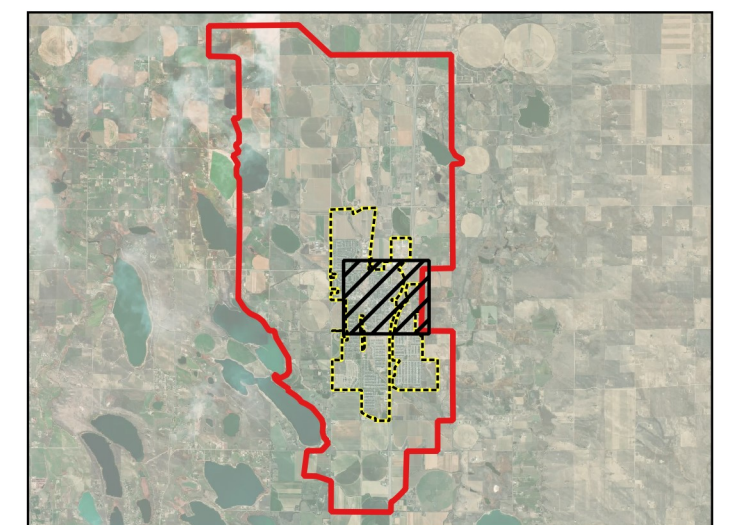
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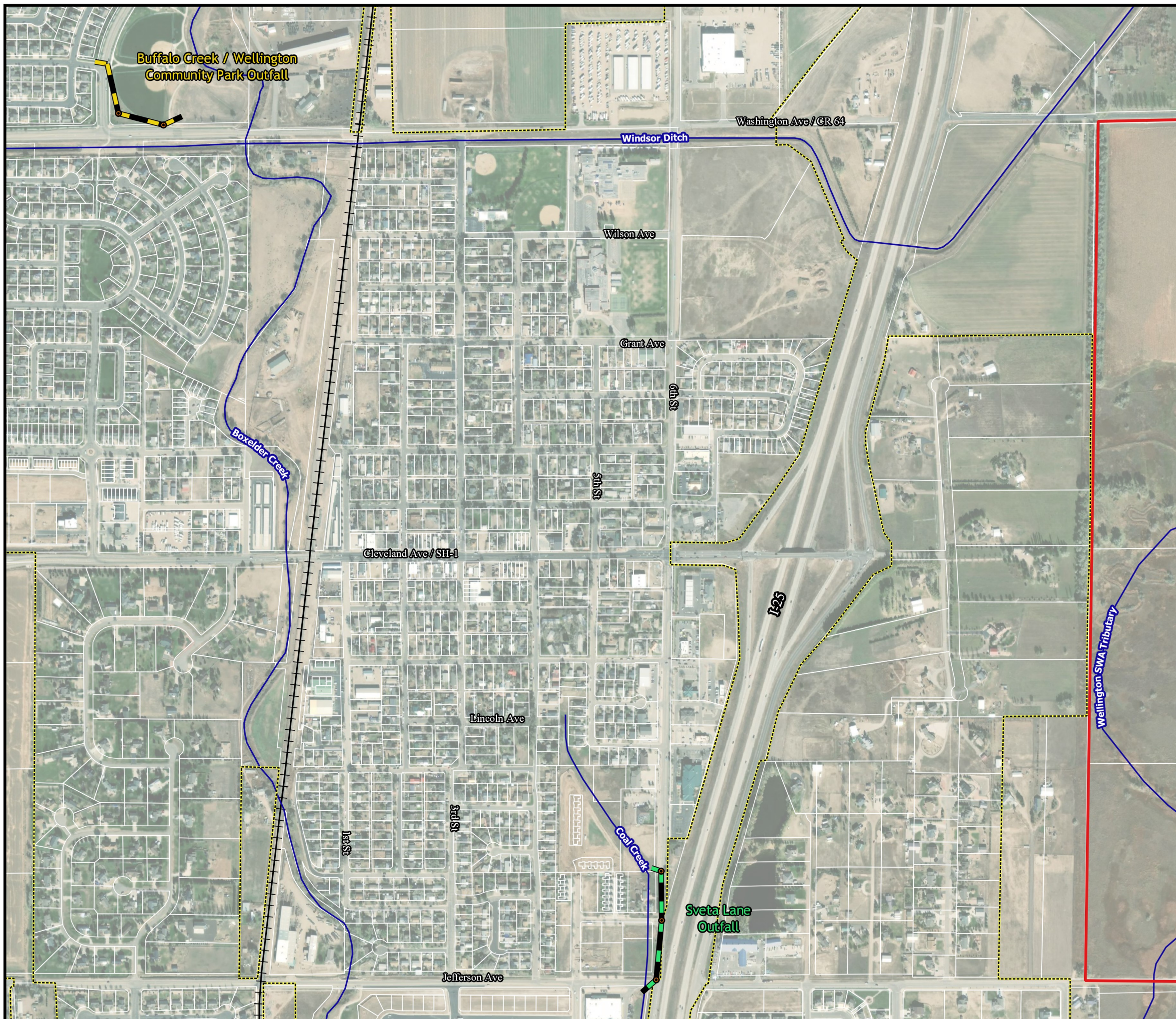

Stormwater Master Plan

Figure 5-5 Alternative Analysis: Town Alternatives

-  Buffalo Creek Proposed Storm Pipe
-  Sveta Ln Proposed Storm Pipe
-  Proposed Manhole
-  Existing Drainageway / Canals
-  Railroad
-  Town Boundary
-  Growth Management Area



0 600 ft

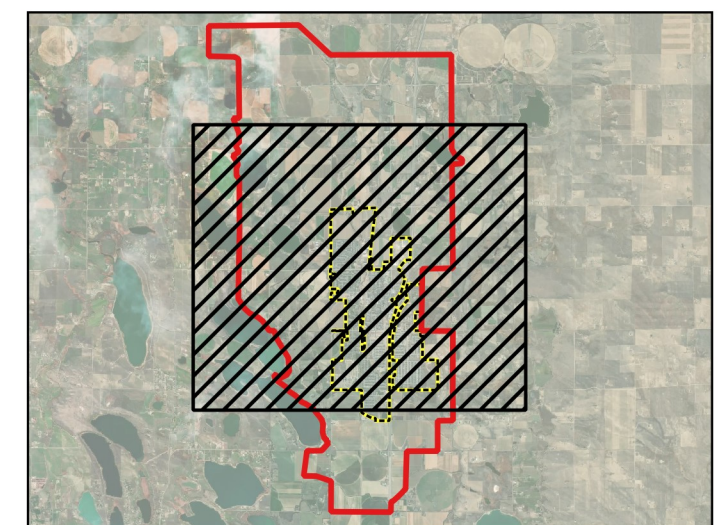



Stormwater Master Plan

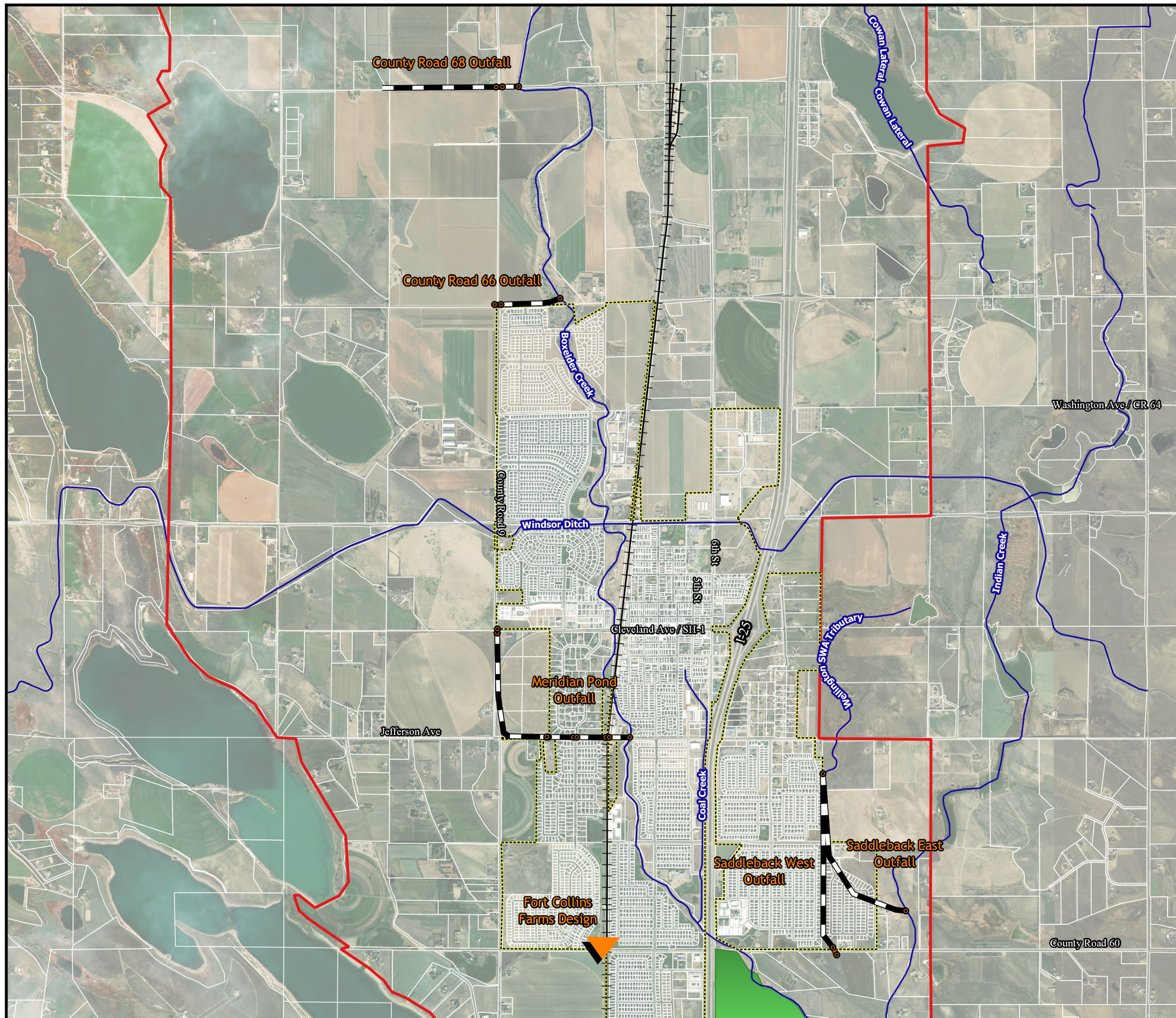
Figure 5-6

Alternative Analysis: GMA Alternatives

-  Proposed Storm Pipe
-  Proposed Storm Channel
-  Proposed Manhole / Hydraulic Structure
-  Existing Drainageway / Canals
-  Railroad
-  Town Boundary
-  Growth Management Area



0 3,500 ft



5.7 ALTERNATIVE PLAN COST ESTIMATE SUMMARY

A comparison of total project cost for each alternative can be found below. A detailed cost breakdown of each alternative plan can be found in the tables below.

Table 5-2: Alternative Plan Cost Estimate Summary

Alternative Plan	CAPITAL	ENGINEERING	LEGAL / ADMINISTRATIVE	CONTRACT ADMIN/CM	CONTINGENCY	TOTAL CAPITAL COST
Old Town Alternative 1 - Combination Minor Storm Conveyance Alternative	\$4,782,778	\$1,080,336	\$372,826	\$804,362	\$3,155,749	\$8,173,009
Old Town Alternative 2 - Combination Flood Mitigation Storm Conveyance Alternative	\$14,588,529	\$2,917,706	\$729,426	\$1,458,853	\$3,647,132	\$23,341,646
Old Town Alternative 3 - 5th Street Minor Storm Conveyance Alternative	\$4,873,737	\$974,747	\$243,687	\$487,374	\$1,218,434	\$7,797,980
Old Town Alternative 4 - 5th Street Flood Mitigation Conveyance Alternative	\$13,090,941	\$2,618,188	\$654,547	\$1,309,094	\$3,272,735	\$20,945,505
Sveta Lane Outfall Alternative 1 - Minor Storm Conveyance Alternative	\$936,340	\$187,268	\$46,817	\$93,634	\$234,085	\$1,498,144
Sveta Lane Outfall Alternative 2 - Flood Mitigation Conveyance Alternative	\$1,309,673	\$261,935	\$65,484	\$130,967	\$327,418	\$2,095,477
Buffalo Creek / Wellington Community Park Alternative 1 - Minor Storm Conveyance Alternative	\$369,071	\$73,814	\$18,454	\$36,907	\$92,268	\$590,514
Buffalo Creek / Wellington Community Park Alternative 2 - Flood Mitigation Conveyance Alternative	\$439,968	\$87,994	\$21,998	\$43,997	\$109,992	\$703,949
GMA Alternatives - County Road 66	\$369,071	\$73,814	\$18,454	\$36,907	\$92,268	\$590,514
GMA Alternatives - County Road 68	\$439,968	\$87,994	\$21,998	\$43,997	\$109,992	\$703,949

Table 5-3: Old Town Alternative 1 – Minor Storm Conveyance Cost Estimate

Alternative Plan	CAPITAL	ENGINEERING	LEGAL / ADMINSTRATIVE	CONTRACT ADMIN/CM	CONTINGENCY	TOTAL CAPITAL COST
Washington Ave Outfall	\$1,355,634	\$336,197	\$84,049	\$168,099	\$420,247	\$2,689,578
Garfield Ave Outfall Inlet Improvements	\$110,630	\$22,126	\$5,532	\$11,063	\$27,658	\$177,008
Cleveland Ave Outfall	\$958,331	\$191,666	\$47,917	\$95,833	\$239,583	\$1,533,330
3rd Street / Lincoln Oufall	\$888,494	\$177,699	\$44,425	\$88,849	\$222,124	\$1,421,591
5th Street Outfall	\$1,070,184	\$214,037	\$53,509	\$107,018	\$267,546	\$1,712,294
6th Street Outfall	\$0	\$58,710	\$117,420	\$293,549	\$1,878,716	\$0
Mae Court Outfall	\$399,505	\$79,901	\$19,975	\$39,951	\$99,876	\$639,208
Total	\$4,782,778	\$1,080,336	\$372,826	\$804,362	\$3,155,749	\$8,173,009

Table 5-4: Old Town Alternative 2 - Flood Mitigation Conveyance Cost Estimate

Alternative Plan	CAPITAL	ENGINEERING	LEGAL / ADMINSTRATIVE	CONTRACT ADMIN/CM	CONTINGENCY	TOTAL CAPITAL COST
Washington Ave Outfall	\$8,229,178	\$1,645,836	\$411,459	\$822,918	\$2,057,295	\$13,166,685
Garfield Ave Outfall Inlet Improvements	\$282,071	\$56,414	\$14,104	\$28,207	\$70,518	\$451,314
Cleveland Ave Outfall	\$1,092,151	\$218,430	\$54,608	\$109,215	\$273,038	\$1,747,441
3rd Street / Lincoln Oufall	\$979,145	\$195,829	\$48,957	\$97,914	\$244,786	\$1,566,631
5th Street Outfall	\$2,288,162	\$457,632	\$114,408	\$228,816	\$572,041	\$3,661,060
6th Street Outfall	\$1,318,317	\$263,663	\$65,916	\$131,832	\$329,579	\$2,109,307
Mae Court Outfall	\$399,505	\$79,901	\$19,975	\$39,951	\$99,876	\$639,208
Total	\$14,588,529	\$2,917,706	\$729,426	\$1,458,853	\$3,647,132	\$23,341,646

Table 5-5: Old Town Alternative 3 – 5th Street Minor Conveyance

REACH	CAPITAL	ENGINEERING	LEGAL / ADMINSTRATIVE	CONTRACT ADMIN/CM	CONTINGENCY	TOTAL CAPITAL COST
Washington Ave Outfall	\$1,680,986	\$336,197	\$84,049	\$168,099	\$420,247	\$2,689,578
Cleveland Ave Outfall	\$958,331	\$191,666	\$47,917	\$95,833	\$239,583	\$1,533,330
5th Street to Coal Creek Outfall	\$1,834,915	\$366,983	\$91,746	\$183,491	\$458,729	\$2,935,864
Mae Court Outfall	\$399,505	\$79,901	\$19,975	\$39,951	\$99,876	\$639,208
Total	\$4,873,737	\$974,747	\$243,687	\$487,374	\$1,218,434	\$7,797,980

Table 5-6: Old Town Alternative 4 - 5th Street Flood Mitigation Conveyance

REACH	CAPITAL	ENGINEERING	LEGAL / ADMINSTRATIVE	CONTRACT ADMIN/CM	CONTINGENCY	TOTAL CAPITAL COST
Washington Ave Outfall	\$8,229,178	\$1,645,836	\$411,459	\$822,918	\$2,057,295	\$13,166,685
Cleveland Ave Outfall	\$1,092,151	\$218,430	\$54,608	\$109,215	\$273,038	\$1,747,441
5th Street to Coal Creek Outfall	\$3,370,107	\$674,021	\$168,505	\$337,011	\$842,527	\$5,392,171
Mae Court Outfall	\$399,505	\$79,901	\$19,975	\$39,951	\$99,876	\$639,208
Total	\$13,090,941	\$2,618,188	\$654,547	\$1,309,094	\$3,272,735	\$20,945,505

Table 5-7: Sveta Lane Outfall Alternative Cost Estimates

Alternative Plan	CAPITAL	ENGINEERING	LEGAL / ADMINSTRATIVE	CONTRACT ADMIN/CM	CONTINGENCY	TOTAL CAPITAL COST
Minor Storm Conveyance	\$936,340	\$187,268	\$46,817	\$93,634	\$234,085	\$1,498,144
Flood Mitigation Conveyance	\$1,309,673	\$261,935	\$65,484	\$130,967	\$327,418	\$2,095,477

Table 5-8: Buffalo Creek / Wellington Community Park Outfall Alternative Cost Estimates

Alternative Plan	CAPITAL	ENGINEERING	LEGAL / ADMINSTRATIVE	CONTRACT ADMIN/CM	CONTINGENCY	TOTAL CAPITAL COST
Minor Storm Conveyance	\$369,071	\$73,814	\$18,454	\$36,907	\$92,268	\$590,514
Flood Mitigation Conveyance	\$439,968	\$87,994	\$21,998	\$43,997	\$109,992	\$703,949

Table 5-9: GMA Alternative Cost Estimates

Alternative Plan	CAPITAL	ENGINEERING	LEGAL / ADMINSTRATIVE	CONTRACT ADMIN/CM	CONTINGENCY	TOTAL CAPITAL COST
County Road 66	\$369,071	\$73,814	\$18,454	\$36,907	\$92,268	\$590,514
County Road 68	\$439,968	\$87,994	\$21,998	\$43,997	\$109,992	\$703,949

5.8 EVALUATION OF ALTERNATIVES

Alternatives were evaluated based on mitigating flood hazards, improving public safety, enhancing water quality and cost effectiveness. Overall, all of the alternative plans provide positive benefits in reducing flood hazard and flood risk; however, these benefits are solely observed for the more frequent storm events and do not mitigate the 100-year flood event.

5.8.1 OLD TOWN ALTERNATIVES

Old Town Alternative 1 is the second most cost-effective alternative for Old Town. The alternative will mitigate flood hazards throughout Old Town for the 2-year design storm event. Old Town Alternative 2 is the least cost-effective solution for Old Town but improves public safety the most of any alternative to a 10-yr level of protection. Alternative 3, similar to Alternative 1, increases flood hazard mitigation to a 2-yr level of protection. Alternative 3 is the second most cost-effective alternative but provides the least hazard mitigation of any alternative. Old Town Alternative 4 is third out of the four alternatives in cost effectiveness but provides additional flood mitigation when compared to Alternatives 1 and 3.

5.8.2 SVETA LANE OUTFALL

Sveta Lane Outfall Alternative 1 provides the most cost-effective improvement while meeting minimum Town criteria. While both alternatives increase public safety by providing formalized conveyance for Coal Creek between Sveta Lane and Jefferson Avenue, Alternative 2 provides a high level of protection by intercepting up to the 10-year design flow.

5.8.3 BUFFALO CREEK / WELLINGTON COMMUNITY PARK

The most cost-effective solution for the Buffalo Creek / Wellington Community Park is Alternative 1. Alternative 1 provides additional storm conveyance and will mitigate flooding hazards up to the 2-yr design storm. Alternative 2 provides additional public safety by mitigating flooding hazards up to a 10-year design level.

5.9 RECOMMENDED PLAN

The recommended plan for each location is listed below. Although the costs for Old Town are higher than the minimum conveyance alternatives, these options balance public safety needs with conveyance requirements.

- Old Town Alternative 2
- Sveta Lane Outfall Flood Mitigation Conveyance
- Buffalo Creek / Wellington Community Park Flood Mitigation Conveyance
- GMA Alternatives – County Road 66
- GMA Alternatives – County Road 68
- GMA Alternatives – Meridian Pond
- GMA Alternatives – Sage Meadows Outfall
- GMA Alternatives – East Wellington Outfall

6.0 CONCEPTUAL DESIGN

6.1 PLAN DESCRIPTION

The selected plan of improvements for the Town of Wellingtons meets the goals set for by this study with input from the Town. The selected plan mostly follows the improvements proposed in Old Town Alternative 2, and flood mitigation conveyance alternative at other locations. One exception is near Washington Avenue, where an additional outfall north of Washington was added and subsequently reduced the size of the Washington Street Outfall, further described in the sections below. All improvements are intended to mitigate pluvial flooding hazards throughout the basin and provides additional protection to the Town above the minimum criteria.

Each proposed storm drain outfall assumes all upstream improvements are implemented together. Consideration should be given for each outfall system during design for additional inflow if upstream improvements are not in place to meet the 10-year design conveyance.

6.2 CONCEPTUAL DESIGN COST ESTIMATES

Cost estimates for the conceptual design were developed using data obtained from MHFD’s master planning cost estimate spreadsheet UD-MP Cost, CDOT construction information, and recently constructed projects.

Inlet quantities were calculated assuming an inlet capacity of 3 cfs per inlet. Each lateral from inlets to the storm drain trunk was assumed to be 50 feet in length.

It was assumed that railroad crossings would be installed through a guided auger bore or guided pipe ram using a steel casing for conveyance rather than a steel casing and then inserting an RCP pipe. An estimate of \$1,200 per linear foot. At Washington Avenue, the proposed box culvert was estimated to be tunneled at \$20,000 per linear foot.

Water and Sanitary main utility information was obtained from the Town in a GIS database. Water main in conflict with the proposed improvements were assumed to be relocated at a cost of \$5,500 each, increased to \$8,500 for 16-inch water main. All other utility relocation and coordination, including water service and sanitary service adjustments, was assumed to be included in the percent of capital costs described below.

General project costs were assigned based on the following percentages of capital costs: Dewatering (2%), Mobilization (5%), Traffic Control (2%), Utility Coordination / Relocation (10%), and Stormwater Management / Erosion Control (5%).

The following additional project costs calculated as a percent of Capital Improvement Costs were obtain from Mile High Flood District UD-MP Cost for: Legal / Administrative (5%), Contract Admin / Construction Management (10%), and Contingency (25%). To more accurately account for the expected cost of permitting and utility research associated with any of the proposed improvements the cost for Engineering was modified from the MHFD default value of 15% to 20%.

Table 6-1: Conceptual Design Cost Estimate Unit Costs

Bid Item	UNIT	Unit Cost	Bid Item	UNIT	Unit Cost
18-INCH RCP	LF	\$150	36-INCH FES	EA	\$10,500
24-INCH RCP	LF	\$180	42-INCH FES	EA	\$11,750
30-INCH RCP	LF	\$215	48-INCH FES	EA	\$12,000
42-INCH RCP	LF	\$275	60 W x 38 H FES	EA	\$15,000
36-INCH RCP	LF	\$251	24-INCH FLAPGATE	EA	\$14,000
48-INCH RCP	LF	\$300	36-INCH FLAPGATE	EA	\$17,000
60-INCH RCP	LF	\$400	FLAT TOP MANHOLE, 8 FT DIA	EA	\$10,500
66-INCH RCP	LF	\$525	CONCRETE HEADWALL, WINGWALL, AND HANDRAIL	EA	\$15,000
72-INCH RCP	LF	\$650	TYPE 13 COMBINATION SINGLE IN	EA	\$6,000
45 W x 29 H HERCP	LF	\$275	TYPE R INLET, 5 FT	EA	\$7,500
49 W x 32 H HERCP	LF	\$290	TYPE R INLET, 10 FT	EA	\$8,600
53 W x 34 H HERCP	LF	\$310	TYPE R INLET, 15 FT	EA	\$11,000
60 W x 38 H HERCP	LF	\$325	WATERLINE LOWERING	EA	\$5,500
4' W x 4' H RCBC	LF	\$1,200	WATERLINE LOWERING (16")	EA	\$8,500
4' W x 3' H RCBC	LF	\$1,100	CONCRETE COLLAR	EA	\$1,400
6' W x 3' H RCBC	LF	\$1,600	REMOVE EX ASPHALT	SY	\$7
7' W x 3' H RCBC	LF	\$1,750	REMOVE EX CURB AND GUTTER	LF	\$10
7' W x 4' H RCBC	LF	\$1,850	ASPHALT PAVING (6" DEPTH)	SY	\$40
8' W X 4' H RCBC	LF	\$2,000	CONCRETE CURB AND GUTTER	LF	\$60
9' W X 4' H RCBC	LF	\$2,150			
10' W x 3' H RCBC	LF	\$2,250	RAILROAD BORING (RCP)	LF	\$1,200
10' W x 4' H RCBC	LF	\$2,325	RAILROAD BORING (RCBC	LF	\$20,000
24 INCH FES	EA	\$5,500	MISC EARTHWORK - CUT AND HAUL OFFSITE	CY	\$35

6.3 MASTER PLAN DESCRIPTION

The master plan improvements are described on an outfall-by-outfall basis in 0 through 6.3.10. Each outfall system was designed to mitigate the 10-year pluvial flooding within the GMA. Regulatory floodplain impacts along Boxelder Creek were not within the scope of this study but need to be studied in future analysis in order to ensure no adverse impacts to the regulatory floodplain. Cost estimates for the conceptual design can be found in Table 6-11. Preliminary design profiles for each selected improvement can be found in Appendix D.

The sizing and cost of improvements assume all improvements are implemented at the same time. In general, improvements should be constructed downstream to upstream to ensure additional flow does not cause adverse impact to any property. Although most proposed improvements are isolated in nature, consideration should be taken as the design advances for each outfall to reevaluate the proposed sizing of infrastructure whether other improvements have been implemented.

6.3.1 BOXELDER BUSINESS PARK OUTFALL

East of Boxelder Creek, just north of the Boxelder Business Park, the Boxelder Business Park Outfall proposes to intercept the 10-year design storm and convey flows to Boxelder Creek. The storm drain improvements will collect flow along the Coal Creek flowpath before it continues south to Washington Avenue, increasing the public safety to Old Town. The improvements are just upstream of the Coal Creek FEMA regulatory floodplain.

The proposed improvements intercept flow in the existing sump location approximately 300 feet east of the Burlington Northern Railroad. Approximately 86 cfs is proposed to be conveyed west to an 5-foot by 4-foot box culvert which will convey flow underneath Burlington Northern Railroad. West of the railroad crossing, the box culvert alignment is contained within an existing 20-foot drainage and utility easement. Additional flow will be intercepted near Pieper Road as the system increases in size to a 7-foot by 4-foot box culvert from Pieper Road west. The longitudinal slope of the improvements is limited to 0.20% by ground cover and the invert elevation outfall into Boxelder Creek.

Existing water utilities in Pieper Road and West 1st Street will require lowering with the proposed storm improvements. A 12-inch sanitary line in West 1st Street may require relocation.

Future development is anticipated north of the proposed outfall. Additional utility conflicts are expected as the roadway transitions from privately maintenance roads to Town right-of-way. If property acquisition is pursued east of the railroad, further consideration should be given to a detention facility which could attenuate peak flows and decrease the size of the downstream infrastructure.

[Click for Conceptual Design Profile](#)

Table 6-2: Boxelder Business Park Outfall Cost Estimate

BID ITEM NO.	DESCRIPTION OF BID ITEM	TOTAL QUANTITY	PAY UNIT	UNIT Cost	TOTAL COST
GENERAL					
1	DEWATERING (2%)	1	LS	\$ 69,244	\$ 69,244
2	MOBILIZATION (5%)	1	LS	\$ 173,109	\$ 173,109
3	TRAFFIC CONTROL (2%)	1	LS	\$ 69,244	\$ 69,244
4	UTILITY COORDINATION / RELOCATION (10%)	1	LS	\$ 346,218	\$ 346,218
5	STORMWATER MANAGEMENT / EROSION CONTROL (5%)	1	LS	\$ 173,109	\$ 173,109
Subtotal Additional Capital Improvement Costs				\$	830,923
REMOVALS					
6	REMOVE EX ASPHALT	1,889	SY	\$ 7	\$ 13,222
STORM DRAIN IMPROVEMENTS					
7	24-INCH RCP	100	LF	\$ 180	\$ 18,000
8	TYPE R INLET, 10 FT	2	EA	\$ 9,000	\$ 18,000
9	5' W X 4' H RCBC	484	LF	\$ 1,400	\$ 677,600
10	7' W X 4' H RCBC	459	LF	\$ 1,800	\$ 826,200
11	TEE BASED MANHOLE, 8 FT DIA	3	EA	\$ 11,000	\$ 33,000
12	CONCRETE HEADWALL, WINGWALL, AND HANDRAIL	2	EA	\$ 15,000	\$ 30,000
13	TYPE M OUTFALL RIPRAP PROTECTION	80	CY	\$ 120	\$ 9,600
14	ASPHALT PAVING (6" DEPTH)	1,889	SY	\$ 40	\$ 75,556
15	MISC. EARTHWORK CHANNEL EAST OF RAILROAD	1	EA	\$ 50,000	\$ 50,000
16	RAILROAD BORING	85	LF	\$ 20,000	\$ 1,700,000
17	WATERLINE LOWERING	2	EA	\$ 5,500	\$ 11,000
Subtotal Capital Improvement Costs					\$3,462,178
Construction Subtotal					\$4,293,100
ADDITIONAL PROJECT COSTS					
Engineering		20%		\$	858,620
Legal / Administrative		5%		\$	214,655
Contract Admin / Construction Management		10%		\$	429,310
Contingency (25%)		25%		\$	1,073,275
Total Project Costs					\$6,868,961

6.3.2 WASHINGTON AVENUE OUTFALL

The Washington Avenue Outfall proposes to collect flow along the historic Coal Creek alignment before the flow overtops the roadway and poses a flooding hazard to Old Town Wellington. The proposed storm drain improvements will intercept up to the 10-year design storm and safely convey flow west along Washington Avenue from County Road 7 (6th Street) to Boxelder Creek.

At the northeast corner of County Road 7 (6th Street) and Washington Avenue, the proposed 45-inch wide by 29-inch tall horizontal elliptical reinforced concrete pipe (HERCP) will intercept the 10-year peak flow of 30 cfs from the Bonfire business development detention basin. As the system heads west from Bonfire, a 15-inch sanitary sewer in County Road 7 (6th Street) will be passed underneath the proposed storm improvements. Approximately 1,600 feet of 16-inch water main is in horizontal conflict along Washington Avenue, requiring relocation with the proposed storm improvements from County Road 7 (6th Street) west.

An additional 16 cfs is proposed to be intercepted just north of Washington Avenue east and west of 3rd Street. To convey the additional flow, the proposed system increases in size to a 53-inch wide by 34-inch tall (HERCP). Property acquisition north of Washington Avenue outside of current Town limits was not pursued as an alternative during this study. If the opportunity presents itself through development or property for sale, regional detention could be evaluated north of Washington to decrease the infrastructure size of the outfall system.

The storm drain improvements continue west at a proposed slope of 0.25% before the crossing with Burlington Northern Railroad. Tunneling of the box culvert underneath the Burlington Northern Railroad is proposed to keep the tracks in service during construction. Further coordination with the railroad will be necessary as the design advances to evaluate the crossing and if open cut trench methods are possible.

Approximately 115 feet east of Boxelder Creek a 16-inch water main crosses the proposed storm drain alignment. Costs have been included to lower the water line while the storm improvements continue on the south side of Washington Avenue. The 12-inch sanitary sewer in Washington Avenue at 1st Street is not anticipated to be in conflict with the proposed alignment.

The Coal Creek FEMA regulated floodplain is present among the proposed improvements. Consideration should be given as the design is advanced to ensure the project has no adverse impacts to the Boxelder or Coal Creek floodplains.

[Click for Conceptual Design Profile](#)

Table 6-3: Washington Avenue Outfall Cost Estimate

BID ITEM NO.	DESCRIPTION OF BID ITEM	TOTAL QUANTITY	PAY UNIT	UNIT Cost	TOTAL COST
GENERAL					
1	DEWATERING (2%)	1	LS	\$ 94,344	\$ 94,344
2	MOBILIZATION (5%)	1	LS	\$ 235,860	\$ 235,860
3	TRAFFIC CONTROL (2%)	1	LS	\$ 94,344	\$ 94,344
4	UTILITY COORDINATION / RELOCATION (10%)	1	LS	\$ 471,720	\$ 471,720
5	STORMWATER MANAGEMENT / EROSION CONTROL (5%)	1	LS	\$ 235,860	\$ 235,860
Subtotal Additional Capital Improvement Costs				\$	1,132,128
REMOVALS					
6	REMOVE EX ASPHALT	8,856	SY	\$ 7	\$ 61,989
STORM DRAIN IMPROVEMENTS					
7	24-INCH RCP	100	LF	\$ 180	\$ 18,000
8	24 INCH FES	2	EA	\$ 5,500	\$ 11,000
9	60 W x 38 H HERCP	392	LF	\$ 325	\$ 127,400
10	53 W x 34 H HERCP	2,244	LF	\$ 310	\$ 695,640
11	45 W x 29 H HERCP	74	LF	\$ 275	\$ 20,350
12	FLAT TOP MANHOLE, 8 FT DIA	4	EA	\$ 12,500	\$ 50,000
13	TEE BASED MANHOLE, 8 FT DIA	8	EA	\$ 11,000	\$ 88,000
14	CONCRETE HEADWALL, WINGWALL, AND HANDRAIL	2	EA	\$ 15,000	\$ 30,000
15	TYPE M OUTFALL RIPRAP PROTECTION	80	CY	\$ 120	\$ 9,600
16	ASPHALT PAVING (6" DEPTH)	8,856	SY	\$ 40	\$ 354,222
17	RAILROAD BORING	150	LF	\$ 20,000	\$ 3,000,000
18	WATERLINE - 16" PVC	1,800	LF	\$ 130	\$ 234,000
19	WATERLINE LOWERING (16")	2	EA	\$ 8,500	\$ 17,000
Subtotal Capital Improvement Costs					\$4,717,201
Construction Subtotal					\$5,849,329
ADDITIONAL PROJECT COSTS					
Engineering		20%	\$		1,169,866
Legal / Administrative		5%	\$		292,466
Contract Admin / Construction Management		10%	\$		584,933
Contingency (25%)		25%	\$		1,462,332
Total Project Costs					\$9,358,927

6.3.3 GARFIELD AVENUE OUTFALL INLET IMPROVEMENTS

In general, stormwater runoff in northwest Old Town drains through street corridors south towards Cleveland Avenue. The existing Garfield Avenue storm drain is the only storm drain system in northwest Old Town and extends from Boxelder Creek east, underneath the Burlington Northern Railroad to 4th Street. The storm system is comprised of a 36-inch RCP from 4th Street downstream to 3rd Street where the storm drain increases to 48-inch. The existing storm drain system has excess capacity, as the inlets do not fill the pipe to the maximum capacity. Inlet improvements are proposed at 3rd and 4th Street to maximize the existing storm drain system and reduce flooding hazards in Old Town. At 4th Street, additional inlets are proposed to collect 6 cfs on both sides of 4th Street north of Garfield Avenue. A 6-inch water main in 4th Street is likely to require lowering with the inlet improvements.

On the east side of 3rd Street, proposed inlets will intercept an additional 3 cfs of stormwater runoff. On the west side of the intersection, the storm drain system increases in size to a 48-inch outfall, allowing an additional 10 cfs to be intercepted without surcharging of the existing storm drain system. The waterline near the storm drain system south of Garfield is anticipated to require lowering with the proposed improvements.

The proposed inlet improvements increase the peak discharge from the system from the existing 25 cfs to 39 cfs during the 10-year design storm and reduce surface flooding in Old Town.

Table 6-4: Garfield Avenue Outfall Inlet Improvement Cost Estimate

BID ITEM NO.	DESCRIPTION OF BID ITEM	TOTAL QUANTITY	PAY UNIT	UNIT Cost	TOTAL COST
GENERAL					
1	DEWATERING (2%)	1	LS	\$ 3,659	\$ 3,659
2	MOBILIZATION (5%)	1	LS	\$ 9,148	\$ 9,148
3	TRAFFIC CONTROL (2%)	1	LS	\$ 3,659	\$ 3,659
4	UTILITY COORDINATION / RELOCATION (10%)	1	LS	\$ 18,297	\$ 18,297
5	STORMWATER MANAGEMENT / EROSION CONTROL (5%)	1	LS	\$ 9,148	\$ 9,148
Subtotal Additional Capital Improvement Costs				\$	43,912
REMOVALS					
6	REMOVE EX ASPHALT	578	SY	\$ 7	\$ 4,044
7	REMOVE EX CURB AND GUTTER	63	LF	\$ 10	\$ 630
STORM DRAIN IMPROVEMENTS					
8	18-INCH RCP	350	LF	\$ 150	\$ 52,500
9	TYPE R INLET, 5 FT	7	EA	\$ 7,500	\$ 52,500
10	FLAT TOP MANHOLE, 8 FT DIA	3	EA	\$ 12,500	\$ 37,500
11	ASPHALT PAVING (6" DEPTH)	578	SY	\$ 40	\$ 23,111
12	CONCRETE CURB AND GUTTER	28	LF	\$ 60	\$ 1,680
13	WATERLINE LOWERING	2	EA	\$ 5,500	\$ 11,000
Subtotal Capital Improvement Costs					\$182,966
Construction Subtotal					\$226,877
ADDITIONAL PROJECT COSTS					
Engineering		20%		\$	45,375
Legal / Administrative		5%		\$	11,344
Contract Admin / Construction Management		10%		\$	22,688
Contingency (25%)		25%		\$	56,719
Total Project Costs					\$363,004

6.3.4 CLEVELAND AVENUE OUTFALL

The Cleveland Avenue Outfall storm drain improvement proposes to intercept stormwater in the western portion of Old Town north of Cleveland Avenue. In conjunction with the other Old Town proposed improvements, the Cleveland Avenue Outfall will reduce street flooding up to the 10-year design storm. The proposed storm drain system extend from Boxelder Creek to the east, underneath the Burlington Northern Railroad along the southern half of Cleveland Avenue to 3rd Street. At 3rd Street, the proposed improvements turn north to intercept flow at the 3rd Street and Harrison Street intersection.

At the upstream end of the storm drain system, inlets are proposed on the north side of 3rd Street and Harrison Avenue to intercept 7 cfs. An 8-inch and 6-inch water main in the intersection are likely to require lowering with the proposed improvements. Midblock between Harrison Avenue and Cleveland Avenue, the 6-inch water main is expected to be in conflict and lowered, while the 8-inch sanitary is not expected to be in conflict with the proposed storm drain.

Inlets are proposed just north of Cleveland Avenue on both the east and west side of 3rd Street to intercept 4 cfs. Additional water main conflicts are anticipated with the 8-inch and 14-inch water mains as the storm drain crosses into the southern lanes of Cleveland Avenue. At 2nd Avenue, an additional lowering of the 14-inch water main will be required for the storm lateral to intercept flow on the north side of Cleveland. Additional flow is intercepted at 1st Avenue before the storm drain improvements continue west.

Approximately 135 feet east of Boxelder Creek, the Cleveland Avenue Outfall is proposed to be tunneled underneath the Burlington Northern Railroad. A trenchless installation is proposed to maintain operation of the railroad during construction of the storm drain system. Downstream of the railroad crossing, the outfall discharges into Boxelder Creek downstream of Cleveland Avenue. The peak discharge from the storm drain system to Boxelder Creek is 17 cfs during the 10-year design flow.

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Table 6-5: Cleveland Avenue Outfall Cost Estimate

BID ITEM NO.	DESCRIPTION OF BID ITEM	TOTAL QUANTITY	PAY UNIT	UNIT Cost	TOTAL COST
GENERAL					
1	DEWATERING (2%)	1	LS	\$ 18,475	\$ 18,475
2	MOBILIZATION (5%)	1	LS	\$ 46,188	\$ 46,188
3	TRAFFIC CONTROL (2%)	1	LS	\$ 18,475	\$ 18,475
4	UTILITY COORDINATION / RELOCATION (10%)	1	LS	\$ 92,375	\$ 92,375
5	STORMWATER MANAGEMENT / EROSION CONTROL (5%)	1	LS	\$ 46,188	\$ 46,188
Subtotal Additional Capital Improvement Costs				\$	221,700
REMOVALS					
6	REMOVE EX ASPHALT	4,456	SY	\$ 7	\$ 31,189
7	REMOVE EX CURB AND GUTTER	90	LF	\$ 10	\$ 900
STORM DRAIN IMPROVEMENTS					
8	18-INCH RCP	500	LF	\$ 150	\$ 75,000
9	24-INCH RCP	336	LF	\$ 180	\$ 60,480
10	30-INCH RCP	716	LF	\$ 215	\$ 153,940
11	36-INCH RCP	369	LF	\$ 251	\$ 92,619
12	36-INCH FES	1	EA	\$ 6,000	\$ 6,000
13	36-INCH FLAPGATE	1	EA	\$ 17,000	\$ 17,000
14	FLAT TOP MANHOLE, 6 FT DIA	3	EA	\$ 9,000	\$ 27,000
15	FLAT TOP MANHOLE, 8 FT DIA	6	EA	\$ 12,500	\$ 75,000
16	TYPE R INLET, 5 FT	10	EA	\$ 7,500	\$ 75,000
17	ASPHALT PAVING (6" DEPTH)	4,456	SY	\$ 40	\$ 178,222
18	CONCRETE CURB AND GUTTER	40	LF	\$ 60	\$ 2,400
19	WATERLINE LOWERING	6	EA	\$ 5,500	\$ 33,000
20	RAILROAD BORING	80	LF	\$ 1,200	\$ 96,000
Subtotal Capital Improvement Costs					\$923,750
Construction Subtotal					\$1,145,450
ADDITIONAL PROJECT COSTS					
Engineering		20%		\$	229,090
Legal / Administrative		5%		\$	57,273
Contract Admin / Construction Management		10%		\$	114,545
Contingency (25%)		25%		\$	286,363
Total Project Costs					\$1,832,720

6.3.5 3RD STREET / LINCOLN AVENUE OUTFALL

The 3rd Street / Lincoln Outfall improvements will intercept flow in west Old Town south of Cleveland Avenue and convey flow to Coal Creek, reducing the flood hazards throughout the basin. The outfall extends south along 3rd Street from McKinley Avenue to Lincoln Avenue where the system turns east to Coal Creek. In conjunction with upstream improvements, the outfall system will reduce flooding hazards within the tributary area up to the 10-year design storm.

Just north of McKinley Avenue the proposed inlets and 24-inch RCP storm drain system intercepts 4 cfs. The storm drain crosses a fire hydrant lateral and a 6-inch water main, both anticipated to require lowering, as the improvements cross McKinley Avenue. Midblock between McKinley and Roosevelt Avenue, the storm conveying runoff at a design slope of 0.7 percent crosses over an 8-inch sanitary sewer.

Before Roosevelt Avenue, the proposed improvements collect an additional 3 cfs as the system continues south to Lincoln Street. In Roosevelt Avenue, the storm drain will require water line lowering of the 6-inch water main. An additional 8-inch crossing is proposed between Roosevelt Avenue and Lincoln Avenue.

At the 3rd Street and Lincoln Avenue Outfall, laterals are proposed on the west side of the intersection to intercept stormwater runoff, requiring an 8-inch water main lowering. The additional flow and lessening of the slope of the storm drain to 0.25 percent increases the size of the storm drain to a 36-inch RCP. The system continues east along Lincoln, intercepting additional runoff before the 4th Street intersection and the outfall into Coal Creek. The peak discharge of the 3rd Street / Lincoln Avenue Outfall into Coal Creek during the 10-year design storm is approximately 12 cfs.

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Table 6-6: 3rd Street / Lincoln Avenue Outfall Cost Estimate

BID ITEM NO.	DESCRIPTION OF BID ITEM	TOTAL QUANTITY	PAY UNIT	UNIT Cost	TOTAL COST
GENERAL					
1	DEWATERING (2%)	1	LS	\$ 15,793	\$ 15,793
2	MOBILIZATION (5%)	1	LS	\$ 39,482	\$ 39,482
3	TRAFFIC CONTROL (2%)	1	LS	\$ 15,793	\$ 15,793
4	UTILITY COORDINATION / RELOCATION (10%)	1	LS	\$ 78,963	\$ 78,963
5	STORMWATER MANAGEMENT / EROSION CONTROL (5%)	1	LS	\$ 39,482	\$ 39,482
Subtotal Additional Capital Improvement Costs				\$	189,512
REMOVALS					
6	REMOVE EX ASPHALT	3,789	SY	\$ 7	\$ 26,522
7	REMOVE EX CURB AND GUTTER	90	LF	\$ 10	\$ 900
STORM DRAIN IMPROVEMENTS					
8	18-INCH RCP	500	LF	\$ 150	\$ 75,000
9	24-INCH RCP	1,033	LF	\$ 180	\$ 185,940
10	36-INCH RCP	565	LF	\$ 251	\$ 141,815
11	36-INCH FES	1	EA	\$ 6,000	\$ 6,000
12	FLAT TOP MANHOLE, 8 FT DIA	6	EA	\$ 12,500	\$ 75,000
13	TYPE R INLET, 5 FT	10	EA	\$ 7,500	\$ 75,000
14	ASPHALT PAVING (6" DEPTH)	3,789	SY	\$ 40	\$ 151,556
15	CONCRETE CURB AND GUTTER	40	LF	\$ 60	\$ 2,400
16	WATERLINE LOWERING	9	EA	\$ 5,500	\$ 49,500
Subtotal Capital Improvement Costs					\$789,633
Construction Subtotal					\$979,145
ADDITIONAL PROJECT COSTS					
Engineering		20%		\$	195,829
Legal / Administrative		5%		\$	48,957
Contract Admin / Construction Management		10%		\$	97,914
Contingency (25%)		25%		\$	244,786
Total Project Costs					\$1,566,631

6.3.6 5TH STREET OUTFALL

The 5th Street Outfall will intercept stormwater in southeast Old Town from Cleveland Avenue to Coal Creek. The proposed improvements will intercept the proposed 6th Street Outfall at Cleveland Avenue and convey the 10-year design storm to Coal Creek. The proposed improvements described below assumes full implementation of the 6th Street Outfall.

At Cleveland Street, the proposed 48-inch RCP will intercept 52 cfs from the proposed upstream 6th Street Outfall in addition to 11 cfs locally at Cleveland Street, combing for total peak flow of 63 cfs. Additional inlets are proposed mid-block between Cleveland Avenue and Roosevelt Avenue to intercept runoff before flow can spill into the Wellington Housing Authority property which is prone to flooding. Between Cleveland and Roosevelt the existing water main will require relocation in conjunction with the storm drain improvements. A sanitary sewer is present on the east side of 5th Street but no conflicts are anticipated.

At Roosevelt Avenue, 8 cfs is intercepted near the intersection as the proposed improvements transition to a 7-foot wide by 3-foot tall box culvert. The storm drain system conveys a peak flow of 70 cfs south of Roosevelt Avenue towards Coal Creek at a proposed slope of the box culvert of 0.40 percent. The existing waterline will require relocation throughout this stretch and a sanitary crossing is required at Roosevelt Avenue.

South of Roosevelt Avenue, additional flow is intercepted at Lincoln Court and Kennedy Avenue before the box culvert system outfalls into Coal Creek. The peak discharge into Coal Creek from the proposed improvements is 78 cfs during the 10-year design storm. From Roosevelt Avenue to Kennedy Avenue the existing water main in the west side of 5th Street will require relocation as part of the proposed improvements. Sanitary service conflicts are anticipated between Lincoln Court and Kennedy Avenue along the west side of 5th Street. For master planning purposes, a parallel sanitary main has been assumed to be required and included in the cost estimate.

Further consideration will be required if the implementation of the 6th Street Outfall is not imminent. Additional inlets and laterals at Cleveland Avenue should be considered to collect surface flow in an interim condition until the 6th Street Outfall can intercept stormwater north of Cleveland Avenue.

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Table 6-7: 5th Street Outfall Cost Estimate

BID ITEM NO.	DESCRIPTION OF BID ITEM	TOTAL QUANTITY	PAY UNIT	UNIT Cost	TOTAL COST
GENERAL					
1	DEWATERING (2%)	1	LS	\$ 41,396	\$ 41,396
2	MOBILIZATION (5%)	1	LS	\$ 103,490	\$ 103,490
3	TRAFFIC CONTROL (2%)	1	LS	\$ 41,396	\$ 41,396
4	UTILITY COORDINATION / RELOCATION (10%)	1	LS	\$ 206,979	\$ 206,979
5	STORMWATER MANAGEMENT / EROSION CONTROL (5%)	1	LS	\$ 103,490	\$ 103,490
Subtotal Additional Capital Improvement Costs				\$	496,750
REMOVALS					
6	REMOVE EX ASPHALT	5,151	SY	\$ 7	\$ 36,058
7	REMOVE EX CURB AND GUTTER	117	LF	\$ 10	\$ 1,170
STORM DRAIN IMPROVEMENTS					
8	18-INCH RCP	650	LF	\$ 150	\$ 97,500
9	48-INCH RCP	613	LF	\$ 300	\$ 183,900
10	7' W x 3' H RCBC	618	LF	\$ 1,750	\$ 1,081,500
11	CONCRETE HEADWALL, WINGWALL, AND HANDRAIL	1	EA	\$ 15,000	\$ 15,000
12	FLAT TOP MANHOLE, 8 FT DIA	7	EA	\$ 12,500	\$ 87,500
13	TYPE R INLET, 5 FT	13	EA	\$ 7,500	\$ 97,500
14	ASPHALT PAVING (6" DEPTH)	5,151	SY	\$ 40	\$ 206,044
15	CONCRETE CURB AND GUTTER	52	LF	\$ 60	\$ 3,120
16	WATERLINE LOWERING	2	EA	\$ 5,500	\$ 11,000
WATERLINE IMPROVEMENTS					
17	8-INCH PVC (W/ VALVES & FITTINGS)	1030	LF	\$ 200	\$ 206,000
SANITARY SEWER IMPROVEMENTS					
18	8-INCH PVC	300	LF	\$ 80	\$ 24,000
19	CONCENTRIC MANHOLE, 5 FT DIA	3	EA	\$ 6,500	\$ 19,500
Subtotal Capital Improvement Costs					\$2,069,792
Construction Subtotal					\$2,566,542
ADDITIONAL PROJECT COSTS					
Engineering		20%		\$	513,308
Legal / Administrative		5%		\$	128,327
Contract Admin / Construction Management		10%		\$	256,654
Contingency (25%)		25%		\$	641,636
Total Project Costs					\$4,106,468

6.3.7 6TH STREET OUTFALL

The 6th Street Outfall storm drain improvements propose to provide up to a 10-year level of protection to northeast Old Town. The existing storm drain system in 6th Street is currently undersized, leading to surface flooding along the street corridors.

The proposed system intercepts runoff from the north at 6th Street and Grant Avenue. The storm drain will intercept flow from the west side of 6th Street which currently is conveyed through a series of small culverts and roadside swale south to Cleveland. Intercepting flow from the northeast at 6th Street and Grant Avenue will reduce the amount of runoff in the parallel 6th Street storm drain, reducing flood hazards east side of 6th Street.

The 36-inch proposed storm drain collects additional stormwater runoff at each intersection, increasing in size from Grant Avenue to Harrison Avenue to a 42-inch RCP as the system continues south. The proposed improvements turn west in Harrison Avenue where the 10-year peak discharge of 48 cfs is conveyed in a 60-inch wide by 38-inch tall elliptical pipe. One block west at 5th Street the proposed improvements turn south where the system continues past Cleveland discharging into the proposed 5th Street Outfall.

Existing water and sanitary utilities are present throughout the proposed storm alignment. The parallel sanitary in 6th Street is not anticipated to be in conflict with the storm improvements. Sanitary mains will cross underneath the storm improvements in the alleyways between Grant Avenue and Garfield Avenue. The existing water main in 6th Avenue will require relocation to the eastern side of the roadway with the proposed improvements if the roadside swale and culverts on the west side within Town right-of-way are maintained.

The Coal Creek FEMA regulatory floodplain extends throughout the project limits and will require permitting and further consideration during final design.

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Table 6-8: 6th Street Outfall

BID ITEM NO.	DESCRIPTION OF BID ITEM	TOTAL QUANTITY	PAY UNIT	UNIT Cost	TOTAL COST
GENERAL					
1	DEWATERING (2%)	1	LS	\$ 21,263	\$ 21,263
2	MOBILIZATION (5%)	1	LS	\$ 53,158	\$ 53,158
3	TRAFFIC CONTROL (2%)	1	LS	\$ 21,263	\$ 21,263
4	UTILITY COORDINATION / RELOCATION (10%)	1	LS	\$ 106,316	\$ 106,316
5	STORMWATER MANAGEMENT / EROSION CONTROL (5%)	1	LS	\$ 53,158	\$ 53,158
Subtotal Additional Capital Improvement Costs				\$	255,158
REMOVALS					
6	REMOVE EX ASPHALT	5,263	SY	\$ 7	\$ 36,843
7	REMOVE EX CURB AND GUTTER	108	LF	\$ 10	\$ 1,080
STORM DRAIN IMPROVEMENTS					
8	18-INCH RCP	600	LF	\$ 150	\$ 90,000
9	42-INCH RCP	666	EA	\$ 275	\$ 183,150
10	36-INCH RCP	322	EA	\$ 251	\$ 80,822
11	48-INCH RCP	542	LF	\$ 300	\$ 162,600
12	60 W x 38 H HERCP	210	LF	\$ 325	\$ 68,250
13	FLAT TOP MANHOLE, 8 FT DIA	7	EA	\$ 12,500	\$ 87,500
14	TYPE R INLET, 5 FT	12	EA	\$ 7,500	\$ 90,000
15	ASPHALT PAVING (6" DEPTH)	5,263	SY	\$ 40	\$ 210,533
16	CONCRETE CURB AND GUTTER	48	LF	\$ 60	\$ 2,880
17	WATERLINE LOWERING	9	EA	\$ 5,500	\$ 49,500
Subtotal Capital Improvement Costs				\$	1,063,159
Construction Subtotal					\$1,318,317
ADDITIONAL PROJECT COSTS					
Engineering		20%	\$	263,663	
Legal / Administrative		5%	\$	65,916	
Contract Admin / Construction Management		10%	\$	131,832	
Contingency (25%)		25%	\$	329,579	
Total Project Costs					\$2,109,307

6.3.8 SVETA LANE OUTFALL

Table 6-9: Sveta Lane Outfall Cost Estimate

BID ITEM NO.	DESCRIPTION OF BID ITEM	TOTAL QUANTITY	PAY UNIT	UNIT Cost	TOTAL COST
GENERAL					
1	DEWATERING (2%)	1	LS	\$ 21,124	\$ 21,124
2	MOBILIZATION (5%)	1	LS	\$ 52,809	\$ 52,809
3	TRAFFIC CONTROL (2%)	1	LS	\$ 21,124	\$ 21,124
4	UTILITY COORDINATION / RELOCATION (10%)	1	LS	\$105,619	\$ 105,619
5	STORMWATER MANAGEMENT / EROSION CONTROL (5%)	1	LS	\$ 52,809	\$ 52,809
Subtotal Additional Capital Improvement Costs				\$	253,485
REMOVALS					
6	REMOVE EX ASPHALT	1,430	SY	\$ 7	\$ 10,008
7	REMOVE EX CURB AND GUTTER	54	LF	\$ 10	\$ 540
8	EXCAVATION AND HAUL OFFSITE	7,264	CY	\$ 30	\$ 217,933
STORM DRAIN IMPROVEMENTS					
9	18-INCH RCP	300	LF	\$ 150	\$ 45,000
10	66-INCH RCP	383	LF	\$ 525	\$ 201,075
11	72-INCH RCP	580	LF	\$ 650	\$ 377,000
12	72-INCH FES	2	EA	\$ 20,000	\$ 40,000
13	FLAT TOP MANHOLE, 8 FT DIA	4	EA	\$ 12,500	\$ 50,000
14	TYPE R INLET, 5 FT	6	EA	\$ 7,500	\$ 45,000
15	ASPHALT PAVING (6" DEPTH)	1,430	SY	\$ 40	\$ 57,191
16	CONCRETE CURB AND GUTTER	24	LF	\$ 60	\$ 1,440
17	WATERLINE LOWERING	2	EA	\$ 5,500	\$ 11,000
Subtotal Capital Improvement Costs				\$	1,056,188
Construction Subtotal					\$1,309,673
ADDITIONAL PROJECT COSTS					
Engineering		20%	\$		261,935
Legal / Administrative		5%	\$		65,484
Contract Admin / Construction Management		10%	\$		130,967
Contingency (25%)		25%	\$		327,418
Total Project Costs					\$2,095,477

The proposed Sveta Lane Outfall will provide stormwater conveyance for Coal Creek from 300 feet north of Sveta Lane to the open channel south of Jefferson Street. Development has infringed on the Coal Creek flowpath and eliminated stormwater conveyance near Sveta Lane. The improvements will provide a storm drain system to convey flows up to the 10-year design storm along 6th Avenue, reducing street flow and flooding hazards in the area.

At the upstream end of the project, a formalized channel with two 3-foot drop structures are proposed to lower channel grade to allow for the storm drain system in 6th Street. Runoff enters the proposed 66-inch storm drain system and is conveyed south in the 6th Street right-of-way to Jefferson Avenue.

At the 6th Street and Jefferson Avenue intersection, the proposed improvements intercept the existing 6th Street storm drain. The system increases in size to a 72-inch storm drain as the combined 155 cfs is conveyed to the open channel south of Jefferson Avenue during the 10-year design storm.

Parallel water, sanitary, and storm utilities are present along 6th Street. Water main lowerings will be required at Sveta Lane and Jefferson Avenue with the proposed improvements. No relocation of the existing sanitary in Jefferson Avenue is anticipated to be required.

Easement acquisition will be required on the 7837 6th Street property to implement the storm improvements.

Property acquisition should be prioritized north of Jefferson Avenue if opportunities arise. Property acquisition could remove property from the floodplain and allow for conveyance for events that exceed the 10-year design storm providing additional protection to the residents of Wellington.

The FEMA regulatory Coal Creek floodplain is present throughout the project extents and will require permitting and future consideration during final design.

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6.3.9 BUFFALO CREEK / WELLINGTON COMMUNITY PARK OUTFALL

The Buffalo Creek / Wellington Community Park Outfall proposes to alleviate frequent flooding in the Wild West Lane and Buffalo Creek Parkway intersection and convey flow to the existing detention basin in the southeast corner of Wellington Community Park.

The proposed improvements originate on the south side of Wild West Lane in the drainage swale adjacent to Buffalo Creek Parkway. A 24-inch storm drain system is proposed to intercept flow from the swale up to a 10-year design level. New 15-foot Type R inlets are proposed on the north and south side of Wild West Lane to collect 19 cfs of surface runoff from the neighborhood during the 10-year design storm. On the north side of the intersection the proposed improvements collect flow from the existing 36-inch storm drain from the west. The system increases in size to a 60-inch wide by 38-inch-tall horizontal elliptical pipe at a design slope of 0.30%. On the east side of Buffalo Creek Parkway, an additional 15-foot Type R inlet is proposed to collect flow from the north and south along the east side of the intersection. An additional 31 cfs of surface flow contributing to intersection flooding during the 10-year design storm will be intercepted with the proposed improvements.

East of Buffalo Creek Parkway, the existing 36-inch storm drain is proposed to remain in place. The existing system will convey flow east, passing underneath the promenade between the baseball fields, turning south to the detention basin. To provide conveyance for the additional flow collected in the intersection, a secondary alignment is proposed to the south that will not require reconstruction of the ballfield promenade. The 60-inch wide by 38-inch tall horizontal elliptical continues south around the ballfield at a 0.30% design slope. The storm drain system transitions to a 48-inch RCP when ground cover no longer necessitates the use of an elliptical pipe for adequate ground cover. The improvements turn east along Washington Avenue before discharging into the existing detention basin.

Existing water main utility conflicts are anticipated in the Wild West Lane and Buffalo Creek Parkway intersection with the proposed improvements. No sanitary crossings will be required with the proposed improvements.

The FEMA regulatory Boxelder Creek floodplain is present along the proposed storm drain improvement alignment and will require permitting and future consideration during final design.

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Table 6-10: Buffalo Creek / Wellington Community Park Cost Estimate

BID ITEM NO.	DESCRIPTION OF BID ITEM	TOTAL QUANTITY	PAY UNIT	UNIT Cost	TOTAL COST
GENERAL					
1	DEWATERING (2%)	1	LS	\$ 8,514	\$ 8,514
2	MOBILIZATION (5%)	1	LS	\$ 21,284	\$ 21,284
3	TRAFFIC CONTROL (2%)	1	LS	\$ 8,514	\$ 8,514
4	UTILITY COORDINATION / RELOCATION (10%)	1	LS	\$ 42,569	\$ 42,569
5	STORMWATER MANAGEMENT / EROSION CONTROL (5%)	1	LS	\$ 21,284	\$ 21,284
REMOVALS					
6	REMOVE EX ASPHALT	533	SY	\$ 7	\$ 3,733
7	REMOVE EX CURB AND GUTTER	63	LF	\$ 10	\$ 630
STORM DRAIN IMPROVEMENTS					
8	24-INCH RCP	32	LF	\$ 180	\$ 5,760
9	45 W X 29 H HERCP	42	LF	\$ 275	\$ 11,550
10	60 W x 38 H HERCP	392	LF	\$ 325	\$ 127,400
11	48-INCH RCP	484	LF	\$ 300	\$ 145,200
12	24 INCH FES	1	EA	\$ 5,500	\$ 5,500
13	60 W x 38 H FES	1	LF	\$ 15,000	\$ 15,000
14	TYPE R INLET, 15 FT	3	EA	\$ 11,000	\$ 33,000
15	JUNCTION STRUCTURE	1	EA	\$ 25,000	\$ 25,000
16	FLAT TOP MANHOLE, 8 FT DIA	2	EA	\$ 12,500	\$ 25,000
17	ASPHALT PAVING (6" DEPTH)	533	SY	\$ 40	\$ 21,333
18	CONCRETE CURB AND GUTTER	18	LF	\$ 60	\$ 1,080
19	WATERLINE LOWERING	1	EA	\$ 5,500	\$ 5,500
Subtotal Capital Improvement Costs				\$425,687	
Construction Subtotal				\$527,851	
ADDITIONAL PROJECT COSTS					
Engineering		20%		\$ 105,570	
Legal / Administrative		5%		\$ 26,393	
Contract Admin / Construction Management		10%		\$ 52,785	
Contingency (25%)		25%		\$ 131,963	
Total Project Costs				\$844,562	

6.3.10 GMA OUTFALLS

Several proposed improvements were developed outside of current Town limits to help in planning for future growth. Each improvement proposes to reduce flooding hazards by constructing drainage infrastructure to convey flows safely to Boxelder or Indian Creek. Improvements would be heavily reliant on the site grading plans of each specific development; therefore the designs were not refined to conceptual levels and no costs were developed. Each GMA improvement is further described below.

6.3.10.1 GMA OUTFALL – COUNTY ROAD 68

North of County Road 68, an outfall channel is proposed to intercept runoff from the north and safely convey flow to Boxelder Creek. The existing flow path overtops County Road 68 just west of County Road 6 and flows south to the sump location west of Buffalo Creek subdivision. The proposed channel will convey flows east, crossing County Road 68 before discharging into Boxelder Creek. An easement will be required for the proposed improvements and should be incorporated into future development site plan north of County Road 68.

6.3.10.2 GMA OUTFALL – COUNTY ROAD 66

Similar to the County Road 68 improvements, an open channel just north of County Road 66 is proposed to intercept runoff from the north, conveying flows east to Boxelder Creek. Intercepting flows to the north will reduce flooding hazards of the Buffalo Creek subdivision as current overflow sumps west of the existing development. The proposed channel should be implemented as development occurs north in the GMA to acquire the necessary property and easements to implement an open channel to Boxelder Creek.

6.3.10.3 GMA OUTFALL – MERIDIAN POND OUTFALL

The Meridian Pond Outfall proposes to convey discharge from the northeast corner of County Road 6 and County Road 62 south to Jefferson Avenue before turning east to Boxelder Creek. The improvements mitigate flooding hazards for the detention facility by providing formalized conveyance and eliminating the reliance on the irrigation ditch. Once the downstream outfall is in place, modifications to the detention basin outlet will allow the facility to function more efficiently.

At the time of this study, CDOT is currently proposing improvements to the County Road 6 and County Road 62 intersection. No detailed proposed improvements have been included in this study for the Meridian Pond Outfall as the final configuration of the intersection is unknown at this time. The downstream channel is shown on private property and should be considered as development occurs in the area.

6.3.10.4 GMA OUTFALL – SAGE MEADOWS OUTFALL

The Sage Meadow Outfall proposes to mitigate flooding hazards by eliminating the reliance on the lift station that currently drains the subdivision to the north. An outfall proposed south, through the upcoming Fort Collins Farms and Sipes development will allow the subdivision to drain without resilience upon the lift station. Any proposed stormwater conveyance to the south through Ft. Collins Farms and Sipes development must coordinate with the Larimer County Canal to ensure all acceptable release rates into the irrigation ditch are being met. Drainage to the east to Boxelder Creek was evaluated during the alternative analysis but is infeasible due to the existing grades of the detention basin.

6.3.10.5 GMA OUTFALL - EAST WELLINGTON OUTFALL

The East Wellington Outfall proposes to convey flow from the Wellington State Wildlife Area Tributary south to Indian Creek. The existing open channel, which conveys flow to the eastern side of the Cottonwood Park at the Meadows, has a tributary area of approximately 1550 acres. The open channel truncates east of the development and a 30-inch storm drain conveys baseflows to the detention basin located just east of McClellan Drive. Flows in excess of the existing storm drain system pond in the backyards of Cottonwood Park at the Meadows before spilling onto Dunes Street in Park Meadows Estates. The overflow continues south from Park Meadows Estates detention basin into The Meadows creating flooding hazards along Summer Street in The Meadows.

The proposed outfall will convey the Wellington State Wildlife Area Tributary to the south along the eastern edge of the developments. Regrading the overflow spillway from the Park Meadows detention basin into the proposed open channel will greatly reduce flooding hazards to the Meadows development, where the existing spillway discharges flow during large storm events. The Saddleback development was currently under planning during the time of the study, and the ultimate alignment of the proposed outfall channel will greatly depend on the site grading of the development. A new crossing of County Road 60 will be required to convey flow to the south into Indian Creek.

Table 6-11: Master Plan Cost Estimate Summary

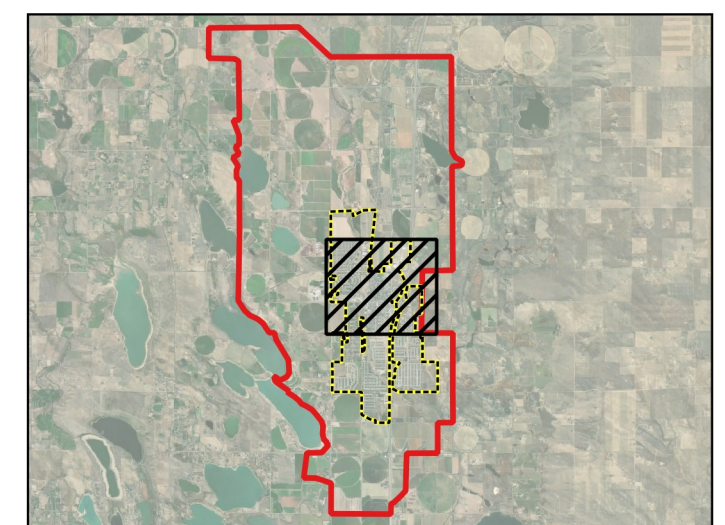
Priority	REACH	CAPITAL	ENGINEERING	LEGAL / ADMINISTRATIVE	CONTRACT ADMIN / CM	CONTINGENCY	TOTAL CAPITAL COST
High	5th Street Outfall	\$2,566,542	\$513,308	\$128,327	\$256,654	\$641,636	\$4,106,468
	6th Street Outfall	\$1,318,317	\$263,663	\$65,916	\$131,832	\$329,579	\$2,109,307
	Sveta Lane Outfall	\$1,309,673	\$261,935	\$65,484	\$130,967	\$327,418	\$2,095,477
	Boxelder Business Park Outfall	\$4,293,100	\$858,620	\$214,655	\$429,310	\$1,073,275	\$6,868,961
	Washington Avenue Outfall	\$5,849,329	\$1,169,866	\$292,466	\$584,933	\$1,462,332	\$9,358,927
	3rd Avenue / Lincoln Avenue Outfall	\$979,145	\$195,829	\$48,957	\$97,914	\$244,786	\$1,566,631
	Buffalo Creek / Wellington Community Park Outfall	\$527,851	\$105,570	\$26,393	\$52,785	\$131,963	\$844,562
Medium	Cleveland Avenue Outfall	\$1,145,450	\$229,090	\$57,273	\$114,545	\$286,363	\$1,832,720
Low	Garfield Avenue Intlet Improvements	\$226,877	\$45,375	\$11,344	\$22,688	\$56,719	\$363,004
Total		\$18,216,285	\$3,643,257	\$910,814	\$1,821,629	\$4,554,071	\$29,146,057

Stormwater Master Plan

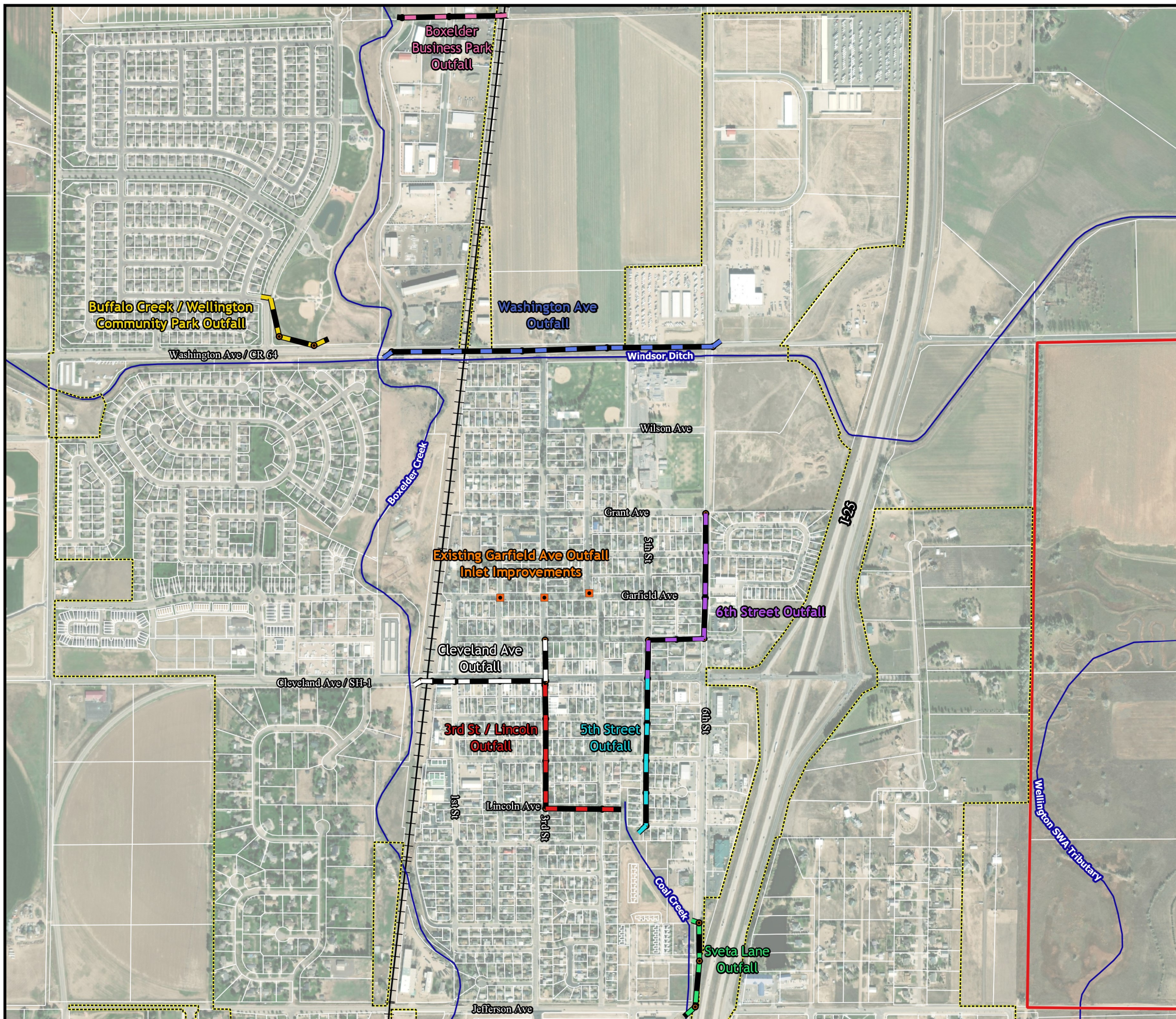
Figure 6-1

Master Plan Town Improvements

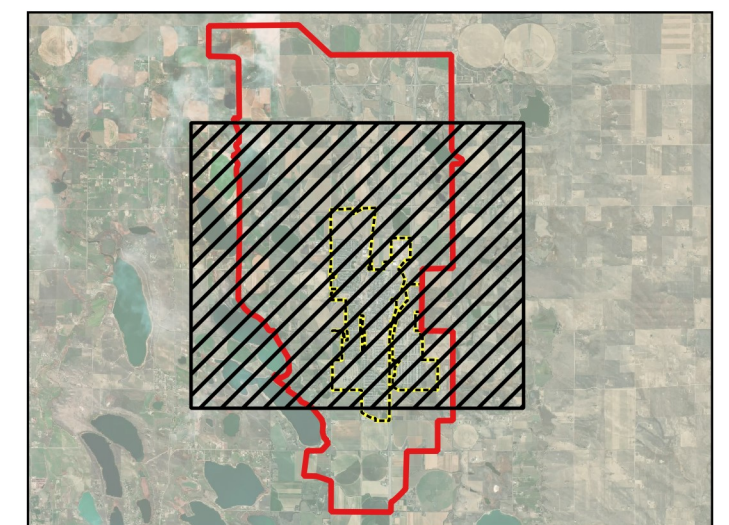
-  Buffalo Creek Proposed Storm Pipe
-  Sveta Ln Proposed Storm Pipe
-  Boxelder Business Park Proposed Storm Pipe
-  3rd St / Lincoln Proposed Storm Pipe
-  5th St Proposed Storm Pipe
-  6th St Proposed Storm Pipe
-  Cleveland Ave Proposed Storm Pipe
-  Washington Ave Proposed Storm Pipe
-  Proposed Manhole
-  Proposed Inlets on Existing Storm Outfall
-  Existing Drainageway / Canals
-  Railroad
-  Town Boundary
-  Growth Management Area



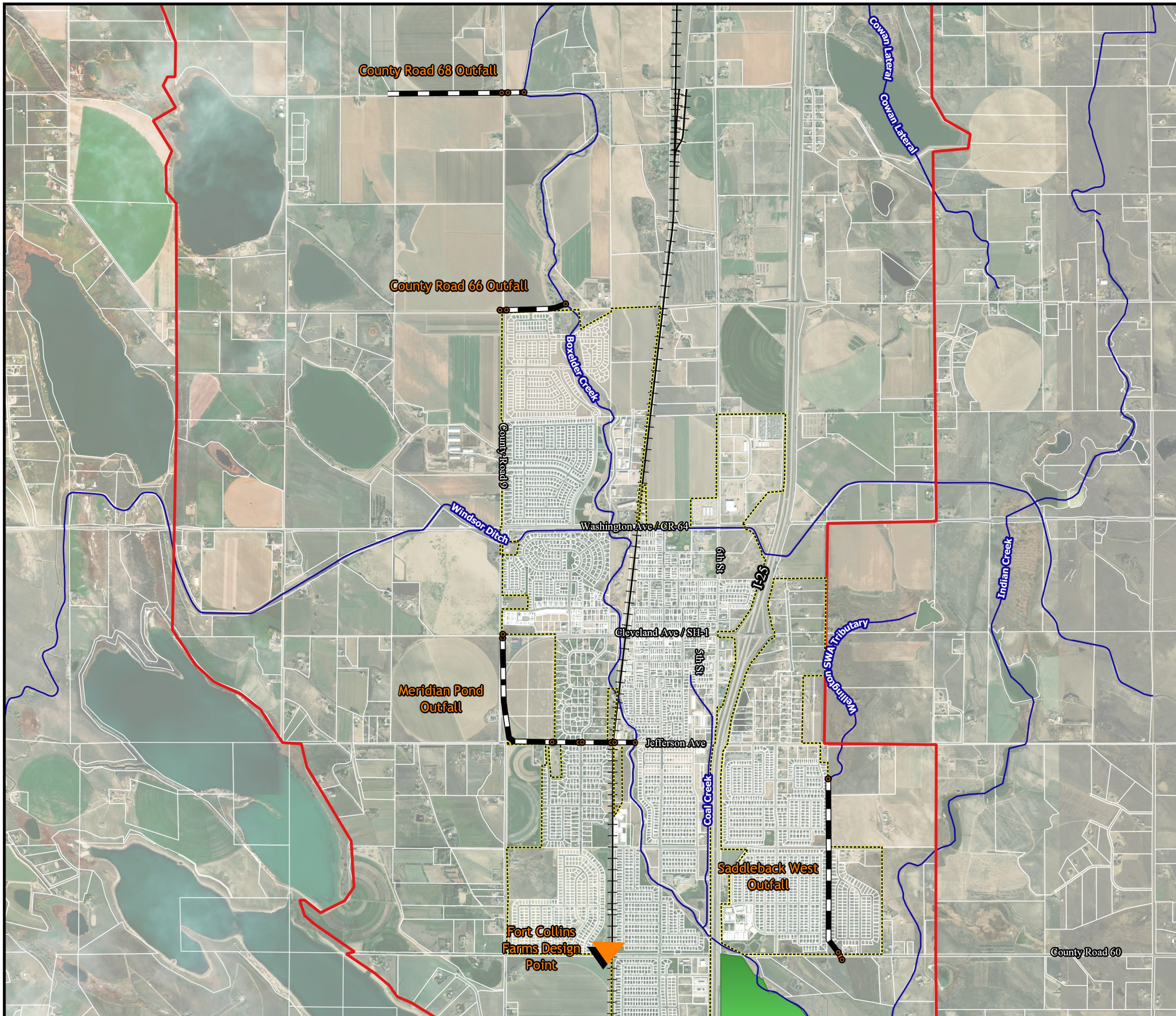
0 1,000 ft



-  Proposed Storm Pipe
-  Proposed Storm Channel
-  Proposed Manhole / Hydraulic Structure
-  Existing Drainageway / Canals
-  Railroad
-  Town Boundary
-  Growth Management Area



0 3,500 ft



6.4 PRIORITIZATION AND PHASING

In general, drainage improvements should be constructed from downstream to upstream to avoid any adverse impacts. Due to the isolated nature of the proposed outfall systems, no adverse impacts would be expected from implementing the proposed projects separately. Consideration should be given to proposed outfall systems in Old Town to ensure no adverse impacts occur to downstream systems or the FEMA regulatory floodplain along Coal Creek. A discussion on prioritization from an engineering perspective is presented below:

6.4.1 HIGH PRIORITIZATION

5th Street Outfall – Similar to the 3rd Street / Lincoln Outfall, the 5th Street Outfall will provide protection to Old Town and convey flows along the historic Coal Creek alignment to the open channel south of Lincoln Street. The outfall is ranked in the high prioritization due to the outfall being located within the FEMA regulatory floodplain and the lack of stormwater conveyance and frequent flooding of Cleveland Avenue in Old Town.

6th Street Outfall – The existing 6th Street storm drain is undersized, and frequently flooding has been observed just east of 6th Street and Hayes Avenue. Additional stormwater conveyance will mitigate the frequent flooding as well as collect flows within the regulatory floodplain that currently pose flooding hazards to structures.

Sveta Lane Outfall Flood Mitigation Conveyance – The Sveta Lane Outfall provides stormwater conveyance for Coal Creek to the open channel south of Jefferson Avenue. The proposed improvement is ranked in the high prioritization as it will provide additional conveyance within the Town right-of-way instead of the historic Coal Creek flow path which development has infringed over the years putting structures at risk in the regulatory floodplain.

Boxelder Business Park Outfall - The Boxelder Business Park Outfall proposes to intercept and convey flows to Boxelder Creek. The storm drain improvements will collect flow along the Coal Creek flowpath before it continues south to Washington Avenue, increasing the public safety to Old Town and reducing the size of the Washington Avenue Outfall downstream.

Washington Avenue Outfall – The Washington Avenue Outfall conveys flow from north of Washington Street west to Boxelder Creek. The outfall system will protect Old Town from runoff along the historic Coal Creek flowpath, where a regulatory floodplain is present and will become more common as development occurs in the upstream watershed.

3rd Street / Lincoln Outfall – The 3rd Street and Lincoln Outfall provides key conveyance for pluvial flooding within Old Town and conveys flow to the Coal Creek channel. Consideration should be given to ensure no adverse impacts to downstream properties, this outfall system should be prioritized as one of the first outfall systems to be implemented to collect stormwater runoff from frequently flooded areas on Cleveland Avenue.

Buffalo Creek / Wellington Community Park Flood Mitigation Conveyance – Frequent flooding of the Buffalo Creek Parkway and Wild West Lane intersection has been reported by Town residents and staff. The proposed improvements will provide additional stormwater conveyance through the park to alleviate the flooding risk.

6.4.2 MEDIUM PRIORITIZATION

Cleveland Avenue Outfall – In conjunction with 3rd Street / Lincoln Outfall and 5th Street, the Cleveland Avenue Outfall is pivotal infrastructure to protect the frequent pluvial flooding of Old Town. The Cleveland Avenue Outfall proposed to intercept flow along Cleveland Avenue and safely convey flows to the west in Boxelder Creek.

6.4.3 LOW PRIORITIZATION

Existing Garfield Avenue Outfall Inlet Improvements – The existing Garfield Avenue Outfall is inlet capacity limited, not intercepting as much stormwater runoff as the storm drain pipe can convey. Inlet improvements could be implemented on an isolated basis as funding allows to maximize the existing infrastructure until funding for the future infrastructure is available.

East Wellington Outfall – The Wellington SWA Tributary currently terminates on the east side of Cottonwood Park at the Meadows subdivision. The outfall system would provide a conveyance path for flows exceeding the small storm drain system and provide protection to the developments to the south as well as the adjacent development. This outfall could be incorporated into future development plans in the Saddleback development.

Meridian Pond Outfall – Separating stormwater runoff from irrigation canals and providing a conveyance path for the Meridian Pond will prevent ongoing maintenance concerns and reduce risk to downstream property owners. As development occurs south of Cleveland Avenue, a conveyance path could be provided through the future development to Jefferson Avenue before flowing east to Boxelder Creek.

Sage Meadows Outfall – Although the lift station is currently functioning as intended, providing a long-term gravity fed conveyance path for all stormwater should be a Town goal. With the upcoming development of Sips and Ft. Collins Farms, opportunities should be investigated to provide conveyance paths through the development to convey runoff from the Sage Meadows development to the south.

County Road 66 Outfall – The County Road 66 outfall will be a pivot conveyance system as development occurs within the Growth Management Area. Adequate conveyance from these developments should be provided to Boxelder Creek and not allowed to continue south to pose flooding hazards to existing developments.

County Road 68 Outfall – Similar to County Road 66 Outfall, County Road 68 Outfall will provide conveyance to Boxelder Creek when future development occurs within the Growth Management Area before causing additional flooding hazards to existing developments if the runoff flow path continues south.

6.5 WATER QUALITY IMPACTS

No regional water quality improvements are proposed for the Town of Wellington GMA. New developments will manage water quality on a site-specific basis.

Water quality treatment has been included in each outfall cost estimate and assumed to be a treatment device at the downstream end of each proposed improvement. During the design of each proposed project, further consideration should be given to the most appropriate water quality BMP.

6.6 OPERATIONS AND MAINTENANCE

The recommended plan includes the installation of both surface and subsurface storm drain infrastructure. All proposed improvements will require maintenance to ensure adequate conveyance in the drainage facilities. The increase in maintenance cost will be offset by the reduction in damages to roads and infrastructure caused by the nuisance level flooding currently experienced by the Town.

6.7 ENVIRONMENTAL AND SAFETY ASSESSMENT

Implementation of the selected plan will reduce pluvial flooding hazards across the GMA. Public safety will be increased by reducing the frequency of roadway overtopping and pluvial flooding with the potential to damage buildings and property and restrict emergency access.

7.0 REFERENCES

- 1. ICON Engineering. (2014). Hydrologic Analysis of the Box Elder Creek / Cooper Slough Watershed.
- 2. Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at the following link: <https://websoilsurvey.sc.egov.usda.gov/>. Accessed August 2021.
- 3. Town of Wellington. (2021). Comprehensive Plan
- 4. Flood Insurance Study Larimer County, Colorado. (2013). Federal Emergency Management Agency
- 5. Urban Drainage and Flood Control District (2016) Urban Storm Drainage Criteria Manual Volume 1 and 2
- 6. Town of Wellington. (2015). Standard Design Criteria and Standard Construction Requirements

APPENDIX A - PROJECT CORRESPONDENCE

Wellington Stormwater Masterplan

KICK-OFF MEETING

July 28, 2021 | 1:00PM

Meeting Minutes

ATTENDEES

Nathan Ewert,..... Town of Wellington
 Bob Gowing, Town of Wellington
 Craig Jacobson, ICON Engineering
 Jaclyn Michaelsen, ICON Engineering
 Jeremy Deischer, ICON Engineering
 Amanda Blair, ICON Engineering

• Meetings:

- Future progress meetings will be held monthly, rotating between in-person and virtual meetings or as requested by the Town.

• Developments:

- The Town reviewed several recent and upcoming developments relevant to the master plan. The Town is compiling all the drainage reports and will provide those when available along with a shapefile of the development boundaries.
 - The Sage Meadows development will be considered fully built in the baseline existing conditions model.
 - Poudre School District (PSD):
 - PSD constructed an infiltration retention pond that will be included in the baseline conditions. During the alternative development, the team will investigate possible future outfalls and modifications to this facility. Ideally, the pond will contain an outfall as the town does not prefer retention ponds.
 - PSD is constructing a new school that will be open in 2023.
 - The Sundance, Fort Collins Farms, Sipes, and Saddleback developments will not be included in baseline existing conditions modeling but will be considered in the future conditions model.
 - The Town believed most developments storm drainage infrastructure to be built per plan although some datum adjustments may be required. There are several retention ponds throughout the town. Nathan will assist ICON in determining which facilities are retention and detention ponds.

Baseline Hydrology/Hydraulics:

- As the baseline models are being developed, ICON will identify areas in which the existing GIS inventory will be supplemented with survey data. ICON will provide the Town this information and at that point it will be determined whether the Town will contract directly with the surveyor or whether it will be contracted through ICON.
- The Box Elder study will be used as the basis for subcatchment boundaries within the Town GMA. These boundaries will be revised for the study and converted to use CUHP as the hydrologic methodology.

Problem Areas/Areas of Concern:

- The group identified several areas of concern that will be studied in more detail as the study begins to develop alternatives.
 - The Old Town corridor and SH 1 / Cleveland Street and the known flooding problems in the area.
 - Several residential structures are in the floodplain at the northwest corner of 6th Street and Sveta Lane.

Selected Plan Development:

- The Town was amiable to regional detention as an alternative to solve flooding hazards as long as outfalls are provided and they are not infiltration basins.
- Enhancing the water quality throughout the basin will be considered during alternative analysis
- The wetland inventory will be used to help identify future permitting requirements of any proposed alternative.
- As the study progresses, more consideration will be given to the drainage manual update and the MS4 requirements.
- ICON will analyze a range of events to help identify the flooding concern.

Schedule:

- The anticipated schedule is as follows:
 - Data Collection – end of August 2021
 - Baseline H&H – end of November 2021
 - Alternative Analysis – End of Feb 2022
 - Master Plan – July/August 2022
 - Criteria Manual Update – End of August 2022
- The next meeting will be held on Friday, August 13th.

Action Items:

1. Town
 - Provide drainage reports & shapefile of development boundaries
2. ICON
 - Begin data collection & baseline hydrology phases

- END OF MEETING MINUTES -

To the best of my knowledge, these minutes are a factual account of the business conducted, the discussions that took place, and the decisions that were reached at the subject meeting. Please direct any exceptions to these minutes in writing to the undersigned within ten (10) days of the issue date appearing herein. Failure to do so will constitute acceptance of these minutes as statements of fact in which you concur.

Minutes prepared by:



Amanda Blair
 ICON Engineering, Inc.

August 3, 2021

Wellington Stormwater Masterplan

KICK-OFF MEETING

August 13, 2021 | 1:00PM

Meeting Minutes

ATTENDEES

Nathan Ewert, Town of Wellington
 Craig Jacobson, ICON Engineering
 Jaclyn Michaelsen, ICON Engineering
 Jeremy Deischer, ICON Engineering
 Amanda Blair, ICON Engineering

Review of July 30th Event:

- The group discussed the July 30th storm event. Nathan estimated the event to be between approximately a 25-yr and 50-yr rainfall event. Nathan reviewed areas that experienced flooding including, but not limited to: 4th and Cleveland Ave, along 6th St north of Cleveland, Hayes Cir, Town Hall, and the Meadows subdivision. Clogged drains were complained about near Garfield and at childcare facility. Nathan will forward flooding photos to the team to use within the report.
- Nathan provided background on several areas within the Meadows subdivision which have known to be a flooding concern, storm drain inlets and pipes in the area appear to be undersized. These areas will be further investigated during the problem area identification phase of the study, this includes Crittenton Lane and Meade Street intersection, the southeast corner of Bragg Lane and Summer Street, and the detention basins within the subdivision that are overgrown with vegetation.

Data Collected:

- The group discussed the progress of the data collection.
 - Nathan has provided numerous drainage reports throughout the Town. ICON is currently reviewing this information and will request any additional missing information.
 - ICON will use Larimer County Base map GIS data for the project. The Town previously provided utility information to ICON.

Supplementing Base Terrain:

- Several areas were noted in which the base topography does not reflect the current development. Nathan had previously tried to obtain the information from the development engineers but have been unsuccessful getting the information on state plane datum. ICON will provide an exhibit showing the areas with missing topography. Nathan will attempt to collect the missing information so it can be used for the study.

Hydrology Modeling Approach:

- For the existing conditions land use scenario, no spatial data exists that covers impervious areas within the Town limits. ICON will develop a layer with generalized existing land uses.
- A future conditions land use scenario will be developed using zoning shapefiles that Nathan will provide to the project team.
- Storm drain infrastructure that is 30" and larger will be included in the EPA SWMM model. Infrastructure smaller than 30" will be included when flow is being conveyed in a different direction than the general street topography.

- The CUHP and SWMM approaches were discussed.
 - To account for flows outside of the growth management area (GMA), inflow hydrographs from the Box Elder SWMM model will be placed near the GMA boundary. Some watersheds from the Box Elder study may be discretized to more accurately represent flow within the GMA.
 - As this study will not be modifying FEMA flows on any tributary with a regulatory floodplain, direct flow areas to the drainageways will not be accounted for. Flows discharging to the tributaries will be modeled as outlets in the SWMM model and will not be routed along each drainageway.
 - The group discussed the modeling approach of the canals whether stormwater conveyance within the irrigation canals should be accounted for, or the canals assumed full during the hydrologic modeling. Nathan was not aware of any previous studies along the canal and will discuss internally about the approach going forward. Hydraulic analysis of the canals is not currently included in the scope of the study. The basins will be delineated to include design points along the canal to allow flexibility going forward once the Town has agreed upon an approach to canal modeling.

FLO-2D Inundation Mapping Approach:

- Two separate FLO-2D models will be developed for the Town. A coarse model, with grid cells of approximately 25 or 30 feet will be utilized to help identify general flow paths throughout the GMA. Within the Town, a separate model of 10-foot by 10-foot grid cells will increase the level of detail and help the team identify areas of inundation.
- The group reviewed a building dataset developed by Microsoft which included approximately 50% of the structures within the Town. The model will utilize these building footprints where available and supplement the missing building footprint areas with a higher manning's n values.

Action Items:

1. Town
 - Provide zoning shapefiles for future conditions analysis
 - Provide any supplemental elevation information from developments
 - Provide any additional drainage reports for the area.
2. ICON
 - Prepare exhibit of topographic needs
 - Provide list of any drainage report missing from the project folder
 - Begin baseline hydrology phases

- END OF MEETING MINUTES -

To the best of my knowledge, these minutes are a factual account of the business conducted, the discussions that took place, and the decisions that were reached at the subject meeting. Please direct any exceptions to these minutes in writing to the undersigned within ten (10) days of the issue date appearing herein. Failure to do so will constitute acceptance of these minutes as statements of fact in which you concur.

Minutes prepared by:



Amanda Blair
 ICON Engineering, Inc.

August 18, 2021

Wellington Stormwater Masterplan
Progress Meeting
 September 10, 2021 | 9:00AM
 Meeting Minutes

ATTENDEES

Nathan Ewert, Town of Wellington
 Craig Jacobson,..... ICON Engineering
 Jaclyn Michaelsen, ICON Engineering
 Jeremy Deischer, ICON Engineering
 Amanda Blair, ICON Engineering

Review of Previous Coordination:

- Clogged inlets and outlets in The Meadows and Bragg Lane's storm drain were noted as areas negatively impacted by the July 30th storm event.
- The group discussed ditch modeling. Ditches will be assumed full for modeling, but adjustments may be made as the project continues. The Box Elder pipe crossing at Windsor ditch has caused some safety concerns and there are tentative plans for fill in that location.

Data Collected:

- The group discussed the progress of the data collection.
- Sage Meadows Topo needed.
- ICON will need pond outlet information.
- ICON will continue identifying areas that need more data including missing storm drain data.

FLO-2D Inundation Mapping Development:

The Flo-2D model was discussed and the Town of Wellington agrees with the modeling approach of 10ft by 10-ft cells inside the city and 20-ft by 20-ft cells in the GBA.

Hydrology Modeling Approach:

- ICON will add additional supplemental terrain and identify key areas of concern.
- ICON will begin the SWMM model for the masterplan.
- The group discussed areas of concern including:
 - A storm water lift station and irrigation storm pond at Sage Meadows
 - An Interstate sump pit with no pump
 - Coal creek berms and ponds to Box Elder work as designed (to spill)
 - Elementary ground water pond (to be removed if possible)
 - The Meadows ponding and spilling
 - Sump in Old town according to topo (used to be river channel), but Nathan said it doesn't flood, maybe functioning as an infiltration basin
 - Potential 3rd street outfall
 - Old Coal Creek
 - North Powder lateral west ditch ponding
 - Wellington west driveway culverts and lack of storm drains in this area
 - Polk Circle at viewpoint - designed as channel, but now it is a pipe traveling through train yards to detention ponds without any easements.

- Nathan is working on old town street projects (sidewalk/ gutter improvements from Wilson to Franklin) but not in time for existing conditions.

Action Items:

1. Town
 - Provide zoning shapefiles for future conditions analysis
 - Provide any supplemental elevation information from developments
 - Provide any additional drainage reports for the area.
 - Provide Pond outlet data
2. ICON
 - Continue H&H Development
 - Compare basins with collected data
 - Compile supplemental terrain into one base DEM

- END OF MEETING MINUTES -

To the best of my knowledge, these minutes are a factual account of the business conducted, the discussions that took place, and the decisions that were reached at the subject meeting. Please direct any exceptions to these minutes in writing to the undersigned within ten (10) days of the issue date appearing herein. Failure to do so will constitute acceptance of these minutes as statements of fact in which you concur.

Minutes prepared by:



Amanda Blair
 ICON Engineering, Inc.

September 29, 2021

Wellington Stormwater Masterplan
PROGRESS MEETING
April 7, 2022 | 10:00AM

ATTENDEES

Nathan Ewert Town of Wellington
Jaclyn Michaelsen ICON
Jeremy Deischer ICON
David Crooks..... ICON

1. Update From Town

- a. Grant Budget
 - ICON will be submitting a change order to the Town for out of scope hydrology work once the hydrology phase is complete.
- b. Wellington Local Government Elections & Town Hall Meeting
 - Nathan informed the project team the local government election results are in and there are several newly elected officials.
 - ICON and the Town will introduce the stormwater master plan at the June 21st Board Meeting. The presentation will be non-technical, in a PowerPoint format and last 5-10 minutes.
- c. Report and Webmap Format
 - The format of the stormwater master plan document and webmap will be left to ICON's discretion for the most cost effective and presentable format for the Town.

2. Hydrology Modeling Update

- a. Review Hydrology GIS shp Questions
 - David led the discussion on Hydrology review from a GIS shp.
 - The first question was related to the outfall structure at Meridian Pond. It is a morning glory spillway structure whose invert appears at or above the rim of the pond. Nathan said he would look for more information on this outlet and its rating curve.
 - The second question was the outlet of a detention basin serving the Cottonwood Park at the Meadows subdivision. The basin, located on private property on the southeast corner of Wellington Downs Drive and McClellan Road. This property has a fence along the property line through the detention basin blocking access to the outlet structure. Nathan will investigate what records exist for this area but did not believe the Town to have an easement on the pond. The group agreed if an easement and operation and maintenance plan is not in place for the facility ICON will remove the facility from functioning as a detention basin in the baseline hydrology.

- The third question was asking if there were any known flooding problems in the cul-de-sac on Mammoth Ct east of the intersection with Man O War Dr. Nathan said there was no known flooding issues here, though he would verify with other Town staff.
- The fourth question was asking if there was any ponding at the intersect of Wild West Ln and Buffalo Creek Pkwy. Nathan said there are no known issues here, but this area will be added to the Larimer County FEMA Floodplain as Box Elder Creek lacks conveyance through the Washington Ave. bridge crossing
- The fifth question was related to flooding at the intersection of Cleveland Ave and 4th St. Nathan said there is flooding down the majority of Cleveland Ave in any event larger than a 5-yr storm. The subwatershed at the corner of 4th St. and Cleveland will be discretized to add the inlet into the baseline model.
- The sixth question was related to flooding west from 5th street into an apartment development between Cleveland Ave and Roosevelt Ave. Nathan informed us that this area does flood in an event larger than a 5-yr storm. A diversion curve will be modeled at this location to evaluate the flow that continues south down 5th street and any flows that spill into the apartment development.
- The seventh question pertains to ditch flow through the Bonfire development. The existing GIS layer contained multiple crossings of Glow Ave. Nathan explained flow is conveyed through parallel ditches and conveyed through two pipes. Nathan said the eastern pipe discharges into a pond south of the Funeral Home on N County Rd 7 and then is conveyed back into the ditch. Nathan will investigate whether any grading is available to include in the base topo.
- The eighth question was asking whether to include the topo and pond from the future Patterson development, located northwest of Sage Meadows, in our Baseline H&H Report. Nathan informed the team the development has been approved and should be considered as existing in the topology and the baseline SWMM model.
- The ninth question was related to I-25 drainage and whether to account for inflow in the SWMM model since the CDOT drainage patterns are unknown. After some discussion the team agreed the best approach would be to isolate the CDOT right-of-way and not include any stormwater flows in the baseline model.
- The tenth question was related to the modified orifice plate at the outlet structure at The Knolls at Wellington South Pond 5. The orifice plate bottom had cut open to enlarge the opening to drain the pond. The outlet structure will be modeled with the enlarged opening in the baseline model.
- The eleventh question was regarding the location of a spillway from Park Meadows Pond 1 detention basin. The topology indicated that flow spills south into The Meadows development and not to the east to the undeveloped parcel and future Saddleback development.
- The twelfth question is related to missing topography information for the Wellington Business Center, several industrial plots in the northeast corner of the Columbine Estates Development. Nathan will try to track down this topology data.
- The thirtieth question was related to storm infrastructure data for the Columbine Estates Development. The GIS layer did not include all the infrastructure that had been built based on ICON's field investigation. Nathan will provide any additional

proposed storm improvements for the development and will be included in the model according to the development plans.

- The fourteenth question was related to a storm pipe with missing GIS data that discharges into The Meadows Pond 2, believed to be conveying flow from the Wellington Village Condos. Nathan will investigate whether the drainage report is available to confirm this is the outfall from the development.
- There was also a question related to a sump inlet at the intersection of Buffalo Creek Pkwy and Washington Ave that likely discharges to a pipe that replaced Windsor Ditch. This led into the irrigation canal discussion recorded below.

b. Irrigation Canal Approach Follow Up

- Nathan will reach back out to the irrigation companies regarding what the project team will assume in the baseline hydrologic routing for Windsor Ditch.

3. Action Items

a. From ICON

- Final touches on baseline H&H Model
- 2D Split Flow Analysis
- Confirm Problem areas and Develop Alternatives
- Next meeting confirmed for May 6th, 2022

b. From Nathan – after the Hydrology GIS shp Question Review, ICON had a list of data that Nathan was to see if he could find. Below is a table of that list.

Location	Data Type
Meridian Pond	Drainage Report or Rating Curve
Bonfire Development Pond	CAD Files
Patterson Development	CAD Files
NE corner of Columbine Estates Development	CAD Files
Updated Storm Network for Columbine Estates	CAD or GIS Files
Pipe Discharging into The Meadows Pond 2	DR, CAD or GIS files

4. Schedule

a. The schedule below has been updated and we feel is a realistic timeline for completing each stage.

a. Baseline Hydrology

- i. Model Submittal w/ Memo – March 22nd
- ii. Town Review (2 weeks)
- iii. Baseline Hydrology Report – April 22nd

b. Alternative Analysis

- i. Hydraulic Analysis & Problem Area ID – May 13th
- ii. Develop Alternatives – June 24th
- iii. Alternative Analysis Report – July 8th
- iv. Town Review (1 week)

c. Selected Plan of Improvements

- i. Refine Recommended Plan & Master Plan Report – August 18th
- ii. Town Review (1 week)

- iii. Revise and Finalize Master Plan – September 9th
- d. Criteria Manual Update – September 1st

- END OF MEETING MINUTES -

To the best of my knowledge, these minutes are a factual account of the business conducted, the discussions that took place, and the decisions that were reached at the subject meeting. Please direct any exceptions to these minutes in writing to the undersigned within ten (10) days of the issue date appearing herein. Failure to do so will constitute acceptance of these minutes as statements of fact in which you concur.

Minutes prepared by:


David Crooks | April 7th, 2022
ICON Engineering, Inc.

Wellington Stormwater Masterplan
PROGRESS MEETING
 May 13, 2022 | 9:00AM

ATTENDEES

Nathan Ewert Town of Wellington
 Jaclyn Michaelsen ICON
 Jeremy Deischer ICON
 David Crooks..... ICON

1. Update From Town

- a. Windsor Ditch irrigation company
 - The Department of Public Work Director had a meeting with the Ditch Company this past week. Nathan will follow up as to what was discussed regarding stormwater conveyance in the ditches.

2. Updates from ICON

- a. Final review ongoing on baseline H&H model
 - ICON will continue to conduct an alternatives analysis while concurrently finalizing the baseline H&H model.
- b. Developed initial Town Council presentation
 - ICON reviewed with Nathan the PowerPoint outline for the Town Board presentation on June 21st. Nathan provided several comments ICON will address on the structure and content of the PowerPoint. Nathan described the layout of the board chambers, and everything will be electronically presented with no poster board exhibits. ICON will revise the presentation for the team to review at the next progress meeting, June 10th.

3. Problem Area Identification

- a. Previously mentioned locations
 - ICON reviewed several known problem areas previously identified with the Town. ICON ranked each location (High, Medium, Low) based on the expected severity of the flooding problem. Each problem area and the assigned priority ranking were reviewed with Nathan, described below.
 - ICON identified four problem areas as High Priority
 - The West side of 6th St north of Cleveland Ave to Grant Ave frequently floods. The alternative analysis will consider collecting and conveying flows south, parallel to the existing storm drain system in 6th Street or west to a new outfall system.
 - There is known flooding at the intersection of 4th St and Cleveland Ave, the alternative analysis will consider routing this flow west to Box Elder Creek or south down 3rd St to Lincoln Ave, then east to the Coal Creek.
 - The Alley behind townhall is known to flood, and the proposed solution here is to convey flows west to Box Elder Creek. Nathan agreed with this approach.

- Flooding on the west side of 5th St between Cleveland Ave and Roosevelt Ave, through an apartment development was the next identified. Alternatives will be developed to intercept the surface flow before flow can overtop the curb into the apartment complex.
- ICON identified four problem areas as Medium Priority
 - There is flooding known to happen in the Public Works Maintenance parking lot and dumpster area at the southwest corner of 6th Street and Grant Ave. Alternatives developed along 6th St will mitigate the nuisance flooding problem.
 - There is flooding concerns on the NE corner of Hayes Cir. Nathan noted the surface flooding is not known to impact the houses. An alternative will be developed to convey flows in the undeveloped parcel to the north owned by the city to the west to 6th St.
 - At the Rice Elementary School Pond there are groundwater concerns. Alternatives will be evaluated to reconfigure the inlet structure or regrade the pond.
 - There is frequent ponding at the intersection of Crittenton Ln and Meade St This problem area was identified by Nathan as Low Priority as Crittenton Ln has just been repaved and it would be unfeasible to revamp the storm system under the road. Additionally, the Streets Superintendent in Wellington noted that this intersection only ponds in large storm events.
- ICON identified three problem areas as Low Priority
 - There is a swale that conveys overflow flows from Park Meadows Pond into The Meadows development. There is an adjacent development, Saddleback, that is proposing a channel on the western limit of The Meadows development.
 - There is capacity concern conveying flows west to east under McClellan Road between The Meadows Ponds as the vegetation is overgrown on the eastern side of McClellan Road. The master plan will include a section recommending O&M plans for all detention facilities.
 - Flows commonly overtop the curb and flow down the spillway at the junction of Bragg Ln and Sumner St. It seems that this system is functioning properly and likely no solution will be proposed within the Master Plan.
- b. Newly identified locations
 - There were three new locations identified by Town as problem areas. There are two High Priority locations identified by the Town Streets Superintendent and one Medium Priority location identified by Nathan as outlined below. ICON will assess these locations in the Alternative Analysis and identify solutions within the Master Plan
 - The first High Priority location is the Town's Streets Superintendent number one concern. There is consistent flooding at the intersection of Buffalo Creek Pkwy and Wild West Ln. Flows back up in Buffalo Creek Pond 1, through the baseball diamonds over the road and into the properties East of Buffalo Creek Pkwy.
 - The second High Priority location identified by the Streets Superintendent is flooding on Firewater Ln at the intersections of Raging Bull Ln and Smoke Signal

Way. Flooding backs up on the road here and inundates adjacent properties. ICON will investigate modifying storm drain inlets at these locations.

- The Medium Priority location identified by Nathan is flooding in the backyards of properties on the Eastern side of the Viewpointe Development, particularly those on the east side of Revere Ct, Polk Cir, and Adams Cir. There is discharge from a HDPE pipe into backyards and that flow is conveyed South to Viewpointe Pond through backyards via a cross pan and swale. There is no maintenance agreement here and no easements, and some property owners or renters are impeding the flow through their properties which is leading to more flooding issues.

c. Preliminary H&H baseline model assessment

- ICON asked Nathan if there were any considerations to be aware of when developing alternatives, specifically the street overlay program that could be combined with storm drain improvements. Nathan informed the team that there is an Old Town street repair project which includes the construction of cross pans across Harrison Ave from 4th St to 2nd St.
- ICON was curious if the railroad companies needed to be identified as stakeholders in the master planning process. Nathan agreed improvements would be designed per the standard storm drain crossing detail from the railroads but would not be brought on as a stakeholder.

4. Alternative Categories

a. Stormwater Alternative Categories

a. No Action Alternative

- A no action alternative will be included in the alternatives analysis.

b. Minimum Criteria Alternative

- Storm drain alternatives will be developed at a minimum to meet current Town storm drain criteria.

c. Flood Hazard Mitigation Alternative

- An alternative category will be developed that provides additional protection above the minimum Town criteria. ICON discussed how other master plans have utilized a 5-, or 10-year design storm level of protection in downtown areas. It was agreed for this study a 5-year design storm would be the flood mitigation alternative

b. Additional Alternative Categories

a. Canal Base Flow Separation Improvements

- Canal base flow separation improvements will be included in the alternatives analysis that recommends the separation of stormwater from irrigation canals.

b. Regional Detention Improvements

- The Town was asked if regional detention improvements should be considered in the Master Plan given that most of the developments have local detention. Generally regional detention won't be included as each future development will be required to provide onsite detention, but regional detention will be considered in the Sundance and Fort Collins Farms development areas.

c. Water Quality / LID Volume Reduction

- ICON will include a paragraph that encourages the implementation of Water Quality and Low Impact Design within the Master Plan but will not design site specific improvements.

d. Stream Buffer Width

- ICON reviewed approaches from previous master plans to provide general guidance and a buffer width for future drainageways. It was agreed upon between ICON and Town to call out a specific stream buffer width in the Master Plan.

5. Next Steps

a. Develop Alternatives

- Several preliminary alternatives were reviewed with the Town for initial feedback.
 - Alternatives will be developed to evaluate the feasibility of the proposed improvements. The first of these is a channel conveying flow southeast through the proposed Saddleback development. Nathan informed ICON that there would be another development north of Saddleback although the development was in the very preliminary stages.
 - At Sage Meadows Pond, alternatives will be developed to gravity drain the facility so the pump station would not be relied on in perpetuity. Initially the alternative will propose to convey the flow east to Box Elder Creek upstream of the I-25 crossing. Nathan seemed to this alternative was plausible as well.
 - Alternatives will be developed at Rice Elementary that propose reconfiguring the outlet structures and reshaping of the detention facility.
 - The newly constructed retention basins at the Poudre District High School were functioning as designed and no improvements to these facilities will be developed.
 - At Meridan Pond, located at the northeast corner of CR-62 and CR-9, the outlet structure is currently configured to retain stormwater. Flows more than the detention basin capacity will overflow to the west into the irrigation ditch. An alternative was discussed to separate the stormwater from the canal flow. Nathan informed ICON that a transportation project was being designed just south of Meridan. The design of these improvements is still in the preliminary stages and further coordination will be required with the transportation project stakeholders while exploring this alternative.
 - Alternatives regarding flooding in Old Town was discussed. It was agreed upon it would be best to convey flow west to Box Elder Creek and south to Coal Creek. Several streets were discussed for ICON to evaluate for storm drain alignments including 1st, 2nd and 3rd St, and Mae Ct. Alternatives will be developed where street conveyance capacity is exceeded, determined from MHFD street capacity spreadsheets.
 - Along the Coal Creek drainageway path, a private property impedes the drainageway at the northwest corner of 6th St and Sveta Ln. Alternatives at this location will include property acquisition and open channel improvements as well as a storm drain alternative in 6th St.
 - North of Washington Ave (E CR 64) east of Box Elder Creek alternatives will be developed to convey flows west to Box Elder Creek before flows spill over the roadway into the Windsor Ditch. Conveying flows west to Box Elder Creek will

provide additional protection to the downtown area and reduce the size of infrastructure required in the downtown basin.

- Outside of the Town limits within the growth management area (GMA), the stream buffer width approach previously discussed will be utilized. Formal conveyance paths will be recommended in the master plan to provide guidance to future developments within the GMA.
- There is a proposed asphalt plant east of Box Elder Creek between E CR 64 and E CR 66. Nathan will coordinate with the developers about conveying this flow directly to Box Elder Creek which would reduce the infrastructure proposed in the master plan to the south.

b. Next Progress Meeting – June 10th

- ICON is to have the PowerPoint presentation draft finished and have drawn profiles for stormwater conveyance to review next meeting.

c. Board Meeting – June 21st

- ICON will present its progress on the Wellington SWMP via PowerPoint to the Town's Board on June 21st, 2022.

6. Project Schedule

- The schedule below has been updated and we feel is a realistic timeline for completing each stage.

a. Alternative Analysis

- a. May 13th: Problem Area ID Review
- b. May 13th – June 10th: Develop Alternatives
- c. June 10th: Meet with Town to Review Alternatives
- d. June 10th – June 24th: Revise Alternatives based on Town feedback
- e. June 21st: Board Presentation
- f. June 24th – July 8th: Develop Cost Estimate, Report, Recommended Plan
- g. July 8th: Meet with Town to Review Costs and Report Overview
- h. July 8th – July 22nd: Town Review & Selected Plan Letter

b. Selected Plan of Improvements

- a. July 22nd – August 12th: Refine Selected Plan to Conceptual Level
- b. August 12th: Meet with Town to Review Conceptual Design
- c. August 12th – August 19th: Town Review
- d. August 19th – September 9th: Address Town Comments and Finalize MP

c. Criteria Manual Update – September 1st

ACTION ITEMS

Town:

1. Coordinate with Public Works regarding the conversation with the Windsor Ditch Company.

ICON:

1. Revise Town Board presentation for next progress meeting
2. Develop Alternatives

- END OF MEETING MINUTES -

To the best of my knowledge, these minutes are a factual account of the business conducted, the discussions that took place, and the decisions that were reached at the subject meeting. Please direct any exceptions to these minutes in writing to the undersigned within ten (10) days of the issue date appearing herein. Failure to do so will constitute acceptance of these minutes as statements of fact in which you concur.

Minutes prepared by:



David Crooks | May 23rd, 2022
ICON Engineering, Inc.

Wellington Stormwater Masterplan PROGRESS MEETING June 15, 2022 | 2:00 PM

ATTENDEES

Nathan Ewert Town of Wellington
Jeremy Deischer ICON
David Crooks ICON

AGENDA

1. Updates from Town

a. Grant funding update

- The town missed the deadline for FEMA grants, but they were awarded a 1.9M main street revitalization grant from CDOT. RFPs for the project are currently underway. ICON and the Town are hopeful to use some of the CDOT grant money to construct some stormwater master plan solutions concurrently with the main street revitalization construction activities.
- Additionally, the Town is applying for a grant that would be allocated to improvements in Coal Creek.

2. Base Information Review

a. Riskmap Model for Coal Creek and Box Elder

- The Coal Creek floodplain was not impacted by the Larimer County Riskmap update.
- Nathan is to send ICON the Coal Creek model as ICON does not have the most up to date version.
- ICON and Town both have the most up to date version of the Box Elder Creek model.

b. Parcel Alignment

- ICON noticed that the parcel shapefile seems to be slightly shifted from the road centerlines and right of ways in town. Nathan was asked if he has a more accurate parcel file. He informed ICON that the file he got was from Larimer County open data, and that was the same file sent to ICON at the beginning of the study.

c. Sanitary GIS database

- There were two different sanitary utility shapefiles sent over to ICON at the beginning of the study. One called sspipes and the other called 210429_Interceptors_Pipes. ICON asked Nathan if there was a difference between these files as they seemed to overlap in most places. Nathan informed ICON that the 210429 shapefile was the result of a downtown master plan and that he refers to the sspipes shapefile for sanitary pipe elevations.

3. Alternative Development

a. Cleveland Ave

- ICON proposed two alternative storm pipe solutions along Cleveland Ave.
 - The first is a pipe at 0.3% slope that runs east from 3rd St to Box Elder Creek. This pipe is designed to discharge about four feet above the channel invert.
 - The second pipe proposed along Cleveland is at 0.9% and runs east from 2nd St to Box Elder Creek. This pipe is designed to discharge about one foot from the

channel invert.

- Nathan informed the team that since Box Elder Creek is a perennial stream that the 2011 LiDAR data that ICON is using as their surface should be a fairly accurate representation of the channel invert. ICON decided that they will stay as high as they can with their design discharge elevations to remain conservative.

b. Lincoln Ave

- ICON proposed two different alternatives for a storm pipe running along Lincoln Avenue and discharging into Coal Creek.
 - The first of these alternatives runs along 3rd street from Cleveland Ave south to Lincoln Ave and then turns east along Lincoln ave and discharges at the invert of Coal Creek.
 - The second alternative takes the same path as the first, however the invert of the downstream end of pipe is two feet lower than the invert of coal creek. In this alternative ICON shows proposed grading in the channel so that the pipe would discharge at the proposed channel invert.
- Since the second proposed alternative would involve a significant amount of earthwork it would be more expensive. ICON asked Nathan if he thought it would be worth including this alternative in the master plan since it would be significantly more expensive. Nathan said it is worth including. Yet, Nathan also spoke to the downstream impacts that grading the channel would have. Also, Coal Creek runs through several parcels of private property in this area, and this would be a hurdle for both the City and property owners.
- ICON and Nathan spoke about include another alternative that takes flows from Cleveland into a pipe running south along 5th St and then turning southwest at the junction of 5th St and Kennedy Ave and discharging at the invert of Coal Creek. ICON and Nathan agreed that this alternative is feasible and will be prepared for next meeting.

c. Mae Ct / Jefferson Avenue

- Both the Mae Ct and Jefferson Ave take flows west and discharge into Box Elder Creek.
 - The Mae Ct alternative is a proposed pipe to replace and upsize an existing storm pipe running from 3rd St along Mae Ct and discharging to Box Elder Creek.
 - The Jefferson Ave alternative is a proposed channel running on the north side of Jefferson Ave. This channel would start east of 3rd St and convey flows to the west discharging to Box Elder Creek.
- ICON was concerned that both the alternatives may not be necessary to propose as they both pull flooding flows from the same problem area. Nathan spoke to this saying to include both in the master plan and the decision to choose on or the other could be made in the future.

d. Sage Meadows / Ft. Collins Farms

- ICON discussed the feasibility of these two alternatives with Nathan. Both of these alternatives goal was to eliminate the pump station from the south Sage Meadows pond that pumped flows to the north Sage Meadows pond.
 - The first alternative was to convey flows from the southern Sage Meadows Pond east to Box Elder Creek. The invert of the pond and Box Elder Creek are roughly the same elevation. Due to this ICON found this alternative to be unfeasible.
 - The second alternative was proposed conveyance from south Sage Meadows pond to the south into the soon to be developed Fort Collins Farms parcels. Nathan was to talk to Shane from the city regarding off site flows coming into

this development. ICON put this alternative on hold.

- Additionally, ICON inquired about conveyance from Columbine Estates retention pond. Nathan said that this was not necessary for the scope of the master plan.

e. Meridian Pond

- ICON proposed this alternative to convey overtopping flows from Meridian Pond in a channel south along N County Rd 9 and east along Jefferson Ave and finally discharging into Box Elder Creek.
 - Nathan informed ICON that CDOT pledged money for a roundabout improvement at the intersection of E County Rd 62, N County Rd 9, and CO State Hwy 1. There is potential for some of this funding to be allocated toward drainage improvements here.

f. Washington Street

- ICON proposed storm conveyance west along Washington Ave from just east of N County Rd 7 to Box Elder Creek.
 - There was a question whether storm flow would best be conveyed in a channel or pipe. Nathan submitted that a pipe running down Washington Ave would be best due to heavy industrial activity in the area.

g. CO-66 / CO-68

- Both proposed alternatives convey flows east along E County Rd 66 and E County Rd 68, respectively, to Box Elder Creek.
 - ICON asked Nathan if he thought piped or open channel flow would be better in these locations. Nathan thought an open channel design would be best here. ICON would develop these alternatives and find flow rates.

4. Alternatives To Be Developed

a. Coal Creek (NW corner of Sveta Ln / 6th St)

- This alternative would convey flow from the proposed Lincoln and 5th street alternatives listed above from the upper portion of Coal Creek to the lower portion of Coal Creek south of Jefferson Ave.
- i. Storm Drain vs. Open Channel
 - ICON asked Nathan whether it would be best for this alternative to be proposed as piped flow or open channel. Nathan responded with piped flow as there is conflict here with property owner parcels, and it would be difficult to get easements.

b. 4th Street / 6th Street north of Cleveland Ave

- ICON informed Nathan of several potential alternatives conveying flow south from Garfield to Kennedy. The team asked Nathan whether 4th St, 5th St, or 6th St would be the best candidate.
 - Nathan informed the team that 5th St would be the best candidate as it is not as busy as 6th St and there is a wider right-of-way on 5th St than that of 4th St.
 - ICON is to develop this alternative and get a slope and flow rate.

c. Buffalo Creek / Wild West Lane

- ICON is to develop a proposed alternative here to pull flows from a known flooding area at the intersection of Buffalo Creek Pkwy and Wild West Ln to the east and discharge into the southernmost Buffalo Creek Pond.
 - The team and Nathan came to agreeance that the best approach would be to pipe flow east across Buffalo Creek Pkwy and then take it southeast around the baseball diamond and discharge into the pond.
 - ICON is to develop this alternative and get a slope and flow rate.

d. Sundance Swale

- The team talked about developing an alternative that would take flows from the East and discharge South of the proposed Sundance development.
 - Nathan informed ICON that Sundance would need to rePLAT before developing, so it'd be good to develop this alternative for the masterplan.
 - ICON is to develop this alternative and get a slope and flow rate.

e. Rice Elementary School Pond

- This alternative would be to improve the currently degrading Rice Elementary School Pond.
 - Nathan told the team to put this alternative on hold as it is on Poudre School District property.

f. Indian Creek/Saddleback

- This alternative is to pull flows from the north of the proposed Saddleback development to Indian creek. ICON proposed two alternative ideas here.
 - One taking flows south between the existing Meadows development, to the west, and the proposed Saddleback development, to the east, and discharging south of E County Rd 60.
 - The other was to convey flows southeast through the proposed Saddleback development and discharge into Indian Creek.
 - ICON is to develop these alternatives and get a slope and flow rate.

5. Next Steps

a. Next Progress Meeting – July 8th

- ICON will present its progress on alternatives and cost estimates and PowerPoint to Nathan on July 8th, 2022.

b. Board Meeting – July 19th

- ICON will present its progress on the Wellington SWMP via PowerPoint to the Town's Board on June 19th, 2022

ACTION ITEMS

ICON:

1. Jackie to develop and deliver change order for preliminary H&H to Nathan
2. Finalize current alternatives
3. Develop remaining alternatives
4. Prepare Cost Estimates

Project Schedule

Alternative Analysis

- June 10th: Meet with Town to Review Alternatives
- June 10th – June 24th: Revise Alternatives based on Town feedback
- June 24th – July 8th: Develop Cost Estimate, Report, Recommended Plan
- July 8th: Meet with Town to Review Costs and Report Overview
- July 8th – July 22nd: Make any Town Revisions, Town Review & Selected Plan Letter
- July 19th – Board Presentation

Selected Plan of Improvements

- July 22nd – August 12th: Refine Selected Plan to Conceptual Level
- August 12th: Meet with Town to Review Conceptual Design

- August 12th – August 19th: Town Review
- August 19th – September 9th: Address Town Comments and Finalize MP

Criteria Manual Update – September 1st

- END OF MEETING MINUTES -

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Minutes prepared by:


David Crooks | June 20th, 2022
ICON Engineering, Inc.

Wellington Stormwater Masterplan
PROGRESS MEETING
July 8, 2022 | 9:00 AM

ATTENDEES

Nathan Ewert Town of Wellington
Jaclyn Michaelsen ICON
Jeremy Deischer ICON
David Crooks..... ICON

AGENDA

- Nathan asked the team if this meeting could be shortened as there was construction at the Wastewater Treatment plan this morning. The ICON team agreed to just highlight the main finding and ask pertinent questions.
1. Updates from Town
 - a. Grant pursuit / funding update
 - No update from the town regarding grant pursuit. Nathan informed the team that there is a meeting regarding this topic in the next few weeks. We will have more information by the August meeting.
 2. Town Presentation
 - a. Review draft presentation ([LINK](#))
 - ICON provided a draft presentation for the up coming PowerPoint presentation at the July 19th Town Hall Meeting.
 - Nathan told the ICON team that there was no need to include plan and profile alternative exhibits in the presentation. But, he did suggest that the team include an exhibit that shows the proposed improvements as simply 2D lines in plan view. He also suggested including a problem area ID slide within the presentation.
 - Nathan also informed that group that they will likely get questions about the Box Elder Creek floodplain, and that he will answer these questions.
 - ICON is to have the PowerPoint presentation to Nathan and Bob by Monday July 18th so they can upload it. The presentation will be at 6:30 PM at the Leeper Center attached to the Wellington Public Library.
 - Jeremy then ran through the draft presentation for Nathan. Nathan stated that he thought the presentation identified problem areas well and allows the Town to get FEMA grants. He added that it would be good to include intentions or benefits of a SWMP in the presentation.
 3. Alternative Development
 - a. Costs
 - ICON informed Nathan that they plan on working on developing alternative costs before the next group meeting.
 4. Alternative Plans
 - a. Old Town Flood Mitigation Combination Alternative – 10-yr
 - i. Washington St
 - Jeremy stated that this alternative would collect a lot of flow coming into Town from the North and discharge it west to Box Elder Creek
 - ii. Garfield Ave Inlet Improvements

- For the 10-yr storm increase inlet capacity will help alleviate flooding flows on Cleveland
 - iii. Cleveland Ave Outfall to Harrison
 - iv. 5th Street
 - ICON asked Nathan if he thought it would be good to present the Old Town Alternatives as a system or provide more robust, stand alone, alternatives. Nathan responded with it is good as a system but could be confusing depending on how the information is presented.
 - b. Discuss approach to individual Old Town Alternatives
 - The team did not discuss this bullet point in the interest of time.
 - c. Buffalo Creek / Community Park Alternative
 - The team did not discuss this bullet point in the interest of time.
 - d. Coal Creek at Sveta Ln
 - This alternative raised into the question the issue of property acquisition where Coal Creek swale conveys stormwater through adjacent properties.
 - Nathan informed the group that the property south of the veterinarian’s office may be bid out and developed.
 - He also said that this property could potentially be purchased by the Town with the help of a FEMA flood mitigation grant.
 - Nathan thinks it’s feasible to propose drop structures in the swale to convey flow to 6th St.
 - Finally, Nathan informed the group that there is no need to include a 100-yr alternative for Coal Creek conveyance.
5. Other Alternatives in Development
 - a. North 5th Street
 - The team did not discuss this bullet point in the interest of time.
 - b. Mae Ct / Jefferson Avenue
 - The team did not discuss this bullet point in the interest of time.
 - c. Sage Meadows / Ft. Collins Farms (Update from Shane?)
 - Jeremy asked Nathan if he had talked with Shane about stormwater conveyance through Fort Collins Farms. Nathan informed the team that construction on the last stage of Sage Meadows will begin on July 11th, and that design on Fort Collins Farms is starting. He said it is not necessary to develop an alternative for this area yet.
 - d. Meridian Pond (CDOT Update?)
 - The Church to the south of Meridian Pond is proposing an expansion along with the CDOT project. There will be a public meeting on July 14th with the county commissioner to discuss further action at this intersection. Currently the CDOT grant and project is on hold.
 - e. CO-66 / CO-68
 - The team did not discuss this bullet point in the interest of time.
 6. Next Steps
 - a. Revise Alternatives & Prepare Cost Estimates
 - b. Send to Town for Review – July 15th

c. Board Meeting – July 19th

Project Schedule

Alternative Analysis

- July 8th: Meet with Town to Alternatives
- July 15th – Submit Alternatives & Cost Estimates to Town for Review
- July 15th – July 22nd: Town Review & Selected Plan of Improvements
- July 19th – Board Presentation

Selected Plan of Improvements

- July 22nd – Additional Progress Meeting to review Selected Plan
- July 22nd – August 12th: Refine Selected Plan to Conceptual Level
- August 12th: Meet with Town to Review Conceptual Design
- August 12th – August 19th: Town Review
- August 19th – September 9th: Address Town Comments and Finalize MP

Criteria Manual Update – September 1st

- END OF MEETING MINUTES -

To the best of my knowledge, these minutes are a factual account of the business conducted, the discussions that took place, and the decisions that were reached at the subject meeting. Please direct any exceptions to these minutes in writing to the undersigned within ten (10) days of the issue date appearing herein. Failure to do so will constitute acceptance of these minutes as statements of fact in which you concur.

Minutes prepared by:


David Crooks | August 17th, 2022
ICON Engineering, Inc.

Wellington Stormwater Masterplan
PROGRESS MEETING
 August 19, 2022 | 9:00 AM

ATTENDEES

Nathan Ewert Town of Wellington
 Bob Gowing Town of Wellington
 Jaclyn Michaelsen ICON
 Jeremy Deischer ICON
 David Crooks..... ICON

AGENDA

1. Updates from Town

a. Main Street Revitalization Funding Update

- Nathan presented the revitalize Main Street project to the town board and informed them that they would be pursuing funding for the project.
- Bob informed the ICON team that there is \$1.3M of MMOF grant funding going to the executive committee of the upper TPR. The goal of Wellington is to secure the full amount of available funding from the upper TPR. This will require the project proposal going to TPR for a vote.
- In addition to the MMOR grant funding available there is also a surplus of CDOT funding for the revitalizing Main Street project estimated to be about \$1.8M.
- To secure the funding from CDOT, the project would have to be designed and constructed to CDOT standards.
- Even if the total of MMOF and CDOT funding was secured by Town there would not be enough funding to complete the entire Old Town system proposed in the ICON MP.
- The Town suggested that the best proposed alternative that the funding would likely cover would be a more robust Cleveland Ave storm drain system.
- With this, there would need to be thorough H&H work to ensure that adjacent properties would not be adversely impacted by the implementation of the proposed system, since the 100-yr flows would not be contained in the Cleveland Ave storm pipe.

b. Community Survey

- Wellington conducted a town survey, and several areas of opportunity were identified as a result. They are as follows:
 - The gutters on Harrison Avenue need replacement.
 - Do not need to plan on including this improvement in MP.
 - At 3255 Thundering Herd Way, the crossspan is cracked due to tree root growth underneath.
 - The East Wellington outfall is a PVC underdrain storm pipe that needs improvement. There is a lot of flooding at the inlet for this pipe which is located at the intersection of Hayes Avenue and Hayes Cir.

2. Alternative Development

a. Costs

- i. MP Cost Approach
 - Jeremy displayed a couple of different formats of spreadsheets for displaying costs for the MP alternatives. One of which was the MHFD workbook for cost estimates and the other the ICON workbook.
 - It was agreed upon by the Town that the ICON workbook would be best to proceed with.
- ii. Units Costs
 - The maintenance cost calculated in the ICON workbook was calculated using a method from the MHFD cost estimate workbook.
 - Bob suggested that there was no need to include this cost in the Master Plan.
- iii. Other cost items (Engineering, Legal / Admin, etc.)
 - The Town offered ICON feedback that the percentage costs for Engineering and Contingency seem a bit low.
 - The team decided to bump the Engineering cost up to 20%.

3. Other Alternatives in Development

a. Sage Meadows / Ft. Collins Farms (Update from Shane?)

- There have not been any further discussions between the Town and Shane who is managing the development in the South Wellington
- Thus, the team is only responsible for reporting design flows, in the Master Plan, for the watersheds in this part of town.
- The Town informed ICON that there is an agreement for release rates subject to change due to the railroad crossing alignment changing at GW Bush Avenue.

b. Meridian Pond (CDOT Update?)

- The Town had no news updates for the CDOT project at the intersection of CR 9 and CO 1.

c. CO-66 / CO-68

- ICON asked the town if they should size the channels for the 10- or 100-yr storm event at CR-66 and CR-68. Also, ICON wanted to know if they should show area of disturbance or channel width on the exhibits or if a channel alignment would suffice for Master Planning purposes.
- The Town informed the team that an alignment in plan view and a profile view of a typical cross-section sized for the 100-yr storm event will be sufficient.

4. Report

- Jeremy ran the Town through the alternative format that ICON has prepared to execute for the Master Plan.
 - The first of this formatting presented to the Town was Executive summaries with GIS exhibits showing general areas with proposed improvements.
 - ICON is planning on including 10-yr alternative exhibits at the 20-30% level of design
- It was talked about with that group that if the Town wanted to secure funding from FEMA that the costs in the Master Plan should be inflated and the 'contingency' cost should be removed.
- Bob mentioned creating an additional alternative that included extending the Cleveland storm pipe east to 5th St.

Project Schedule

- 8/29: Alternatives Report & Exhibits to Town
- 8/29 – 9/2: Town Review
- 8/29 – 9/9: Storm Drain Criteria Review and Recommendations
- 9/9: Additional meeting with Town to review criteria recommendations
- 9/12 – 9/26:
 - Conceptual Design Section of the Report
 - Develop criteria manual text
- 9/26 – 9/30: Town Review and final revisions

- END OF MEETING MINUTES -

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Minutes prepared by:


David Crooks | August 17th, 2022
ICON Engineering, Inc.

Wellington Stormwater Masterplan
PROGRESS MEETING
September 9, 2022 | 9:30 AM

ATTENDEES

Nathan Ewert Town of Wellington
Bob Gowing Town of Wellington
Jaclyn Michaelsen ICON
Jeremy Deischer ICON
David Crooks..... ICON

AGENDA

The purpose of this meeting was to give an overview of the current storm water criteria for Wellington, compare it to the criteria for surrounding local municipalities and discuss whether to leave their criteria as is, adopt another municipality’s criteria, or create new criteria all together. A comparison workbook was compiled to facilitate this meeting, the categories below correspond to the grouped column headers in the workbook.

- 1. General Policy
 - The current Wellington General Policy for the stormwater criteria is ‘unless specified refer to USDCM’ this will be changed to ‘unless specified refer to City of Fort Collins stormwater criteria.’

Hydrology

- 2. Acceptable Methods
 - The Rational method and CUHP are acceptable methods for hydrologic analysis for Wellington.
 - Per other criteria the Town would like to specify a development size range for each criteria following City of Fort Collins criteria.
- 3. Rainfall Source
 - Currently the rainfall source for the Wellington stormwater criteria manual is an intensity – duration – frequency curve from the 2015 criteria update.
 - The Town would like to use NOAA 14 rainfall data for updated criteria manual. ICON suggests that the location chosen for Wellington’s rainfall be a centralized location in town.
- 4. Minor Design Storm
 - The current minor design storm criteria for Wellington are 2-yr for residential design and 10- and 100-yr for commercial, industrial, and public space design. This criterion will remain as is.

Streets/Storm Sewer

Bob suggested that Wellington adopt City of Fort Collins stormwater criteria for the Streets/Storm Sewer category. Ultimately, this is what ICON will update the Town’s criteria to reflect – below are more specific notes taken from this meeting regarding the streets and storm sewer criteria.

- 5. Inlets
 - The current Town criteria is to refer to the USDCM criteria for street inlets.
 - Bob suggested that Type R inlets should be required in public streets as they don’t clog up and are friendly to bike traffic. He also stated that Type C, and Type 13 inlets are fine in open area. Finally, he mentioned that Combo Type 13 should be mentioned in criteria.
 - The team discussed that Wellington will have to abide by CDOT M standards for any CDOT projects and that may cause issues with criteria if they only adopt City of Fort Collins.

- 6. Storm Sewer
 - The current Wellington criteria for storm sewer is a 15” minimum diameter or equivalent.
 - Jeremy pointed out that their criteria specifies that inlet laterals have to a minimum of 18” diameter or equivalent. Thus, it was agreed upon by the group to change the Wellington criteria to an 18” diameter minimum or equivalent for any public storm sewer.
- 7. Material
 - The current Town criteria for storm sewer materials is as follows:
 - CMP & PVC allowed for culverts only
 - RCP for storm pipes
 - Jeremy asked Bob and Nathan what they thought about adding ADS HP storm pipes to the criteria as they are certified for right-of-way use and ICON has used these pipes before. The benefit to this material is that it is lot lighter than and equally as strong as concrete.
 - Bob replied that he thinks this material would be okay for private. Yes, it is less expensive and lighter but ultimately is not as robust or reliable of a material as concrete.
 - The team agreed on keeping Wellington’s storm pipe criteria as is and adding the verbiage that ‘Any other material type needs to be granted a variance by town.’

Allowable Street Capacity

Unlike previous sections of the stormwater criteria comparison the Town agreed upon going with the USDCM standard instead of City of Fort Collins. This applies to the allowable street capacity standards for both minor and major storm events.

- Bob made a note in this section that the Town would like to update their driveway apron details to reflect a 1.5” vertical rise at the flowline and the apron at a more-shallow grade going back.
- 8. Minor Storm
 - See above.
- 9. Major Storm
 - See above.

Cross Street Flow

The Town agreed that they would like to look at the surrounding local municipality’s criteria and decide on what criteria to adopt of the minor and major storm cross street flow in the future. USDCM and City of Fort Collins criteria differs slightly. The Town’s current criteria refers to USDCM but that could change with this criterion manual update.

- 10. Minor Storm
 - See above.
- 11. Major Storm
 - The Town decided to defer to 12” above gutter flow line for Local roads. This deferment reflects the USDCM criteria but differs from the City of Fort Collins’.
 - Bob once again made that comment that the Town needs to go through and look at typical street cross sections, and make sure they are good to go for the criteria manual.
- 12. Culverts
 - The Town agreed to increase local road culverts sizing up to the 10-yr storm interval. It is currently set to conveying the 2-yr storm interval.
 - The Town also decided to increase the minimum driveway culvert size up to 18” diameter or equivalent. The current criteria is 15” diameter or equivalent.

Detention

- 13. Release Rates
 - The Town decided that it is not necessary to include verbiage about full spectrum detention in the criteria manual update.
 - The Town concluded that the maximum allowable release rate for the update to their criteria should be adopted from the USDCM. The maximum allowable release rate under this criteria is

- 90% of the upstream historic flows for all design storms.
- Additionally, the Town decided to include in their update verbiage that ‘developers need to build detention referring to most recent master plan flows for the development site’ and this would require the developers signature.

14. Outlet Structures

- The Town decided that the City of Fort Collins criteria is the best starting point for updating their criteria on detention outlet structures.
- This was another area in which the Town wants to update their standard details based on surrounding municipality’s.

15. Water Quality

- The Town at a minimum requested that ICON include MS4 verbiage in the water quality section of their criteria manual update.
- ICON agreed as a team to bring Heather Seitz in to help craft this section of the update.

Next Meeting:

September 23rd – discuss nearly complete MP

Project Schedule

Alternative Analysis

- July 8th: Meet with Town to Alternatives
- July 15th – Submit Alternatives & Cost Estimates to Town for Review
- July 15th – July 22nd: Town Review & Selected Plan of Improvements
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Selected Plan of Improvements

- July 22nd – Additional Progress Meeting to review Selected Plan
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Criteria Manual Update – September 1st

- END OF MEETING MINUTES -

To the best of my knowledge, these minutes are a factual account of the business conducted, the discussions that took place, and the decisions that were reached at the subject meeting. Please direct any exceptions to these minutes in writing to the undersigned within ten (10) days of the issue date appearing herein. Failure to do so will constitute acceptance of these minutes as statements of fact in which you concur.

Minutes prepared by:


David Crooks | August 17th, 2022
ICON Engineering, Inc.

APPENDIX B - HYDROLOGIC ANALYSIS

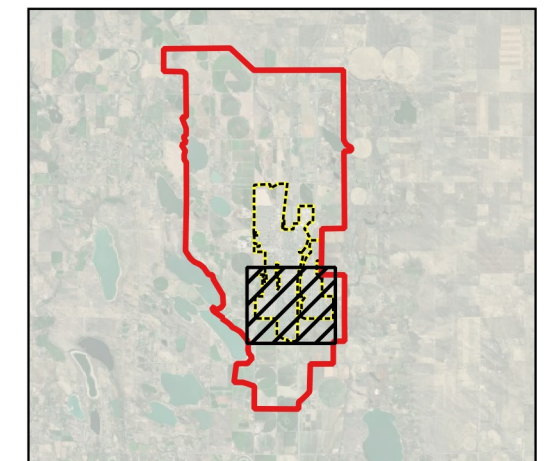
Stormwater Master Plan

Figure B-1

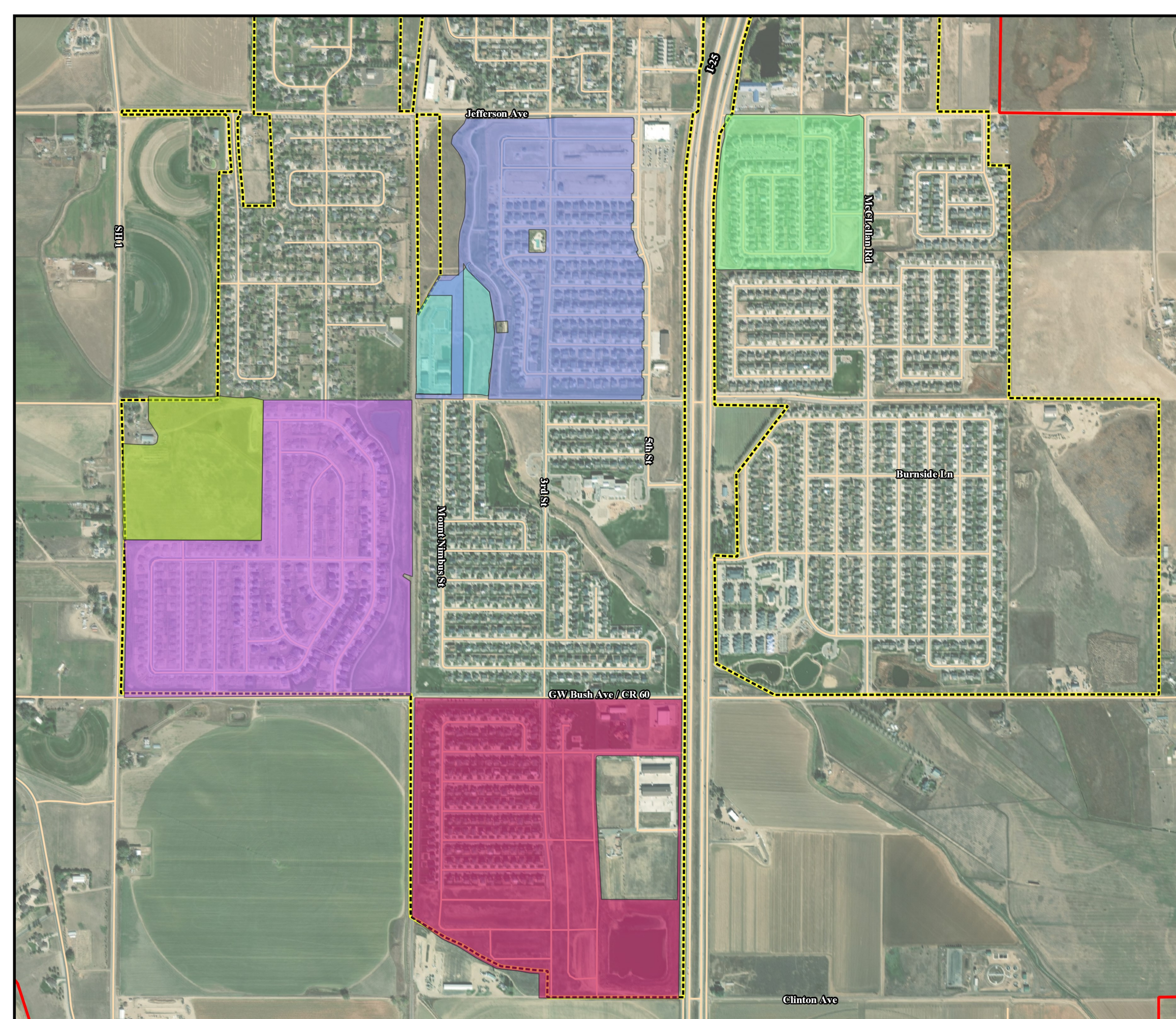
Hydrologic Analysis Exhibit: Sources of Terrain

Sources of Terrain

-  Box Elder Commons
-  Columbine Estates
-  Harvest Village
-  Patterson
-  Sage Meadows
-  Wellington Downs
-  Existing Drainageway / Canal
-  Growth Management Area
-  Town Boundary
-  Major Roads



0 1,000 ft

Stormwater Master Plan

Figure B-2

Hydrologic Analysis Exhibit: Soil Map

 Study Area Boundary

 Subwatersheds

Soil Classes

 Type A

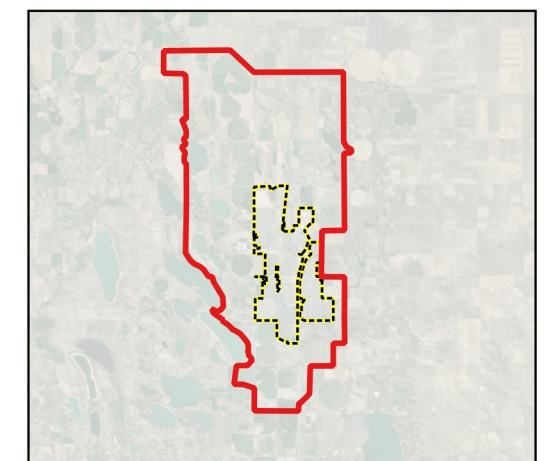
 Type A/D

 Type B

 Type C

 Type D

 Type Water



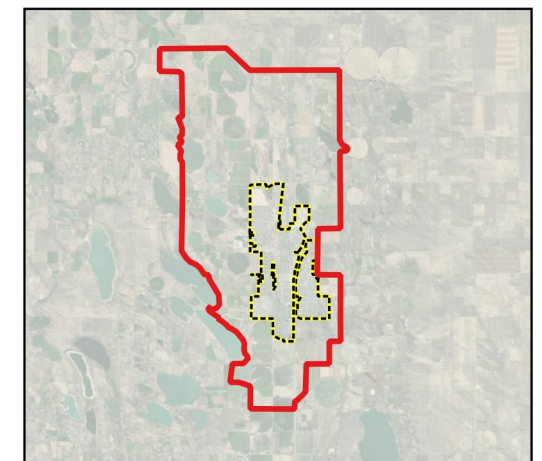
0 4,500 ft

Stormwater Master Plan

Figure B-3

Hydrologic Analysis Exhibit: Land Use Map

-  Study Area Boundary
-  Subwatersheds
- Land Use
 -  Grass - 2%
 -  Agricultural - 5%
 -  Parks - 10%
 -  Residential Low - 12%
 -  Residential Medium - 20%
 -  Residential Agricultural - 30%
 -  Hard Packed Earth - 40%
 -  Residential High - 45%
 -  Community buildings - 55%
 -  Apartments - 75%
 -  Industrial Light - 80%
 -  Roadways - 90%
 -  Business Downtown - 95%
 -  Paved Streets / Open Water 100%



0 4,500 ft

CUHP Rainfall Distribution

2 yr 1-hr Point Rainfall = 0.857 in.	
Time (min.)	Depth (in.)
5	0.02
10	0.03
15	0.07
20	0.14
25	0.21
30	0.12
35	0.05
40	0.04
45	0.03
50	0.03
55	0.03
60	0.03
65	0.03
70	0.02
75	0.02
80	0.02
85	0.02
90	0.02
95	0.02
100	0.02
105	0.02
110	0.02
115	0.01
120	0.01

5 yr 1-hr Point Rainfall = 1.15 in.	
Time (min.)	Depth (in.)
5	0.02
10	0.04
15	0.10
20	0.18
25	0.29
30	0.15
35	0.07
40	0.05
45	0.04
50	0.04
55	0.03
60	0.03
65	0.03
70	0.03
75	0.03
80	0.03
85	0.03
90	0.03
95	0.03
100	0.02
105	0.02
110	0.02
115	0.02
120	0.01

10 yr 1-hr Point Rainfall = 0.1.44 in.	
Time (min.)	Depth (in.)
5	0.03
10	0.05
15	0.12
20	0.22
25	0.36
30	0.17
35	0.08
40	0.06
45	0.05
50	0.05
55	0.05
60	0.05
65	0.05
70	0.05
75	0.05
80	0.04
85	0.03
90	0.03
95	0.03
100	0.03
105	0.03
110	0.03
115	0.02
120	0.02

50 yr 1-hr Point Rainfall = 2.35 in.	
Time (min.)	Depth (in.)
5	0.03
10	0.08
15	0.12
20	0.19
25	0.35
30	0.59
35	0.28
40	0.19
45	0.12
50	0.12
55	0.08
60	0.08
65	0.08
70	0.06
75	0.06
80	0.04
85	0.04
90	0.03
95	0.03
100	0.03
105	0.03
110	0.03
115	0.03
120	0.03

100 yr 1-hr Point Rainfall = 2.82 in.	
Time (min.)	Depth (in.)
5	0.03
10	0.08
15	0.13
20	0.23
25	0.39
30	0.70
35	0.39
40	0.23
45	0.17
50	0.14
55	0.11
60	0.11
65	0.11
70	0.06
75	0.06
80	0.03
85	0.03
90	0.03
95	0.03
100	0.03
105	0.03
110	0.03
115	0.03
120	0.03

CUHP Input Parameters

Subcatchment Name	EPA SWMM Target Node	Raingage	Area (ac.)	Length to Centroid (ft)	Length (ft)	Slope (ft/ft)	Percent Imperviousness	Depression Losses (in.)		Horton's Infiltration Parameters		
								Pervious	Impervious	Initial Rate (in/hr)	Decay Coefficient (1/seconds)	Final Rate (in/hr)
AOMI_B100	AOMI_B100	Wellington_SWMP	342.9	2673	8170	0.004	36	0.4	0.1	3	0.0013	0.5
AOMI_B300	AOMI_B300	Wellington_SWMP	22.1	2091	4431	0.004	11	0.4	0.1	4.1	0.0018	0.6
AOMI_B400	AOMI_B400	Wellington_SWMP	46.6	394	2280	0.015	12	0.4	0.1	4.1	0.0018	0.6
AOMI_B500	AOMI_B500	Wellington_SWMP	132.4	1667	3660	0.005	7	0.4	0.1	3.2	0.0018	0.5
AOMI_B600	AOMI_B600	Wellington_SWMP	30.5	1257	1847	0.004	6	0.4	0.1	3.4	0.0018	0.5
ARR_B100	ARR_B100	Wellington_SWMP	92.1	1250	3243	0.011	5	0.4	0.1	3.4	0.0018	0.5
ARR_B200	ARR_B200	Wellington_SWMP	101.3	1291	4311	0.008	5	0.4	0.1	4.2	0.0018	0.6
BCOM_B050	BCOM_B050	Wellington_SWMP	10.2	625	1518	0.007	53	0.4	0.1	4	0.0018	0.6
BCOM_B100	BCOM_B100	Wellington_SWMP	7.8	454	1208	0.007	61	0.4	0.1	4.5	0.0018	0.6
BCOM_B150	BCOM_B150	Wellington_SWMP	8.8	641	1137	0.005	69	0.4	0.1	4.1	0.0018	0.6
BCOM_B200	BCOM_B200	Wellington_SWMP	0.5	163	218	0.008	86	0.4	0.1	4.5	0.0018	0.6
BCOM_B250	BCOM_B250	Wellington_SWMP	0.2	111	244	0.006	92	0.4	0.1	4.5	0.0018	0.6
BCOM_B300	BCOM_B300	Wellington_SWMP	0.4	129	273	0.006	40	0.4	0.1	4.5	0.0018	0.6
BCOM_B350	BCOM_B350	Wellington_SWMP	0.7	136	301	0.005	34	0.4	0.1	4.5	0.0018	0.6
BCOM_B400	BCOM_B400	Wellington_SWMP	0.3	135	294	0.009	92	0.4	0.1	4.5	0.0018	0.6
BCOM_B450	BCOM_B450	Wellington_SWMP	0.8	95	213	0.009	95	0.4	0.1	4.5	0.0018	0.6
BCOM_B500	BCOM_B500	Wellington_SWMP	1.2	472	866	0.006	93	0.4	0.1	3.9	0.0018	0.6
BCOM_B550	BCOM_B550	Wellington_SWMP	2.8	430	946	0.005	95	0.4	0.1	3.9	0.0018	0.6
BCOM_B600	BCOM_B600	Wellington_SWMP	7.3	555	1310	0.008	57	0.4	0.1	4.2	0.0018	0.6
BCOM_B650	BCOM_B650	Wellington_SWMP	0.4	191	384	0.02	92	0.4	0.1	3.8	0.0018	0.6
BCOM_B700	BCOM_B700	Wellington_SWMP	15.2	401	1155	0.008	60	0.4	0.1	4.5	0.0018	0.6
BCOM_B750	BCOM_B750	Wellington_SWMP	5.5	493	886	0.007	56	0.4	0.1	4.5	0.0018	0.6
BCOM_B800	BCOM_B800	Wellington_SWMP	6.6	378	804	0.006	59	0.4	0.1	4.5	0.0018	0.6
BCOM_B850	BCOM_B850	Wellington_SWMP	7.9	384	760	0.006	55	0.4	0.1	4.5	0.0018	0.6
BCOM_B900	BCOM_B900	Wellington_SWMP	6.6	388	839	0.011	56	0.4	0.1	4.5	0.0018	0.6
BCOM_B950	BCOM_B950	Wellington_SWMP	4.2	599	1204	0.007	74	0.4	0.1	4.5	0.0018	0.6
BCOM_B975	BCOM_B975	Wellington_SWMP	9.5	361	986	0.006	59	0.4	0.1	4.5	0.0018	0.6
BMA_B100	BMA_B100	Wellington_SWMP	125.7	2050	5212	0.01	5	0.4	0.1	3.9	0.0018	0.6
BMA_B200	BMA_B200	Wellington_SWMP	34.9	935	1829	0.018	8	0.4	0.1	4.4	0.0018	0.6
BMA_B300	BMA_B300	Wellington_SWMP	228.7	3294	6166	0.011	6	0.4	0.1	4.4	0.0018	0.6
BMA_B400	BMA_B400	Wellington_SWMP	130.4	2861	5597	0.007	7	0.4	0.1	4.5	0.0018	0.6
BMA_B500	BMA_B500	Wellington_SWMP	49.7	859	2494	0.017	8	0.4	0.1	4.3	0.0014	0.7
BMA_B600	BMA_B600	Wellington_SWMP	13	460	1492	0.008	11	0.4	0.1	3.6	0.0018	0.5
BON_B100	BON_B100	Wellington_SWMP	100.7	1533	4738	0.007	5	0.4	0.1	3.8	0.0018	0.6
BRG_B100	BRG_B100	Wellington_SWMP	21.7	442	1132	0.013	7	0.4	0.1	3	0.0018	0.5
BRG_B200	BRG_B200	Wellington_SWMP	162.2	2048	3488	0.003	13	0.4	0.1	3.3	0.0018	0.5
BRG_B300	BRG_B300	Wellington_SWMP	101.6	588	2844	0.01	6	0.4	0.1	3.9	0.0016	0.5
BUC_B100	BUC_B100	Wellington_SWMP	8.5	437	795	0.006	11	0.4	0.1	3	0.0018	0.5
BUC_B200	BUC_B200	Wellington_SWMP	8.6	558	1470	0.008	13	0.4	0.1	3.4	0.0018	0.5
BUC_B300	BUC_B300	Wellington_SWMP	9.3	711	1695	0.007	63	0.4	0.1	4.1	0.0018	0.6
BUC_B400	BUC_B400	Wellington_SWMP	7	424	862	0.013	48	0.4	0.1	3.3	0.0018	0.5
BUC_B500	BUC_B500	Wellington_SWMP	17.6	439	1971	0.012	59	0.4	0.1	3.3	0.0018	0.5
BUC_B600	BUC_B600	Wellington_SWMP	36.5	1400	1962	0.007	58	0.4	0.1	3.7	0.0018	0.5
BUC_B650	BUC_B650	Wellington_SWMP	2.9	539	1123	0.005	52	0.4	0.1	3.1	0.0018	0.5

CUHP Input Parameters

Subcatchment Name	EPA SWMM Target Node	Raingage	Area (ac.)	Length to Centroid (ft)	Length (ft)	Slope (ft/ft)	Percent Imperviousness	Depression Losses (in.)		Horton's Infiltration Parameters		
								Pervious	Impervious	Initial Rate (in/hr)	Decay Coefficient (1/seconds)	Final Rate (in/hr)
BUC_B750	BUC_B750	Wellington_SWMP	4	271	825	0.007	60	0.4	0.1	4.5	0.0018	0.6
BUC_B800	BUC_B800	Wellington_SWMP	16.8	512	1054	0.005	59	0.4	0.1	4.4	0.0018	0.6
BUC_B900	BUC_B900	Wellington_SWMP	15.3	733	1323	0.005	58	0.4	0.1	3	0.0018	0.5
CCC_B100	CCC_B100	Wellington_SWMP	9.7	882	1693	0.008	85	0.4	0.1	3	0.0018	0.5
CCC_B200	CCC_B200	Wellington_SWMP	4.4	417	757	0.007	92	0.4	0.1	3	0.0018	0.5
CCC_B300	CCC_B300	Wellington_SWMP	6.8	277	667	0.012	64	0.4	0.1	3	0.0018	0.5
CLK_B100	CLK_B100	Wellington_SWMP	101.3	2109	4719	0.008	5	0.4	0.1	4.3	0.0018	0.6
CLK_B200	CLK_B200	Wellington_SWMP	487.6	3676	7253	0.004	14	0.4	0.1	3	0.0009	0.5
CLK_B300	CLK_B300	Wellington_SWMP	61.7	1710	3644	0.011	6	0.4	0.1	3.4	0.0018	0.5
CLK_B400	CLK_B400	Wellington_SWMP	677.4	8246	17078	0.009	21	0.4	0.1	3.8	0.0017	0.6
COLE_B100	COLE_B100	Wellington_SWMP	53	821	1977	0.009	45	0.4	0.1	3.1	0.0018	0.5
COLE_B200	COLE_B200	Wellington_SWMP	10.7	897	1278	0.006	47	0.4	0.1	3	0.0018	0.5
COLE_B300	COLE_B300	Wellington_SWMP	31.1	746	1870	0.005	52	0.4	0.1	3.4	0.0018	0.5
COLE_B400	COLE_B400	Wellington_SWMP	5.3	308	746	0.008	58	0.4	0.1	3	0.0018	0.5
COLE_B500	COLE_B500	Wellington_SWMP	40.9	692	1382	0.008	54	0.4	0.1	3.1	0.0018	0.5
CPATM_B100	CPATM_B100	Wellington_SWMP	29	706	1679	0.009	40	0.4	0.1	3	0.0018	0.5
DCM_B100	DCM_B100	Wellington_SWMP	124.8	944	2785	0.008	19	0.4	0.1	4.2	0.0018	0.6
DCM_B200	DCM_B200	Wellington_SWMP	478.1	3981	8182	0.011	8	0.4	0.1	3.2	0.0018	0.5
DCM_B300	DCM_B300	Wellington_SWMP	259.1	3697	6920	0.007	7	0.4	0.1	3.4	0.0018	0.6
DCM_B400	DCM_B400	Wellington_SWMP	189.6	1623	3953	0.03	7	0.4	0.1	4.3	0.0015	0.7
DCM_B500	DCM_B500	Wellington_SWMP	85.5	2651	5680	0.012	12	0.4	0.1	3.2	0.0018	0.5
FCE_B100	FCE_B100	Wellington_SWMP	15.6	539	2039	0.007	40	0.4	0.1	3	0.0018	0.5
HILD_B100	HILD_B100	Wellington_SWMP	130.8	3794	5446	0.005	5	0.4	0.1	3.3	0.0018	0.5
IND_B0100	IND_B0100	Wellington_SWMP	72.3	1948	4740	0.004	6	0.4	0.1	4	0.0018	0.6
IND_B0105	IND_B0105	Wellington_SWMP	50.4	1412	2833	0.006	9	0.4	0.1	3.2	0.0018	0.5
IND_B0110	IND_B0110	Wellington_SWMP	47.9	1423	2934	0.005	13	0.4	0.1	4.2	0.0018	0.6
IND_B0115	IND_B0115	Wellington_SWMP	138.1	1770	4069	0.011	7	0.4	0.1	3.8	0.0018	0.5
IND_B0120	IND_B0120	Wellington_SWMP	153.8	3513	6157	0.009	8	0.4	0.1	3.4	0.0017	0.5
KAWS_B100	KAWS_B100	Wellington_SWMP	9.2	573	1168	0.005	51	0.4	0.1	3	0.0018	0.5
KAWS_B150	KAWS_B150	Wellington_SWMP	8.3	206	815	0.011	44	0.4	0.1	3	0.0018	0.5
KAWS_B200	KAWS_B200	Wellington_SWMP	6	308	563	0.014	50	0.4	0.1	3	0.0018	0.5
KAWS_B250	KAWS_B250	Wellington_SWMP	11.1	530	1077	0.008	57	0.4	0.1	3	0.0018	0.5
KAWS_B300	KAWS_B300	Wellington_SWMP	3.3	136	446	0.009	61	0.4	0.1	3	0.0018	0.5
KAWS_B350	KAWS_B350	Wellington_SWMP	8.1	210	616	0.009	46	0.4	0.1	3	0.0018	0.5
KAWS_B400	KAWS_B400	Wellington_SWMP	8.6	102	723	0.008	50	0.4	0.1	3	0.0018	0.5
KAWS_B500	KAWS_B500	Wellington_SWMP	10.6	654	1778	0.011	37	0.4	0.1	3	0.0018	0.5
KAWS_B550	KAWS_B550	Wellington_SWMP	8.3	938	1317	0.006	58	0.4	0.1	3	0.0018	0.5
KAWS_B575	KAWS_B575	Wellington_SWMP	2.5	563	1139	0.004	85	0.4	0.1	3	0.0018	0.5
KAWS_B600	KAWS_B600	Wellington_SWMP	5.5	307	742	0.017	61	0.4	0.1	3	0.0018	0.5
KAWS_B625	KAWS_B625	Wellington_SWMP	10.6	320	838	0.022	58	0.4	0.1	3	0.0018	0.5
KAWS_B650	KAWS_B650	Wellington_SWMP	3.8	407	821	0.01	66	0.4	0.1	4.4	0.0018	0.6
KAWS_B700	KAWS_B700	Wellington_SWMP	2.8	221	403	0.013	54	0.4	0.1	4.5	0.0018	0.6
KAWS_B750	KAWS_B750	Wellington_SWMP	21.4	673	1360	0.01	48	0.4	0.1	4.4	0.0018	0.6
KAWS_B775	KAWS_B775	Wellington_SWMP	6.3	621	1319	0.006	46	0.4	0.1	4.4	0.0018	0.6

CUHP Input Parameters

Subcatchment Name	EPA SWMM Target Node	Raingage	Area (ac.)	Length to Centroid (ft)	Length (ft)	Slope (ft/ft)	Percent Imperviousness	Depression Losses (in.)		Horton's Infiltration Parameters		
								Pervious	Impervious	Initial Rate (in/hr)	Decay Coefficient (1/seconds)	Final Rate (in/hr)
KAWS_B800	KAWS_B800	Wellington_SWMP	6.1	334	655	0.006	32	0.4	0.1	4.5	0.0018	0.6
KNL_B050	KNL_B050	Wellington_SWMP	42.4	1850	4679	0.008	29	0.4	0.1	3	0.0018	0.5
KNL_B100	KNL_B100	Wellington_SWMP	202.8	4893	7966	0.007	15	0.4	0.1	3.4	0.0018	0.5
KNL_B200	KNL_B200	Wellington_SWMP	63	1506	2938	0.018	8	0.4	0.1	3.3	0.0018	0.5
KNL_B300	KNL_B300	Wellington_SWMP	65.8	864	2076	0.019	6	0.4	0.1	3.6	0.0018	0.5
KNL_B400	KNL_B400	Wellington_SWMP	143.3	1831	3816	0.006	53	0.4	0.1	3.3	0.0018	0.5
KNL_B450	KNL_B450	Wellington_SWMP	1.8	163	778	0.012	69	0.4	0.1	3	0.0018	0.5
KNL_B500	KNL_B500	Wellington_SWMP	59.3	819	2002	0.007	7	0.4	0.1	3.5	0.0018	0.5
LCD_B100	LCD_B100	Wellington_SWMP	154.9	1866	4894	0.006	15	0.4	0.1	3.8	0.0018	0.6
LCD_B1000	LCD_B1000	Wellington_SWMP	88.1	1360	3147	0.011	8	0.4	0.1	3.4	0.0018	0.5
LCD_B1100	LCD_B1100	Wellington_SWMP	138.9	1778	3094	0.009	15	0.4	0.1	3	0.0018	0.5
LCD_B1200	LCD_B1200	Wellington_SWMP	89.3	757	2023	0.008	10	0.4	0.1	4.3	0.0018	0.6
LCD_B1300	LCD_B1300	Wellington_SWMP	120.3	654	2814	0.02	12	0.4	0.1	4.2	0.0018	0.6
LCD_B1400	LCD_B1400	Wellington_SWMP	61.5	590	2373	0.007	15	0.4	0.1	3	0.0018	0.5
LCD_B1500	LCD_B1500	Wellington_SWMP	99.1	1442	2795	0.005	11	0.4	0.1	3	0.0018	0.5
LCD_B200	LCD_B200	Wellington_SWMP	237.7	2587	5171	0.006	12	0.4	0.1	4.1	0.0018	0.6
LCD_B300	LCD_B300	Wellington_SWMP	114.2	1554	3999	0.008	10	0.4	0.1	3.6	0.0018	0.5
LCD_B400	LCD_B400	Wellington_SWMP	13.2	356	1384	0.012	12	0.4	0.1	4.4	0.0018	0.6
LCD_B500	LCD_B500	Wellington_SWMP	27.8	664	1439	0.007	13	0.4	0.1	3.2	0.0018	0.5
LCD_B600	LCD_B600	Wellington_SWMP	320.4	2638	5731	0.009	11	0.4	0.1	3.3	0.0018	0.5
LCD_B700	LCD_B700	Wellington_SWMP	208.5	1329	3673	0.009	17	0.4	0.1	3.9	0.0018	0.6
LCD_B800	LCD_B800	Wellington_SWMP	17.6	424	1385	0.01	33	0.4	0.1	4.4	0.0018	0.6
LCD_B900	LCD_B900	Wellington_SWMP	129	1074	2523	0.006	10	0.4	0.1	3.2	0.0017	0.5
LON_B100	LON_B100	Wellington_SWMP	198.9	2882	6192	0.01	5	0.4	0.1	3.7	0.0017	0.6
LON_B200	LON_B200	Wellington_SWMP	108.6	1529	3191	0.008	5	0.4	0.1	3.6	0.0018	0.5
LON_B300	LON_B300	Wellington_SWMP	112.7	1851	3707	0.006	5	0.4	0.1	3.8	0.0016	0.6
MCG_B100	MCG_B100	Wellington_SWMP	34.8	849	1843	0.01	9	0.4	0.1	3.1	0.0018	0.5
MCG_B200	MCG_B200	Wellington_SWMP	8.9	188	729	0.012	14	0.4	0.1	3	0.0018	0.5
MCG_B300	MCG_B300	Wellington_SWMP	19.7	1643	3061	0.005	24	0.4	0.1	3	0.0018	0.5
MCG_B400	MCG_B400	Wellington_SWMP	38.8	446	2731	0.006	10	0.4	0.1	3	0.0018	0.5
MCG_B500	MCG_B500	Wellington_SWMP	32.2	405	1348	0.016	34	0.4	0.1	3.2	0.0018	0.5
MCG_B600	MCG_B600	Wellington_SWMP	26.6	572	1333	0.013	40	0.4	0.1	3.1	0.0018	0.5
MEA_B100	MEA_B100	Wellington_SWMP	8.2	175	894	0.005	28	0.4	0.1	4.1	0.0018	0.6
MEA_B150	MEA_B150	Wellington_SWMP	3.8	541	896	0.006	67	0.4	0.1	4.4	0.0018	0.6
MEA_B200	MEA_B200	Wellington_SWMP	30.2	754	1206	0.008	52	0.4	0.1	4.2	0.0018	0.6
MEA_B250	MEA_B250	Wellington_SWMP	6.2	767	1255	0.007	59	0.4	0.1	4.4	0.0018	0.6
MEA_B300	MEA_B300	Wellington_SWMP	4	341	618	0.006	58	0.4	0.1	4.5	0.0018	0.6
MEA_B350	MEA_B350	Wellington_SWMP	14	746	1451	0.008	59	0.4	0.1	4.4	0.0018	0.6
MEA_B375	MEA_B375	Wellington_SWMP	22.6	954	1507	0.006	60	0.4	0.1	4.5	0.0018	0.6
MEA_B400	MEA_B400	Wellington_SWMP	9.9	595	1445	0.006	59	0.4	0.1	4.2	0.0018	0.6
MEA_B450	MEA_B450	Wellington_SWMP	8.9	630	1451	0.006	58	0.4	0.1	3.3	0.0018	0.5
MEA_B500	MEA_B500	Wellington_SWMP	11.4	711	1240	0.005	60	0.4	0.1	3.2	0.0018	0.5
MEA_B550	MEA_B550	Wellington_SWMP	14.5	904	2068	0.006	59	0.4	0.1	3.8	0.0018	0.6
MEA_B600	MEA_B600	Wellington_SWMP	4.8	1025	2239	0.008	39	0.4	0.1	3.3	0.0018	0.5

CUHP Input Parameters

Subcatchment Name	EPA SWMM Target Node	Raingage	Area (ac.)	Length to Centroid (ft)	Length (ft)	Slope (ft/ft)	Percent Imperviousness	Depression Losses (in.)		Horton's Infiltration Parameters		
								Pervious	Impervious	Initial Rate (in/hr)	Decay Coefficient (1/seconds)	Final Rate (in/hr)
MEA_B650	MEA_B650	Wellington_SWMP	14.9	739	1509	0.01	37	0.4	0.1	4.4	0.0018	0.6
MEA_B700	MEA_B700	Wellington_SWMP	1.9	528	1289	0.006	76	0.4	0.1	4.2	0.0018	0.6
MER_B100	MER_B100	Wellington_SWMP	18	814	1053	0.003	57	0.4	0.1	3.9	0.0018	0.6
OLT_B0100	OLT_B0100	Wellington_SWMP	2.9	142	534	0.013	44	0.4	0.1	3.6	0.0018	0.5
OLT_B0150	OLT_B0150	Wellington_SWMP	4.4	300	655	0.007	57	0.4	0.1	4.4	0.0018	0.6
OLT_B0200	OLT_B0200	Wellington_SWMP	7.2	751	1141	0.007	57	0.4	0.1	4	0.0018	0.6
OLT_B0250	OLT_B0250	Wellington_SWMP	2.5	453	705	0.005	61	0.4	0.1	4.5	0.0018	0.6
OLT_B0300	OLT_B0300	Wellington_SWMP	5.7	198	907	0.008	58	0.4	0.1	4.4	0.0018	0.6
OLT_B0350	OLT_B0350	Wellington_SWMP	5.8	500	1158	0.006	61	0.4	0.1	4.1	0.0018	0.6
OLT_B0400	OLT_B0400	Wellington_SWMP	4.4	540	1133	0.007	60	0.4	0.1	4.5	0.0018	0.6
OLT_B0450	OLT_B0450	Wellington_SWMP	2.1	290	645	0.003	55	0.4	0.1	4.4	0.0018	0.6
OLT_B0500	OLT_B0500	Wellington_SWMP	6	354	813	0.007	67	0.4	0.1	4.2	0.0018	0.6
OLT_B0550	OLT_B0550	Wellington_SWMP	1	434	848	0.006	59	0.4	0.1	3.9	0.0018	0.6
OLT_B0600	OLT_B0600	Wellington_SWMP	9	405	726	0.006	53	0.4	0.1	4.2	0.0018	0.6
OLT_B0650	OLT_B0650	Wellington_SWMP	13.7	344	1147	0.007	55	0.4	0.1	3	0.0018	0.5
OLT_B0700	OLT_B0700	Wellington_SWMP	7.1	271	1033	0.011	56	0.4	0.1	3	0.0018	0.5
OLT_B0750	OLT_B0750	Wellington_SWMP	3.2	281	638	0.007	72	0.4	0.1	3	0.0018	0.5
OLT_B0800	OLT_B0800	Wellington_SWMP	3.7	145	723	0.011	37	0.4	0.1	4.2	0.0018	0.6
OLT_B0850	OLT_B0850	Wellington_SWMP	2.5	160	551	0.005	58	0.4	0.1	4	0.0018	0.6
OLT_B0900	OLT_B0900	Wellington_SWMP	1	346	621	0.006	60	0.4	0.1	4.5	0.0018	0.6
OLT_B0950	OLT_B0950	Wellington_SWMP	4.1	292	644	0.008	66	0.4	0.1	3.9	0.0018	0.6
OLT_B1000	OLT_B1000	Wellington_SWMP	1.7	410	641	0.01	68	0.4	0.1	3.1	0.0018	0.5
OLT_B1050	OLT_B1050	Wellington_SWMP	2.3	342	585	0.011	87	0.4	0.1	3.3	0.0018	0.5
OLT_B1100	OLT_B1100	Wellington_SWMP	4.8	669	1129	0.011	69	0.4	0.1	4.4	0.0018	0.6
OLT_B1150	OLT_B1150	Wellington_SWMP	2.7	169	372	0.006	58	0.4	0.1	4.5	0.0018	0.6
OLT_B1200	OLT_B1200	Wellington_SWMP	0.3	182	352	0.007	59	0.4	0.1	4.5	0.0018	0.6
OLT_B1225	OLT_B1225	Wellington_SWMP	1.2	175	335	0.008	75	0.4	0.1	3	0.0018	0.5
OLT_B1250	OLT_B1250	Wellington_SWMP	5.9	722	1102	0.007	90	0.4	0.1	3	0.0018	0.5
OLT_B1300	OLT_B1300	Wellington_SWMP	1.1	407	976	0.007	75	0.4	0.1	3.6	0.0018	0.5
OLT_B1350	OLT_B1350	Wellington_SWMP	3.5	393	643	0.008	83	0.4	0.1	3.7	0.0018	0.5
OLT_B1400	OLT_B1400	Wellington_SWMP	2.3	317	545	0.019	59	0.4	0.1	4.5	0.0018	0.6
OLT_B1450	OLT_B1450	Wellington_SWMP	2.6	313	563	0.016	56	0.4	0.1	4.5	0.0018	0.6
OLT_B1500	OLT_B1500	Wellington_SWMP	0.3	179	354	0.006	78	0.4	0.1	4.5	0.0017	0.6
OLT_B1550	OLT_B1550	Wellington_SWMP	2.6	153	400	0.007	61	0.4	0.1	4.5	0.0018	0.6
OLT_B1600	OLT_B1600	Wellington_SWMP	0.7	353	650	0.007	84	0.4	0.1	4.5	0.0018	0.6
OLT_B1650	OLT_B1650	Wellington_SWMP	2	338	762	0.008	94	0.4	0.1	4.4	0.0018	0.6
OLT_B1700	OLT_B1700	Wellington_SWMP	5.5	688	1481	0.01	80	0.4	0.1	3.1	0.0018	0.5
OLT_B1750	OLT_B1750	Wellington_SWMP	2.9	111	573	0.011	80	0.4	0.1	4.5	0.0018	0.6
OLT_B1775	OLT_B1775	Wellington_SWMP	0.6	209	420	0.011	80	0.4	0.1	4.5	0.0018	0.6
OLT_B1800	OLT_B1800	Wellington_SWMP	0.4	179	333	0.012	93	0.4	0.1	4.5	0.0018	0.6
OLT_B1850	OLT_B1850	Wellington_SWMP	3	195	955	0.005	78	0.4	0.1	4.5	0.0018	0.6
OLT_B1900	OLT_B1900	Wellington_SWMP	0.3	152	301	0.01	84	0.4	0.1	4.5	0.0017	0.6
OLT_B2000	OLT_B2000	Wellington_SWMP	2.4	338	496	0.009	74	0.4	0.1	4.5	0.0018	0.6
OLT_B2100	OLT_B2100	Wellington_SWMP	3	230	675	0.007	82	0.4	0.1	3	0.0018	0.5

CUHP Input Parameters

								Depression Losses (in.)		Horton's Infiltration Parameters		
Subcatchment Name	EPA SWMM Target Node	Raingage	Area (ac.)	Length to Centroid (ft)	Length (ft)	Slope (ft/ft)	Percent Imperviousness	Pervious	Impervious	Initial Rate (in/hr)	Decay Coefficient (1/seconds)	Final Rate (in/hr)
OLT_B2150	OLT_B2150	Wellington_SWMP	3.2	60	382	0.007	79	0.4	0.1	4.3	0.0018	0.6
OLT_B2200	OLT_B2200	Wellington_SWMP	3.3	218	706	0.005	70	0.4	0.1	4.5	0.0018	0.6
OLT_B2250	OLT_B2250	Wellington_SWMP	2.6	154	605	0.005	76	0.4	0.1	4.5	0.0018	0.6
OLT_B2300	OLT_B2300	Wellington_SWMP	1.8	112	290	0.009	75	0.4	0.1	4.5	0.0018	0.6
OLT_B2350	OLT_B2350	Wellington_SWMP	5.5	320	618	0.006	59	0.4	0.1	4	0.0018	0.6
OLT_B2400	OLT_B2400	Wellington_SWMP	0.6	162	284	0.007	64	0.4	0.1	4.5	0.0018	0.6
OLT_B2450	OLT_B2450	Wellington_SWMP	2.5	279	425	0.006	57	0.4	0.1	4.5	0.0018	0.6
OLT_B2500	OLT_B2500	Wellington_SWMP	3.3	548	847	0.004	57	0.4	0.1	4.5	0.0018	0.6
OLT_B2550	OLT_B2550	Wellington_SWMP	3.4	167	789	0.006	63	0.4	0.1	3.9	0.0018	0.6
OLT_B2600	OLT_B2600	Wellington_SWMP	3.3	160	458	0.009	58	0.4	0.1	3	0.0018	0.5
OLT_B2650	OLT_B2650	Wellington_SWMP	3.4	296	556	0.008	60	0.4	0.1	3	0.0018	0.5
OLT_B2700	OLT_B2700	Wellington_SWMP	3.2	125	620	0.006	60	0.4	0.1	3.7	0.0018	0.5
OLT_B2750	OLT_B2750	Wellington_SWMP	3.2	428	1021	0.005	62	0.4	0.1	4.5	0.0018	0.6
OLT_B2800	OLT_B2800	Wellington_SWMP	1.9	360	904	0.005	64	0.4	0.1	4.5	0.0018	0.6
OLT_B2850	OLT_B2850	Wellington_SWMP	3.8	326	665	0.007	52	0.4	0.1	4.5	0.0018	0.6
OLT_B2900	OLT_B2900	Wellington_SWMP	5.8	334	678	0.006	64	0.4	0.1	4.5	0.0018	0.6
OLT_B2950	OLT_B2950	Wellington_SWMP	7.2	544	1633	0.007	44	0.4	0.1	4.4	0.0018	0.6
OLT_B3000	OLT_B3000	Wellington_SWMP	3.1	388	932	0.009	31	0.4	0.1	3.9	0.0018	0.6
OLT_B3050	OLT_B3050	Wellington_SWMP	5.1	577	746	0.006	59	0.4	0.1	3.3	0.0018	0.5
OLT_B3100	OLT_B3100	Wellington_SWMP	15.1	591	1298	0.008	60	0.4	0.1	3.2	0.0018	0.5
OLT_B3150	OLT_B3150	Wellington_SWMP	6.8	313	635	0.007	58	0.4	0.1	4.5	0.0018	0.6
OLT_B3200	OLT_B3200	Wellington_SWMP	6.3	713	1534	0.006	61	0.4	0.1	4.5	0.0018	0.6
OLT_B3250	OLT_B3250	Wellington_SWMP	17	618	1695	0.006	56	0.4	0.1	4.3	0.0018	0.6
OLT_B3300	OLT_B3300	Wellington_SWMP	9.9	280	1179	0.005	27	0.4	0.1	3.8	0.0018	0.6
PHS_B100	PHS_B100	Wellington_SWMP	475.7	4489	7755	0.008	5	0.4	0.1	3.2	0.0016	0.5
PHS_B300	PHS_B300	Wellington_SWMP	23.1	499	1025	0.017	7	0.4	0.1	3.5	0.0018	0.5
PIE_B050	PIE_B050	Wellington_SWMP	20.9	800	1407	0.007	81	0.4	0.1	3	0.0018	0.5
PIE_B100	PIE_B100	Wellington_SWMP	120.5	2219	3924	0.009	27	0.4	0.1	4.2	0.0018	0.6
PME_B100	PME_B100	Wellington_SWMP	54.1	774	1992	0.01	35	0.4	0.1	3.4	0.0018	0.5
PME_B200	PME_B200	Wellington_SWMP	37.4	889	1982	0.008	55	0.4	0.1	3.2	0.0018	0.5
PRR_B100	PRR_B100	Wellington_SWMP	82.9	1487	3107	0.01	19	0.4	0.1	3.4	0.0016	0.6
PRR_B200	PRR_B200	Wellington_SWMP	25.2	1043	3996	0.013	35	0.4	0.1	3.1	0.0018	0.5
PVE_B100	PVE_B100	Wellington_SWMP	198.3	2295	5245	0.008	5	0.4	0.1	3	0.0015	0.5
SAD_B100	SAD_B100	Wellington_SWMP	40.1	969	2301	0.012	5	0.4	0.1	3	0.0018	0.5
SAD_B200	SAD_B200	Wellington_SWMP	28	1455	2738	0.012	5	0.4	0.1	3.1	0.0018	0.5
SBC_B100	SBC_B100	Wellington_SWMP	399	3288	7511	0.004	9	0.4	0.1	3.2	0.0015	0.5
SME_B050	SME_B050	Wellington_SWMP	5.7	1217	2564	0.016	49	0.4	0.1	3	0.0018	0.5
SME_B100	SME_B100	Wellington_SWMP	15.2	685	1835	0.012	23	0.4	0.1	3	0.0018	0.5
SME_B200	SME_B200	Wellington_SWMP	9	405	1043	0.03	26	0.4	0.1	3	0.0018	0.5
SME_B300	SME_B300	Wellington_SWMP	5.2	288	793	0.006	58	0.4	0.1	3	0.0018	0.5
SME_B400	SME_B400	Wellington_SWMP	17.3	577	944	0.015	57	0.4	0.1	3	0.0018	0.5
SME_B500	SME_B500	Wellington_SWMP	59.4	678	1678	0.012	28	0.4	0.1	3	0.0018	0.5
SME_B550	SME_B550	Wellington_SWMP	18	466	918	0.006	59	0.4	0.1	3	0.0018	0.5
SME_B600	SME_B600	Wellington_SWMP	9.8	423	1303	0.025	61	0.4	0.1	3	0.0018	0.5

CUHP Input Parameters

Subcatchment Name	EPA SWMM Target Node	Raingage	Area (ac.)	Length to Centroid (ft)	Length (ft)	Slope (ft/ft)	Percent Imperviousness	Depression Losses (in.)		Horton's Infiltration Parameters		
								Pervious	Impervious	Initial Rate (in/hr)	Decay Coefficient (1/seconds)	Final Rate (in/hr)
SME_B700	SME_B700	Wellington_SWMP	18.3	653	1427	0.024	53	0.4	0.1	3	0.0018	0.5
STT_B100	STT_B100	Wellington_SWMP	41.4	1336	2717	0.007	5	0.4	0.1	3.1	0.0018	0.5
STT_B200	STT_B200	Wellington_SWMP	14.9	475	1259	0.007	6	0.4	0.1	3.4	0.0016	0.6
STT_B300	STT_B300	Wellington_SWMP	37.6	1352	2744	0.011	13	0.4	0.1	3.6	0.0018	0.6
STT_B400	STT_B400	Wellington_SWMP	108.1	2015	3303	0.007	17	0.4	0.1	4.2	0.0018	0.6
STT_B500	STT_B500	Wellington_SWMP	241.1	5318	13837	0.01	33	0.4	0.1	3.3	0.0018	0.5
SUN_B100	SUN_B100	Wellington_SWMP	65.4	1661	2702	0.007	29	0.4	0.1	4.4	0.0018	0.6
SUN_B200	SUN_B200	Wellington_SWMP	25.7	1502	3629	0.006	32	0.4	0.1	4.3	0.0018	0.6
SUN_B300	SUN_B300	Wellington_SWMP	17	537	1342	0.005	31	0.4	0.1	4.5	0.0018	0.6
SWM_B100	SWM_B100	Wellington_SWMP	341.5	3178	5666	0.008	6	0.4	0.1	4.4	0.0018	0.6
SWM_B200	SWM_B200	Wellington_SWMP	65.8	3445	4615	0.006	32	0.4	0.1	3.6	0.0018	0.5
SWM_B300	SWM_B300	Wellington_SWMP	89.9	2617	5048	0.006	6	0.4	0.1	4	0.0018	0.6
SWM_B400	SWM_B400	Wellington_SWMP	154.1	5034	7289	0.003	6	0.4	0.1	3.9	0.0018	0.6
SWM_B500	SWM_B500	Wellington_SWMP	343.1	3154	7921	0.01	6	0.4	0.1	3.4	0.0017	0.5
TSIL_B100	TSIL_B100	Wellington_SWMP	8.9	305	780	0.012	49	0.4	0.1	3	0.0018	0.5
TSIL_B200	TSIL_B200	Wellington_SWMP	10.6	142	1199	0.018	39	0.4	0.1	3	0.0018	0.5
UND_B100	UND_B100	Wellington_SWMP	29.7	567	1268	0.013	13	0.4	0.1	3	0.0018	0.5
UNK_B100	UNK_B100	Wellington_SWMP	44.4	891	2455	0.011	5	0.4	0.1	3.4	0.0018	0.5
UNK_B150	UNK_B150	Wellington_SWMP	123.6	1711	3821	0.015	5	0.4	0.1	3.5	0.0017	0.5
UNK_B200	UNK_B200	Wellington_SWMP	326.6	2903	6202	0.008	5	0.4	0.1	3.2	0.0018	0.5
UNK_B250	UNK_B250	Wellington_SWMP	30.8	1064	1749	0.017	5	0.4	0.1	3.4	0.0018	0.5
VPT_B100	VPT_B100	Wellington_SWMP	13.9	689	1512	0.008	24	0.4	0.1	3	0.0018	0.5
VPT_B200	VPT_B200	Wellington_SWMP	28.9	1455	1941	0.009	44	0.4	0.1	3.9	0.0018	0.6
VPT_B300	VPT_B300	Wellington_SWMP	2.3	537	886	0.011	57	0.4	0.1	3	0.0018	0.5
VPT_B350	VPT_B350	Wellington_SWMP	6.1	319	718	0.009	37	0.4	0.1	3	0.0018	0.5
VPT_B400	VPT_B400	Wellington_SWMP	7.3	267	752	0.007	53	0.4	0.1	3	0.0018	0.5
VPT_B450	VPT_B450	Wellington_SWMP	4.7	463	851	0.005	56	0.4	0.1	3	0.0018	0.5
VPT_B500	VPT_B500	Wellington_SWMP	22	396	1103	0.014	10	0.4	0.1	3	0.0018	0.5
VPT_B600	VPT_B600	Wellington_SWMP	3.5	552	1079	0.007	40	0.4	0.1	3	0.0018	0.5
VPT_B650	VPT_B650	Wellington_SWMP	12.2	617	1214	0.008	48	0.4	0.1	3.2	0.0018	0.5
VPT_B700	VPT_B700	Wellington_SWMP	8.8	711	1346	0.008	24	0.4	0.1	3	0.0018	0.5
VPT_B750	VPT_B750	Wellington_SWMP	4.8	711	1485	0.007	68	0.4	0.1	3	0.0018	0.5
VPT_B800	VPT_B800	Wellington_SWMP	34.3	819	1609	0.005	11	0.4	0.1	3	0.0018	0.5
WDO_B050	WDO_B050	Wellington_SWMP	1.4	652	1339	0.007	66	0.4	0.1	3	0.0018	0.5
WDO_B100	WDO_B100	Wellington_SWMP	12.6	629	1239	0.011	48	0.4	0.1	3	0.0018	0.5
WDO_B200	WDO_B200	Wellington_SWMP	20.1	535	1719	0.007	56	0.4	0.1	3	0.0018	0.5
WELE_B100	WELE_B100	Wellington_SWMP	9.1	313	1252	0.006	72	0.4	0.1	3	0.0018	0.5
WELE_B200	WELE_B200	Wellington_SWMP	11.1	513	1430	0.005	58	0.4	0.1	3	0.0018	0.5
WELE_B300	WELE_B300	Wellington_SWMP	4.6	318	569	0.008	54	0.4	0.1	3	0.0018	0.5
WELE_B400	WELE_B400	Wellington_SWMP	2.1	330	926	0.007	81	0.4	0.1	3	0.0018	0.5
WELP_B100	WELP_B100	Wellington_SWMP	16.1	971	1774	0.004	67	0.4	0.1	4.5	0.0018	0.6
WELP_B200	WELP_B200	Wellington_SWMP	2.2	321	622	0.005	62	0.4	0.1	4.5	0.0018	0.6
WELP_B300	WELP_B300	Wellington_SWMP	75.5	1196	2505	0.007	15	0.4	0.1	3.3	0.0018	0.5
WELW_B100	WELW_B100	Wellington_SWMP	30.9	899	2663	0.005	22	0.4	0.1	4.4	0.0018	0.6

CUHP Input Parameters

								Depression Losses (in.)		Horton's Infiltration Parameters		
Subcatchment Name	EPA SWMM Target Node	Raingage	Area (ac.)	Length to Centroid (ft)	Length (ft)	Slope (ft/ft)	Percent Imperviousness	Pervious	Impervious	Initial Rate (in/hr)	Decay Coefficient (1/seconds)	Final Rate (in/hr)
WELW_B200	WELW_B200	Wellington_SWMP	13.6	256	844	0.016	37	0.4	0.1	4.5	0.0018	0.6
WELW_B250	WELW_B250	Wellington_SWMP	9.4	845	1857	0.006	37	0.4	0.1	4.5	0.0018	0.6
WELW_B300	WELW_B300	Wellington_SWMP	33.5	489	2259	0.007	34	0.4	0.1	4.4	0.0018	0.6
WGR_B100	WGR_B100	Wellington_SWMP	1082	6500	12600	0.008	8	0.4	0.1	3.5	0.0018	0.5
WIL_B100	WIL_B100	Wellington_SWMP	257.9	3044	5523	0.008	21	0.4	0.1	3	0.0015	0.5
WIL_B200	WIL_B200	Wellington_SWMP	383.5	2942	7019	0.008	6	0.4	0.1	4	0.0018	0.6
WIL_B300	WIL_B300	Wellington_SWMP	25.9	687	1859	0.006	5	0.4	0.1	4.2	0.0018	0.6
WIL_B400	WIL_B400	Wellington_SWMP	230.8	3150	6775	0.006	7	0.4	0.1	4.2	0.0018	0.6
WIL_B450	WIL_B450	Wellington_SWMP	181.4	2025	5195	0.015	7	0.4	0.1	4.2	0.0018	0.6
WIL_B500	WIL_B500	Wellington_SWMP	75.3	1810	3857	0.009	17	0.4	0.1	4.2	0.0018	0.6
WIL_B600	WIL_B600	Wellington_SWMP	534.3	4312	8357	0.007	6	0.4	0.1	4.2	0.0018	0.6
WIL_B700	WIL_B700	Wellington_SWMP	157.5	2698	4953	0.006	7	0.4	0.1	3	0.0017	0.5
WIM_B100	WIM_B100	Wellington_SWMP	163.5	1788	4193	0.007	5	0.4	0.1	3.3	0.0017	0.5
WIM_B200	WIM_B200	Wellington_SWMP	76.5	1633	2995	0.015	22	0.4	0.1	3.5	0.0015	0.6
WIM_B300	WIM_B300	Wellington_SWMP	42.7	1021	2540	0.021	20	0.4	0.1	4.3	0.0018	0.6
WPT_B050	WPT_B050	Wellington_SWMP	1.7	457	944	0.001	93	0.4	0.1	3	0.0018	0.5
WPT_B100	WPT_B100	Wellington_SWMP	4.2	267	736	0.005	20	0.4	0.1	4.4	0.0018	0.6
WPT_B200	WPT_B200	Wellington_SWMP	18.5	692	1369	0.01	42	0.4	0.1	4.3	0.0018	0.6
WPT_B300	WPT_B300	Wellington_SWMP	7.5	232	880	0.007	60	0.4	0.1	4.5	0.0018	0.6
WPT_B400	WPT_B400	Wellington_SWMP	22.2	319	1052	0.008	51	0.4	0.1	4.2	0.0018	0.6
WPT_B500	WPT_B500	Wellington_SWMP	10.7	434	1019	0.005	64	0.4	0.1	3.5	0.0018	0.5
WPT_B600	WPT_B600	Wellington_SWMP	21.6	907	1863	0.009	55	0.4	0.1	3.6	0.0018	0.5
WPT_B650	WPT_B650	Wellington_SWMP	7	1066	1987	0.008	86	0.4	0.1	3.4	0.0018	0.5
WPT_B700	WPT_B700	Wellington_SWMP	1	486	959	0.003	90	0.4	0.1	3.4	0.0018	0.5
WPT_B800	WPT_B800	Wellington_SWMP	1.6	83	371	0.006	83	0.4	0.1	3	0.0018	0.5
WPT_B850	WPT_B850	Wellington_SWMP	3.3	170	588	0.005	75	0.4	0.1	3	0.0018	0.5
WPT_B900	WPT_B900	Wellington_SWMP	6	281	787	0.006	86	0.4	0.1	4.5	0.0018	0.6

Node Peak Flows (cfs)

Node	Junction Type	2-yr	5-yr	10-yr	50-yr	100-yr
AOMI_B100	JUNCTION	49.9	76.7	124.7	361.1	485.0
AOMI_B300	JUNCTION	0.3	0.6	1.6	7.6	11.1
AOMI_B400	JUNCTION	3.3	5.9	16.9	68.8	94.3
AOMI_B500	JUNCTION	3.3	10.2	30.0	117.4	163.6
AOMI_B600	JUNCTION	0.5	1.6	5.3	21.8	30.8
AOMI_J400	JUNCTION	20.3	35.9	76.3	272.4	380.5
ARR_B100	JUNCTION	2.0	6.9	23.4	96.1	133.8
ARR_B200	JUNCTION	1.6	3.1	15.6	84.4	120.7
ARR_J100	JUNCTION	3.0	9.2	85.2	565.8	857.6
ARR_J200	JUNCTION	3.5	11.6	23.1	94.0	130.6
BCOM_B050	JUNCTION	3.4	4.9	7.1	16.9	21.7
BCOM_B100	JUNCTION	3.6	5.1	7.1	15.5	19.8
BCOM_B150	JUNCTION	4.4	6.2	8.4	17.6	22.1
BCOM_B200	JUNCTION	0.4	0.6	0.7	1.3	1.6
BCOM_B250	JUNCTION	0.1	0.2	0.2	0.4	0.5
BCOM_B300	JUNCTION	0.1	0.1	0.2	0.5	0.7
BCOM_B350	JUNCTION	0.1	0.2	0.3	0.9	1.2
BCOM_B400	JUNCTION	0.2	0.3	0.4	0.7	0.9
BCOM_B450	JUNCTION	1.0	1.3	1.7	2.9	3.4
BCOM_B500	JUNCTION	0.6	0.8	1.1	2.0	2.4
BCOM_B550	JUNCTION	1.9	2.6	3.2	5.9	7.3
BCOM_B600	JUNCTION	2.8	3.9	5.6	12.8	16.4
BCOM_B650	JUNCTION	0.3	0.4	0.5	1.0	1.2
BCOM_B700	JUNCTION	9.1	13.1	18.2	39.1	50.3
BCOM_B750	JUNCTION	2.1	3.0	4.3	10.0	12.8
BCOM_B800	JUNCTION	3.2	4.7	6.5	14.2	18.3
BCOM_B850	JUNCTION	3.7	5.4	7.7	17.3	22.3
BCOM_B900	JUNCTION	3.2	4.7	6.6	14.7	19.0
BCOM_B950	JUNCTION	2.0	2.7	3.6	7.4	9.3
BCOM_B975	JUNCTION	5.0	7.2	10.0	21.9	28.1
BCOM_J050	JUNCTION	110.7	174.6	271.7	898.2	1346.1
BCOM_J100	JUNCTION	5.5	7.8	10.6	12.5	12.5
BCOM_J105	JUNCTION	5.5	7.8	10.6	12.5	12.5
BCOM_J110	JUNCTION	5.5	7.8	10.6	25.2	37.0
BCOM_J150	JUNCTION	101.3	148.2	219.5	870.7	1295.5
BCOM_J155	JUNCTION	103.0	162.1	232.7	884.5	1308.7
BCOM_J160	JUNCTION	104.9	166.2	255.0	889.2	1327.4
BCOM_J165	JUNCTION	104.8	166.2	254.9	889.3	1327.6
BCOM_J170	JUNCTION	106.7	168.9	260.0	891.7	1332.7
BCOM_J250	JUNCTION	0.1	0.2	0.2	0.4	0.5
BCOM_J300	JUNCTION	0.1	0.1	0.2	0.5	0.7
BCOM_J950	JUNCTION	2.0	2.7	3.6	5.0	5.0
BCOM_J955	JUNCTION	2.0	2.7	3.6	5.0	5.0
BCOM_J975	JUNCTION	0.0	0.0	0.8	9.0	9.0
BCOM_J980	JUNCTION	5.0	7.2	9.0	9.0	9.0

Node	Junction Type	2-yr	5-yr	10-yr	50-yr	100-yr
BCOM_J985	JUNCTION	5.0	7.2	9.0	9.0	9.0
BCOM_J990	JUNCTION	4.9	7.1	9.0	9.0	9.1
BCOM_J995	JUNCTION	0.0	0.0	0.8	9.0	9.0
BMA_B100	JUNCTION	1.7	3.4	17.2	91.4	132.2
BMA_B200	JUNCTION	1.1	2.1	7.5	36.3	51.2
BMA_B300	JUNCTION	3.3	6.6	27.6	152.8	223.0
BMA_B400	JUNCTION	1.9	3.8	13.9	76.2	111.5
BMA_B500	JUNCTION	1.2	2.5	5.5	47.0	69.2
BMA_B600	JUNCTION	0.6	1.3	3.4	12.7	17.6
BMA_J100	JUNCTION	1.7	3.4	17.2	20.1	20.1
BMA_J200	JUNCTION	1.1	2.1	7.5	36.3	51.2
BMA_J400	JUNCTION	4.1	6.9	15.2	60.1	83.8
BMA_J410	JUNCTION	1.9	3.8	13.9	76.2	111.5
BMA_J600	JUNCTION	11.6	34.0	95.6	372.7	526.5
BMA_O500	JUNCTION	1.2	2.5	5.5	47.0	69.2
BON_B100	JUNCTION	1.4	2.8	14.2	74.5	107.2
BON_J100	JUNCTION	3.6	11.9	30.2	150.0	219.8
BRG_B100	JUNCTION	0.9	3.0	8.4	30.8	41.7
BRG_B110	JUNCTION	0.9	3.0	8.4	30.8	41.7
BRG_B120	JUNCTION	9.1	21.4	63.5	275.0	389.5
BRG_B200	JUNCTION	7.1	16.1	38.0	135.5	188.5
BRG_B210	JUNCTION	8.2	20.0	61.2	270.1	384.9
BRG_B300	JUNCTION	3.3	6.3	30.1	139.8	193.2
BRG_B310	JUNCTION	3.3	6.3	30.1	139.8	193.2
BRG_J320	JUNCTION	8.5	19.4	58.0	252.0	355.8
BUC_B100	JUNCTION	0.4	1.1	2.6	8.9	12.2
BUC_B200	JUNCTION	0.4	0.8	2.0	7.0	9.7
BUC_B300	JUNCTION	3.7	5.2	7.2	15.8	20.0
BUC_B400	JUNCTION	2.7	4.2	6.3	14.5	18.7
BUC_B500	JUNCTION	9.8	14.3	20.2	42.8	54.7
BUC_B600	JUNCTION	15.3	22.3	31.5	70.1	89.2
BUC_B650	JUNCTION	0.7	1.1	1.5	3.5	4.6
BUC_B700	JUNCTION	8.7	12.4	17.6	37.8	48.9
BUC_B750	JUNCTION	1.9	2.8	3.9	8.4	10.8
BUC_B800	JUNCTION	9.0	13.0	18.1	39.5	50.8
BUC_B900	JUNCTION	6.5	9.7	13.6	30.0	38.0
BUC_J700	JUNCTION	1.9	8.9	18.9	62.4	86.4
BUC_J750	JUNCTION	2.0	5.9	11.1	33.8	47.4
BUC_J800	JUNCTION	7.0	7.0	7.0	7.0	7.0
BUC_J900	JUNCTION	6.5	9.7	13.6	30.0	38.0
CCC_B100	JUNCTION	6.0	8.2	10.5	20.2	24.9
CCC_B200	JUNCTION	3.9	5.3	6.6	11.8	14.6
CCC_B300	JUNCTION	5.0	7.2	9.9	19.9	25.4
CCC_J100	JUNCTION	2.5	2.5	2.5	2.5	2.5
CCC_J105	JUNCTION	2.5	2.5	2.5	2.5	2.5

Node	Junction Type	2-yr	5-yr	10-yr	50-yr	100-yr
CLK_B100	JUNCTION	1.2	2.4	11.8	67.1	97.4
CLK_B200	JUNCTION	14.1	27.0	48.3	289.3	429.6
CLK_B300	JUNCTION	1.1	3.6	11.5	47.6	67.0
CLK_B400	JUNCTION	26.5	45.8	88.4	319.1	453.0
CLK_J100	JUNCTION	1.2	2.4	11.8	67.1	97.4
CLK_J110	JUNCTION	0.9	2.0	10.0	62.9	93.5
CLK_J120	JUNCTION	8.3	17.2	57.4	254.0	365.4
CLK_J130	JUNCTION	7.7	16.7	56.8	253.1	365.0
CLK_J300	JUNCTION	1.1	3.6	11.5	47.6	67.0
COLE_B100	JUNCTION	20.4	31.7	48.8	115.2	148.9
COLE_B200	JUNCTION	2.8	4.3	6.4	15.3	20.0
COLE_B300	JUNCTION	12.4	18.5	26.9	61.9	79.3
COLE_B400	JUNCTION	2.8	4.2	5.9	12.5	15.9
COLE_B500	JUNCTION	23.4	34.9	50.8	110.1	141.5
COLE_J200	JUNCTION	27.0	41.1	60.2	135.0	173.6
COLE_J205	JUNCTION	26.9	40.9	59.6	134.4	172.6
COLE_J300	JUNCTION	0.0	0.0	0.0	0.0	0.0
COLE_J305	JUNCTION	12.2	18.0	18.0	18.0	18.0
COLE_STD3	JUNCTION	12.2	18.0	18.0	18.0	18.0
CPATM_B100	JUNCTION	8.5	13.8	21.7	54.1	70.2
CPATM_B110	JUNCTION	23.9	34.9	49.3	106.1	129.0
CPATM_J105	JUNCTION	15.8	24.2	24.6	31.8	31.8
DCM_B100	JUNCTION	13.3	21.7	46.3	167.0	229.6
DCM_B200	JUNCTION	11.2	33.0	92.9	362.1	510.9
DCM_B300	JUNCTION	4.0	8.2	32.6	155.3	226.6
DCM_B400	JUNCTION	4.8	10.0	27.0	206.4	300.4
DCM_B500	JUNCTION	2.7	6.5	15.7	57.2	80.9
DCM_J100	JUNCTION	13.3	21.7	46.3	167.0	229.6
DCM_J200	JUNCTION	11.2	33.0	92.9	362.1	510.9
FCE_B100	JUNCTION	3.7	5.9	9.3	23.4	30.4
HILD_B100	JUNCTION	1.3	4.8	16.4	70.1	101.2
HILD_J100	JUNCTION	3.5	11.5	94.1	612.7	929.9
IND_B0100	JUNCTION	0.8	1.7	7.1	38.2	56.3
IND_B0105	JUNCTION	1.4	3.9	10.4	39.4	54.9
IND_B0110	JUNCTION	1.7	3.0	7.6	33.4	47.3
IND_B0115	JUNCTION	3.7	9.6	31.1	130.7	183.4
IND_B0120	JUNCTION	2.9	7.4	22.7	95.7	137.6
IND_J0105	JUNCTION	30.8	37.7	55.0	1029.1	1075.9
IND_J0115	JUNCTION	3.7	9.6	31.1	130.7	183.4
INT_J035	JUNCTION	0.0	1.3	5.0	20.1	28.0
KAWS_B100	JUNCTION	3.1	4.7	6.8	15.7	20.1
KAWS_B150	JUNCTION	3.7	5.8	9.0	20.6	26.9
KAWS_B200	JUNCTION	3.1	4.7	6.9	15.2	19.7
KAWS_B250	JUNCTION	5.4	8.0	11.4	24.4	31.2
KAWS_B300	JUNCTION	2.4	3.5	4.9	9.9	12.8

Node Peak Flows (cfs)

Node	Junction Type	2-yr	5-yr	10-yr	50-yr	100-yr
KAWS_B350	JUNCTION	4.0	6.2	9.5	21.4	27.9
KAWS_B400	JUNCTION	5.5	8.3	12.4	27.6	34.9
KAWS_B500	JUNCTION	2.0	3.3	5.3	13.8	18.3
KAWS_B550	JUNCTION	2.7	4.1	5.7	12.6	16.2
KAWS_B575	JUNCTION	1.2	1.6	2.0	4.0	4.9
KAWS_B600	JUNCTION	3.5	5.1	7.2	14.7	18.8
KAWS_B625	JUNCTION	7.4	10.9	15.5	32.0	41.3
KAWS_B650	JUNCTION	2.0	2.8	3.8	7.9	10.0
KAWS_B700	JUNCTION	1.5	2.2	3.1	6.9	9.0
KAWS_B750	JUNCTION	8.2	12.1	17.9	43.1	56.2
KAWS_B775	JUNCTION	1.4	2.1	3.1	8.0	10.5
KAWS_B800	JUNCTION	1.1	1.7	2.9	8.8	11.7
KAWS_J575	JUNCTION	0.0	0.0	0.0	9.2	22.0
KAWS_J580	JUNCTION	0.0	0.0	0.0	9.2	22.0
KAWS_J700	JUNCTION	1.5	2.2	3.1	6.9	9.0
KAWS_J800	JUNCTION	110.7	175.2	272.2	900.1	1348.9
KNL_B050	JUNCTION	3.6	6.6	11.4	33.0	45.1
KNL_B100	JUNCTION	6.6	14.2	31.7	111.2	157.2
KNL_B200	JUNCTION	2.0	5.7	16.3	62.5	86.6
KNL_B300	JUNCTION	2.2	6.7	22.0	88.9	122.1
KNL_B400	JUNCTION	56.7	85.0	123.4	279.8	357.5
KNL_B450	JUNCTION	1.1	1.6	2.2	4.4	5.6
KNL_B500	JUNCTION	2.0	5.6	17.3	68.1	94.3
KNL_D200	JUNCTION	53.7	88.7	154.8	461.7	624.5
KNL_J100	JUNCTION	53.0	93.0	171.9	545.1	750.0
KNL_J300	JUNCTION	53.6	85.5	142.7	406.1	544.0
KNL_J400	JUNCTION	57.5	87.2	133.4	339.0	444.8
KNL_J410	JUNCTION	54.3	83.2	128.8	332.6	437.6
KNL_J460	JUNCTION	7.1	18.1	56.7	256.2	373.9
KNL_J500	JUNCTION	2.0	5.6	17.3	68.1	94.3
LCD_B100	JUNCTION	7.6	13.2	31.9	127.8	178.7
LCD_B1000	JUNCTION	2.9	8.1	23.4	90.8	125.8
LCD_B1100	JUNCTION	9.7	21.8	47.1	155.9	212.6
LCD_B1200	JUNCTION	4.5	8.5	26.7	118.0	162.9
LCD_B1300	JUNCTION	9.5	17.0	48.7	196.7	269.8
LCD_B1400	JUNCTION	5.2	11.8	25.3	82.1	112.0
LCD_B1500	JUNCTION	4.4	11.5	27.8	98.0	134.6
LCD_B200	JUNCTION	8.2	15.0	40.8	180.2	256.0
LCD_B300	JUNCTION	4.2	10.3	27.7	106.6	148.5
LCD_B400	JUNCTION	0.7	1.3	3.5	14.8	20.7
LCD_B500	JUNCTION	1.7	4.0	9.2	31.7	43.4
LCD_B600	JUNCTION	12.6	31.2	78.5	288.8	400.4
LCD_B700	JUNCTION	18.1	30.0	69.2	256.1	351.9
LCD_B800	JUNCTION	3.7	5.8	9.8	28.9	38.4
LCD_B900	JUNCTION	6.5	15.8	42.9	159.6	219.1

Node	Junction Type	2-yr	5-yr	10-yr	50-yr	100-yr
LCD_J100	JUNCTION	7.6	13.2	31.9	127.8	178.7
LCD_J1000	JUNCTION	14.0	36.9	99.3	396.2	750.8
LCD_J200	JUNCTION	13.0	24.8	65.8	295.3	423.4
LCD_J400	JUNCTION	0.7	1.3	3.5	14.8	20.7
LCD_J500	JUNCTION	1.7	4.0	9.2	31.7	43.4
LCD_J600	JUNCTION	13.2	32.3	81.4	384.5	723.5
LCD_J625	JUNCTION	12.4	31.8	82.7	383.5	721.2
LCD_J900	JUNCTION	15.3	42.6	121.1	496.7	773.3
LON_B100	JUNCTION	2.4	4.8	23.8	131.9	193.2
LON_B200	JUNCTION	2.1	6.9	24.6	104.9	146.5
LON_B300	JUNCTION	1.5	3.0	14.0	83.9	120.9
LON_J100	JUNCTION	1.9	5.5	26.1	155.9	230.9
LON_J110	JUNCTION	2.9	8.1	79.0	523.1	790.0
LON_J200	JUNCTION	3.3	11.2	14.1	14.1	14.1
LON_J300	JUNCTION	3.0	9.2	38.4	206.5	303.6
MCG_B100	JUNCTION	1.4	3.9	10.2	37.0	51.0
MCG_B200	JUNCTION	0.9	2.1	4.6	14.9	20.0
MCG_B300	JUNCTION	1.1	2.1	3.8	11.5	16.0
MCG_B400	JUNCTION	1.8	5.0	12.3	43.4	59.5
MCG_B410	JUNCTION	20.8	35.3	62.0	170.3	224.4
MCG_B420	JUNCTION	18.0	33.4	63.2	193.1	261.5
MCG_B500	JUNCTION	10.5	17.2	29.5	75.4	99.5
MCG_B510	JUNCTION	19.8	32.1	53.4	133.7	175.6
MCG_B600	JUNCTION	9.4	14.9	24.0	58.3	76.1
MCG_B610	JUNCTION	9.4	14.9	24.0	58.3	76.1
MCG_J200	JUNCTION	17.3	33.2	64.1	202.0	274.5
MCG_J220	JUNCTION	16.9	32.6	63.2	200.8	273.2
MCG_J300	JUNCTION	8.1	20.2	61.6	273.0	393.0
MEA_B100	JUNCTION	1.4	2.2	4.1	12.7	17.0
MEA_B150	JUNCTION	1.6	2.3	3.1	6.7	8.4
MEA_B200	JUNCTION	14.5	21.2	30.7	70.8	91.8
MEA_B250	JUNCTION	2.1	3.0	4.1	9.4	12.0
MEA_B300	JUNCTION	1.8	2.6	3.7	8.1	10.5
MEA_B350	JUNCTION	6.0	8.6	12.0	27.1	34.6
MEA_B375	JUNCTION	10.1	14.4	19.9	44.9	57.3
MEA_B400	JUNCTION	3.9	5.6	7.9	17.8	22.7
MEA_B450	JUNCTION	3.3	4.9	6.9	15.4	19.5
MEA_B500	JUNCTION	4.8	7.1	9.8	21.5	27.2
MEA_B550	JUNCTION	5.0	7.2	10.1	22.7	29.1
MEA_B600	JUNCTION	0.5	0.9	1.4	3.6	4.9
MEA_B650	JUNCTION	3.0	4.5	7.3	20.5	27.2
MEA_B700	JUNCTION	0.7	1.0	1.3	2.6	3.3
MEA_J110	JUNCTION	4.1	6.3	48.2	947.1	947.1
MEA_J650	JUNCTION	3.0	4.5	7.3	20.5	27.2
MER_B100	JUNCTION	7.3	10.5	14.9	34.1	43.6

Node	Junction Type	2-yr	5-yr	10-yr	50-yr	100-yr
MER_J100	JUNCTION	0.0	0.0	1.9	26.0	26.0
MER_J110	JUNCTION	0.0	0.0	1.8	26.0	26.0
MER_J120	JUNCTION	0.0	0.0	1.8	26.0	26.0
OLT_B0100	JUNCTION	1.2	1.9	2.9	6.8	8.9
OLT_B0150	JUNCTION	2.1	3.1	4.3	9.6	12.3
OLT_B0200	JUNCTION	2.5	3.6	5.1	11.7	14.9
OLT_B0250	JUNCTION	0.9	1.3	1.8	4.0	5.0
OLT_B0300	JUNCTION	3.2	4.6	6.5	14.1	18.2
OLT_B0350	JUNCTION	2.3	3.3	4.6	10.3	13.1
OLT_B0400	JUNCTION	1.6	2.2	3.1	7.1	9.0
OLT_B0450	JUNCTION	0.7	1.0	1.4	3.2	4.1
OLT_B0500	JUNCTION	3.7	5.2	7.1	14.5	18.4
OLT_B0550	JUNCTION	0.3	0.4	0.5	1.1	1.5
OLT_B0600	JUNCTION	4.2	6.1	8.8	19.9	25.8
OLT_B0650	JUNCTION	7.4	11.1	16.0	34.4	44.1
OLT_B0700	JUNCTION	3.8	5.7	8.2	17.5	22.5
OLT_B0750	JUNCTION	2.1	3.0	4.1	7.9	10.0
OLT_B0800	JUNCTION	1.1	1.6	2.7	7.1	9.4
OLT_B0850	JUNCTION	1.3	1.9	2.6	5.7	7.3
OLT_B0900	JUNCTION	0.3	0.4	0.6	1.4	1.8
OLT_B0950	JUNCTION	2.6	3.6	4.9	10.1	12.9
OLT_B1000	JUNCTION	0.8	1.1	1.5	3.2	4.0
OLT_B1050	JUNCTION	1.9	2.6	3.3	6.0	7.5
OLT_B1100	JUNCTION	2.2	3.1	4.2	8.9	11.2
OLT_B1150	JUNCTION	1.6	2.3	3.2	6.9	8.9
OLT_B1200	JUNCTION	0.1	0.1	0.2	0.4	0.5
OLT_B1225	JUNCTION	0.9	1.3	1.7	3.2	4.0
OLT_B1250	JUNCTION	4.0	5.5	7.0	13.0	16.0
OLT_B1300	JUNCTION	0.4	0.6	0.8	1.6	2.0
OLT_B1350	JUNCTION	2.7	3.7	4.8	9.0	11.2
OLT_B1400	JUNCTION	1.2	1.7	2.4	5.1	6.6
OLT_B1450	JUNCTION	1.2	1.8	2.5	5.6	7.2
OLT_B1500	JUNCTION	0.1	0.2	0.3	0.5	0.6
OLT_B1550	JUNCTION	1.7	2.4	3.3	7.0	9.0
OLT_B1600	JUNCTION	0.3	0.4	0.6	1.1	1.4
OLT_B1650	JUNCTION	1.5	2.1	2.6	4.6	5.7
OLT_B1700	JUNCTION	3.0	4.2	5.5	10.8	13.4
OLT_B1750	JUNCTION	2.9	4.0	5.2	10.0	12.2
OLT_B1775	JUNCTION	0.4	0.5	0.7	1.3	1.6
OLT_B1800	JUNCTION	0.3	0.4	0.5	1.0	1.2
OLT_B1850	JUNCTION	2.0	2.8	3.7	7.1	8.9
OLT_B1900	JUNCTION	0.2	0.3	0.3	0.6	0.8
OLT_B2000	JUNCTION	1.6	2.2	2.9	5.8	7.3
OLT_B2100	JUNCTION	2.5	3.4	4.4	8.2	10.3
OLT_B2150	JUNCTION	3.6	5.1	6.7	12.8	15.5

Node Peak Flows (cfs)

Node	Junction Type	2-yr	5-yr	10-yr	50-yr	100-yr
OLT_B2200	JUNCTION	2.1	2.9	3.9	7.9	10.0
OLT_B2250	JUNCTION	2.0	2.8	3.6	7.0	8.8
OLT_B2300	JUNCTION	1.7	2.3	3.1	6.1	7.4
OLT_B2350	JUNCTION	3.0	4.2	6.0	12.9	16.5
OLT_B2400	JUNCTION	0.3	0.4	0.6	1.2	1.6
OLT_B2450	JUNCTION	1.2	1.7	2.4	5.2	6.7
OLT_B2500	JUNCTION	1.0	1.4	2.0	4.6	5.9
OLT_B2550	JUNCTION	2.0	2.8	3.9	8.2	10.5
OLT_B2600	JUNCTION	2.1	3.1	4.5	9.2	11.9
OLT_B2650	JUNCTION	1.8	2.7	3.8	7.9	10.1
OLT_B2700	JUNCTION	2.0	2.9	4.0	8.4	10.8
OLT_B2750	JUNCTION	1.2	1.6	2.3	5.0	6.4
OLT_B2800	JUNCTION	0.7	1.0	1.3	2.9	3.6
OLT_B2850	JUNCTION	1.4	2.1	3.0	7.1	9.2
OLT_B2900	JUNCTION	3.4	4.9	6.7	14.0	17.9
OLT_B2950	JUNCTION	1.6	2.3	3.5	9.1	12.1
OLT_B3000	JUNCTION	0.4	0.6	1.0	3.2	4.3
OLT_B3050	JUNCTION	2.1	3.1	4.3	9.5	12.1
OLT_B3100	JUNCTION	7.9	11.6	16.4	34.5	43.9
OLT_B3150	JUNCTION	3.8	5.5	7.7	16.8	21.7
OLT_B3200	JUNCTION	2.1	3.0	4.1	9.2	11.8
OLT_B3250	JUNCTION	6.9	9.9	14.0	32.5	41.6
OLT_B3300	JUNCTION	1.4	2.1	3.9	12.4	16.7
OLT_D1750	JUNCTION	2.9	4.0	5.2	10.0	12.2
OLT_J0105	JUNCTION	74.5	118.7	188.3	840.3	1262.9
OLT_J0110	JUNCTION	82.5	126.7	196.0	848.4	1271.0
OLT_J0450	JUNCTION	7.6	10.9	15.2	34.2	43.8
OLT_J0500	JUNCTION	16.0	23.1	32.2	72.7	93.2
OLT_J0600	JUNCTION	4.2	6.1	8.8	22.6	30.4
OLT_J0650	JUNCTION	47.8	75.3	115.9	760.7	1178.6
OLT_J0655	JUNCTION	47.8	75.3	115.9	760.7	1178.6
OLT_J0750	JUNCTION	44.8	71.2	110.0	757.6	1174.9
OLT_J0850	JUNCTION	6.0	8.6	11.8	25.8	32.9
OLT_J0950	JUNCTION	5.6	8.0	11.0	23.5	30.0
OLT_J1000	JUNCTION	2.2	3.1	4.0	7.7	9.6
OLT_J1150	JUNCTION	4.5	6.5	8.9	19.1	24.4
OLT_J1200	JUNCTION	0.4	0.6	0.8	1.6	2.0
OLT_J1300	JUNCTION	24.1	25.9	27.6	34.9	38.9
OLT_J1350	JUNCTION	2.7	3.7	67.5	606.3	936.7
OLT_J1355	JUNCTION	10.4	29.7	74.8	719.7	1132.3
OLT_J1450	JUNCTION	3.2	4.5	6.0	12.6	15.9
OLT_J1500	JUNCTION	0.3	0.5	0.6	1.2	1.4
OLT_J1550	JUNCTION	3.1	4.4	6.0	12.5	15.9
OLT_J1600	JUNCTION	0.3	0.4	0.6	1.1	1.4
OLT_J1605	JUNCTION	5.9	8.4	11.5	24.5	31.2

Node	Junction Type	2-yr	5-yr	10-yr	50-yr	100-yr
OLT_J1650	JUNCTION	1.5	2.1	2.6	4.6	5.7
OLT_J1700	JUNCTION	3.0	4.2	5.5	10.8	13.4
OLT_J1800	JUNCTION	0.3	0.4	0.5	1.0	1.2
OLT_J1850	JUNCTION	2.0	2.8	3.7	7.1	8.9
OLT_J1900	JUNCTION	0.2	0.3	0.3	0.6	0.8
OLT_J2000	JUNCTION	1.6	2.2	2.9	5.8	7.3
OLT_J2101	JUNCTION	16.9	24.9	35.1	187.6	296.3
OLT_J2110	JUNCTION	28.9	47.3	61.0	212.3	323.2
OLT_J2150	JUNCTION	12.4	21.6	23.2	30.4	33.9
OLT_J2250	JUNCTION	6.1	8.8	11.9	28.8	38.4
OLT_J2300	JUNCTION	4.5	6.5	8.9	22.5	30.4
OLT_J2350	JUNCTION	3.0	4.2	6.0	12.9	16.5
OLT_J2400	JUNCTION	0.3	0.4	0.6	5.8	9.0
OLT_J2450	JUNCTION	5.8	10.7	17.1	47.7	64.0
OLT_J2500	JUNCTION	6.6	12.0	19.0	52.2	69.8
OLT_J2550	JUNCTION	2.0	2.8	3.9	8.2	10.5
OLT_J2600	JUNCTION	17.1	25.1	35.4	164.1	260.5
OLT_J2650	JUNCTION	13.5	19.8	27.9	59.7	76.0
OLT_J2700	JUNCTION	2.0	2.9	4.0	8.4	10.8
OLT_J2800	JUNCTION	7.1	14.9	97.9	623.3	944.5
OLT_J3000	JUNCTION	16.3	21.6	25.4	30.7	31.0
OLT_J3050	JUNCTION	9.9	14.6	20.6	43.7	55.6
OLT_J3100	JUNCTION	7.9	11.6	16.4	34.5	43.9
OLT_J3150	JUNCTION	4.7	12.6	95.7	618.0	937.4
OLT_J3200	JUNCTION	2.1	3.0	4.1	9.2	11.8
OLT_J3250	JUNCTION	6.9	9.9	14.0	32.5	41.6
OLT_J3300	JUNCTION	1.4	2.1	3.9	12.4	16.7
OLT_J3310	JUNCTION	3.6	11.9	95.0	616.4	935.4
OLT_J550	JUNCTION	0.3	0.4	0.5	1.1	1.5
PHS_B100	JUNCTION	5.9	16.5	67.6	312.2	450.6
PHS_B300	JUNCTION	1.0	2.8	8.8	34.1	46.4
PHS_J100	JUNCTION	10.5	27.7	111.6	540.9	787.9
PHS_J120	JUNCTION	12.8	34.7	144.3	703.9	1026.4
PHS_J300	JUNCTION	3.0	8.2	37.0	175.9	253.3
PIE_B050	JUNCTION	16.7	23.4	30.4	56.7	70.6
PIE_B100	JUNCTION	13.0	20.4	36.8	121.0	165.3
PIE_J100	JUNCTION	13.2	22.4	53.7	241.5	350.9
PIE_J110	JUNCTION	13.2	22.4	53.7	241.5	350.8
PME_B100	JUNCTION	14.2	23.2	38.5	102.1	133.7
PME_B200	JUNCTION	17.1	25.4	36.6	81.0	103.6
PME_J100	JUNCTION	0.0	0.0	162.9	1036.3	1515.6
PRR_B100	JUNCTION	6.5	10.7	22.5	83.6	115.8
PRR_B200	JUNCTION	3.7	6.2	10.2	27.7	36.8
PRR_J100	JUNCTION	7.1	12.7	25.1	94.3	133.2
PRR_J200	JUNCTION	3.7	6.2	10.2	27.7	36.8

Node	Junction Type	2-yr	5-yr	10-yr	50-yr	100-yr
PVE_B100	JUNCTION	3.0	7.6	33.6	156.0	222.4
PVE_J100	JUNCTION	3.0	7.6	33.6	156.0	222.4
SAD_B100	JUNCTION	0.8	3.3	10.2	39.9	55.4
SAD_B200	JUNCTION	0.4	1.5	4.8	19.5	27.6
SAD_J100	JUNCTION	0.8	3.3	10.2	39.9	55.4
SBC_B100	JUNCTION	8.3	17.2	57.4	254.0	365.4
SME_B050	JUNCTION	1.1	1.6	2.4	5.7	7.5
SME_B100	JUNCTION	1.5	2.9	5.3	15.9	21.5
SME_B200	JUNCTION	1.5	2.8	5.0	14.1	18.6
SME_B300	JUNCTION	2.6	3.9	5.5	11.7	14.9
SME_B400	JUNCTION	10.7	15.8	22.6	47.4	60.9
SME_B500	JUNCTION	12.5	22.6	39.8	110.9	146.3
SME_B550	JUNCTION	11.2	16.5	23.4	48.7	62.3
SME_B600	JUNCTION	6.1	9.0	12.6	25.9	33.1
SME_B700	JUNCTION	9.5	14.3	20.9	45.5	58.5
SME_J105	JUNCTION	1.8	1.8	1.8	1.8	1.8
SME_J110	JUNCTION	0.0	0.0	0.0	323.2	594.7
SME_J600	JUNCTION	51.2	91.3	171.7	556.6	772.6
STD003	JUNCTION	3.5	3.5	3.5	3.5	3.5
STD004	JUNCTION	3.5	3.5	3.5	3.5	3.5
STD013	JUNCTION	4.5	4.5	4.5	4.5	4.5
STD014	JUNCTION	9.5	9.5	9.5	9.5	9.5
STD016	JUNCTION	5.0	5.0	5.0	5.0	5.0
STD017	JUNCTION	4.5	4.5	4.5	4.5	4.5
STD018	JUNCTION	4.5	4.5	4.5	4.5	4.5
STD019	JUNCTION	4.5	4.5	4.5	4.5	4.5
STD020	JUNCTION	4.5	4.5	4.5	4.5	4.5
STD021	JUNCTION	18.1	35.4	45.0	62.5	75.1
STD024	JUNCTION	1.7	2.3	2.9	5.0	5.0
STD027	JUNCTION	9.4	10.0	10.0	10.0	10.0
STD028	JUNCTION	0.5	2.6	4.6	5.0	5.0
STD029	JUNCTION	9.8	12.5	14.6	15.0	15.0
STD030	JUNCTION	9.8	12.5	14.6	15.0	15.0
STD031	JUNCTION	9.8	12.5	14.6	15.0	15.0
STD032	JUNCTION	4.5	5.0	5.0	5.0	5.0
STD034	JUNCTION	4.5	5.0	5.0	5.0	5.0
STD037	JUNCTION	4.5	5.0	5.0	5.0	5.0
STD038	JUNCTION	12.4	18.0	26.5	60.1	78.7
STD045	JUNCTION	19.0	30.9	63.6	259.8	374.7
STD048	JUNCTION	13.9	23.6	46.2	61.5	61.5
STD049	JUNCTION	13.9	23.6	46.2	61.5	61.5
STD050	JUNCTION	13.9	23.6	46.2	61.5	61.5
STD051	JUNCTION	13.8	23.6	46.2	61.5	61.5
STD053	JUNCTION	22.9	36.1	54.2	74.2	74.2
STD054	JUNCTION	22.9	36.1	54.2	74.2	74.2

Node Peak Flows (cfs)

Node	Junction Type	2-yr	5-yr	10-yr	50-yr	100-yr
STD055	JUNCTION	22.9	36.1	54.2	74.2	74.2
STD056	JUNCTION	22.9	36.1	54.2	74.2	74.2
STD057	JUNCTION	22.9	36.1	54.2	74.2	74.2
STD062	JUNCTION	0.0	0.0	0.0	8.2	8.2
STD063	JUNCTION	0.0	0.0	0.0	5.0	5.0
STD064	JUNCTION	4.0	6.0	8.5	30.4	37.2
STD070	JUNCTION	7.4	10.8	15.4	32.0	41.1
STD071	JUNCTION	7.4	10.8	15.4	32.0	41.1
STD072	JUNCTION	7.4	10.9	15.5	32.0	41.3
STD074	JUNCTION	2.7	4.1	5.7	9.0	9.0
STD077	JUNCTION	2.7	3.2	3.8	10.1	19.4
STD078	JUNCTION	2.7	3.2	3.8	10.1	19.4
STD080	JUNCTION	2.7	3.2	3.8	10.1	19.4
STD081	JUNCTION	2.7	3.2	3.8	10.1	19.4
STD082	JUNCTION	0.1	2.7	4.5	13.3	27.0
STD084	JUNCTION	0.1	2.7	4.5	13.3	27.0
STD085	JUNCTION	0.1	2.7	4.5	13.3	27.0
STD089	JUNCTION	23.0	23.0	23.0	23.0	23.0
STD090	JUNCTION	23.0	23.0	23.0	23.0	23.0
STD092	JUNCTION	0.1	0.1	0.4	4.9	7.1
STD098	JUNCTION	0.2	0.2	1.9	14.5	14.5
STD099	JUNCTION	1.3	1.7	2.3	18.0	19.3
STD100	JUNCTION	1.3	1.7	2.3	17.9	19.2
STD101	JUNCTION	1.3	1.7	2.3	17.9	19.2
STD106	JUNCTION	1.7	2.3	2.9	5.0	5.0
STD107	JUNCTION	4.3	6.0	7.8	14.6	18.3
STD108	JUNCTION	4.3	6.0	7.8	14.6	18.3
STD114	JUNCTION	1.9	2.8	3.9	7.0	7.0
STD115	JUNCTION	8.9	9.8	10.9	14.0	14.0
STD116	JUNCTION	8.9	9.8	10.9	14.0	14.0
STD119	JUNCTION	26.9	38.9	48.6	49.6	49.7
STD122	JUNCTION	26.9	38.9	48.5	49.5	49.5
STD126	JUNCTION	8.7	11.5	11.5	11.5	11.5
STD127	JUNCTION	8.7	11.5	11.5	11.5	11.5
STD128	JUNCTION	8.7	11.5	11.5	11.5	11.5
STD129	JUNCTION	8.7	11.5	11.5	11.5	11.5
STD130	JUNCTION	8.7	11.5	11.5	11.5	11.5
STD131	JUNCTION	13.2	16.0	16.0	16.0	16.0
STD132	JUNCTION	4.5	4.5	4.5	4.5	4.5
STD133	JUNCTION	4.5	4.5	4.5	4.5	4.5
STD134	JUNCTION	4.5	4.5	4.5	4.5	4.5
STD135	JUNCTION	3.9	4.5	4.5	4.5	4.5
STD136	JUNCTION	3.9	4.5	4.5	4.5	4.5
STD137	JUNCTION	3.9	4.5	4.5	4.5	4.5
STD139	JUNCTION	4.5	4.5	4.5	4.5	4.5

Node	Junction Type	2-yr	5-yr	10-yr	50-yr	100-yr
STD140	JUNCTION	4.5	4.5	4.5	4.5	4.5
STD141	JUNCTION	4.2	7.0	7.0	7.0	7.0
STD149	JUNCTION	3.3	4.5	4.5	4.5	4.5
STD151	JUNCTION	13.2	16.0	16.0	16.0	16.0
STD152	JUNCTION	13.2	17.1	22.8	51.2	65.4
STD155	JUNCTION	24.4	24.4	24.4	24.4	24.4
STD156	JUNCTION	24.4	24.4	24.4	24.4	24.4
STD157	JUNCTION	25.3	26.7	30.6	47.5	56.9
STD158	JUNCTION	29.3	32.4	71.9	988.2	1000.5
STD159	JUNCTION	1.8	3.2	4.5	4.5	4.5
STD161	JUNCTION	13.1	14.6	15.1	15.1	15.1
STD162	JUNCTION	3.3	4.5	4.5	4.5	4.5
STD164	JUNCTION	0.9	1.3	1.8	3.9	5.0
STD165	JUNCTION	0.9	1.3	1.8	3.9	5.0
STD166	JUNCTION	0.9	1.3	1.8	3.5	3.5
STD175	JUNCTION	17.4	34.0	37.0	37.0	37.0
STD176	JUNCTION	17.4	34.0	37.0	37.0	37.0
STD180	JUNCTION	16.8	32.6	42.1	42.1	42.1
STD181	JUNCTION	16.8	32.6	42.1	42.1	42.1
STD186	JUNCTION	5.6	8.4	12.6	24.5	25.1
STD187	JUNCTION	5.6	8.4	12.5	24.5	25.1
STD188	JUNCTION	5.5	8.4	12.5	24.6	25.2
STD189	JUNCTION	9.5	14.5	21.9	48.6	62.8
STD190	JUNCTION	8.5	11.3	15.5	27.6	28.2
STD191	JUNCTION	8.5	11.3	15.5	27.6	28.2
STD192	JUNCTION	0.3	0.5	0.9	2.4	3.3
STD212	JUNCTION	2.0	2.8	3.8	7.9	10.0
STD213	JUNCTION	2.0	2.8	3.8	7.9	10.0
STD214	JUNCTION	2.0	2.8	3.8	7.9	10.0
STD215	JUNCTION	2.0	2.8	3.8	7.9	9.5
STD216	JUNCTION	3.4	4.8	6.7	14.7	18.8
STD217	JUNCTION	3.4	4.9	6.8	14.7	18.9
STD218	JUNCTION	3.4	4.9	6.8	14.7	18.9
STD219	JUNCTION	3.4	4.9	6.8	14.7	18.8
STD220	JUNCTION	10.3	17.4	25.9	25.0	25.0
STD221	JUNCTION	4.2	6.4	8.0	8.0	8.0
STD222	JUNCTION	11.8	19.9	31.5	33.0	33.0
STD223	JUNCTION	11.8	19.9	31.5	33.0	33.0
STD227	JUNCTION	1.6	4.1	5.0	5.0	5.0
STD228	JUNCTION	1.6	4.1	5.0	5.0	5.0
STD229	JUNCTION	1.6	4.1	5.0	5.0	5.0
STD230	JUNCTION	2.3	5.5	6.0	6.0	6.0
STD232	JUNCTION	3.7	5.6	8.2	17.9	23.0
STD233	JUNCTION	3.7	5.6	8.2	17.9	23.0
STD234	JUNCTION	3.7	5.6	8.2	17.9	23.0

Node	Junction Type	2-yr	5-yr	10-yr	50-yr	100-yr
STD235	JUNCTION	3.7	5.6	8.2	17.9	23.1
STD236	JUNCTION	3.8	5.7	8.3	18.0	23.1
STD237	JUNCTION	3.8	5.7	8.3	18.0	23.2
STD243	JUNCTION	10.9	14.9	20.0	33.4	33.5
STD244	JUNCTION	10.9	14.9	20.0	33.0	33.0
STD246	JUNCTION	9.1	13.1	18.2	65.1	73.8
STD247	JUNCTION	26.5	30.1	34.2	51.4	59.9
STD251	JUNCTION	1.1	1.6	2.7	3.5	3.5
STD258	JUNCTION	3.8	12.0	26.3	25.0	24.6
STD262	JUNCTION	0.3	0.3	0.3	0.3	0.3
STD266	JUNCTION	1.0	1.0	1.0	1.0	1.0
STD269	JUNCTION	5.0	5.0	5.0	5.0	5.0
STD270	JUNCTION	10.0	10.0	10.0	10.0	10.0
STD272	JUNCTION	1.0	1.0	0.9	0.9	0.9
STD274	JUNCTION	0.0	0.0	0.0	0.0	0.0
STD276	JUNCTION	18.5	40.2	79.6	728.6	1143.1
STD277	JUNCTION	7.7	7.7	7.7	7.7	7.7
STD278	JUNCTION	5.0	5.0	5.0	5.0	5.0
STD279	JUNCTION	8.5	8.3	8.2	8.6	9.1
STD282	JUNCTION	3.8	5.2	5.2	5.4	5.5
STD283	JUNCTION	3.8	5.2	5.2	5.4	5.5
STD284	JUNCTION	3.2	4.7	18.0	18.0	18.0
STD285	JUNCTION	3.3	7.5	23.6	26.0	26.0
STD286	JUNCTION	15.8	24.2	24.6	31.8	31.8
STD287	JUNCTION	0.1	0.2	0.6	7.8	7.8
STD290	JUNCTION	3.6	5.4	10.2	28.8	33.4
STD291	JUNCTION	11.4	12.7	12.7	12.7	12.7
STD292	JUNCTION	11.4	12.7	12.7	12.7	12.7
STD293	JUNCTION	11.4	12.7	12.7	12.7	12.7
STD294	JUNCTION	11.4	12.7	12.7	12.7	12.7
STD295	JUNCTION	11.4	12.7	12.7	12.7	12.7
STD296	JUNCTION	3.9	5.0	5.0	5.0	5.0
STD297	JUNCTION	7.6	7.7	7.7	7.7	7.7
STD298	JUNCTION	7.6	7.7	7.7	7.7	7.7
STD299	JUNCTION	2.9	2.9	2.9	2.9	2.9
STD302	JUNCTION	0.0	0.0	0.0	0.0	0.0
STD303	JUNCTION	3.6	5.4	10.3	28.9	33.5
STD304	JUNCTION	0.4	0.8	6.6	14.5	14.5
STD305	JUNCTION	0.0	0.3	6.2	9.5	9.5
STD306	JUNCTION	0.4	0.6	0.7	5.0	5.0
STD307	JUNCTION	3.7	5.0	5.0	5.0	5.0
STD308	JUNCTION	3.3	7.5	23.6	26.0	26.0
STD311	JUNCTION	3.2	14.5	15.6	16.5	16.5
STD312	JUNCTION	3.2	14.6	15.6	16.5	16.5
STD313	JUNCTION	1.0	1.3	2.2	2.5	2.5

Node Peak Flows (cfs)

Node	Junction Type	2-yr	5-yr	10-yr	50-yr	100-yr
STD314	JUNCTION	16.1	16.3	16.6	17.5	17.9
STD315	JUNCTION	17.5	18.7	19.1	20.0	20.4
STD316	JUNCTION	17.5	18.7	19.1	20.0	20.4
STD317	JUNCTION	15.5	15.5	15.5	15.5	15.5
STD318	JUNCTION	16.1	16.3	16.6	17.5	17.9
STD319	JUNCTION	0.6	0.8	1.1	2.0	2.4
STD324	JUNCTION	8.3	8.4	8.5	9.0	9.2
STD325	JUNCTION	8.3	8.4	8.5	9.0	9.2
STD326	JUNCTION	8.0	8.0	8.0	8.0	8.0
STD327	JUNCTION	8.3	8.4	8.5	9.0	9.2
STD328	JUNCTION	5.0	5.0	5.0	5.0	5.0
STD329	JUNCTION	5.0	5.0	5.0	5.0	5.0
STD330	JUNCTION	55.9	58.2	58.4	58.7	58.7
STD333	JUNCTION	54.5	58.3	58.7	59.1	59.0
STD334	JUNCTION	15.8	24.2	24.6	31.8	31.8
STD335	JUNCTION	15.8	24.2	24.6	31.8	31.8
STD336	JUNCTION	15.8	24.2	24.6	31.8	31.8
STD363	JUNCTION	0.7	1.0	1.3	2.6	3.3
STD364	JUNCTION	0.7	1.0	1.3	2.6	3.3
STD365	JUNCTION	0.7	1.0	1.3	2.6	3.3
STD371	JUNCTION	11.9	17.7	25.4	51.1	58.6
STD374	JUNCTION	11.9	17.7	25.4	51.1	58.6
STD375	JUNCTION	15.8	24.2	24.6	31.8	31.8
STD380	JUNCTION	2.5	2.5	2.5	2.5	2.5
STD381	JUNCTION	2.5	2.5	2.5	2.5	2.5
STD382	JUNCTION	5.5	5.5	5.5	5.5	5.5
STD384	JUNCTION	7.2	9.1	9.1	9.1	9.1
STD385	JUNCTION	2.9	3.0	3.2	3.8	4.1
STD386	JUNCTION	2.5	2.5	2.5	2.5	2.5
STD388	JUNCTION	2.0	2.0	2.0	2.0	2.0
STD389	JUNCTION	5.0	5.0	5.0	13.2	13.2
STD390	JUNCTION	8.2	13.0	13.0	13.0	13.0
STD393	JUNCTION	27.3	60.4	194.6	979.7	1450.1
STD401	JUNCTION	13.0	13.0	13.0	13.0	13.0
STD402	JUNCTION	22.4	23.3	23.3	23.3	23.3
STD405	JUNCTION	27.2	28.5	28.5	28.4	28.5
STD406	JUNCTION	27.2	28.2	27.8	27.9	27.9
STD407	JUNCTION	27.2	28.0	27.7	27.8	27.8
STD411	JUNCTION	27.2	28.5	28.4	28.3	28.4
STD414	JUNCTION	9.6	14.2	14.2	14.2	14.2
STD415	JUNCTION	9.6	14.1	14.2	14.2	14.2
STD428	JUNCTION	3.6	11.9	23.4	23.4	23.4
STD429	JUNCTION	3.6	11.9	24.0	23.0	22.5
STD432	JUNCTION	8.2	13.0	13.0	13.0	13.0
STD433	JUNCTION	14.5	19.2	20.9	23.0	23.0

Node	Junction Type	2-yr	5-yr	10-yr	50-yr	100-yr
STD434	JUNCTION	1.4	2.1	3.0	5.0	5.0
STD435	JUNCTION	6.4	7.1	8.0	10.0	10.0
STD436	JUNCTION	1.6	2.3	3.5	4.5	4.5
STD437	JUNCTION	16.0	21.0	24.4	27.5	27.5
STD438	JUNCTION	0.4	0.6	1.0	3.2	3.5
STD439	JUNCTION	16.3	21.5	25.4	30.7	31.0
STD442	JUNCTION	0.0	0.0	0.0	0.0	0.0
STD450	JUNCTION	9.5	9.5	9.5	9.6	9.6
STD452	JUNCTION	9.5	9.5	9.5	9.6	9.6
STD458	JUNCTION	1.9	2.2	2.6	3.6	4.1
STD460	JUNCTION	6.0	6.0	6.0	6.0	6.0
STD461	JUNCTION	6.0	6.0	6.0	6.0	6.0
STD462	JUNCTION	6.0	6.0	6.0	6.0	6.0
STD464	JUNCTION	6.0	6.0	6.0	6.0	6.0
STD465	JUNCTION	6.0	6.0	6.0	6.0	6.0
STD466	JUNCTION	6.0	6.0	6.0	6.0	6.0
STD467	JUNCTION	0.0	0.0	0.0	0.0	0.0
STD468	JUNCTION	0.0	0.0	0.0	0.0	0.0
STD469	JUNCTION	0.0	0.0	0.0	0.0	0.0
STD471	JUNCTION	0.0	0.0	0.0	0.0	0.0
STD473	JUNCTION	5.0	5.0	5.0	5.0	5.0
STD475	JUNCTION	7.3	7.3	7.3	7.3	7.3
STD477	JUNCTION	7.3	7.3	7.3	7.3	7.3
STD478	JUNCTION	15.8	24.0	24.0	24.0	24.0
STD479	JUNCTION	0.4	0.5	0.7	1.5	1.9
STD480	JUNCTION	0.4	0.5	0.7	1.5	1.9
STD481	JUNCTION	0.4	0.5	0.7	1.5	1.9
STD486	JUNCTION	0.9	1.3	1.7	2.5	2.5
STD488	JUNCTION	13.9	23.6	46.2	61.5	61.5
STD497	JUNCTION	2.9	29.0	29.0	29.0	29.0
STD498	JUNCTION	2.9	29.0	29.0	29.0	29.0
STD499	JUNCTION	2.9	29.0	29.0	29.0	29.0
STD500	JUNCTION	2.9	29.0	29.0	29.0	29.0
STD501	JUNCTION	2.9	29.0	29.0	29.0	29.0
STD502	JUNCTION	12.5	20.9	39.1	39.2	39.3
STD503	JUNCTION	3.7	5.6	8.2	17.9	23.0
STD505	JUNCTION	0.0	0.0	0.0	1.9	1.9
STD506	JUNCTION	0.0	0.0	0.0	1.9	1.9
STD512	JUNCTION	10.6	15.7	22.4	47.2	60.7
STD513	JUNCTION	0.0	0.0	0.0	0.0	0.0
STD514	JUNCTION	0.0	0.0	0.0	0.0	0.0
STD515	JUNCTION	16.5	16.5	16.5	16.5	16.5
STD516	JUNCTION	16.5	16.5	16.5	16.5	16.5
STD517	JUNCTION	9.5	9.5	9.5	9.5	9.5
STD518	JUNCTION	9.5	9.5	9.5	9.5	9.5

Node	Junction Type	2-yr	5-yr	10-yr	50-yr	100-yr
STD519	JUNCTION	7.0	7.0	7.0	7.0	7.0
STD520	JUNCTION	0.0	0.0	0.0	0.0	0.0
STD522	JUNCTION	0.0	0.0	0.0	0.0	0.0
STD523	JUNCTION	0.0	0.0	0.0	0.0	0.0
STD524	JUNCTION	1.1	1.6	2.4	5.7	7.5
STD526	JUNCTION	13.9	19.3	27.7	55.1	67.4
STD528	JUNCTION	13.9	19.3	27.7	55.1	60.4
STD539	JUNCTION	0.1	0.1	0.1	0.2	4.0
STD540	JUNCTION	0.1	2.7	4.5	13.3	27.0
STD555	JUNCTION	16.3	21.5	25.4	30.7	31.0
STD556	JUNCTION	0.1	0.1	0.2	0.5	0.7
STD557	JUNCTION	0.1	0.1	0.2	0.5	0.7
STD560	JUNCTION	4.5	4.5	4.5	4.5	4.5
STD562	JUNCTION	6.5	6.5	6.5	6.5	6.5
STD563	JUNCTION	7.7	13.6	163.6	1055.3	1544.6
STD567	JUNCTION	6.1	10.5	10.5	10.5	10.5
STD568	JUNCTION	6.1	10.5	10.5	10.5	10.5
STD569	JUNCTION	6.1	10.5	10.5	10.5	10.5
STD570	JUNCTION	6.1	10.5	10.5	10.5	10.5
STD571	JUNCTION	6.1	10.5	10.5	10.5	10.5
STD573	JUNCTION	12.8	17.5	17.5	17.5	17.5
STD574	JUNCTION	12.8	17.5	17.5	17.5	17.5
STD575	JUNCTION	14.0	19.3	27.7	55.1	68.0
STD578	JUNCTION	4.0	6.0	8.5	30.4	37.2
STD580	JUNCTION	0.0	0.0	0.0	3.5	3.5
STD581	JUNCTION	5.0	5.0	5.0	13.2	13.2
STD589	JUNCTION	2.5	2.5	2.5	2.5	2.5
STT_B100	JUNCTION	0.6	2.4	7.7	31.2	43.9
STT_B200	JUNCTION	0.3	0.6	2.7	13.9	19.9
STT_B300	JUNCTION	1.5	2.7	7.3	29.6	41.8
STT_B400	JUNCTION	6.5	10.9	24.5	95.3	133.0
STT_B500	JUNCTION	21.3	36.2	60.4	168.5	230.7
STT_J100	JUNCTION	1.1	3.2	13.5	143.9	218.8
STT_J200	JUNCTION	1.0	2.2	8.8	48.4	69.1
STT_J301	JUNCTION	1.1	2.0	7.4	36.1	50.9
STT_J500	JUNCTION	21.3	36.2	60.4	168.5	230.7
STT_O400	JUNCTION	30.4	54.6	101.2	349.8	498.9
SUN_B100	JUNCTION	7.6	12.1	21.3	69.0	94.1
SUN_B200	JUNCTION	2.3	3.7	6.1	19.2	26.4
SUN_B300	JUNCTION	2.6	4.0	7.0	21.4	29.1
SUN_J100	JUNCTION	30.3	65.6	205.7	1018.4	1505.5
SWM_B100	JUNCTION	5.4	10.8	45.4	250.2	361.7
SWM_B110	JUNCTION	10.4	25.6	92.5	484.8	726.0
SWM_B200	JUNCTION	5.9	10.0	16.9	48.8	66.9
SWM_B300	JUNCTION	1.0	2.1	9.0	48.6	71.6

Node Peak Flows (cfs)

Node	Junction Type	2-yr	5-yr	10-yr	50-yr	100-yr
SWM_B400	JUNCTION	1.2	2.5	10.3	55.6	82.1
SWM_B500	JUNCTION	5.7	16.2	57.1	249.8	356.6
SWM_J200	JUNCTION	6.2	10.8	23.5	89.4	128.3
SWM_J300	JUNCTION	1.0	2.1	9.0	48.6	71.6
SWM_J400	JUNCTION	6.5	18.0	66.2	301.5	433.7
SWM_J410	JUNCTION	5.8	16.5	62.8	295.3	427.5
SWM_J420	JUNCTION	10.1	24.6	81.6	373.6	543.0
SWM_J500	JUNCTION	5.7	16.2	57.1	249.8	356.6
TSIL_B100	JUNCTION	4.4	6.8	10.1	22.4	29.1
TSIL_B200	JUNCTION	4.4	7.1	11.6	27.5	36.2
TSIL_J200	JUNCTION	18.0	35.3	45.0	62.2	74.9
UND_B100	JUNCTION	2.4	5.7	13.0	43.4	58.2
UND_J100	JUNCTION	3.6	11.9	34.5	174.0	254.7
UNK_B100	JUNCTION	0.9	3.2	10.8	44.7	62.3
UNK_B150	JUNCTION	2.5	7.1	28.0	123.4	172.8
UNK_B200	JUNCTION	5.1	19.0	62.8	258.4	367.0
UNK_B250	JUNCTION	0.6	2.2	7.6	31.1	43.4
UNK_J155	JUNCTION	16.4	49.0	200.9	1004.0	1485.9
UNK_J210	JUNCTION	13.4	41.1	178.0	887.4	1308.6
UNK_J250	JUNCTION	0.6	2.2	7.6	31.1	43.4
VPT_B100	JUNCTION	1.4	2.6	4.8	14.2	19.2
VPT_B200	JUNCTION	7.1	10.5	16.0	41.2	54.5
VPT_B300	JUNCTION	0.7	1.1	1.6	3.5	4.4
VPT_B350	JUNCTION	1.6	2.7	4.3	11.0	14.3
VPT_B400	JUNCTION	3.8	5.7	8.3	18.0	23.2
VPT_B450	JUNCTION	1.7	2.6	3.7	8.3	10.5
VPT_B500	JUNCTION	1.4	4.0	9.9	34.0	45.8
VPT_B600	JUNCTION	0.6	1.0	1.5	3.9	5.2
VPT_B650	JUNCTION	4.2	6.4	9.5	22.6	29.0
VPT_B700	JUNCTION	0.8	1.4	2.6	7.9	10.7
VPT_B750	JUNCTION	1.8	2.6	3.6	7.5	9.4
VPT_B800	JUNCTION	1.6	4.1	9.9	35.0	48.0
VPT_J100	JUNCTION	19.5	31.3	51.4	132.4	177.3
VPT_J200	JUNCTION	7.1	10.5	16.0	41.2	54.5
VPT_J210	JUNCTION	7.1	10.4	16.0	41.2	54.4
VPT_J400	JUNCTION	3.8	5.7	8.3	18.0	23.2
VPT_J500	JUNCTION	51.7	91.8	172.2	554.7	767.7
VPT_J750	JUNCTION	1.8	2.6	3.6	7.5	9.4
WDO_B050	JUNCTION	0.4	0.5	0.7	1.5	1.9
WDO_B100	JUNCTION	4.5	7.0	10.4	24.4	31.3
WDO_B200	JUNCTION	9.5	14.2	20.4	44.1	56.3
WDO_B300	JUNCTION	0.0	0.0	0.0	0.0	0.0
WDO_J050	JUNCTION	0.0	0.0	0.0	0.0	10.7
WDO_J215	JUNCTION	8.0	13.8	21.9	59.0	78.5
WELE_B100	JUNCTION	6.4	9.1	12.2	23.8	30.0

Node	Junction Type	2-yr	5-yr	10-yr	50-yr	100-yr
WELE_B200	JUNCTION	4.7	7.0	9.8	21.5	27.3
WELE_B300	JUNCTION	2.2	3.4	4.9	10.6	13.6
WELE_B400	JUNCTION	1.2	1.7	2.2	4.3	5.3
WELE_J105	JUNCTION	2.9	2.9	2.9	2.9	2.9
WELP_B100	JUNCTION	6.8	9.5	12.9	27.6	34.8
WELP_B200	JUNCTION	0.9	1.3	1.8	4.0	5.0
WELP_B300	JUNCTION	5.1	10.9	24.2	82.5	112.9
WELW_B100	JUNCTION	2.2	3.6	7.1	25.4	35.1
WELW_B200	JUNCTION	4.9	7.4	12.0	31.7	42.4
WELW_B250	JUNCTION	1.3	1.9	3.1	9.0	12.0
WELW_B300	JUNCTION	7.1	10.9	18.3	53.2	70.5
WELW_J100	JUNCTION	11.7	19.0	33.0	153.0	222.2
WELW_J200	JUNCTION	4.9	7.4	12.0	31.7	42.4
WELW_J205	JUNCTION	5.2	8.0	13.1	38.0	50.4
WELW_J250	JUNCTION	1.3	1.9	3.1	9.0	12.0
WELW_J300	JUNCTION	7.1	10.9	18.3	93.7	140.9
WGR_B100	JUNCTION	19.7	54.9	161.7	652.4	933.4
WIL_B100	JUNCTION	19.1	32.9	67.4	225.5	311.7
WIL_B200	JUNCTION	6.1	12.1	52.8	276.7	402.0
WIL_B300	JUNCTION	0.4	0.8	4.0	21.7	30.8
WIL_B400	JUNCTION	3.4	6.8	25.8	136.2	199.6
WIL_B450	JUNCTION	4.2	8.0	31.5	159.3	226.6
WIL_B500	JUNCTION	4.1	6.9	15.2	60.1	83.8
WIL_B600	JUNCTION	6.9	14.2	59.5	326.7	477.8
WIL_B700	JUNCTION	3.0	9.1	27.6	111.1	158.0
WIL_J110	JUNCTION	19.1	32.9	67.4	225.5	311.7
WIL_J200	JUNCTION	11.8	28.8	114.5	660.2	986.8
WIL_J500	JUNCTION	4.2	8.0	31.5	159.3	226.6
WIL_J600	JUNCTION	11.1	25.9	93.7	482.2	704.6
WIL_J700	JUNCTION	3.0	9.1	27.6	111.1	158.0
WIM_B100	JUNCTION	2.9	9.1	33.7	145.8	204.8
WIM_B200	JUNCTION	7.3	11.7	22.3	80.6	111.4
WIM_B300	JUNCTION	4.0	6.5	13.4	48.4	66.6
WIM_J100	JUNCTION	2.9	9.1	33.7	145.8	204.8
WIM_J300	JUNCTION	4.0	6.5	13.4	48.4	66.6
WPT_B050	JUNCTION	0.7	1.0	1.2	2.3	2.8
WPT_B100	JUNCTION	0.3	0.6	1.1	4.2	5.7
WPT_B200	JUNCTION	5.3	7.9	12.3	32.4	42.3
WPT_B300	JUNCTION	4.5	6.5	9.0	19.3	24.8
WPT_B400	JUNCTION	12.4	18.0	26.5	60.2	78.8
WPT_B500	JUNCTION	6.2	8.9	12.3	25.3	32.2
WPT_B600	JUNCTION	8.6	12.7	18.2	41.3	52.7
WPT_B650	JUNCTION	3.5	4.8	6.1	11.7	14.6
WPT_B700	JUNCTION	0.4	0.5	0.7	1.3	1.6
WPT_B800	JUNCTION	1.7	2.3	2.9	5.5	6.7

Node	Junction Type	2-yr	5-yr	10-yr	50-yr	100-yr
WPT_B850	JUNCTION	2.6	3.7	4.9	9.3	11.7
WPT_B900	JUNCTION	5.6	7.6	9.6	17.6	22.0
WPT_J500	JUNCTION	22.5	32.3	44.7	222.3	320.3
WPT_J650	JUNCTION	6.9	18.1	57.3	257.7	375.6
WPT_J900	JUNCTION	0.0	0.0	0.0	7.5	11.8
WPT_J905	JUNCTION	9.5	12.1	14.2	22.4	26.7
AOMI_O100	OUTFALL	50.2	77.3	126.2	368.2	495.3
BCOM_O115	OUTFALL	0.9	1.3	1.8	9.5	15.5
BCOM_O975	OUTFALL	0.0	0.0	0.1	0.8	1.1
BMA_O400	OUTFALL	5.1	10.3	41.4	228.8	333.7
BUC_O100	OUTFALL	9.6	11.9	14.4	21.3	23.8
BUC_O200	OUTFALL	3.7	5.0	7.6	17.0	20.6
CLK_O200	OUTFALL	14.8	30.0	58.9	335.4	495.5
CLK_O400	OUTFALL	26.5	45.8	88.4	319.1	453.0
DCM_J500	OUTFALL	2.7	6.5	15.7	57.2	80.9
DCM_O200	OUTFALL	10.3	31.5	91.7	366.4	520.9
DCM_O400	OUTFALL	4.8	10.0	27.0	206.4	300.4
IND_O0105	OUTFALL	31.5	39.3	62.0	1056.3	1123.3
IND_O0110	OUTFALL	1.7	3.0	7.6	33.4	47.3
IND_O0115	OUTFALL	3.7	9.6	31.1	130.7	183.4
IND_O0120	OUTFALL	2.9	7.4	22.7	95.7	137.6
KAWS_O100	OUTFALL	0.1	0.1	0.4	4.9	7.2
KAWS_O150	OUTFALL	0.1	0.1	0.1	0.2	4.0
KAWS_O200	OUTFALL	0.0	0.0	0.0	0.0	0.0
KAWS_O350	OUTFALL	2.6	3.0	3.3	4.3	4.7
KAWS_O750	OUTFALL	26.2	118.5	214.5	228.8	241.4
KAWS_O775	OUTFALL	1.4	2.1	60.6	694.1	1143.9
KNL_O050	OUTFALL	3.6	6.6	11.4	33.0	45.1
LCD_O1100	OUTFALL	9.7	21.8	47.1	155.9	212.6
LCD_O1200	OUTFALL	15.3	43.0	125.1	541.6	790.8
LCD_O1300	OUTFALL	9.5	17.0	48.7	196.7	269.8
LCD_O1400	OUTFALL	5.2	11.8	25.3	82.1	112.0
LCD_O1500	OUTFALL	4.4	11.5	27.8	98.0	134.6
LCD_O300	OUTFALL	4.2	10.3	27.7	106.6	148.5
LCD_O700	OUTFALL	20.0	39.9	101.5	461.1	675.2
LCD_O800	OUTFALL	3.7	5.8	9.8	28.9	38.4
OF2	OUTFALL	0.9	2.0	10.0	62.9	93.5
OLT_O0350	OUTFALL	6.7	8.5	10.6	19.9	24.7
OLT_O1700	OUTFALL	3.0	4.2	5.5	10.8	13.4
PIE_O050	OUTFALL	19.0	30.9	63.6	259.8	374.7
STD242	OUTFALL	0.0	0.0	0.0	33.9	42.7
STD440	OUTFALL	16.3	21.5	25.4	30.7	31.0
STD504	OUTFALL	10.9	14.9	20.0	33.4	33.5
SUN_O200	OUTFALL	31.7	67.9	209.6	1030.8	1523.1
SUN_O300	OUTFALL	2.6	4.0	7.0	21.4	29.1

Node Peak Flows (cfs)

Node	Junction Type	2-yr	5-yr	10-yr	50-yr	100-yr
SWM_O100	OUTFALL	11.8	29.2	109.1	589.3	888.7
WELP_O200	OUTFALL	6.7	9.4	12.7	27.4	34.8
WELW_O100	OUTFALL	5.0	10.7	24.0	35.7	35.6
WELW_O110	OUTFALL	11.7	18.9	32.9	152.7	221.9
WGR_O100	OUTFALL	19.7	54.9	161.7	652.4	933.4
WIL_O300	OUTFALL	0.4	0.8	4.0	21.7	30.8
WPT_O100	OUTFALL	14.7	25.4	38.4	96.7	126.1
WPT_O700	OUTFALL	6.9	18.3	57.7	258.7	376.8
WIL_O400	OUTFALL	3.4	6.8	25.8	136.2	199.6
STT_J300	OUTFALL	31.8	57.6	109.5	408.0	588.5
WIM_O200	OUTFALL	8.9	15.2	29.9	118.1	165.6
AOMI_D600	DIVIDER	12.0	29.6	118.1	676.9	1011.2
BCOM_D100	DIVIDER	3.6	5.1	7.1	20.2	32.0
BCOM_D200	DIVIDER	0.4	0.6	0.7	121.0	184.5
BCOM_D400	DIVIDER	0.2	0.3	0.4	4.1	6.2
BCOM_D450	DIVIDER	1.0	1.3	2.2	5.9	7.8
BCOM_D500	DIVIDER	0.6	0.8	1.1	2.0	2.4
BCOM_D550	DIVIDER	1.9	2.6	3.2	5.9	7.3
BCOM_D600	DIVIDER	19.0	31.7	48.4	127.4	168.3
BCOM_D650	DIVIDER	0.3	0.4	0.5	1.0	1.2
BCOM_D700	DIVIDER	15.6	31.5	52.2	150.9	202.2
BCOM_D750	DIVIDER	2.1	17.6	39.7	144.3	198.6
BCOM_D800	DIVIDER	3.2	4.7	26.3	138.6	196.9
BCOM_D850	DIVIDER	3.7	5.4	11.3	134.5	197.7
BCOM_D900	DIVIDER	0.0	0.3	6.2	129.5	192.6
BCOM_D950	DIVIDER	2.0	2.7	3.6	7.4	9.3
BCOM_D975	DIVIDER	5.0	7.2	10.0	21.9	28.1
BCOM_D980	DIVIDER	0.0	0.0	0.8	12.7	18.9
BCOM_J350	DIVIDER	0.1	4.7	5.8	10.0	12.4
BMA_D100	DIVIDER	1.7	3.4	17.2	91.4	132.2
BUC_D300	DIVIDER	3.7	5.2	10.6	82.5	118.3
BUC_D305	DIVIDER	0.7	2.2	7.6	79.5	115.3
BUC_D400	DIVIDER	5.0	18.0	31.6	100.9	136.2
BUC_D505	DIVIDER	9.4	13.7	13.6	13.7	13.7
BUC_D600	DIVIDER	15.3	22.3	31.5	70.1	89.2
BUC_D700	DIVIDER	8.9	15.9	25.9	69.4	93.4
BUC_D750	DIVIDER	1.9	2.8	3.9	8.4	10.8
BUC_D800	DIVIDER	9.0	13.0	18.1	39.5	50.8
CCC_D100	DIVIDER	6.0	8.2	12.7	36.3	48.6
CCC_D200	DIVIDER	3.9	6.5	10.1	25.2	33.1
CCC_D210	DIVIDER	0.0	1.4	5.1	20.2	28.1
CCC_D300	DIVIDER	5.0	7.2	9.9	19.9	25.4
COLE_D200	DIVIDER	2.8	4.3	6.4	15.3	20.0
COLE_D300	DIVIDER	12.4	18.5	26.9	61.9	79.3
COLE_D305	DIVIDER	12.2	18.3	26.8	61.6	79.0

Node	Junction Type	2-yr	5-yr	10-yr	50-yr	100-yr
COLE_D400	DIVIDER	26.0	38.8	56.5	122.3	157.1
KAWS_D350	DIVIDER	4.0	6.2	9.5	24.3	38.4
KAWS_D400	DIVIDER	5.5	8.3	12.4	27.6	34.9
KAWS_D550	DIVIDER	2.7	4.1	5.7	12.6	16.2
KAWS_D575	DIVIDER	0.0	0.0	0.0	9.1	22.0
KAWS_D580	DIVIDER	0.0	0.0	0.0	5.9	18.8
KAWS_D585	DIVIDER	23.4	34.9	50.8	110.1	141.5
KAWS_D650	DIVIDER	2.0	2.8	3.8	7.9	10.0
KAWS_D805	DIVIDER	110.1	174.7	271.0	899.8	1348.4
KNL_D450	DIVIDER	7.1	18.1	56.7	256.2	374.0
LON_D200	DIVIDER	3.3	11.2	50.3	273.7	407.0
MCG_D240	DIVIDER	16.8	32.6	63.2	200.8	273.2
MEA_D250	DIVIDER	7.7	13.6	22.0	60.5	80.0
MEA_D300	DIVIDER	1.8	3.2	6.2	20.7	28.0
MEA_D310	DIVIDER	2.4	4.0	7.0	21.5	28.7
MEA_D350	DIVIDER	6.0	8.6	12.0	27.1	34.6
MEA_D375	DIVIDER	10.1	14.4	19.9	44.9	57.3
MEA_D400	DIVIDER	3.9	5.6	7.9	17.8	22.7
MEA_D450	DIVIDER	3.3	4.9	6.9	15.4	19.5
MEA_D500	DIVIDER	4.8	7.3	12.1	32.1	42.0
MEA_D650	DIVIDER	4.2	8.3	14.3	42.6	56.6
MEA_D700	DIVIDER	0.7	1.0	1.3	2.6	3.3
MER_D100	DIVIDER	0.0	0.0	1.9	25.6	25.6
MER_D110	DIVIDER	0.0	0.0	1.8	26.0	26.0
OLT_D0100	DIVIDER	47.9	76.0	116.9	761.1	1179.2
OLT_D0250	DIVIDER	22.0	33.5	48.7	120.5	157.6
OLT_D0300	DIVIDER	15.5	23.8	34.4	82.3	106.7
OLT_D0350	DIVIDER	4.2	6.0	8.1	17.4	22.2
OLT_D0500	DIVIDER	16.0	23.1	32.2	72.7	93.2
OLT_D0550	DIVIDER	10.8	19.1	29.8	78.3	103.0
OLT_D0800	DIVIDER	1.1	1.6	2.7	7.1	9.4
OLT_D1050	DIVIDER	10.9	31.0	75.1	721.1	1135.0
OLT_D1100	DIVIDER	2.2	3.4	6.3	19.3	26.0
OLT_D1225	DIVIDER	0.9	1.3	1.7	3.2	4.0
OLT_D1300	DIVIDER	28.7	47.1	60.7	212.3	323.2
OLT_D1400	DIVIDER	1.4	2.8	4.9	13.1	17.6
OLT_D2100	DIVIDER	13.9	24.1	26.8	38.3	44.1
OLT_D2200	DIVIDER	14.1	22.8	89.4	627.5	957.6
OLT_D2201	DIVIDER	11.6	20.3	86.9	625.0	955.1
OLT_D2750	DIVIDER	8.2	15.8	98.6	625.2	947.0
OLT_D2850	DIVIDER	1.4	2.1	3.0	7.1	9.2
OLT_D2950	DIVIDER	1.6	2.3	3.5	9.1	12.1
OLT_D3000	DIVIDER	0.4	0.6	1.0	3.2	4.3
OLT_D3250	DIVIDER	9.8	14.2	20.0	45.5	58.3
PME_D200	DIVIDER	0.4	0.5	0.7	1.5	1.9

Node	Junction Type	2-yr	5-yr	10-yr	50-yr	100-yr
SME_D300	DIVIDER	46.5	87.9	170.4	565.1	787.7
SME_D305	DIVIDER	44.0	85.4	167.9	562.5	785.2
SME_D400	DIVIDER	10.7	15.8	22.6	47.4	60.9
SME_D550	DIVIDER	53.0	94.0	175.9	567.7	788.7
SME_D600	DIVIDER	6.1	9.0	12.6	25.9	33.1
SME_D700	DIVIDER	9.5	14.3	20.9	45.5	58.5
STD022	DIVIDER	18.1	35.4	45.0	62.5	75.2
STD039	DIVIDER	12.4	18.0	26.5	60.2	78.8
STD052	DIVIDER	22.9	36.1	54.2	74.2	74.2
STD097	DIVIDER	0.2	0.2	1.9	23.9	36.7
STD117	DIVIDER	7.5	17.2	30.5	89.8	121.2
STD118	DIVIDER	23.3	33.8	48.2	110.8	142.2
STD121	DIVIDER	26.3	36.8	50.3	50.3	50.3
STD138	DIVIDER	13.1	14.6	15.8	15.8	15.8
STD160	DIVIDER	13.1	14.6	15.1	15.1	15.1
STD163	DIVIDER	7.8	9.0	9.0	9.0	9.0
STD177	DIVIDER	17.4	34.0	42.4	50.4	56.2
STD194	DIVIDER	2.4	3.5	4.9	9.9	12.8
STD224	DIVIDER	12.5	20.9	32.9	40.0	40.0
STD225	DIVIDER	4.0	7.9	13.0	13.0	13.0
STD226	DIVIDER	2.3	5.5	12.1	16.6	16.6
STD245	DIVIDER	10.9	14.9	20.0	66.9	75.6
STD252	DIVIDER	9.4	11.6	11.5	11.5	11.5
STD257	DIVIDER	13.2	22.7	45.7	104.1	115.3
STD263	DIVIDER	3.6	11.9	34.8	174.3	255.0
STD267	DIVIDER	13.3	15.1	15.0	15.0	14.9
STD268	DIVIDER	11.0	11.0	11.0	11.0	11.0
STD309	DIVIDER	2.1	17.6	18.0	18.0	18.0
STD310	DIVIDER	2.3	17.8	18.3	22.1	24.2
STD383	DIVIDER	5.8	7.0	8.3	13.6	16.2
STD394	DIVIDER	27.3	60.4	194.6	979.7	1450.1
STD396	DIVIDER	15.9	16.8	17.9	21.0	21.0
STD416	DIVIDER	9.8	14.3	20.2	42.8	54.7
STD430	DIVIDER	5.8	12.3	37.8	178.8	260.3
STD451	DIVIDER	9.5	9.5	9.5	9.6	9.6
STD459	DIVIDER	6.1	8.3	11.7	25.8	32.9
STD472	DIVIDER	11.0	11.0	11.0	11.0	11.0
STD508	DIVIDER	0.0	0.0	0.0	33.9	42.7
STD525	DIVIDER	1.1	1.6	2.4	5.7	7.5
STD527	DIVIDER	14.0	19.3	27.7	55.1	68.0
STD577	DIVIDER	1.3	1.7	2.3	18.0	19.3
STD579	DIVIDER	0.0	0.0	0.0	5.0	5.0
SUN_D200	DIVIDER	31.7	67.9	209.6	1030.8	1523.1
UNK_D100	DIVIDER	16.4	49.4	203.6	1022.4	1515.2
VPT_D350	DIVIDER	1.6	2.7	6.6	66.5	97.4

Node Peak Flows (cfs)

Node	Junction Type	2-yr	5-yr	10-yr	50-yr	100-yr
VPT_D355	DIVIDER	0.7	1.1	1.6	61.9	93.7
VPT_D450	DIVIDER	1.7	2.6	9.4	43.9	62.0
VPT_D600	DIVIDER	2.4	3.5	11.4	64.7	92.3
VPT_D650	DIVIDER	4.2	6.4	9.5	22.6	29.0
VPT_D700	DIVIDER	0.8	1.4	2.6	7.9	10.7
VPT_D800	DIVIDER	1.6	4.1	9.9	35.0	48.0
VPT_D805	DIVIDER	0.0	0.0	4.9	31.0	46.9
WDO_D200	DIVIDER	9.5	14.5	22.6	59.7	79.2
WELE_D100	DIVIDER	9.3	14.9	21.8	50.4	64.8
WELE_D200	DIVIDER	6.5	9.8	14.1	31.6	40.3
WELE_D300	DIVIDER	2.2	3.4	4.9	10.6	13.6
WELE_D400	DIVIDER	1.2	1.7	14.2	155.2	236.6
WELP_D100	DIVIDER	6.8	9.5	12.9	27.6	34.8
WELP_D200	DIVIDER	0.9	1.3	1.8	4.0	5.0
WELP_D300	DIVIDER	5.1	10.9	24.2	82.5	112.9
WPT_D200	DIVIDER	5.3	7.9	12.3	32.4	42.3
WPT_D300	DIVIDER	4.5	6.5	9.0	19.3	24.8
WPT_D500	DIVIDER	8.8	16.1	32.5	203.5	298.0
WPT_D600	DIVIDER	8.6	12.7	31.9	188.5	272.8
WPT_D800	DIVIDER	1.7	2.3	2.9	5.5	6.7
WPT_D900	DIVIDER	5.6	7.6	9.6	17.6	22.0
WPT_D905	DIVIDER	0.5	2.6	4.6	12.6	17.0
BCOM_S100	STORAGE	5.5	7.8	10.6	25.1	36.9
BCOM_S975	STORAGE	4.6	6.7	9.5	18.1	18.1
BUC_S100	STORAGE	27.4	40.6	56.2	131.4	169.9
BUC_S200	STORAGE	27.2	39.6	58.6	132.8	171.1
COLE_S100	STORAGE	58.8	90.0	132.4	309.0	397.9
CPATM_S100	STORAGE	16.6	32.8	44.5	77.6	94.0
KAWS_S100	STORAGE	3.1	4.7	6.8	15.7	20.1
KAWS_S150	STORAGE	3.7	5.8	9.0	20.7	38.1
KAWS_S200	STORAGE	4.9	6.8	9.3	18.4	28.9
KAWS_S250	STORAGE	5.4	8.0	11.4	24.4	31.2
KAWS_S350	STORAGE	11.0	16.9	25.5	57.5	74.0
KAWS_S500	STORAGE	15.2	22.7	32.8	70.6	90.9
KAWS_S750	STORAGE	115.3	182.6	223.0	259.8	279.3
MEA_S100	STORAGE	54.1	75.5	201.3	1141.4	1654.9
MEA_S200	STORAGE	25.8	35.2	47.2	114.3	148.5
MER_S100	STORAGE	36.4	64.0	98.1	305.2	426.1
OLT_S0150	STORAGE	2.1	3.1	4.3	9.6	12.3
PAT_S100	STORAGE	12.5	22.6	39.8	110.9	146.3
PME_S100	STORAGE	37.8	58.0	216.9	1067.5	1574.9
PME_S200	STORAGE	17.8	26.3	37.8	83.6	106.7
SME_S100	STORAGE	63.6	111.6	202.4	631.6	875.7
SME_S200	STORAGE	1.5	2.8	5.0	14.1	18.6
VPT_S100	STORAGE	23.8	38.3	59.7	168.0	222.2

Node	Junction Type	2-yr	5-yr	10-yr	50-yr	100-yr
WDO_S100	STORAGE	18.9	27.2	38.4	88.9	115.5
WDO_S300	STORAGE	0.0	0.0	0.0	0.0	0.0
WPT_S100	STORAGE	17.1	25.4	38.4	96.7	126.1
WPT_O100	OUTFALL	14.7	25.4	38.4	96.7	126.1
WPT_O700	OUTFALL	6.9	18.3	57.7	258.7	376.8
WPT_S100	STORAGE	17.1	25.4	38.4	96.7	126.1

Total Node Inflow (Ac-ft)

Node	Junction Type	2-yr	5-yr	10-yr	50-yr	100-yr
AOMI_B100	JUNCTION	7.2	11.1	17.6	45.4	60.8
AOMI_B300	JUNCTION	0.1	0.1	0.4	1.6	2.3
AOMI_B400	JUNCTION	0.2	0.4	1.1	4.7	6.8
AOMI_B500	JUNCTION	0.4	1.2	3.7	14.2	20.2
AOMI_B600	JUNCTION	0.1	0.2	0.8	3.1	4.5
AOMI_J400	JUNCTION	2.9	5.3	10.8	34.7	48.5
ARR_B100	JUNCTION	0.2	0.6	2.3	9.6	13.8
ARR_B200	JUNCTION	0.2	0.4	1.6	9.5	14.0
ARR_J100	JUNCTION	0.7	2.1	13.5	80.7	119.7
ARR_J200	JUNCTION	0.8	2.3	5.0	12.9	17.5
BCOM_B050	JUNCTION	0.3	0.5	0.7	1.5	2.0
BCOM_B100	JUNCTION	0.3	0.4	0.6	1.2	1.6
BCOM_B150	JUNCTION	0.4	0.6	0.8	1.5	1.9
BCOM_B200	JUNCTION	0.0	0.0	0.1	0.1	0.1
BCOM_B250	JUNCTION	0.0	0.0	0.0	0.0	0.0
BCOM_B300	JUNCTION	0.0	0.0	0.0	0.1	0.1
BCOM_B350	JUNCTION	0.0	0.0	0.0	0.1	0.1
BCOM_B400	JUNCTION	0.0	0.0	0.0	0.1	0.1
BCOM_B450	JUNCTION	0.0	0.1	0.1	0.1	0.2
BCOM_B500	JUNCTION	0.1	0.1	0.1	0.2	0.3
BCOM_B550	JUNCTION	0.2	0.3	0.3	0.6	0.7
BCOM_B600	JUNCTION	0.3	0.4	0.5	1.1	1.4
BCOM_B650	JUNCTION	0.0	0.0	0.0	0.1	0.1
BCOM_B700	JUNCTION	0.6	0.8	1.1	2.3	3.0
BCOM_B750	JUNCTION	0.2	0.3	0.4	0.8	1.1
BCOM_B800	JUNCTION	0.2	0.4	0.5	1.0	1.3
BCOM_B850	JUNCTION	0.3	0.4	0.5	1.2	1.5
BCOM_B900	JUNCTION	0.2	0.3	0.5	1.0	1.3
BCOM_B950	JUNCTION	0.2	0.3	0.4	0.7	0.9
BCOM_B975	JUNCTION	0.4	0.5	0.7	1.5	1.9
BCOM_J050	JUNCTION	12.1	19.5	41.7	156.8	223.7
BCOM_J100	JUNCTION	0.5	0.7	1.0	1.5	1.7
BCOM_J105	JUNCTION	0.5	0.7	1.0	1.5	1.7
BCOM_J110	JUNCTION	0.5	0.7	1.0	2.0	2.7
BCOM_J150	JUNCTION	10.9	17.4	38.1	145.2	207.5
BCOM_J155	JUNCTION	11.2	18.1	39.3	146.7	209.0
BCOM_J160	JUNCTION	11.4	18.4	40.2	148.8	211.4
BCOM_J165	JUNCTION	11.3	18.4	40.2	148.5	211.1
BCOM_J170	JUNCTION	11.6	18.7	40.5	148.8	211.4
BCOM_J250	JUNCTION	0.0	0.0	0.0	0.0	0.0
BCOM_J300	JUNCTION	0.0	0.0	0.0	0.1	0.1
BCOM_J950	JUNCTION	0.2	0.3	0.4	0.6	0.7
BCOM_J955	JUNCTION	0.2	0.3	0.4	0.6	0.7
BCOM_J975	JUNCTION	0.0	0.0	0.0	0.4	0.6
BCOM_J980	JUNCTION	0.4	0.5	0.7	1.0	1.1

Node	Junction Type	2-yr	5-yr	10-yr	50-yr	100-yr
BCOM_J985	JUNCTION	0.4	0.5	0.7	1.0	1.1
BCOM_J990	JUNCTION	0.4	0.5	0.7	1.0	1.1
BCOM_J995	JUNCTION	0.0	0.0	0.0	0.4	0.6
BMA_B100	JUNCTION	0.2	0.5	2.1	11.7	17.3
BMA_B200	JUNCTION	0.1	0.2	0.6	3.3	4.9
BMA_B300	JUNCTION	0.4	0.9	3.7	20.8	30.7
BMA_B400	JUNCTION	0.3	0.6	2.1	11.5	16.9
BMA_B500	JUNCTION	0.1	0.2	0.5	4.1	6.3
BMA_B600	JUNCTION	0.1	0.1	0.4	1.4	2.0
BMA_J100	JUNCTION	0.2	0.5	2.1	4.8	5.2
BMA_J200	JUNCTION	0.1	0.2	0.6	3.3	4.9
BMA_J400	JUNCTION	0.6	1.0	2.1	8.0	11.3
BMA_J410	JUNCTION	0.3	0.6	2.1	11.5	16.9
BMA_J600	JUNCTION	1.6	4.7	13.6	51.6	73.0
BMA_O500	JUNCTION	0.1	0.2	0.5	4.1	6.3
BON_B100	JUNCTION	0.2	0.4	1.7	9.4	14.0
BON_J100	JUNCTION	0.8	2.3	6.2	22.0	31.0
BRG_B100	JUNCTION	0.1	0.2	0.6	2.3	3.3
BRG_B110	JUNCTION	0.1	0.2	0.6	2.3	3.3
BRG_B120	JUNCTION	1.3	3.0	8.3	31.3	44.2
BRG_B200	JUNCTION	1.0	2.2	5.3	18.1	25.4
BRG_B210	JUNCTION	1.3	2.9	8.2	31.0	43.9
BRG_B300	JUNCTION	0.2	0.5	2.1	10.2	14.7
BRG_B310	JUNCTION	0.2	0.5	2.1	10.2	14.7
BRG_J320	JUNCTION	1.2	2.8	7.7	29.0	40.8
BUC_B100	JUNCTION	0.0	0.1	0.3	1.0	1.3
BUC_B200	JUNCTION	0.1	0.1	0.3	1.0	1.3
BUC_B300	JUNCTION	0.4	0.5	0.7	1.5	1.9
BUC_B400	JUNCTION	0.2	0.3	0.5	1.0	1.3
BUC_B500	JUNCTION	0.7	1.0	1.4	2.8	3.6
BUC_B600	JUNCTION	1.4	2.0	2.9	5.8	7.5
BUC_B650	JUNCTION	0.1	0.1	0.2	0.4	0.6
BUC_B700	JUNCTION	0.5	0.7	1.0	2.1	2.7
BUC_B750	JUNCTION	0.2	0.2	0.3	0.6	0.8
BUC_B800	JUNCTION	0.6	0.9	1.3	2.6	3.3
BUC_B900	JUNCTION	0.6	0.9	1.2	2.5	3.1
BUC_J700	JUNCTION	0.0	0.2	0.6	2.8	4.2
BUC_J750	JUNCTION	0.0	0.2	0.4	1.6	2.4
BUC_J800	JUNCTION	0.6	0.8	0.9	1.0	1.0
BUC_J900	JUNCTION	0.6	0.9	1.2	2.5	3.1
CCC_B100	JUNCTION	0.6	0.8	1.0	1.8	2.3
CCC_B200	JUNCTION	0.3	0.4	0.5	0.9	1.0
CCC_B300	JUNCTION	0.3	0.4	0.6	1.1	1.4
CCC_J100	JUNCTION	0.4	0.4	0.5	0.5	0.5
CCC_J105	JUNCTION	0.4	0.4	0.5	0.5	0.5

Node	Junction Type	2-yr	5-yr	10-yr	50-yr	100-yr
CLK_B100	JUNCTION	0.2	0.3	1.6	9.2	13.6
CLK_B200	JUNCTION	2.3	4.5	8.3	43.6	64.1
CLK_B300	JUNCTION	0.1	0.5	1.6	6.4	9.2
CLK_B400	JUNCTION	5.4	9.2	17.6	59.8	83.8
CLK_J100	JUNCTION	0.2	0.3	1.6	9.2	13.6
CLK_J110	JUNCTION	0.2	0.3	1.6	9.0	13.3
CLK_J120	JUNCTION	1.3	2.8	9.2	38.7	55.5
CLK_J130	JUNCTION	1.2	2.7	8.9	38.1	54.6
CLK_J300	JUNCTION	0.1	0.5	1.6	6.4	9.2
COLE_B100	JUNCTION	1.5	2.3	3.5	7.8	10.1
COLE_B200	JUNCTION	0.3	0.5	0.7	1.6	2.1
COLE_B300	JUNCTION	1.0	1.6	2.3	4.8	6.2
COLE_B400	JUNCTION	0.2	0.3	0.4	0.8	1.1
COLE_B500	JUNCTION	1.4	2.1	3.1	6.4	8.2
COLE_J200	JUNCTION	2.1	3.2	4.7	12.2	16.4
COLE_J205	JUNCTION	2.1	3.2	4.7	12.2	16.4
COLE_J300	JUNCTION	0.0	0.0	0.0	0.0	0.0
COLE_J305	JUNCTION	1.0	1.6	2.0	2.6	2.7
COLE_STD3	JUNCTION	1.0	1.6	2.0	2.6	2.7
CPATM_B100	JUNCTION	0.7	1.2	1.8	4.1	5.4
CPATM_B110	JUNCTION	5.3	8.4	9.9	14.9	17.2
CPATM_J105	JUNCTION	3.9	6.3	6.8	8.7	8.8
DCM_B100	JUNCTION	1.1	1.9	3.8	13.7	19.2
DCM_B200	JUNCTION	1.6	4.6	13.3	50.0	71.2
DCM_B300	JUNCTION	0.6	1.3	4.9	23.5	34.4
DCM_B400	JUNCTION	0.4	0.8	2.0	15.7	24.2
DCM_B500	JUNCTION	0.4	1.1	2.6	9.0	12.6
DCM_J100	JUNCTION	1.1	1.9	3.8	13.7	19.2
DCM_J200	JUNCTION	1.6	4.6	13.3	50.0	71.2
FCE_B100	JUNCTION	0.4	0.6	1.0	2.2	2.9
HILD_B100	JUNCTION	0.2	0.8	2.9	11.9	17.1
HILD_J100	JUNCTION	0.8	2.7	15.8	90.2	133.8
IND_B0100	JUNCTION	0.1	0.3	1.2	6.2	9.1
IND_B0105	JUNCTION	0.2	0.5	1.5	5.4	7.7
IND_B0110	JUNCTION	0.2	0.5	1.1	4.8	6.8
IND_B0115	JUNCTION	0.4	1.1	3.5	14.5	20.8
IND_B0120	JUNCTION	0.5	1.2	3.7	15.0	21.5
IND_J0105	JUNCTION	6.0	9.4	13.3	162.0	236.6
IND_J0115	JUNCTION	0.4	1.1	3.5	14.5	20.8
INT_J035	JUNCTION	0.0	0.0	0.1	0.8	1.2
KAWS_B100	JUNCTION	0.3	0.5	0.7	1.4	1.8
KAWS_B150	JUNCTION	0.2	0.3	0.5	1.2	1.5
KAWS_B200	JUNCTION	0.2	0.3	0.4	0.9	1.1
KAWS_B250	JUNCTION	0.4	0.6	0.9	1.8	2.2
KAWS_B300	JUNCTION	0.1	0.2	0.3	0.5	0.6

Total Node Inflow (Ac-ft)

Node	Junction Type	2-yr	5-yr	10-yr	50-yr	100-yr
KAWS_B350	JUNCTION	0.2	0.3	0.5	1.1	1.5
KAWS_B400	JUNCTION	0.3	0.4	0.6	1.2	1.6
KAWS_B500	JUNCTION	0.2	0.4	0.6	1.5	1.9
KAWS_B550	JUNCTION	0.3	0.5	0.7	1.3	1.7
KAWS_B575	JUNCTION	0.1	0.2	0.3	0.5	0.6
KAWS_B600	JUNCTION	0.2	0.3	0.4	0.9	1.1
KAWS_B625	JUNCTION	0.4	0.6	0.8	1.6	2.1
KAWS_B650	JUNCTION	0.2	0.2	0.3	0.6	0.8
KAWS_B700	JUNCTION	0.1	0.1	0.2	0.4	0.5
KAWS_B750	JUNCTION	0.6	0.9	1.3	3.0	4.0
KAWS_B775	JUNCTION	0.2	0.3	0.4	0.9	1.2
KAWS_B800	JUNCTION	0.1	0.2	0.3	0.7	1.0
KAWS_J575	JUNCTION	0.0	0.0	0.0	0.6	1.8
KAWS_J580	JUNCTION	0.0	0.0	0.0	0.6	1.8
KAWS_J700	JUNCTION	0.1	0.1	0.2	0.4	0.5
KAWS_J800	JUNCTION	12.1	19.5	41.4	156.2	223.4
KNL_B050	JUNCTION	0.7	1.2	2.0	5.2	7.1
KNL_B100	JUNCTION	1.2	2.7	6.0	19.8	27.7
KNL_B200	JUNCTION	0.2	0.6	1.8	6.8	9.7
KNL_B300	JUNCTION	0.2	0.5	1.6	6.9	9.9
KNL_B400	JUNCTION	4.9	7.4	10.6	22.3	28.7
KNL_B450	JUNCTION	0.1	0.1	0.2	0.3	0.4
KNL_B500	JUNCTION	0.2	0.5	1.6	6.3	9.0
KNL_D200	JUNCTION	5.6	9.1	15.7	46.6	62.3
KNL_J100	JUNCTION	6.8	11.8	21.7	66.0	89.3
KNL_J300	JUNCTION	5.3	8.5	14.0	40.2	52.8
KNL_J400	JUNCTION	5.1	7.9	12.2	28.6	37.7
KNL_J410	JUNCTION	5.2	7.9	12.3	33.8	43.3
KNL_J460	JUNCTION	1.1	2.8	8.2	32.2	45.4
KNL_J500	JUNCTION	0.2	0.5	1.6	6.3	9.0
LCD_B100	JUNCTION	1.0	1.8	4.2	16.3	23.2
LCD_B1000	JUNCTION	0.3	0.8	2.4	9.5	13.5
LCD_B1100	JUNCTION	1.0	2.3	5.0	16.1	22.5
LCD_B1200	JUNCTION	0.3	0.7	1.9	8.8	12.8
LCD_B1300	JUNCTION	0.6	1.1	2.8	12.1	17.5
LCD_B1400	JUNCTION	0.5	1.0	2.2	7.2	9.9
LCD_B1500	JUNCTION	0.5	1.3	3.2	11.1	15.6
LCD_B200	JUNCTION	1.1	2.1	5.5	23.8	34.4
LCD_B300	JUNCTION	0.5	1.2	3.3	12.4	17.6
LCD_B400	JUNCTION	0.1	0.1	0.3	1.3	1.9
LCD_B500	JUNCTION	0.2	0.4	0.9	3.2	4.4
LCD_B600	JUNCTION	1.5	3.9	9.9	35.6	50.0
LCD_B700	JUNCTION	1.6	2.9	6.1	22.5	31.9
LCD_B800	JUNCTION	0.3	0.5	0.8	2.2	3.0
LCD_B900	JUNCTION	0.5	1.4	3.8	14.1	19.9

Node	Junction Type	2-yr	5-yr	10-yr	50-yr	100-yr
LCD_J100	JUNCTION	1.0	1.8	4.2	16.3	23.2
LCD_J1000	JUNCTION	2.0	5.2	13.5	80.4	128.0
LCD_J200	JUNCTION	2.1	4.0	9.7	39.9	57.4
LCD_J400	JUNCTION	0.1	0.1	0.3	1.3	1.9
LCD_J500	JUNCTION	0.2	0.4	0.9	3.2	4.4
LCD_J600	JUNCTION	1.6	4.0	10.2	71.5	114.5
LCD_J625	JUNCTION	1.8	4.4	11.1	72.1	115.7
LCD_J900	JUNCTION	2.5	6.4	17.0	92.1	144.9
LON_B100	JUNCTION	0.3	0.7	3.2	18.0	26.8
LON_B200	JUNCTION	0.2	0.7	2.6	11.2	16.2
LON_B300	JUNCTION	0.2	0.4	1.7	10.3	15.3
LON_J100	JUNCTION	0.4	1.0	4.0	20.6	30.2
LON_J110	JUNCTION	0.7	1.6	11.5	72.4	108.0
LON_J200	JUNCTION	0.7	2.1	3.6	3.8	3.9
LON_J300	JUNCTION	0.5	1.5	5.6	27.3	39.9
MCG_B100	JUNCTION	0.1	0.4	1.0	3.8	5.4
MCG_B200	JUNCTION	0.1	0.1	0.3	1.0	1.4
MCG_B300	JUNCTION	0.2	0.4	0.8	2.1	2.9
MCG_B400	JUNCTION	0.2	0.5	1.2	4.3	6.1
MCG_B410	JUNCTION	1.5	2.6	4.6	12.4	16.7
MCG_B420	JUNCTION	1.7	3.1	5.7	16.3	22.3
MCG_B500	JUNCTION	0.6	1.1	1.7	4.3	5.7
MCG_B510	JUNCTION	1.3	2.1	3.3	8.0	10.6
MCG_B600	JUNCTION	0.7	1.0	1.6	3.7	4.9
MCG_B610	JUNCTION	0.7	1.0	1.6	3.7	4.9
MCG_J200	JUNCTION	1.7	3.2	6.0	17.4	23.7
MCG_J220	JUNCTION	1.7	3.2	6.0	17.3	23.7
MCG_J300	JUNCTION	1.4	3.2	8.7	32.8	46.3
MEA_B100	JUNCTION	0.1	0.2	0.3	1.0	1.3
MEA_B150	JUNCTION	0.2	0.2	0.3	0.6	0.8
MEA_B200	JUNCTION	1.0	1.4	2.0	4.4	5.8
MEA_B250	JUNCTION	0.2	0.3	0.5	1.0	1.2
MEA_B300	JUNCTION	0.1	0.2	0.3	0.6	0.8
MEA_B350	JUNCTION	0.5	0.8	1.1	2.2	2.8
MEA_B375	JUNCTION	0.9	1.3	1.7	3.6	4.5
MEA_B400	JUNCTION	0.4	0.5	0.8	1.5	2.0
MEA_B450	JUNCTION	0.3	0.5	0.7	1.4	1.8
MEA_B500	JUNCTION	0.5	0.7	0.9	1.9	2.4
MEA_B550	JUNCTION	0.6	0.8	1.1	2.3	2.9
MEA_B600	JUNCTION	0.1	0.2	0.3	0.6	0.8
MEA_B650	JUNCTION	0.3	0.5	0.8	1.9	2.6
MEA_B700	JUNCTION	0.1	0.1	0.2	0.3	0.4
MEA_J110	JUNCTION	0.7	1.5	3.5	144.9	218.2
MEA_J650	JUNCTION	0.3	0.5	0.8	1.9	2.6
MER_B100	JUNCTION	0.7	1.0	1.3	2.8	3.6

Node	Junction Type	2-yr	5-yr	10-yr	50-yr	100-yr
MER_J100	JUNCTION	0.0	0.0	0.1	5.4	5.9
MER_J110	JUNCTION	0.0	0.0	0.1	5.2	5.7
MER_J120	JUNCTION	0.0	0.0	0.1	5.2	5.7
OLT_B0100	JUNCTION	0.1	0.1	0.2	0.4	0.5
OLT_B0150	JUNCTION	0.2	0.2	0.3	0.7	0.8
OLT_B0200	JUNCTION	0.3	0.4	0.5	1.1	1.4
OLT_B0250	JUNCTION	0.1	0.1	0.2	0.4	0.5
OLT_B0300	JUNCTION	0.2	0.3	0.4	0.9	1.1
OLT_B0350	JUNCTION	0.2	0.3	0.5	0.9	1.2
OLT_B0400	JUNCTION	0.2	0.2	0.3	0.7	0.9
OLT_B0450	JUNCTION	0.1	0.1	0.1	0.3	0.4
OLT_B0500	JUNCTION	0.3	0.4	0.5	1.0	1.2
OLT_B0550	JUNCTION	0.0	0.1	0.1	0.2	0.2
OLT_B0600	JUNCTION	0.3	0.4	0.6	1.3	1.7
OLT_B0650	JUNCTION	0.5	0.7	1.0	2.1	2.7
OLT_B0700	JUNCTION	0.3	0.4	0.5	1.1	1.4
OLT_B0750	JUNCTION	0.2	0.2	0.3	0.5	0.7
OLT_B0800	JUNCTION	0.1	0.1	0.2	0.5	0.6
OLT_B0850	JUNCTION	0.1	0.1	0.2	0.4	0.5
OLT_B0900	JUNCTION	0.0	0.1	0.1	0.2	0.2
OLT_B0950	JUNCTION	0.2	0.2	0.3	0.7	0.8
OLT_B1000	JUNCTION	0.1	0.1	0.2	0.3	0.4
OLT_B1050	JUNCTION	0.1	0.2	0.2	0.4	0.5
OLT_B1100	JUNCTION	0.2	0.3	0.4	0.8	1.0
OLT_B1150	JUNCTION	0.1	0.1	0.2	0.4	0.5
OLT_B1200	JUNCTION	0.0	0.0	0.0	0.0	0.1
OLT_B1225	JUNCTION	0.1	0.1	0.1	0.2	0.3
OLT_B1250	JUNCTION	0.4	0.5	0.7	1.1	1.4
OLT_B1300	JUNCTION	0.1	0.1	0.1	0.2	0.2
OLT_B1350	JUNCTION	0.2	0.3	0.4	0.6	0.8
OLT_B1400	JUNCTION	0.1	0.1	0.2	0.3	0.4
OLT_B1450	JUNCTION	0.1	0.1	0.2	0.4	0.5
OLT_B1500	JUNCTION	0.0	0.0	0.0	0.1	0.1
OLT_B1550	JUNCTION	0.1	0.1	0.2	0.4	0.5
OLT_B1600	JUNCTION	0.0	0.1	0.1	0.1	0.2
OLT_B1650	JUNCTION	0.1	0.2	0.2	0.4	0.5
OLT_B1700	JUNCTION	0.3	0.4	0.6	1.0	1.3
OLT_B1750	JUNCTION	0.1	0.2	0.3	0.5	0.6
OLT_B1775	JUNCTION	0.0	0.0	0.1	0.1	0.1
OLT_B1800	JUNCTION	0.0	0.0	0.0	0.1	0.1
OLT_B1850	JUNCTION	0.2	0.2	0.3	0.5	0.7
OLT_B1900	JUNCTION	0.0	0.0	0.0	0.1	0.1
OLT_B2000	JUNCTION	0.1	0.2	0.2	0.4	0.5
OLT_B2100	JUNCTION	0.2	0.2	0.3	0.5	0.7
OLT_B2150	JUNCTION	0.1	0.2	0.3	0.5	0.6

Total Node Inflow (Ac-ft)

Node	Junction Type	2-yr	5-yr	10-yr	50-yr	100-yr
OLT_B2200	JUNCTION	0.1	0.2	0.3	0.5	0.7
OLT_B2250	JUNCTION	0.1	0.2	0.2	0.4	0.5
OLT_B2300	JUNCTION	0.1	0.1	0.2	0.3	0.4
OLT_B2350	JUNCTION	0.2	0.3	0.4	0.8	1.1
OLT_B2400	JUNCTION	0.0	0.0	0.0	0.1	0.1
OLT_B2450	JUNCTION	0.1	0.1	0.2	0.4	0.5
OLT_B2500	JUNCTION	0.1	0.2	0.2	0.5	0.7
OLT_B2550	JUNCTION	0.1	0.2	0.3	0.5	0.7
OLT_B2600	JUNCTION	0.1	0.2	0.2	0.5	0.6
OLT_B2650	JUNCTION	0.1	0.2	0.3	0.5	0.7
OLT_B2700	JUNCTION	0.1	0.2	0.2	0.5	0.6
OLT_B2750	JUNCTION	0.1	0.2	0.3	0.5	0.6
OLT_B2800	JUNCTION	0.1	0.1	0.2	0.3	0.4
OLT_B2850	JUNCTION	0.1	0.2	0.3	0.5	0.7
OLT_B2900	JUNCTION	0.2	0.3	0.5	0.9	1.2
OLT_B2950	JUNCTION	0.2	0.3	0.4	1.0	1.3
OLT_B3000	JUNCTION	0.1	0.1	0.1	0.4	0.5
OLT_B3050	JUNCTION	0.2	0.3	0.4	0.8	1.0
OLT_B3100	JUNCTION	0.6	0.9	1.2	2.4	3.1
OLT_B3150	JUNCTION	0.2	0.4	0.5	1.0	1.3
OLT_B3200	JUNCTION	0.2	0.4	0.5	1.0	1.3
OLT_B3250	JUNCTION	0.6	0.9	1.2	2.6	3.3
OLT_B3300	JUNCTION	0.1	0.2	0.4	1.2	1.6
OLT_D1750	JUNCTION	0.1	0.2	0.3	0.5	0.6
OLT_J0105	JUNCTION	8.5	14.0	34.4	140.9	202.9
OLT_J0110	JUNCTION	9.4	15.0	35.3	141.8	203.8
OLT_J0450	JUNCTION	0.7	1.0	1.4	2.7	3.5
OLT_J0500	JUNCTION	1.4	2.1	2.8	5.6	7.0
OLT_J0600	JUNCTION	0.3	0.4	0.6	1.4	2.0
OLT_J0650	JUNCTION	4.7	7.2	22.1	120.6	180.8
OLT_J0655	JUNCTION	4.7	7.2	22.1	120.6	180.8
OLT_J0750	JUNCTION	4.2	6.5	21.4	119.4	179.2
OLT_J0850	JUNCTION	0.5	0.7	0.9	1.8	2.3
OLT_J0950	JUNCTION	0.4	0.6	0.8	1.6	2.0
OLT_J1000	JUNCTION	0.2	0.3	0.4	0.7	0.8
OLT_J1150	JUNCTION	0.3	0.5	0.7	1.3	1.7
OLT_J1200	JUNCTION	0.0	0.1	0.1	0.2	0.2
OLT_J1300	JUNCTION	2.2	3.1	6.5	7.1	7.5
OLT_J1350	JUNCTION	0.2	0.3	9.4	88.4	134.7
OLT_J1355	JUNCTION	0.4	1.2	12.1	108.3	166.9
OLT_J1450	JUNCTION	0.2	0.3	0.5	0.9	1.1
OLT_J1500	JUNCTION	0.0	0.0	0.1	0.1	0.1
OLT_J1550	JUNCTION	0.2	0.3	0.4	0.8	1.0
OLT_J1600	JUNCTION	0.0	0.1	0.1	0.1	0.2
OLT_J1605	JUNCTION	0.5	0.7	0.9	1.7	2.2

Node	Junction Type	2-yr	5-yr	10-yr	50-yr	100-yr
OLT_J1650	JUNCTION	0.1	0.2	0.2	0.4	0.5
OLT_J1700	JUNCTION	0.3	0.4	0.6	1.0	1.3
OLT_J1800	JUNCTION	0.0	0.0	0.0	0.1	0.1
OLT_J1850	JUNCTION	0.2	0.2	0.3	0.5	0.7
OLT_J1900	JUNCTION	0.0	0.0	0.0	0.1	0.1
OLT_J2000	JUNCTION	0.1	0.2	0.2	0.4	0.5
OLT_J2101	JUNCTION	1.3	1.9	2.7	19.4	31.6
OLT_J2110	JUNCTION	2.0	3.5	8.6	25.8	38.4
OLT_J2150	JUNCTION	0.7	1.5	6.0	6.3	6.4
OLT_J2250	JUNCTION	0.4	0.6	0.8	1.9	2.6
OLT_J2300	JUNCTION	0.3	0.4	0.6	1.5	2.1
OLT_J2350	JUNCTION	0.2	0.3	0.4	0.8	1.1
OLT_J2400	JUNCTION	0.0	0.0	0.0	0.4	0.6
OLT_J2450	JUNCTION	0.3	0.6	1.0	3.0	4.2
OLT_J2500	JUNCTION	0.4	0.7	1.3	3.5	4.9
OLT_J2550	JUNCTION	0.1	0.2	0.3	0.5	0.7
OLT_J2600	JUNCTION	1.3	1.9	2.7	17.2	28.3
OLT_J2650	JUNCTION	1.0	1.5	2.1	4.3	5.5
OLT_J2700	JUNCTION	0.1	0.2	0.2	0.5	0.6
OLT_J2800	JUNCTION	1.4	3.5	16.8	92.1	136.0
OLT_J3000	JUNCTION	2.6	4.7	5.4	6.3	6.5
OLT_J3050	JUNCTION	0.8	1.2	1.6	3.3	4.1
OLT_J3100	JUNCTION	0.6	0.9	1.2	2.4	3.1
OLT_J3150	JUNCTION	1.1	3.1	16.3	91.1	135.0
OLT_J3200	JUNCTION	0.2	0.4	0.5	1.0	1.3
OLT_J3250	JUNCTION	0.6	0.9	1.2	2.6	3.3
OLT_J3300	JUNCTION	0.1	0.2	0.4	1.2	1.6
OLT_J3310	JUNCTION	0.9	2.8	15.9	90.5	134.1
OLT_J550	JUNCTION	0.0	0.1	0.1	0.2	0.2
PHS_B100	JUNCTION	0.9	2.5	10.2	45.7	66.3
PHS_B300	JUNCTION	0.1	0.2	0.6	2.4	3.5
PHS_J100	JUNCTION	2.0	5.0	18.8	82.6	119.4
PHS_J120	JUNCTION	2.3	6.0	23.1	103.1	149.1
PHS_J300	JUNCTION	0.4	1.2	4.9	22.2	32.2
PIE_B050	JUNCTION	1.1	1.6	2.2	3.9	4.8
PIE_B100	JUNCTION	1.7	2.7	4.8	14.3	19.6
PIE_J100	JUNCTION	2.2	3.7	8.2	31.9	45.7
PIE_J110	JUNCTION	2.1	3.7	8.2	31.9	45.4
PME_B100	JUNCTION	1.1	1.8	3.0	7.4	9.8
PME_B200	JUNCTION	1.3	2.0	2.8	5.9	7.5
PME_J100	JUNCTION	0.0	0.0	15.3	145.8	221.6
PRR_B100	JUNCTION	0.7	1.3	2.5	9.1	12.8
PRR_B200	JUNCTION	0.5	0.9	1.4	3.4	4.6
PRR_J100	JUNCTION	1.3	2.2	4.0	12.6	17.5
PRR_J200	JUNCTION	0.5	0.9	1.4	3.4	4.6

Node	Junction Type	2-yr	5-yr	10-yr	50-yr	100-yr
PVE_B100	JUNCTION	0.4	1.0	4.4	20.0	29.0
PVE_J100	JUNCTION	0.4	1.0	4.4	20.0	29.0
SAD_B100	JUNCTION	0.1	0.3	1.1	4.3	6.1
SAD_B200	JUNCTION	0.1	0.2	0.7	2.8	4.1
SAD_J100	JUNCTION	0.1	0.3	1.1	4.3	6.1
SBC_B100	JUNCTION	1.3	2.8	9.2	38.7	55.5
SME_B050	JUNCTION	0.2	0.3	0.4	0.9	1.1
SME_B100	JUNCTION	0.2	0.4	0.7	1.9	2.6
SME_B200	JUNCTION	0.1	0.2	0.4	1.1	1.5
SME_B300	JUNCTION	0.2	0.3	0.4	0.8	1.0
SME_B400	JUNCTION	0.6	0.9	1.3	2.7	3.4
SME_B500	JUNCTION	0.9	1.7	2.9	7.7	10.3
SME_B550	JUNCTION	0.7	1.0	1.4	2.9	3.7
SME_B600	JUNCTION	0.4	0.6	0.8	1.6	2.0
SME_B700	JUNCTION	0.6	0.9	1.4	2.8	3.6
SME_J105	JUNCTION	0.6	0.6	0.6	0.6	0.6
SME_J110	JUNCTION	0.0	0.0	0.0	37.1	64.8
SME_J600	JUNCTION	6.6	11.7	21.9	67.5	91.8
STD003	JUNCTION	0.4	0.5	0.6	0.6	0.6
STD004	JUNCTION	0.4	0.5	0.6	0.6	0.6
STD013	JUNCTION	0.6	0.7	0.8	0.9	1.0
STD014	JUNCTION	1.1	1.4	1.6	1.9	2.0
STD016	JUNCTION	0.5	0.6	0.8	1.0	1.0
STD017	JUNCTION	0.6	0.7	0.8	0.9	1.0
STD018	JUNCTION	0.6	0.7	0.8	0.9	1.0
STD019	JUNCTION	0.6	0.7	0.8	0.9	1.0
STD020	JUNCTION	0.6	0.7	0.8	0.9	1.0
STD021	JUNCTION	2.2	4.0	6.4	10.0	11.4
STD024	JUNCTION	0.1	0.1	0.2	0.3	0.3
STD027	JUNCTION	0.6	0.8	1.0	1.2	1.2
STD028	JUNCTION	0.0	0.0	0.1	0.3	0.3
STD029	JUNCTION	0.6	0.9	1.1	1.5	1.6
STD030	JUNCTION	0.6	0.9	1.1	1.5	1.6
STD031	JUNCTION	0.6	0.9	1.1	1.5	1.6
STD032	JUNCTION	0.3	0.4	0.5	0.6	0.6
STD034	JUNCTION	0.3	0.4	0.5	0.6	0.6
STD037	JUNCTION	0.3	0.4	0.5	0.6	0.6
STD038	JUNCTION	0.7	1.0	1.4	3.1	4.1
STD045	JUNCTION	3.3	5.3	10.3	35.6	50.0
STD048	JUNCTION	1.8	4.1	9.0	15.2	16.1
STD049	JUNCTION	1.8	4.0	9.0	15.2	16.0
STD050	JUNCTION	1.8	4.0	9.0	15.1	16.0
STD051	JUNCTION	1.8	4.0	9.0	15.1	15.9
STD053	JUNCTION	2.7	5.2	10.3	16.7	17.6
STD054	JUNCTION	2.7	5.2	10.3	16.6	17.5

Total Node Inflow (Ac-ft)

Node	Junction Type	2-yr	5-yr	10-yr	50-yr	100-yr
STD055	JUNCTION	2.7	5.1	10.3	16.6	17.5
STD056	JUNCTION	2.7	5.1	10.3	16.6	17.5
STD057	JUNCTION	2.7	5.1	10.3	16.6	17.5
STD062	JUNCTION	0.0	0.0	0.0	0.6	1.0
STD063	JUNCTION	0.0	0.0	0.0	0.3	0.6
STD064	JUNCTION	0.5	0.8	1.2	4.4	5.3
STD070	JUNCTION	0.4	0.6	0.8	1.6	2.1
STD071	JUNCTION	0.4	0.6	0.8	1.6	2.1
STD072	JUNCTION	0.4	0.6	0.8	1.6	2.1
STD074	JUNCTION	0.3	0.5	0.7	1.2	1.3
STD077	JUNCTION	0.4	0.6	0.9	1.5	1.9
STD078	JUNCTION	0.4	0.6	0.9	1.5	1.9
STD080	JUNCTION	0.4	0.6	0.9	1.5	2.0
STD081	JUNCTION	0.4	0.6	0.9	1.5	2.0
STD082	JUNCTION	0.0	0.2	0.6	1.6	2.3
STD084	JUNCTION	0.0	0.2	0.6	1.6	2.3
STD085	JUNCTION	0.0	0.2	0.6	1.6	2.3
STD089	JUNCTION	4.5	5.2	5.5	5.8	5.9
STD090	JUNCTION	4.5	5.2	5.5	5.8	5.9
STD092	JUNCTION	0.0	0.0	0.1	0.8	1.1
STD098	JUNCTION	0.1	0.1	0.2	2.4	2.7
STD099	JUNCTION	0.2	0.3	0.5	2.8	3.3
STD100	JUNCTION	0.2	0.3	0.5	2.8	3.3
STD101	JUNCTION	0.2	0.3	0.5	2.8	3.3
STD106	JUNCTION	0.1	0.1	0.2	0.3	0.3
STD107	JUNCTION	0.2	0.3	0.5	0.8	1.0
STD108	JUNCTION	0.2	0.3	0.5	0.8	1.0
STD114	JUNCTION	0.2	0.2	0.3	0.6	0.7
STD115	JUNCTION	0.8	1.0	1.2	1.6	1.7
STD116	JUNCTION	0.8	1.0	1.2	1.6	1.7
STD119	JUNCTION	2.4	3.5	4.7	6.3	6.6
STD122	JUNCTION	2.4	3.5	4.7	6.3	6.6
STD126	JUNCTION	0.9	1.2	1.6	1.9	2.0
STD127	JUNCTION	0.9	1.2	1.6	1.9	2.0
STD128	JUNCTION	0.9	1.2	1.6	1.9	2.0
STD129	JUNCTION	0.9	1.2	1.6	1.9	2.0
STD130	JUNCTION	0.9	1.2	1.6	1.9	2.0
STD131	JUNCTION	1.5	2.0	2.3	2.8	2.9
STD132	JUNCTION	0.6	0.7	0.8	0.8	0.8
STD133	JUNCTION	0.6	0.7	0.8	0.8	0.8
STD134	JUNCTION	0.6	0.7	0.8	0.8	0.8
STD135	JUNCTION	0.4	0.5	0.6	0.7	0.8
STD136	JUNCTION	0.4	0.5	0.6	0.7	0.8
STD137	JUNCTION	0.4	0.5	0.6	0.7	0.8
STD139	JUNCTION	0.4	0.6	0.7	0.8	0.8

Node	Junction Type	2-yr	5-yr	10-yr	50-yr	100-yr
STD140	JUNCTION	0.4	0.6	0.7	0.8	0.8
STD141	JUNCTION	0.4	0.6	0.9	1.2	1.2
STD149	JUNCTION	0.3	0.5	0.6	0.8	0.8
STD151	JUNCTION	1.5	2.0	2.3	2.8	2.9
STD152	JUNCTION	1.5	2.0	2.6	5.0	6.2
STD155	JUNCTION	4.9	7.2	7.2	7.2	7.3
STD156	JUNCTION	4.9	7.2	7.2	7.2	7.2
STD157	JUNCTION	5.1	7.5	8.2	10.7	12.1
STD158	JUNCTION	5.7	9.0	11.6	155.3	229.9
STD159	JUNCTION	0.1	0.2	0.4	0.6	0.6
STD161	JUNCTION	1.3	1.7	2.1	2.5	2.6
STD162	JUNCTION	0.3	0.5	0.6	0.8	0.8
STD164	JUNCTION	0.1	0.1	0.2	0.3	0.4
STD165	JUNCTION	0.1	0.1	0.2	0.3	0.4
STD166	JUNCTION	0.1	0.1	0.2	0.3	0.4
STD175	JUNCTION	2.0	3.6	5.5	7.8	8.4
STD176	JUNCTION	2.0	3.6	5.5	7.8	8.4
STD180	JUNCTION	1.7	3.2	5.2	7.3	7.8
STD181	JUNCTION	1.7	3.2	5.2	7.3	7.8
STD186	JUNCTION	0.3	0.5	0.8	1.7	2.2
STD187	JUNCTION	0.3	0.5	0.8	1.7	2.2
STD188	JUNCTION	0.3	0.5	0.8	1.7	2.2
STD189	JUNCTION	0.5	0.9	1.3	2.9	3.8
STD190	JUNCTION	0.5	0.8	1.1	2.1	2.6
STD191	JUNCTION	0.5	0.8	1.1	2.1	2.6
STD192	JUNCTION	0.1	0.1	0.2	0.6	0.8
STD212	JUNCTION	0.2	0.2	0.3	0.6	0.8
STD213	JUNCTION	0.2	0.2	0.3	0.6	0.8
STD214	JUNCTION	0.2	0.2	0.3	0.6	0.8
STD215	JUNCTION	0.2	0.2	0.3	0.6	0.8
STD216	JUNCTION	0.3	0.4	0.5	1.0	1.3
STD217	JUNCTION	0.3	0.4	0.5	1.0	1.3
STD218	JUNCTION	0.3	0.4	0.5	1.0	1.3
STD219	JUNCTION	0.3	0.4	0.5	1.0	1.3
STD220	JUNCTION	1.1	1.9	3.3	4.7	5.1
STD221	JUNCTION	0.4	0.6	0.8	1.1	1.2
STD222	JUNCTION	1.3	2.2	3.7	5.9	6.4
STD223	JUNCTION	1.3	2.2	3.7	5.9	6.4
STD227	JUNCTION	0.2	0.4	0.8	1.2	1.2
STD228	JUNCTION	0.2	0.4	0.8	1.2	1.2
STD229	JUNCTION	0.2	0.4	0.8	1.2	1.2
STD230	JUNCTION	0.3	0.7	1.1	1.5	1.5
STD232	JUNCTION	0.2	0.4	0.5	1.1	1.4
STD233	JUNCTION	0.2	0.4	0.5	1.1	1.4
STD234	JUNCTION	0.2	0.4	0.5	1.1	1.4

Node	Junction Type	2-yr	5-yr	10-yr	50-yr	100-yr
STD235	JUNCTION	0.2	0.4	0.5	1.1	1.4
STD236	JUNCTION	0.2	0.4	0.5	1.1	1.4
STD237	JUNCTION	0.2	0.4	0.5	1.1	1.4
STD243	JUNCTION	2.7	3.6	5.0	8.1	8.8
STD244	JUNCTION	2.7	3.7	5.0	8.1	8.8
STD246	JUNCTION	2.2	3.1	4.5	11.7	16.5
STD247	JUNCTION	2.5	3.5	6.9	8.1	8.8
STD251	JUNCTION	0.1	0.1	0.2	0.3	0.4
STD258	JUNCTION	1.0	2.8	6.2	7.1	7.1
STD262	JUNCTION	0.1	0.1	0.1	0.1	0.1
STD266	JUNCTION	0.1	0.2	0.3	0.3	0.3
STD269	JUNCTION	0.7	0.8	0.9	0.9	1.0
STD270	JUNCTION	1.0	1.3	1.5	1.7	1.8
STD272	JUNCTION	0.1	0.2	0.3	0.3	0.3
STD274	JUNCTION	0.0	0.0	0.0	0.0	0.0
STD276	JUNCTION	1.5	2.6	14.1	110.8	170.0
STD277	JUNCTION	0.6	0.8	0.9	1.1	1.1
STD278	JUNCTION	0.9	0.9	1.0	1.1	1.1
STD279	JUNCTION	1.0	1.2	1.3	1.7	1.9
STD282	JUNCTION	0.3	0.4	0.5	0.7	0.8
STD283	JUNCTION	0.3	0.4	0.5	0.7	0.8
STD284	JUNCTION	0.2	0.4	0.9	1.9	2.1
STD285	JUNCTION	0.3	0.4	1.2	2.7	3.0
STD286	JUNCTION	4.0	6.4	6.9	8.8	8.9
STD287	JUNCTION	0.0	0.0	0.1	1.8	1.9
STD290	JUNCTION	0.3	0.4	0.7	2.3	2.8
STD291	JUNCTION	0.9	1.2	1.4	1.7	1.7
STD292	JUNCTION	0.9	1.2	1.4	1.7	1.7
STD293	JUNCTION	0.9	1.2	1.4	1.7	1.7
STD294	JUNCTION	0.9	1.2	1.4	1.7	1.7
STD295	JUNCTION	0.9	1.2	1.4	1.7	1.7
STD296	JUNCTION	0.3	0.4	0.5	0.6	0.6
STD297	JUNCTION	0.6	0.8	0.9	1.1	1.1
STD298	JUNCTION	0.6	0.8	0.9	1.1	1.1
STD299	JUNCTION	0.4	0.4	0.5	0.5	0.5
STD302	JUNCTION	0.0	0.0	0.0	0.0	0.0
STD303	JUNCTION	0.3	0.4	0.7	2.3	2.8
STD304	JUNCTION	0.0	0.0	0.2	1.4	1.5
STD305	JUNCTION	0.0	0.0	0.1	0.9	1.0
STD306	JUNCTION	0.0	0.0	0.1	0.4	0.5
STD307	JUNCTION	0.3	0.4	0.5	0.7	0.7
STD308	JUNCTION	0.3	0.4	1.2	2.7	3.0
STD311	JUNCTION	0.3	0.8	1.2	1.9	2.1
STD312	JUNCTION	0.3	0.8	1.2	1.9	2.1
STD313	JUNCTION	0.0	0.1	0.1	0.2	0.3

Total Node Inflow (Ac-ft)

Node	Junction Type	2-yr	5-yr	10-yr	50-yr	100-yr
STD314	JUNCTION	1.1	1.7	2.1	2.7	2.8
STD315	JUNCTION	1.2	1.9	2.4	3.0	3.2
STD316	JUNCTION	1.2	1.9	2.4	3.0	3.2
STD317	JUNCTION	1.0	1.5	2.0	2.4	2.5
STD318	JUNCTION	1.1	1.7	2.1	2.7	2.8
STD319	JUNCTION	0.1	0.1	0.1	0.2	0.3
STD324	JUNCTION	0.9	1.2	1.4	1.5	1.6
STD325	JUNCTION	0.9	1.2	1.4	1.5	1.6
STD326	JUNCTION	0.9	1.1	1.3	1.5	1.5
STD327	JUNCTION	0.9	1.2	1.4	1.5	1.6
STD328	JUNCTION	0.9	0.9	1.0	1.1	1.1
STD329	JUNCTION	0.9	0.9	1.0	1.1	1.1
STD330	JUNCTION	5.7	7.5	14.3	15.4	15.7
STD333	JUNCTION	5.7	7.5	14.3	15.4	15.7
STD334	JUNCTION	3.9	6.3	6.8	8.7	8.8
STD335	JUNCTION	4.0	6.4	6.9	8.7	8.9
STD336	JUNCTION	3.9	6.4	6.8	8.7	8.9
STD363	JUNCTION	0.1	0.1	0.2	0.3	0.4
STD364	JUNCTION	0.1	0.1	0.2	0.3	0.4
STD365	JUNCTION	0.1	0.1	0.2	0.3	0.4
STD371	JUNCTION	1.0	1.4	2.0	4.1	5.0
STD374	JUNCTION	1.0	1.4	2.0	4.1	5.0
STD375	JUNCTION	3.9	6.3	6.8	8.7	8.8
STD380	JUNCTION	0.5	0.5	0.6	0.6	0.6
STD381	JUNCTION	0.5	0.5	0.6	0.6	0.6
STD382	JUNCTION	0.9	1.0	1.1	1.1	1.2
STD384	JUNCTION	0.7	0.9	1.3	1.4	1.5
STD385	JUNCTION	0.5	0.5	0.8	0.9	0.9
STD386	JUNCTION	0.4	0.5	0.8	0.8	0.8
STD388	JUNCTION	0.3	0.3	0.4	0.4	0.4
STD389	JUNCTION	0.7	0.8	0.9	1.5	1.9
STD390	JUNCTION	1.6	3.5	3.8	3.9	3.9
STD393	JUNCTION	5.4	11.5	34.4	151.9	220.0
STD401	JUNCTION	1.3	1.7	2.0	2.2	2.3
STD402	JUNCTION	2.0	2.6	3.1	3.5	3.6
STD405	JUNCTION	2.3	3.0	3.7	4.2	4.4
STD406	JUNCTION	2.3	3.0	3.7	4.2	4.4
STD407	JUNCTION	2.3	3.0	3.6	4.2	4.4
STD411	JUNCTION	2.3	3.0	3.7	4.2	4.4
STD414	JUNCTION	0.7	1.0	1.3	1.6	1.7
STD415	JUNCTION	0.7	1.0	1.3	1.6	1.7
STD428	JUNCTION	0.9	2.6	5.8	6.3	6.4
STD429	JUNCTION	0.9	2.6	5.7	6.3	6.4
STD432	JUNCTION	1.5	3.5	3.8	3.8	3.8
STD433	JUNCTION	2.3	4.4	4.9	5.2	5.3

Node	Junction Type	2-yr	5-yr	10-yr	50-yr	100-yr
STD434	JUNCTION	0.1	0.2	0.3	0.5	0.5
STD435	JUNCTION	0.8	1.0	1.1	1.4	1.5
STD436	JUNCTION	0.2	0.3	0.4	0.7	0.8
STD437	JUNCTION	2.5	4.7	5.3	5.9	6.1
STD438	JUNCTION	0.1	0.1	0.1	0.4	0.5
STD439	JUNCTION	2.5	4.7	5.4	6.2	6.5
STD442	JUNCTION	0.0	0.0	0.0	0.0	0.0
STD450	JUNCTION	1.1	1.4	1.6	1.9	2.0
STD452	JUNCTION	1.1	1.4	1.6	1.9	2.0
STD458	JUNCTION	0.2	0.2	0.3	0.7	0.8
STD460	JUNCTION	0.8	1.0	1.1	1.2	1.2
STD461	JUNCTION	0.8	1.0	1.1	1.2	1.2
STD462	JUNCTION	0.8	1.0	1.1	1.2	1.2
STD464	JUNCTION	0.8	1.0	1.1	1.2	1.2
STD465	JUNCTION	0.8	1.0	1.1	1.2	1.2
STD466	JUNCTION	0.8	1.0	1.1	1.2	1.2
STD467	JUNCTION	0.0	0.0	0.0	0.0	0.0
STD468	JUNCTION	0.0	0.0	0.0	0.0	0.0
STD469	JUNCTION	0.0	0.0	0.0	0.0	0.0
STD471	JUNCTION	0.0	0.0	0.0	0.0	0.0
STD473	JUNCTION	0.6	0.7	0.8	0.9	0.9
STD475	JUNCTION	1.1	1.2	1.3	1.4	1.4
STD477	JUNCTION	1.1	1.2	1.3	1.4	1.4
STD478	JUNCTION	4.0	6.4	6.8	7.0	7.0
STD479	JUNCTION	0.1	0.1	0.1	0.2	0.3
STD480	JUNCTION	0.1	0.1	0.1	0.2	0.3
STD481	JUNCTION	0.1	0.1	0.1	0.2	0.3
STD486	JUNCTION	0.1	0.1	0.1	0.2	0.2
STD488	JUNCTION	1.8	4.1	9.1	15.2	16.1
STD497	JUNCTION	0.6	3.5	6.1	7.2	7.4
STD498	JUNCTION	0.6	3.5	6.1	7.2	7.4
STD499	JUNCTION	0.6	3.7	6.3	7.4	7.6
STD500	JUNCTION	0.6	3.7	6.4	7.5	7.6
STD501	JUNCTION	0.6	3.9	6.5	7.6	7.8
STD502	JUNCTION	1.3	2.3	3.9	6.5	7.1
STD503	JUNCTION	0.2	0.4	0.5	1.1	1.4
STD505	JUNCTION	0.0	0.0	0.0	0.3	0.4
STD506	JUNCTION	0.0	0.0	0.0	0.3	0.4
STD512	JUNCTION	0.6	0.9	1.3	2.7	3.4
STD513	JUNCTION	0.0	0.0	0.0	0.0	0.0
STD514	JUNCTION	0.0	0.0	0.0	0.0	0.0
STD515	JUNCTION	4.2	4.8	5.0	5.0	5.0
STD516	JUNCTION	4.2	4.9	5.0	5.0	5.0
STD517	JUNCTION	2.8	2.9	2.9	2.9	2.9
STD518	JUNCTION	2.8	2.9	2.9	2.9	2.9

Node	Junction Type	2-yr	5-yr	10-yr	50-yr	100-yr
STD519	JUNCTION	2.1	2.2	2.2	2.2	2.2
STD520	JUNCTION	0.0	0.0	0.0	0.0	0.0
STD522	JUNCTION	0.0	0.0	0.0	0.0	0.0
STD523	JUNCTION	0.0	0.0	0.0	0.0	0.0
STD524	JUNCTION	0.2	0.3	0.4	0.9	1.1
STD526	JUNCTION	1.7	2.7	3.5	5.1	5.9
STD528	JUNCTION	1.7	2.7	3.5	5.1	5.7
STD539	JUNCTION	0.0	0.0	0.0	0.0	0.3
STD540	JUNCTION	0.0	0.2	0.6	1.6	2.3
STD555	JUNCTION	2.6	4.7	5.4	6.3	6.5
STD556	JUNCTION	0.0	0.0	0.0	0.1	0.1
STD557	JUNCTION	0.0	0.0	0.0	0.1	0.1
STD560	JUNCTION	0.4	0.6	0.7	0.8	0.8
STD562	JUNCTION	0.8	1.0	1.1	1.3	1.3
STD563	JUNCTION	0.8	1.4	17.1	149.8	227.1
STD567	JUNCTION	1.1	1.8	2.3	2.4	2.4
STD568	JUNCTION	1.1	1.8	2.3	2.4	2.4
STD569	JUNCTION	1.1	1.8	2.2	2.3	2.4
STD570	JUNCTION	1.1	1.8	2.2	2.3	2.4
STD571	JUNCTION	1.1	1.8	2.2	2.3	2.3
STD573	JUNCTION	1.7	2.5	3.1	3.3	3.4
STD574	JUNCTION	1.7	2.5	3.1	3.3	3.4
STD575	JUNCTION	1.7	2.7	3.6	5.1	6.0
STD578	JUNCTION	0.5	0.8	1.2	4.4	5.3
STD580	JUNCTION	0.0	0.0	0.0	0.3	0.5
STD581	JUNCTION	0.7	0.8	0.9	1.5	1.9
STD589	JUNCTION	0.4	0.4	0.5	0.5	0.5
STT_B100	JUNCTION	0.1	0.3	1.1	4.3	6.1
STT_B200	JUNCTION	0.0	0.1	0.3	1.4	2.1
STT_B300	JUNCTION	0.2	0.4	1.0	3.9	5.6
STT_B400	JUNCTION	0.8	1.5	3.1	11.5	16.4
STT_B500	JUNCTION	4.1	6.9	11.4	28.9	38.7
STT_J100	JUNCTION	0.2	0.6	2.0	16.1	25.5
STT_J200	JUNCTION	0.1	0.3	0.9	4.8	7.1
STT_J301	JUNCTION	0.1	0.2	0.7	3.3	4.9
STT_J500	JUNCTION	4.1	6.9	11.4	28.9	38.7
STT_O400	JUNCTION	5.8	9.9	17.8	52.8	72.7
SUN_B100	JUNCTION	1.0	1.6	2.7	7.9	10.8
SUN_B200	JUNCTION	0.4	0.7	1.1	3.0	4.1
SUN_B300	JUNCTION	0.3	0.5	0.7	2.1	2.8
SUN_J100	JUNCTION	6.2	12.8	36.5	158.4	228.9
SWM_B100	JUNCTION	0.7	1.4	5.6	31.6	47.0
SWM_B110	JUNCTION	2.3	5.2	17.6	84.7	124.3
SWM_B200	JUNCTION	1.1	1.9	3.1	8.1	10.8
SWM_B300	JUNCTION	0.2	0.4	1.4	7.7	11.4

Total Node Inflow (Ac-ft)

Node	Junction Type	2-yr	5-yr	10-yr	50-yr	100-yr
SWM_B400	JUNCTION	0.2	0.5	2.1	10.8	15.9
SWM_B500	JUNCTION	0.8	2.3	8.1	34.7	49.7
SWM_J200	JUNCTION	1.3	2.2	4.5	15.5	21.8
SWM_J300	JUNCTION	0.2	0.4	1.4	7.7	11.4
SWM_J400	JUNCTION	1.0	2.7	10.0	44.8	65.1
SWM_J410	JUNCTION	0.9	2.6	9.7	43.6	63.2
SWM_J420	JUNCTION	2.1	4.5	13.6	57.4	82.9
SWM_J500	JUNCTION	0.8	2.3	8.1	34.7	49.7
TSIL_B100	JUNCTION	0.3	0.4	0.6	1.3	1.7
TSIL_B200	JUNCTION	0.2	0.4	0.6	1.4	1.9
TSIL_J200	JUNCTION	2.2	3.9	6.3	9.9	11.3
UND_B100	JUNCTION	0.2	0.4	1.0	3.4	4.7
UND_J100	JUNCTION	0.9	2.6	6.9	25.0	35.3
UNK_B100	JUNCTION	0.1	0.3	1.1	4.6	6.7
UNK_B150	JUNCTION	0.2	0.7	2.8	12.7	18.3
UNK_B200	JUNCTION	0.7	2.4	8.3	33.8	48.5
UNK_B250	JUNCTION	0.1	0.2	0.8	3.2	4.6
UNK_J155	JUNCTION	3.7	10.1	36.2	157.7	228.3
UNK_J210	JUNCTION	2.6	7.9	30.7	136.3	197.3
UNK_J250	JUNCTION	0.1	0.2	0.8	3.2	4.6
VPT_B100	JUNCTION	0.2	0.3	0.6	1.7	2.4
VPT_B200	JUNCTION	0.8	1.2	1.7	4.0	5.3
VPT_B300	JUNCTION	0.1	0.1	0.2	0.4	0.5
VPT_B350	JUNCTION	0.1	0.2	0.3	0.8	1.1
VPT_B400	JUNCTION	0.2	0.4	0.5	1.1	1.4
VPT_B450	JUNCTION	0.2	0.3	0.4	0.7	0.9
VPT_B500	JUNCTION	0.1	0.3	0.7	2.4	3.4
VPT_B600	JUNCTION	0.1	0.1	0.2	0.5	0.7
VPT_B650	JUNCTION	0.4	0.6	0.8	1.8	2.4
VPT_B700	JUNCTION	0.1	0.2	0.4	1.1	1.5
VPT_B750	JUNCTION	0.2	0.3	0.4	0.8	1.0
VPT_B800	JUNCTION	0.2	0.4	1.1	3.8	5.4
VPT_J100	JUNCTION	2.1	3.4	5.6	13.7	18.4
VPT_J200	JUNCTION	0.8	1.2	1.7	4.0	5.3
VPT_J210	JUNCTION	0.8	1.2	1.7	4.0	5.3
VPT_J400	JUNCTION	0.2	0.4	0.5	1.1	1.4
VPT_J500	JUNCTION	6.8	11.8	22.0	67.2	91.5
VPT_J750	JUNCTION	0.2	0.3	0.4	0.8	1.0
WDO_B050	JUNCTION	0.1	0.1	0.1	0.2	0.3
WDO_B100	JUNCTION	0.4	0.6	0.9	1.9	2.4
WDO_B200	JUNCTION	0.7	1.1	1.6	3.2	4.1
WDO_B300	JUNCTION	0.0	0.0	0.0	0.0	0.0
WDO_J050	JUNCTION	0.0	0.0	0.0	0.0	0.4
WDO_J215	JUNCTION	0.4	0.9	1.7	4.5	6.1
WELE_B100	JUNCTION	0.43	0.62	0.8	1.6	2.0

Node	Junction Type	2-yr	5-yr	10-yr	50-yr	100-yr
WELE_B200	JUNCTION	0.4	0.6	0.9	1.8	2.3
WELE_B300	JUNCTION	0.2	0.2	0.3	0.7	0.9
WELE_B400	JUNCTION	0.1	0.2	0.2	0.4	0.5
WELE_J105	JUNCTION	0.4	0.4	0.5	0.5	0.5
WELP_B100	JUNCTION	0.7	1.0	1.4	2.7	3.4
WELP_B200	JUNCTION	0.1	0.1	0.2	0.3	0.4
WELP_B300	JUNCTION	0.5	1.2	2.7	8.7	12.2
WELW_B100	JUNCTION	0.3	0.6	1.0	3.4	4.8
WELW_B200	JUNCTION	0.3	0.4	0.7	1.7	2.3
WELW_B250	JUNCTION	0.2	0.3	0.5	1.2	1.6
WELW_B300	JUNCTION	0.6	1.0	1.6	4.2	5.7
WELW_J100	JUNCTION	1.5	2.3	3.7	13.8	20.5
WELW_J200	JUNCTION	0.3	0.4	0.7	1.7	2.3
WELW_J205	JUNCTION	0.5	0.7	1.1	2.9	3.9
WELW_J250	JUNCTION	0.2	0.3	0.5	1.2	1.6
WELW_J300	JUNCTION	0.6	1.0	1.6	7.4	11.7
WGR_B100	JUNCTION	3.2	8.9	26.5	103.4	147.6
WIL_B100	JUNCTION	2.7	4.9	9.8	30.4	42.0
WIL_B200	JUNCTION	0.8	1.6	6.7	35.9	52.8
WIL_B300	JUNCTION	0.0	0.1	0.4	2.4	3.6
WIL_B400	JUNCTION	0.5	1.1	3.9	20.5	30.1
WIL_B450	JUNCTION	0.4	0.9	3.3	17.3	25.5
WIL_B500	JUNCTION	0.6	1.0	2.1	8.0	11.3
WIL_B600	JUNCTION	1.0	2.2	8.7	47.3	70.0
WIL_B700	JUNCTION	0.4	1.3	4.1	16.1	23.0
WIL_J110	JUNCTION	2.7	4.9	9.8	30.4	42.0
WIL_J200	JUNCTION	2.5	5.6	20.4	103.7	152.2
WIL_J500	JUNCTION	0.4	0.9	3.3	17.3	25.5
WIL_J600	JUNCTION	2.0	4.4	14.7	70.9	103.4
WIL_J700	JUNCTION	0.4	1.3	4.1	16.1	23.0
WIM_B100	JUNCTION	0.3	1.0	3.9	16.9	24.4
WIM_B200	JUNCTION	0.8	1.4	2.5	8.5	11.9
WIM_B300	JUNCTION	0.4	0.7	1.4	4.7	6.6
WIM_J100	JUNCTION	0.3	1.0	3.9	16.9	24.4
WIM_J300	JUNCTION	0.4	0.7	1.4	4.7	6.6
WPT_B050	JUNCTION	0.1	0.2	0.2	0.3	0.4
WPT_B100	JUNCTION	0.0	0.1	0.1	0.5	0.6
WPT_B200	JUNCTION	0.5	0.7	1.0	2.5	3.3
WPT_B300	JUNCTION	0.3	0.4	0.6	1.1	1.5
WPT_B400	JUNCTION	0.7	1.0	1.4	3.1	4.1
WPT_B500	JUNCTION	0.4	0.7	0.9	1.8	2.2
WPT_B600	JUNCTION	0.8	1.1	1.6	3.4	4.4
WPT_B650	JUNCTION	0.4	0.6	0.8	1.3	1.6
WPT_B700	JUNCTION	0.1	0.1	0.1	0.2	0.2
WPT_B800	JUNCTION	0.1	0.1	0.2	0.3	0.3

Node	Junction Type	2-yr	5-yr	10-yr	50-yr	100-yr
WPT_B850	JUNCTION	0.2	0.2	0.3	0.6	0.7
WPT_B900	JUNCTION	0.3	0.5	0.6	1.1	1.3
WPT_J500	JUNCTION	1.9	2.7	4.7	17.7	25.5
WPT_J650	JUNCTION	1.2	3.0	8.3	32.5	46.0
WPT_J900	JUNCTION	0.0	0.0	0.0	0.2	0.4
WPT_J905	JUNCTION	0.6	0.9	1.1	1.7	2.0
AOMI_O100	OUTFALL	7.2	11.2	18.0	47.0	62.9
BCOM_O115	OUTFALL	0.2	0.3	0.4	1.3	2.0
BCOM_O975	OUTFALL	0.0	0.0	0.0	0.2	0.2
BMA_O400	OUTFALL	0.7	1.5	5.8	32.2	47.6
BUC_O100	OUTFALL	2.1	2.9	3.7	5.5	6.2
BUC_O200	OUTFALL	0.9	1.2	1.7	4.1	5.0
CLK_O200	OUTFALL	2.4	5.0	9.8	50.0	73.3
CLK_O400	OUTFALL	5.4	9.2	17.6	59.8	83.8
DCM_J500	OUTFALL	0.4	1.1	2.6	9.0	12.6
DCM_O200	OUTFALL	1.6	4.6	13.3	50.6	71.8
DCM_O400	OUTFALL	0.4	0.8	2.0	15.7	24.2
IND_O0105	OUTFALL	6.0	9.4	14.2	166.6	242.1
IND_O0110	OUTFALL	0.2	0.5	1.1	4.8	6.8
IND_O0115	OUTFALL	0.4	1.1	3.5	14.5	20.8
IND_O0120	OUTFALL	0.5	1.2	3.7	15.0	21.5
KAWS_O100	OUTFALL	0.0	0.0	0.1	0.8	1.1
KAWS_O150	OUTFALL	0.0	0.0	0.0	0.0	0.3
KAWS_O200	OUTFALL	0.0	0.0	0.0	0.0	0.0
KAWS_O350	OUTFALL	0.7	0.8	0.9	1.2	1.3
KAWS_O750	OUTFALL	5.2	11.8	31.6	50.3	52.2
KAWS_O775	OUTFALL	0.2	0.3	2.1	99.7	165.7
KNL_O050	OUTFALL	0.7	1.2	2.0	5.2	7.1
LCD_O1100	OUTFALL	1.0	2.3	5.0	16.1	22.5
LCD_O1200	OUTFALL	2.7	6.8	18.5	97.3	153.4
LCD_O1300	OUTFALL	0.6	1.1	2.8	12.1	17.5
LCD_O1400	OUTFALL	0.5	1.0	2.2	7.2	9.9
LCD_O1500	OUTFALL	0.5	1.3	3.2	11.1	15.6
LCD_O300	OUTFALL	0.5	1.2	3.3	12.4	17.6
LCD_O700	OUTFALL	3.6	6.7	15.5	61.7	88.1
LCD_O800	OUTFALL	0.3	0.5	0.8	2.2	3.0
OF2	OUTFALL	0.2	0.3	1.5	9.0	13.3
OLT_O0350	OUTFALL	0.9	1.1	1.4	2.2	2.6
OLT_O1700	OUTFALL	0.3	0.4	0.6	1.0	1.3
PIE_O050	OUTFALL	3.3	5.3	10.2	35.6	50.0
STD242	OUTFALL	0.0	0.0	0.0	4.1	8.3
STD440	OUTFALL	2.5	4.7	5.4	6.2	6.5
STD504	OUTFALL	2.7	3.6	5.0	8.1	8.7
SUN_O200	OUTFALL	6.3	13.0	36.5	159.0	229.9
SUN_O300	OUTFALL	0.3	0.5	0.7	2.1	2.8

Total Node Inflow (Ac-ft)

Node	Junction Type	2-yr	5-yr	10-yr	50-yr	100-yr
SWM_O100	OUTFALL	2.8	6.4	22.2	107.4	157.4
WELP_O200	OUTFALL	0.7	1.0	1.4	2.7	3.4
WELW_O100	OUTFALL	0.6	1.2	2.7	5.7	6.3
WELW_O110	OUTFALL	1.5	2.3	3.7	13.7	20.4
WGR_O100	OUTFALL	3.2	8.9	26.5	103.4	147.6
WIL_O300	OUTFALL	0.0	0.1	0.4	2.4	3.6
WPT_O100	OUTFALL	1.3	1.9	2.8	6.5	8.5
WPT_O700	OUTFALL	1.2	3.0	8.3	32.2	45.7
WIL_O400	OUTFALL	0.5	1.1	3.9	20.5	30.1
STT_J300	OUTFALL	5.9	10.3	18.9	60.2	84.1
WIM_O200	OUTFALL	1.2	2.1	3.9	13.3	18.7
AOMI_D600	DIVIDER	2.5	5.7	21.0	106.2	155.9
BCOM_D100	DIVIDER	0.3	0.4	0.6	1.4	2.1
BCOM_D200	DIVIDER	0.0	0.0	0.1	4.9	8.7
BCOM_D400	DIVIDER	0.0	0.0	0.0	0.2	0.3
BCOM_D450	DIVIDER	0.0	0.1	0.1	0.3	0.5
BCOM_D500	DIVIDER	0.1	0.1	0.1	0.2	0.3
BCOM_D550	DIVIDER	0.2	0.3	0.3	0.6	0.7
BCOM_D600	DIVIDER	1.3	2.3	3.6	9.0	12.0
BCOM_D650	DIVIDER	0.0	0.0	0.0	0.1	0.1
BCOM_D700	DIVIDER	1.0	2.0	3.5	9.9	13.5
BCOM_D750	DIVIDER	0.2	0.8	1.9	8.3	12.1
BCOM_D800	DIVIDER	0.2	0.4	1.0	7.1	11.0
BCOM_D850	DIVIDER	0.3	0.4	0.7	6.4	10.4
BCOM_D900	DIVIDER	0.0	0.0	0.1	5.7	9.7
BCOM_D950	DIVIDER	0.2	0.3	0.4	0.7	0.9
BCOM_D975	DIVIDER	0.4	0.5	0.7	1.5	1.9
BCOM_D980	DIVIDER	0.0	0.0	0.0	0.5	0.8
BCOM_J350	DIVIDER	0.0	0.1	0.3	0.8	1.0
BMA_D100	DIVIDER	0.2	0.5	2.1	11.7	17.3
BUC_D300	DIVIDER	0.4	0.5	0.8	4.3	6.6
BUC_D305	DIVIDER	0.0	0.1	0.3	3.7	6.0
BUC_D400	DIVIDER	0.2	0.8	1.7	6.3	8.8
BUC_D505	DIVIDER	0.7	1.0	1.3	1.6	1.7
BUC_D600	DIVIDER	1.4	2.0	2.9	5.8	7.5
BUC_D700	DIVIDER	0.5	0.9	1.4	3.7	5.2
BUC_D750	DIVIDER	0.2	0.2	0.3	0.6	0.8
BUC_D800	DIVIDER	0.6	0.9	1.3	2.6	3.3
CCC_D100	DIVIDER	0.6	0.8	1.2	2.7	3.5
CCC_D200	DIVIDER	0.3	0.4	0.6	1.4	1.8
CCC_D210	DIVIDER	0.0	0.0	0.1	0.8	1.2
CCC_D300	DIVIDER	0.3	0.4	0.6	1.1	1.4
COLE_D200	DIVIDER	0.3	0.5	0.7	1.6	2.1
COLE_D300	DIVIDER	1.0	1.6	2.3	4.8	6.2
COLE_D305	DIVIDER	1.0	1.6	2.3	4.8	6.2

Node	Junction Type	2-yr	5-yr	10-yr	50-yr	100-yr
COLE_D400	DIVIDER	1.6	2.4	3.5	7.8	11.0
KAWS_D350	DIVIDER	0.2	0.3	0.5	1.2	1.7
KAWS_D400	DIVIDER	0.3	0.4	0.6	1.2	1.6
KAWS_D550	DIVIDER	0.3	0.5	0.7	1.3	1.7
KAWS_D575	DIVIDER	0.0	0.0	0.0	0.6	1.8
KAWS_D580	DIVIDER	0.0	0.0	0.0	0.3	1.3
KAWS_D585	DIVIDER	1.4	2.1	3.1	6.4	9.0
KAWS_D650	DIVIDER	0.2	0.2	0.3	0.6	0.8
KAWS_D805	DIVIDER	12.0	19.3	40.8	155.0	221.9
KNL_D450	DIVIDER	1.1	2.9	8.2	31.9	45.4
LON_D200	DIVIDER	0.7	2.1	8.1	38.1	55.5
MCG_D240	DIVIDER	1.7	3.2	6.0	17.3	23.7
MEA_D250	DIVIDER	0.8	1.4	2.1	5.3	7.1
MEA_D300	DIVIDER	0.1	0.2	0.4	1.4	2.0
MEA_D310	DIVIDER	0.1	0.2	0.4	1.5	2.1
MEA_D350	DIVIDER	0.5	0.8	1.1	2.2	2.8
MEA_D375	DIVIDER	0.9	1.3	1.7	3.6	4.5
MEA_D400	DIVIDER	0.4	0.5	0.8	1.5	2.0
MEA_D450	DIVIDER	0.3	0.5	0.7	1.4	1.8
MEA_D500	DIVIDER	0.5	0.7	1.0	2.5	3.4
MEA_D650	DIVIDER	0.4	0.6	1.1	3.3	4.6
MEA_D700	DIVIDER	0.1	0.1	0.2	0.3	0.4
MER_D100	DIVIDER	0.0	0.0	0.1	5.3	5.8
MER_D110	DIVIDER	0.0	0.0	0.1	5.2	5.6
OLT_D0100	DIVIDER	4.8	7.3	22.1	120.3	180.8
OLT_D0250	DIVIDER	1.9	2.8	4.1	8.9	11.6
OLT_D0300	DIVIDER	1.1	1.8	2.7	5.8	7.5
OLT_D0350	DIVIDER	0.4	0.6	0.8	1.6	2.0
OLT_D0500	DIVIDER	1.4	2.1	2.8	5.6	7.0
OLT_D0550	DIVIDER	0.5	1.1	1.9	5.0	6.8
OLT_D0800	DIVIDER	0.1	0.1	0.2	0.5	0.6
OLT_D1050	DIVIDER	0.5	1.4	12.4	108.9	168.2
OLT_D1100	DIVIDER	0.2	0.3	0.5	1.1	1.6
OLT_D1225	DIVIDER	0.1	0.1	0.1	0.2	0.3
OLT_D1300	DIVIDER	2.0	3.5	8.5	25.7	38.1
OLT_D1400	DIVIDER	0.1	0.2	0.2	0.6	0.9
OLT_D2100	DIVIDER	0.9	1.8	6.2	6.8	7.0
OLT_D2200	DIVIDER	1.0	1.8	15.5	94.5	140.6
OLT_D2201	DIVIDER	0.5	1.3	14.7	93.6	139.9
OLT_D2750	DIVIDER	1.6	3.7	17.0	92.7	136.9
OLT_D2850	DIVIDER	0.1	0.2	0.3	0.5	0.7
OLT_D2950	DIVIDER	0.2	0.3	0.4	1.0	1.3
OLT_D3000	DIVIDER	0.1	0.1	0.1	0.4	0.5
OLT_D3250	DIVIDER	0.8	1.2	1.7	3.5	4.5
PME_D200	DIVIDER	0.1	0.1	0.1	0.2	0.3

Node	Junction Type	2-yr	5-yr	10-yr	50-yr	100-yr
SME_D300	DIVIDER	5.3	10.7	21.3	68.4	93.9
SME_D305	DIVIDER	4.6	9.9	20.6	67.5	93.0
SME_D400	DIVIDER	0.6	0.9	1.3	2.7	3.4
SME_D550	DIVIDER	7.2	12.6	23.1	70.0	95.1
SME_D600	DIVIDER	0.4	0.6	0.8	1.6	2.0
SME_D700	DIVIDER	0.6	0.9	1.4	2.8	3.6
STD022	DIVIDER	2.2	4.0	6.4	10.0	11.4
STD039	DIVIDER	0.7	1.0	1.4	3.1	4.1
STD052	DIVIDER	2.7	5.2	10.3	16.7	17.6
STD097	DIVIDER	0.1	0.1	0.2	3.0	4.5
STD117	DIVIDER	0.7	1.3	2.1	5.7	7.9
STD118	DIVIDER	2.0	2.9	4.1	8.3	10.6
STD121	DIVIDER	2.4	3.3	4.5	6.1	6.5
STD138	DIVIDER	1.3	1.7	2.1	2.5	2.6
STD160	DIVIDER	1.3	1.7	2.1	2.5	2.6
STD163	DIVIDER	0.8	1.1	1.3	1.5	1.6
STD177	DIVIDER	2.0	3.6	5.7	8.6	9.5
STD194	DIVIDER	0.1	0.2	0.3	0.5	0.6
STD224	DIVIDER	1.4	2.3	3.9	6.8	7.5
STD225	DIVIDER	0.5	0.9	1.8	2.8	3.0
STD226	DIVIDER	0.3	0.7	1.5	3.0	3.3
STD245	DIVIDER	2.7	3.7	5.0	12.2	17.1
STD252	DIVIDER	0.9	1.2	1.6	1.8	1.9
STD257	DIVIDER	1.8	4.0	9.0	17.2	19.1
STD263	DIVIDER	0.9	2.6	6.9	25.0	35.3
STD267	DIVIDER	1.3	1.6	2.6	2.9	3.0
STD268	DIVIDER	1.2	1.5	2.4	2.5	2.5
STD309	DIVIDER	0.2	0.8	1.4	2.2	2.4
STD310	DIVIDER	0.2	0.8	1.4	2.4	2.7
STD383	DIVIDER	0.6	0.7	1.1	1.4	1.5
STD394	DIVIDER	5.4	11.5	34.4	151.9	220.0
STD396	DIVIDER	1.3	1.6	2.0	2.6	2.7
STD416	DIVIDER	0.7	1.0	1.4	2.8	3.6
STD430	DIVIDER	1.3	3.1	7.5	25.7	36.2
STD451	DIVIDER	1.1	1.4	1.6	1.9	2.0
STD459	DIVIDER	0.8	1.1	1.4	2.7	3.4
STD472	DIVIDER	1.4	1.7	1.9	2.1	2.2
STD508	DIVIDER	0.0	0.0	0.0	4.1	8.2
STD525	DIVIDER	0.2	0.3	0.4	0.9	1.1
STD527	DIVIDER	1.7	2.7	3.5	5.1	5.9
STD577	DIVIDER	0.2	0.3	0.5	2.8	3.3
STD579	DIVIDER	0.0	0.0	0.0	0.4	0.7
SUN_D200	DIVIDER	6.3	13.0	36.5	159.0	230.2
UNK_D100	DIVIDER	3.5	10.0	36.5	160.2	232.3
VPT_D350	DIVIDER	0.1	0.2	0.4	5.0	8.0

Total Node Inflow (Ac-ft)

Node	Junction Type	2-yr	5-yr	10-yr	50-yr	100-yr
VPT_D355	DIVIDER	0.1	0.1	0.2	4.1	7.1
VPT_D450	DIVIDER	0.2	0.3	0.8	4.2	6.3
VPT_D600	DIVIDER	0.3	0.5	1.0	5.6	8.5
VPT_D650	DIVIDER	0.4	0.6	0.8	1.8	2.4
VPT_D700	DIVIDER	0.1	0.2	0.4	1.1	1.5
VPT_D800	DIVIDER	0.2	0.4	1.1	3.8	5.4
VPT_D805	DIVIDER	0.0	0.0	0.3	2.7	4.4
WDO_D200	DIVIDER	0.7	1.2	1.9	4.8	6.3
WELE_D100	DIVIDER	0.7	1.1	1.7	3.6	4.7
WELE_D200	DIVIDER	0.5	0.8	1.2	2.4	3.1
WELE_D300	DIVIDER	0.2	0.2	0.3	0.7	0.9
WELE_D400	DIVIDER	0.1	0.2	1.4	19.0	29.5
WELP_D100	DIVIDER	0.7	1.0	1.4	2.7	3.4
WELP_D200	DIVIDER	0.1	0.1	0.2	0.3	0.4
WELP_D300	DIVIDER	0.5	1.2	2.7	8.7	12.2
WPT_D200	DIVIDER	0.5	0.7	1.0	2.5	3.3
WPT_D300	DIVIDER	0.3	0.4	0.6	1.1	1.5
WPT_D500	DIVIDER	0.6	1.1	2.8	15.1	22.5
WPT_D600	DIVIDER	0.8	1.1	2.6	13.6	20.4
WPT_D800	DIVIDER	0.1	0.1	0.2	0.3	0.3
WPT_D900	DIVIDER	0.3	0.5	0.6	1.1	1.3
WPT_D905	DIVIDER	0.0	0.0	0.1	0.5	0.7
BCOM_S100	STORAGE	0.5	0.7	1.0	2.0	2.7
BCOM_S975	STORAGE	0.4	0.5	0.7	1.4	1.6
BUC_S100	STORAGE	2.3	3.5	5.1	10.7	13.8
BUC_S200	STORAGE	2.5	3.7	5.2	10.9	13.9
COLE_S100	STORAGE	4.7	7.1	10.4	24.8	32.5
CPATM_S100	STORAGE	4.2	7.1	8.2	10.7	12.2
KAWS_S100	STORAGE	0.3	0.5	0.7	1.4	1.8
KAWS_S150	STORAGE	0.2	0.5	1.1	2.8	3.8
KAWS_S200	STORAGE	0.6	0.9	1.3	2.3	3.1
KAWS_S250	STORAGE	0.4	0.6	0.9	1.8	2.2
KAWS_S350	STORAGE	0.7	1.0	1.5	3.4	4.4
KAWS_S500	STORAGE	1.2	1.7	2.5	5.3	6.8
KAWS_S750	STORAGE	12.9	20.6	41.1	60.5	62.3
MEA_S100	STORAGE	5.6	10.7	31.3	174.0	256.3
MEA_S200	STORAGE	2.5	3.4	4.6	9.4	12.0
MER_S100	STORAGE	5.1	8.1	13.0	31.3	41.4
OLT_S0150	STORAGE	0.2	0.2	0.3	0.7	0.8
PAT_S100	STORAGE	0.9	1.7	2.9	7.7	10.3
PME_S100	STORAGE	6.5	14.2	42.4	174.9	251.3
PME_S200	STORAGE	1.4	2.1	3.0	6.2	7.9
SME_S100	STORAGE	10.0	17.2	29.4	81.0	108.9
SME_S200	STORAGE	0.1	0.2	0.4	1.1	1.5
VPT_S100	STORAGE	2.6	4.1	6.8	17.4	23.2

Node	Junction Type	2-yr	5-yr	10-yr	50-yr	100-yr
WDO_S100	STORAGE	1.9	2.8	3.9	7.8	10.0
WDO_S300	STORAGE	0.0	0.0	0.0	0.0	0.0
WPT_S100	STORAGE	1.3	1.9	2.8	6.5	8.5
WPT_O100	OUTFALL	1.3	1.9	2.8	6.5	8.5
WPT_O700	OUTFALL	1.2	3.0	8.3	32.2	45.7
WPT_S100	STORAGE	1.3	1.9	2.8	6.5	8.5

APPENDIX C - ALTERNATIVE ANALYSIS

**WELLINGTON STORMWATER MP - WASHINGTON AVE
OLD TOWN ALTERNATIVE 1
ICON ENGINEERING
9/30/2022**



BID ITEM NO.	DESCRIPTION OF BID ITEM	TOTAL QUANTITY	PAY UNIT	UNIT Cost	TOTAL COST
GENERAL					
1	DEWATERING (2%)	1	LS	\$ 27,113	\$ 27,113
2	MOBILIZATION (5%)	1	LS	\$ 67,782	\$ 67,782
3	TRAFFIC CONTROL (2%)	1	LS	\$ 27,113	\$ 27,113
4	UTILITY COORDINATION / RELOCATION (10%)	1	LS	\$135,563	\$ 135,563
5	STORMWATER MANAGEMENT / EROSION CONTROL (5%)	1	LS	\$ 67,782	\$ 67,782
Subtotal Additional Capital Improvement Costs				\$	325,352
REMOVALS					
6	REMOVE EX ASPHALT	8,854	SY	\$ 7	\$ 61,981
STORM DRAIN IMPROVEMENTS					
7	24-INCH RCP	100	LF	\$ 180	\$ 18,000
8	36-INCH RCP	1,042	LF	\$ 250	\$ 260,500
9	42-INCH RCP	1,619	LF	\$ 275	\$ 445,225
10	36-INCH FES	1	EA	\$ 10,500	\$ 10,500
11	42-INCH FES	1	EA	\$ 11,750	\$ 11,750
12	FLAT TOP MANHOLE, 6 FT DIA	4	EA	\$ 9,000	\$ 36,000
13	FLAT TOP MANHOLE, 8 FT DIA	7	EA	\$ 12,500	\$ 87,500
14	ASPHALT PAVING (6" DEPTH)	8,854	SY	\$ 40	\$ 354,178
15	RAILROAD BORING	40	LF	\$ 1,200	\$ 48,000
16	WATERLINE LOWERING	4	EA	\$ 5,500	\$ 22,000
Subtotal Capital Improvement Costs				\$	1,355,634
Construction Subtotal				\$	1,680,986
ADDITIONAL PROJECT COSTS					
Engineering		20%	\$	336,197	
Legal / Administrative		5%	\$	84,049	
Contract Admin / Construction Management		10%	\$	168,099	
Contingency (25%)		25%	\$	420,247	
Total Project Costs				\$	2,689,578

**WELLINGTON STORMWATER MP - GARFIELD AVE
OLD TOWN ALTERNATIVE 1
ICON ENGINEERING
9/30/2022**



BID ITEM NO.	DESCRIPTION OF BID ITEM	TOTAL QUANTITY	PAY UNIT	UNIT Cost	TOTAL COST
GENERAL					
1	DEWATERING (2%)	1	LS	\$ 1,784	\$ 1,784
2	MOBILIZATION (5%)	1	LS	\$ 4,461	\$ 4,461
3	TRAFFIC CONTROL (2%)	1	LS	\$ 1,784	\$ 1,784
4	UTILITY COORDINATION / RELOCATION (10%)	1	LS	\$ 8,922	\$ 8,922
5	STORMWATER MANAGEMENT / EROSION CONTROL (5%)	1	LS	\$ 4,461	\$ 4,461
Subtotal Additional Capital Improvement Costs				\$	21,412
REMOVALS					
6	REMOVE EX ASPHALT	309	SY	\$ 7	\$ 2,162
7	REMOVE EX CURB AND GUTTER	30	LF	\$ 10	\$ 300
STORM DRAIN IMPROVEMENTS					
8	18-INCH RCP	50	LF	\$ 150	\$ 7,500
9	TYPE R INLET, 5 FT	4	EA	\$ 7,500	\$ 30,000
10	FLAT TOP MANHOLE, 8 FT DIA	2	EA	\$ 12,500	\$ 25,000
11	ASPHALT PAVING (6" DEPTH)	309	SY	\$ 40	\$ 12,356
12	CONCRETE CURB AND GUTTER	15	LF	\$ 60	\$ 900
13	WATERLINE LOWERING	2	EA	\$ 5,500	\$ 11,000
Subtotal Capital Improvement Costs				\$	89,218
Construction Subtotal				\$	110,630
ADDITIONAL PROJECT COSTS					
Engineering		20%		\$	22,126
Legal / Administrative		5%		\$	5,532
Contract Admin / Construction Management		10%		\$	11,063
Contingency (25%)		25%		\$	27,658
Total Project Costs				\$	177,008

**WELLINGTON STORMWATER MP - CLEVELAND AVE OUTFALL
OLD TOWN - ALT 1
ICON ENGINEERING
9/30/2022**



BID ITEM NO.	DESCRIPTION OF BID ITEM	TOTAL QUANTITY	PAY UNIT	UNIT Cost	TOTAL COST
GENERAL					
1	DEWATERING (2%)	1	LS	\$ 15,457	\$ 15,457
2	MOBILIZATION (5%)	1	LS	\$ 38,642	\$ 38,642
3	TRAFFIC CONTROL (2%)	1	LS	\$ 15,457	\$ 15,457
4	UTILITY COORDINATION / RELOCATION (10%)	1	LS	\$ 77,285	\$ 77,285
5	STORMWATER MANAGEMENT / EROSION CONTROL (5%)	1	LS	\$ 38,642	\$ 38,642
Subtotal Additional Capital Improvement Costs				\$	185,483
REMOVALS					
6	REMOVE EX ASPHALT	3,839	SY	\$ 7	\$ 26,872
7	REMOVE EX CURB AND GUTTER	72	LF	\$ 10	\$ 720
STORM DRAIN IMPROVEMENTS					
8	18-INCH RCP	1,100	LF	\$ 150	\$ 165,000
9	24-INCH RCP	721	LF	\$ 180	\$ 129,780
10	24-INCH FES	1	EA	\$ 4,000	\$ 4,000
11	24-INCH FLAPGATE	1	EA	\$ 14,000	\$ 14,000
12	FLAT TOP MANHOLE, 8 FT DIA	10	EA	\$ 12,500	\$ 125,000
13	TYPE R INLET, 5 FT	8	EA	\$ 7,500	\$ 60,000
14	ASPHALT PAVING (6" DEPTH)	3,839	SY	\$ 40	\$ 153,556
15	CONCRETE CURB AND GUTTER	32	LF	\$ 60	\$ 1,920
16	WATERLINE LOWERING	8	EA	\$ 5,500	\$ 44,000
17	RAILROAD BORING	40	LF	\$ 1,200	\$ 48,000
Subtotal Capital Improvement Costs				\$	772,848
Construction Subtotal				\$	958,331
ADDITIONAL PROJECT COSTS					
Engineering		20%		\$	191,666
Legal / Administrative		5%		\$	47,917
Contract Admin / Construction Management		10%		\$	95,833
Contingency (25%)		25%		\$	239,583
Total Project Costs				\$	1,533,330

**WELLINGTON STORMWATER MP - LINCOLN AVE
OLD TOWN - ALT 1
ICON ENGINEERING
9/30/2022**



BID ITEM NO.	DESCRIPTION OF BID ITEM	TOTAL QUANTITY	PAY UNIT	UNIT Cost	TOTAL COST
GENERAL					
1	DEWATERING (2%)	1	LS	\$ 14,331	\$ 14,331
2	MOBILIZATION (5%)	1	LS	\$ 35,826	\$ 35,826
3	TRAFFIC CONTROL (2%)	1	LS	\$ 14,331	\$ 14,331
4	UTILITY COORDINATION / RELOCATION (10%)	1	LS	\$ 71,653	\$ 71,653
5	STORMWATER MANAGEMENT / EROSION CONTROL (5%)	1	LS	\$ 35,826	\$ 35,826
Subtotal Additional Capital Improvement Costs				\$	171,967
REMOVALS					
6	REMOVE EX ASPHALT	3,789	SY	\$ 7	\$ 26,522
7	REMOVE EX CURB AND GUTTER	90	LF	\$ 10	\$ 900
STORM DRAIN IMPROVEMENTS					
8	18-INCH RCP	1,533	LF	\$ 150	\$ 229,950
9	24-INCH RCP	565	LF	\$ 180	\$ 101,700
10	24-INCH FES	1	EA	\$ 4,000	\$ 4,000
11	FLAT TOP MANHOLE, 8 FT DIA	6	EA	\$ 12,500	\$ 75,000
12	TYPE R INLET, 5 FT	10	EA	\$ 7,500	\$ 75,000
13	ASPHALT PAVING (6" DEPTH)	3,789	SY	\$ 40	\$ 151,556
14	CONCRETE CURB AND GUTTER	40	LF	\$ 60	\$ 2,400
15	WATERLINE LOWERING	9	EA	\$ 5,500	\$ 49,500
Subtotal Capital Improvement Costs				\$	716,528
Construction Subtotal				\$	888,494
ADDITIONAL PROJECT COSTS					
Engineering		20%	\$	177,699	
Legal / Administrative		5%	\$	44,425	
Contract Admin / Construction Management		10%	\$	88,849	
Contingency (25%)		25%	\$	222,124	
Total Project Costs				\$	1,421,591

**WELLINGTON STORMWATER MP - S 5TH ST
OLD TOWN - ALT 1
ICON ENGINEERING
9/30/2022**



BID ITEM NO.	DESCRIPTION OF BID ITEM	TOTAL QUANTITY	PAY UNIT	UNIT Cost	TOTAL COST
GENERAL					
1	DEWATERING (2%)	1	LS	\$ 17,261	\$ 17,261
2	MOBILIZATION (5%)	1	LS	\$ 43,153	\$ 43,153
3	TRAFFIC CONTROL (2%)	1	LS	\$ 17,261	\$ 17,261
4	UTILITY COORDINATION / RELOCATION (10%)	1	LS	\$ 86,305	\$ 86,305
5	STORMWATER MANAGEMENT / EROSION CONTROL (5%)	1	LS	\$ 43,153	\$ 43,153
Subtotal Additional Capital Improvement Costs				\$	207,132
REMOVALS					
6	REMOVE EX ASPHALT	5,151	SY	\$ 7	\$ 36,058
7	REMOVE EX CURB AND GUTTER	117	LF	\$ 10	\$ 1,170
STORM DRAIN IMPROVEMENTS					
8	18-INCH RCP	650	LF	\$ 150	\$ 97,500
9	30-INCH RCP	661	LF	\$ 215	\$ 142,115
10	36-INCH RCP	544	LF	\$ 251	\$ 136,544
11	36-INCH FES	1	EA	\$ 6,000	\$ 6,000
12	FLAT TOP MANHOLE, 8 FT DIA	7	EA	\$ 12,500	\$ 87,500
13	TYPE R INLET, 5 FT	13	EA	\$ 7,500	\$ 97,500
14	ASPHALT PAVING (6" DEPTH)	5,151	SY	\$ 40	\$ 206,044
15	CONCRETE CURB AND GUTTER	52	LF	\$ 60	\$ 3,120
16	WATERLINE LOWERING	9	EA	\$ 5,500	\$ 49,500
Subtotal Capital Improvement Costs				\$863,051	
Construction Subtotal				\$1,070,184	
ADDITIONAL PROJECT COSTS					
Engineering		20%		\$	214,037
Legal / Administrative		5%		\$	53,509
Contract Admin / Construction Management		10%		\$	107,018
Contingency (25%)		25%		\$	267,546
Total Project Costs				\$1,712,294	

WELLINGTON STORMWATER MP - N 6TH ST
OLD TOWN - ALT 1
ICON ENGINEERING
9/30/2022



BID ITEM NO.	DESCRIPTION OF BID ITEM	TOTAL QUANTITY	PAY UNIT	UNIT Cost	TOTAL COST
GENERAL					
1	DEWATERING (2%)	1	LS	\$ 18,939	\$ 18,939
2	MOBILIZATION (5%)	1	LS	\$ 47,347	\$ 47,347
3	TRAFFIC CONTROL (2%)	1	LS	\$ 18,939	\$ 18,939
4	UTILITY COORDINATION / RELOCATION (10%)	1	LS	\$ 94,693	\$ 94,693
5	STORMWATER MANAGEMENT / EROSION CONTROL (5%)	1	LS	\$ 47,347	\$ 47,347
Subtotal Additional Capital Improvement Costs				\$	227,264
REMOVALS					
6	REMOVE EX ASPHALT	5,263	SY	\$ 7	\$ 36,843
7	REMOVE EX CURB AND GUTTER	108	LF	\$ 10	\$ 1,080
STORM DRAIN IMPROVEMENTS					
8	18-INCH RCP	600	LF	\$ 150	\$ 90,000
9	24-INCH RCP	645	EA	\$ 180	\$ 116,100
10	30-INCH RCP	343	EA	\$ 215	\$ 73,745
11	36-INCH RCP	752	LF	\$ 251	\$ 188,752
12	FLAT TOP MANHOLE, 8 FT DIA	7	EA	\$ 12,500	\$ 87,500
13	TYPE R INLET, 5 FT	12	EA	\$ 7,500	\$ 90,000
14	ASPHALT PAVING (6" DEPTH)	5,263	SY	\$ 40	\$ 210,533
15	CONCRETE CURB AND GUTTER	48	LF	\$ 60	\$ 2,880
16	WATERLINE LOWERING	9	EA	\$ 5,500	\$ 49,500
Subtotal Capital Improvement Costs				\$946,934	
Construction Subtotal				\$1,174,198	
ADDITIONAL PROJECT COSTS					
Engineering		20%		\$ 234,840	
Legal / Administrative		5%		\$ 58,710	
Contract Admin / Construction Management		10%		\$ 117,420	
Contingency (25%)		25%		\$ 293,549	
Total Project Costs				\$1,878,716	

**WELLINGTON STORMWATER MP - WASHINGTON AVE
OLD TOWN ALTERNATIVE 2
ICON ENGINEERING
9/30/2022**



BID ITEM NO.	DESCRIPTION OF BID ITEM	TOTAL QUANTITY	PAY UNIT	UNIT Cost	TOTAL COST
GENERAL					
1	DEWATERING (2%)	1	LS	\$ 132,729	\$ 132,729
2	MOBILIZATION (5%)	1	LS	\$ 331,822	\$ 331,822
3	TRAFFIC CONTROL (2%)	1	LS	\$ 132,729	\$ 132,729
4	UTILITY COORDINATION / RELOCATION (10%)	1	LS	\$ 663,643	\$ 663,643
5	STORMWATER MANAGEMENT / EROSION CONTROL (5%)	1	LS	\$ 331,822	\$ 331,822
Subtotal Additional Capital Improvement Costs				\$	1,592,744
REMOVALS					
6	REMOVE EX ASPHALT	8,854	SY	\$ 7	\$ 61,981
STORM DRAIN IMPROVEMENTS					
7	24-INCH RCP	100	LF	\$ 180	\$ 18,000
8	6' W x 3' H RCBC	1,042	LF	\$ 1,600	\$ 1,667,200
9	10' W x 3' H RCBC	400	LF	\$ 2,250	\$ 900,000
10	10' W x 4' H RCBC	1,231	LF	\$ 2,325	\$ 2,862,075
11	TEE BASED MANHOLE, 8 FT DIA	11	EA	\$ 11,000	\$ 121,000
12	CONCRETE HEADWALL, WINGWALL, AND HANDRAIL	2	EA	\$ 15,000	\$ 30,000
13	ASPHALT PAVING (6" DEPTH)	8,854	SY	\$ 40	\$ 354,178
14	RAILROAD BORING	40	LF	\$ 15,000	\$ 600,000
15	WATERLINE LOWERING	4	EA	\$ 5,500	\$ 22,000
Subtotal Capital Improvement Costs				\$	6,636,434
Construction Subtotal				\$	8,229,178
ADDITIONAL PROJECT COSTS					
Engineering		20%	\$	1,645,836	
Legal / Administrative		5%	\$	411,459	
Contract Admin / Construction Management		10%	\$	822,918	
Contingency (25%)		25%	\$	2,057,295	
Total Project Costs				\$	13,166,685

**WELLINGTON STORMWATER MP - GARFIELD AVE
OLD TOWN ALTERNATIVE 2
ICON ENGINEERING
9/30/2022**



BID ITEM NO.	DESCRIPTION OF BID ITEM	TOTAL QUANTITY	PAY UNIT	UNIT Cost	TOTAL COST
GENERAL					
1	DEWATERING (2%)	1	LS	\$ 4,550	\$ 4,550
2	MOBILIZATION (5%)	1	LS	\$ 11,374	\$ 11,374
3	TRAFFIC CONTROL (2%)	1	LS	\$ 4,550	\$ 4,550
4	UTILITY COORDINATION / RELOCATION (10%)	1	LS	\$ 22,748	\$ 22,748
5	STORMWATER MANAGEMENT / EROSION CONTROL (5%)	1	LS	\$ 11,374	\$ 11,374
Subtotal Additional Capital Improvement Costs				\$	54,594
REMOVALS					
6	REMOVE EX ASPHALT	1,333	SY	\$ 7	\$ 9,333
7	REMOVE EX CURB AND GUTTER	63	LF	\$ 10	\$ 630
STORM DRAIN IMPROVEMENTS					
8	18-INCH RCP	300	LF	\$ 150	\$ 45,000
9	TYPE R INLET, 5 FT	7	EA	\$ 7,500	\$ 52,500
10	FLAT TOP MANHOLE, 8 FT DIA	3	EA	\$ 12,500	\$ 37,500
11	ASPHALT PAVING (6" DEPTH)	1,333	SY	\$ 40	\$ 53,333
12	CONCRETE CURB AND GUTTER	28	LF	\$ 60	\$ 1,680
13	WATERLINE LOWERING	5	EA	\$ 5,500	\$ 27,500
Subtotal Capital Improvement Costs				\$	227,477
Construction Subtotal				\$	282,071
ADDITIONAL PROJECT COSTS					
Engineering		20%		\$	56,414
Legal / Administrative		5%		\$	14,104
Contract Admin / Construction Management		10%		\$	28,207
Contingency (25%)		25%		\$	70,518
Total Project Costs				\$	451,314

**WELLINGTON STORMWATER MP - CLEVELAND AVE
OLD TOWN - ALT 2
ICON ENGINEERING
9/30/2022**



BID ITEM NO.	DESCRIPTION OF BID ITEM	TOTAL QUANTITY	PAY UNIT	UNIT Cost	TOTAL COST
GENERAL					
1	DEWATERING (2%)	1	LS	\$ 17,615	\$ 17,615
2	MOBILIZATION (5%)	1	LS	\$ 44,038	\$ 44,038
3	TRAFFIC CONTROL (2%)	1	LS	\$ 17,615	\$ 17,615
4	UTILITY COORDINATION / RELOCATION (10%)	1	LS	\$ 88,077	\$ 88,077
5	STORMWATER MANAGEMENT / EROSION CONTROL (5%)	1	LS	\$ 44,038	\$ 44,038
Subtotal Additional Capital Improvement Costs				\$	211,384
REMOVALS					
6	REMOVE EX ASPHALT	3,839	SY	\$ 7	\$ 26,872
7	REMOVE EX CURB AND GUTTER	90	LF	\$ 10	\$ 900
STORM DRAIN IMPROVEMENTS					
8	18-INCH RCP	500	LF	\$ 150	\$ 75,000
9	24-INCH RCP	336	LF	\$ 180	\$ 60,480
10	30-INCH RCP	716	LF	\$ 215	\$ 153,940
11	36-INCH RCP	369	LF	\$ 251	\$ 92,619
12	36-INCH FES	1	EA	\$ 6,000	\$ 6,000
13	36-INCH FLAPGATE	1	EA	\$ 17,000	\$ 17,000
14	FLAT TOP MANHOLE, 8 FT DIA	10	EA	\$ 12,500	\$ 125,000
15	TYPE R INLET, 5 FT	10	EA	\$ 7,500	\$ 75,000
16	ASPHALT PAVING (6" DEPTH)	3,839	SY	\$ 40	\$ 153,556
17	CONCRETE CURB AND GUTTER	40	LF	\$ 60	\$ 2,400
18	WATERLINE LOWERING	8	EA	\$ 5,500	\$ 44,000
19	RAILROAD BORING	40	LF	\$ 1,200	\$ 48,000
Subtotal Capital Improvement Costs				\$880,767	
Construction Subtotal					\$1,092,151
ADDITIONAL PROJECT COSTS					
Engineering		20%		\$	218,430
Legal / Administrative		5%		\$	54,608
Contract Admin / Construction Management		10%		\$	109,215
Contingency (25%)		25%		\$	273,038
Total Project Costs					\$1,747,441

**WELLINGTON STORMWATER MP - LINCOLN AVE
OLD TOWN - ALT 2
ICON ENGINEERING
9/30/2022**



BID ITEM NO.	DESCRIPTION OF BID ITEM	TOTAL QUANTITY	PAY UNIT	UNIT Cost	TOTAL COST
GENERAL					
1	DEWATERING (2%)	1	LS	\$ 15,793	\$ 15,793
2	MOBILIZATION (5%)	1	LS	\$ 39,482	\$ 39,482
3	TRAFFIC CONTROL (2%)	1	LS	\$ 15,793	\$ 15,793
4	UTILITY COORDINATION / RELOCATION (10%)	1	LS	\$ 78,963	\$ 78,963
5	STORMWATER MANAGEMENT / EROSION CONTROL (5%)	1	LS	\$ 39,482	\$ 39,482
Subtotal Additional Capital Improvement Costs				\$	189,512
REMOVALS					
6	REMOVE EX ASPHALT	3,789	SY	\$ 7	\$ 26,522
7	REMOVE EX CURB AND GUTTER	90	LF	\$ 10	\$ 900
STORM DRAIN IMPROVEMENTS					
8	18-INCH RCP	500	LF	\$ 150	\$ 75,000
9	24-INCH RCP	1,033	LF	\$ 180	\$ 185,940
10	36-INCH RCP	565	LF	\$ 251	\$ 141,815
11	36-INCH FES	1	EA	\$ 6,000	\$ 6,000
12	FLAT TOP MANHOLE, 8 FT DIA	6	EA	\$ 12,500	\$ 75,000
13	TYPE R INLET, 5 FT	10	EA	\$ 7,500	\$ 75,000
14	ASPHALT PAVING (6" DEPTH)	3,789	SY	\$ 40	\$ 151,556
15	CONCRETE CURB AND GUTTER	40	LF	\$ 60	\$ 2,400
16	WATERLINE LOWERING	9	EA	\$ 5,500	\$ 49,500
Subtotal Capital Improvement Costs				\$	789,633
Construction Subtotal				\$	979,145
ADDITIONAL PROJECT COSTS					
Engineering		20%		\$	195,829
Legal / Administrative		5%		\$	48,957
Contract Admin / Construction Management		10%		\$	97,914
Contingency (25%)		25%		\$	244,786
Total Project Costs				\$	1,566,631

**WELLINGTON STORMWATER MP - S 5TH ST
OLD TOWN - ALT 2
ICON ENGINEERING
9/30/2022**



BID ITEM NO.	DESCRIPTION OF BID ITEM	TOTAL QUANTITY	PAY UNIT	UNIT Cost	TOTAL COST
GENERAL					
1	DEWATERING (2%)	1	LS	\$ 36,906	\$ 36,906
2	MOBILIZATION (5%)	1	LS	\$ 92,265	\$ 92,265
3	TRAFFIC CONTROL (2%)	1	LS	\$ 36,906	\$ 36,906
4	UTILITY COORDINATION / RELOCATION (10%)	1	LS	\$ 184,529	\$ 184,529
5	STORMWATER MANAGEMENT / EROSION CONTROL (5%)	1	LS	\$ 92,265	\$ 92,265
Subtotal Additional Capital Improvement Costs				\$	442,870
REMOVALS					
6	REMOVE EX ASPHALT	5,151	SY	\$ 7	\$ 36,058
7	REMOVE EX CURB AND GUTTER	162	LF	\$ 10	\$ 1,620
STORM DRAIN IMPROVEMENTS					
8	18-INCH RCP	900	LF	\$ 150	\$ 135,000
9	48-INCH RCP	645	LF	\$ 300	\$ 193,500
10	7' W x 3' H RCBC	561	LF	\$ 1,750	\$ 981,750
11	CONCRETE HEADWALL, WINGWALL, AND HANDRAIL	1	EA	\$ 15,000	\$ 15,000
12	FLAT TOP MANHOLE, 8 FT DIA	7	EA	\$ 12,500	\$ 87,500
13	TYPE R INLET, 5 FT	18	EA	\$ 7,500	\$ 135,000
14	ASPHALT PAVING (6" DEPTH)	5,151	SY	\$ 40	\$ 206,044
15	CONCRETE CURB AND GUTTER	72	LF	\$ 60	\$ 4,320
16	WATERLINE LOWERING	9	EA	\$ 5,500	\$ 49,500
Subtotal Capital Improvement Costs				\$	1,845,292
Construction Subtotal				\$	2,288,162
ADDITIONAL PROJECT COSTS					
Engineering		20%	\$	457,632	
Legal / Administrative		5%	\$	114,408	
Contract Admin / Construction Management		10%	\$	228,816	
Contingency (25%)		25%	\$	572,041	
Total Project Costs				\$	3,661,060

**WELLINGTON STORMWATER MP - N 6TH ST
OLD TOWN - ALT 2
ICON ENGINEERING
9/30/2022**



BID ITEM NO.	DESCRIPTION OF BID ITEM	TOTAL QUANTITY	PAY UNIT	UNIT Cost	TOTAL COST
GENERAL					
1	DEWATERING (2%)	1	LS	\$ 21,373	\$ 21,373
2	MOBILIZATION (5%)	1	LS	\$ 53,433	\$ 53,433
3	TRAFFIC CONTROL (2%)	1	LS	\$ 21,373	\$ 21,373
4	UTILITY COORDINATION / RELOCATION (10%)	1	LS	\$106,866	\$ 106,866
5	STORMWATER MANAGEMENT / EROSION CONTROL (5%)	1	LS	\$ 53,433	\$ 53,433
Subtotal Additional Capital Improvement Costs				\$	256,478
REMOVALS					
6	REMOVE EX ASPHALT	5,263	SY	\$ 7	\$ 36,843
7	REMOVE EX CURB AND GUTTER	108	LF	\$ 10	\$ 1,080
STORM DRAIN IMPROVEMENTS					
8	18-INCH RCP	600	LF	\$ 150	\$ 90,000
9	42-INCH RCP	686	EA	\$ 275	\$ 188,650
10	36-INCH RCP	322	EA	\$ 251	\$ 80,822
11	48-INCH RCP	542	LF	\$ 300	\$ 162,600
12	60 W x 38 H HERCP	210	LF	\$ 325	\$ 68,250
13	FLAT TOP MANHOLE, 8 FT DIA	7	EA	\$ 12,500	\$ 87,500
14	TYPE R INLET, 5 FT	12	EA	\$ 7,500	\$ 90,000
15	ASPHALT PAVING (6" DEPTH)	5,263	SY	\$ 40	\$ 210,533
16	CONCRETE CURB AND GUTTER	48	LF	\$ 60	\$ 2,880
17	WATERLINE LOWERING	9	EA	\$ 5,500	\$ 49,500
Subtotal Capital Improvement Costs				\$	1,068,659
Construction Subtotal				\$	1,325,137
ADDITIONAL PROJECT COSTS					
Engineering		20%	\$		265,027
Legal / Administrative		5%	\$		66,257
Contract Admin / Construction Management		10%	\$		132,514
Contingency (25%)		25%	\$		331,284
Total Project Costs				\$	2,120,219

**WELLINGTON STORMWATER MP - SVETA LANE OUTFALL
MINOR STORM CONVEYANCE ALTERNATIVE
ICON ENGINEERING
9/30/2022**



BID ITEM NO.	DESCRIPTION OF BID ITEM	TOTAL QUANTITY	PAY UNIT	UNIT Cost	TOTAL COST
GENERAL					
1	DEWATERING (2%)	1	LS	\$ 15,102	\$ 15,102
2	MOBILIZATION (5%)	1	LS	\$ 37,756	\$ 37,756
3	TRAFFIC CONTROL (2%)	1	LS	\$ 15,102	\$ 15,102
4	UTILITY COORDINATION / RELOCATION (10%)	1	LS	\$ 75,511	\$ 75,511
5	STORMWATER MANAGEMENT / EROSION CONTROL (5%)	1	LS	\$ 37,756	\$ 37,756
Subtotal Additional Capital Improvement Costs				\$	181,227
REMOVALS					
6	REMOVE EX ASPHALT	1,430	SY	\$ 7	\$ 10,008
7	REMOVE EX CURB AND GUTTER	54	LF	\$ 10	\$ 540
8	EXCAVATION AND HAUL OFFSITE	7,264	CY	\$ 30	\$ 217,933
STORM DRAIN IMPROVEMENTS					
9	18-INCH RCP	300	LF	\$ 150	\$ 45,000
10	48-INCH RCP	862	LF	\$ 300	\$ 258,600
11	60-INCH RCP	101	LF	\$ 400	\$ 40,400
12	48-INCH FES	1	EA	\$ 8,000	\$ 8,000
13	60-INCH FES	1	EA	\$ 10,000	\$ 10,000
14	FLAT TOP MANHOLE, 8 FT DIA	4	EA	\$ 12,500	\$ 50,000
15	TYPE R INLET, 5 FT	6	EA	\$ 7,500	\$ 45,000
16	ASPHALT PAVING (6" DEPTH)	1,430	SY	\$ 40	\$ 57,191
17	CONCRETE CURB AND GUTTER	24	LF	\$ 60	\$ 1,440
18	WATERLINE LOWERING	2	EA	\$ 5,500	\$ 11,000
Subtotal Capital Improvement Costs				\$	755,113
Construction Subtotal				\$	936,340
ADDITIONAL PROJECT COSTS					
Engineering		20%		\$	187,268
Legal / Administrative		5%		\$	46,817
Contract Admin / Construction Management		10%		\$	93,634
Contingency (25%)		25%		\$	234,085
Total Project Costs				\$	1,498,144

**WELLINGTON STORMWATER MP - SVETA LANE OUTFALL
FLOOD MITIGATION CONVEYANCE
ICON ENGINEERING
9/30/2022**



BID ITEM NO.	DESCRIPTION OF BID ITEM	TOTAL QUANTITY	PAY UNIT	UNIT Cost	TOTAL COST
GENERAL					
1	DEWATERING (2%)	1	LS	\$ 21,124	\$ 21,124
2	MOBILIZATION (5%)	1	LS	\$ 52,809	\$ 52,809
3	TRAFFIC CONTROL (2%)	1	LS	\$ 21,124	\$ 21,124
4	UTILITY COORDINATION / RELOCATION (10%)	1	LS	\$105,619	\$ 105,619
5	STORMWATER MANAGEMENT / EROSION CONTROL (5%)	1	LS	\$ 52,809	\$ 52,809
Subtotal Additional Capital Improvement Costs				\$	253,485
REMOVALS					
6	REMOVE EX ASPHALT	1,430	SY	\$ 7	\$ 10,008
7	REMOVE EX CURB AND GUTTER	54	LF	\$ 10	\$ 540
8	EXCAVATION AND HAUL OFFSITE	7,264	CY	\$ 30	\$ 217,933
STORM DRAIN IMPROVEMENTS					
9	18-INCH RCP	300	LF	\$ 150	\$ 45,000
10	66-INCH RCP	383	LF	\$ 525	\$ 201,075
11	72-INCH RCP	580	LF	\$ 650	\$ 377,000
12	72-INCH FES	2	EA	\$ 20,000	\$ 40,000
13	FLAT TOP MANHOLE, 8 FT DIA	4	EA	\$ 12,500	\$ 50,000
14	TYPE R INLET, 5 FT	6	EA	\$ 7,500	\$ 45,000
15	ASPHALT PAVING (6" DEPTH)	1430	SY	\$ 40	\$ 57,191
16	CONCRETE CURB AND GUTTER	24	LF	\$ 60	\$ 1,440
17	WATERLINE LOWERING	2	EA	\$ 5,500	\$ 11,000
Subtotal Capital Improvement Costs				\$	1,056,188
Construction Subtotal				\$	1,309,673
ADDITIONAL PROJECT COSTS					
Engineering		20%		\$	261,935
Legal / Administrative		5%		\$	65,484
Contract Admin / Construction Management		10%		\$	130,967
Contingency (25%)		25%		\$	327,418
Total Project Costs				\$	2,095,477

**WELLINGTON STORMWATER MP - 5TH ST
OLD TOWN - 5TH STREET TRUNK - MINOR CONVEYANCE
ICON ENGINEERING
9/30/2022**



BID ITEM NO.	DESCRIPTION OF BID ITEM	TOTAL QUANTITY	PAY UNIT	UNIT Cost	TOTAL COST
GENERAL					
1	DEWATERING (2%)	1	LS	\$ 29,595	\$ 29,595
2	MOBILIZATION (5%)	1	LS	\$ 73,989	\$ 73,989
3	TRAFFIC CONTROL (2%)	1	LS	\$ 29,595	\$ 29,595
4	UTILITY COORDINATION / RELOCATION (10%)	1	LS	\$147,977	\$ 147,977
5	STORMWATER MANAGEMENT / EROSION CONTROL (5%)	1	LS	\$ 73,989	\$ 73,989
Subtotal Additional Capital Improvement Costs				\$	355,145
REMOVALS					
6	REMOVE EX ASPHALT	8,082	SY	\$ 7	\$ 56,574
7	REMOVE EX CURB AND GUTTER	117	LF	\$ 10	\$ 1,170
STORM DRAIN IMPROVEMENTS					
8	18-INCH RCP	1,141	LF	\$ 150	\$ 171,150
9	24-INCH RCP	491	LF	\$ 180	\$ 88,380
10	30-INCH RCP	1,999	LF	\$ 215	\$ 429,785
11	36-INCH RCP	561	LF	\$ 251	\$ 140,811
12	36-INCH FES	1	EA	\$ 6,000	\$ 6,000
13	FLAT TOP MANHOLE, 8 FT DIA	9	EA	\$ 12,500	\$ 112,500
14	TYPE R INLET, 5 FT	13	EA	\$ 7,500	\$ 97,500
15	ASPHALT PAVING (6" DEPTH)	8,082	SY	\$ 40	\$ 323,280
16	CONCRETE CURB AND GUTTER	52	LF	\$ 60	\$ 3,120
17	WATERLINE LOWERING	9	EA	\$ 5,500	\$ 49,500
Subtotal Capital Improvement Costs				\$	1,479,770
Construction Subtotal				\$	1,834,915
ADDITIONAL PROJECT COSTS					
Engineering		20%	\$		366,983
Legal / Administrative		5%	\$		91,746
Contract Admin / Construction Management		10%	\$		183,491
Contingency (25%)		25%	\$		458,729
Total Project Costs				\$	2,935,864

**WELLINGTON STORMWATER MP - 5TH ST
OLD TOWN - 5TH STREET TRUNK - FLOOD MITIGATION
ICON ENGINEERING
9/30/2022**



BID ITEM NO.	DESCRIPTION OF BID ITEM	TOTAL QUANTITY	PAY UNIT	UNIT Cost	TOTAL COST
GENERAL					
1	DEWATERING (2%)	1	LS	\$ 54,357	\$ 54,357
2	MOBILIZATION (5%)	1	LS	\$135,891	\$ 135,891
3	TRAFFIC CONTROL (2%)	1	LS	\$ 54,357	\$ 54,357
4	UTILITY COORDINATION / RELOCATION (10%)	1	LS	\$271,783	\$ 271,783
5	STORMWATER MANAGEMENT / EROSION CONTROL (5%)	1	LS	\$135,891	\$ 135,891
Subtotal Additional Capital Improvement Costs				\$	652,279
REMOVALS					
6	REMOVE EX ASPHALT	8,082	SY	\$ 7	\$ 56,574
7	REMOVE EX CURB AND GUTTER	207	LF	\$ 10	\$ 2,070
STORM DRAIN IMPROVEMENTS					
8	18-INCH RCP	1,150	LF	\$ 150	\$ 172,500
9	30-INCH RCP	491	LF	\$ 215	\$ 105,565
10	36-INCH RCP	469	LF	\$ 251	\$ 117,719
11	42-INCH RCP	1,354	LF	\$ 275	\$ 372,350
12	48-INCH RCP	645	LF	\$ 300	\$ 193,500
13	7' W x 3' H RCBC	561	LF	\$ 1,750	\$ 981,750
14	CONCRETE HEADWALL, WINGWALL, AND HANDRAIL	1	EA	\$ 15,000	\$ 15,000
15	FLAT TOP MANHOLE, 8 FT DIA	12	EA	\$ 12,500	\$ 150,000
16	TYPE R INLET, 5 FT	23	EA	\$ 7,500	\$ 172,500
17	ASPHALT PAVING (6" DEPTH)	8,082	SY	\$ 40	\$ 323,280
18	CONCRETE CURB AND GUTTER	92	LF	\$ 60	\$ 5,520
19	WATERLINE LOWERING	9	EA	\$ 5,500	\$ 49,500
Subtotal Capital Improvement Costs				\$	2,717,828
Construction Subtotal				\$	3,370,107
ADDITIONAL PROJECT COSTS					
Engineering		20%		\$	674,021
Legal / Administrative		5%		\$	168,505
Contract Admin / Construction Management		10%		\$	337,011
Contingency (25%)		25%		\$	842,527
Total Project Costs				\$	5,392,171

WELLINGTON STORMWATER MP - JEFFERSON AVE 10YR ALT
TOWN OF WELLINGTON
ICON ENGINEERING
9/30/2022



BID ITEM NO.	DESCRIPTION OF BID ITEM	TOTAL QUANTITY	PAY UNIT	UNIT Cost	TOTAL COST
GENERAL					
1	DEWATERING (2%)	1	LS	\$ 13,063	\$ 13,063
2	MOBILIZATION (5%)	1	LS	\$ 32,658	\$ 32,658
3	TRAFFIC CONTROL (2%)	1	LS	\$ 13,063	\$ 13,063
4	UTILITY COORDINATION / RELOCATION (10%)	1	LS	\$ 65,315	\$ 65,315
5	STORMWATER MANAGEMENT / EROSION CONTROL (5%)	1	LS	\$ 32,658	\$ 32,658
Subtotal Additional Capital Improvement Costs				\$	156,756
REMOVALS					
6	REMOVE EX ASPHALT	98	SY	\$ 7	\$ 686
7	REMOVE EX CURB AND GUTTER	34	LF	\$ 10	\$ 340
STORM DRAIN IMPROVEMENTS					
8	45 W x 29 H HERCP	55	LF	\$ 275	\$ 15,125
9	CHANNEL IMPROVEMENTS	842	LF	\$ 750	\$ 631,500
10	WATERLINE LOWERING	1	EA	\$ 5,500	\$ 5,500
Subtotal Capital Improvement Costs				\$	653,151
Construction Subtotal				\$	809,907
ADDITIONAL PROJECT COSTS					
Engineering		20%		\$	161,981
Legal / Administrative		5%		\$	40,495
Contract Admin / Construction Management		10%		\$	80,991
Contingency (25%)		25%		\$	202,477
Total Project Costs				\$	1,295,852

WELLINGTON STORMWATER MP - WELLINGTON COMMUNITY PARK 2YR ALT
TOWN OF WELLINGTON
ICON ENGINEERING
9/30/2022



BID ITEM NO.	DESCRIPTION OF BID ITEM	TOTAL QUANTITY	PAY UNIT	UNIT Cost	TOTAL COST
GENERAL					
1	DEWATERING (2%)	1	LS	\$ 5,953	\$ 5,953
2	MOBILIZATION (5%)	1	LS	\$ 14,882	\$ 14,882
3	TRAFFIC CONTROL (2%)	1	LS	\$ 5,953	\$ 5,953
4	UTILITY COORDINATION / RELOCATION (10%)	1	LS	\$ 29,764	\$ 29,764
5	STORMWATER MANAGEMENT / EROSION CONTROL (5%)	1	LS	\$ 14,882	\$ 14,882
REMOVALS					
6	REMOVE EX ASPHALT	181	SY	\$ 7	\$ 1,270
7	REMOVE EX CURB AND GUTTER	18	LF	\$ 10	\$ 180
STORM DRAIN IMPROVEMENTS					
8	18-INCH RCP	100	LF	\$ 150	\$ 15,000
9	30-INCH RCP	80	LF	\$ 215	\$ 17,200
11	36-INCH RCP	795	LF	\$ 250	\$ 198,750
10	36-INCH FES	1	EA	\$ 10,500	\$ 10,500
11	TYPE R INLET, 5 FT	1	EA	\$ 7,500	\$ 7,500
12	TYPE R INLET, 10 FT	1	EA	\$ 9,000	\$ 9,000
13	FLAT TOP MANHOLE, 8 FT DIA	2	EA	\$ 12,500	\$ 25,000
14	ASPHALT PAVING (6" DEPTH)	181	SY	\$ 40	\$ 7,258
15	CONCRETE CURB AND GUTTER	8	LF	\$ 60	\$ 480
16	WATERLINE LOWERING	1	EA	\$ 5,500	\$ 5,500
Subtotal Capital Improvement Costs				\$297,638	
Construction Subtotal				\$369,071	
ADDITIONAL PROJECT COSTS					
Engineering		20%		\$ 73,814	
Legal / Administrative		5%		\$ 18,454	
Contract Admin / Construction Management		10%		\$ 36,907	
Contingency (25%)		25%		\$ 92,268	
Total Project Costs				\$590,514	

WELLINGTON STORMWATER MP - WELLINGTON COMMUNITY PARK 10YR ALT
TOWN OF WELLINGTON
ICON ENGINEERING
9/30/2022



BID ITEM NO.	DESCRIPTION OF BID ITEM	TOTAL QUANTITY	PAY UNIT	UNIT Cost	TOTAL COST
GENERAL					
1	DEWATERING (2%)	1	LS	\$ 7,096	\$ 7,096
2	MOBILIZATION (5%)	1	LS	\$ 17,741	\$ 17,741
3	TRAFFIC CONTROL (2%)	1	LS	\$ 7,096	\$ 7,096
4	UTILITY COORDINATION / RELOCATION (10%)	1	LS	\$ 35,481	\$ 35,481
5	STORMWATER MANAGEMENT / EROSION CONTROL (5%)	1	LS	\$ 17,741	\$ 17,741
REMOVALS					
6	REMOVE EX ASPHALT	181	SY	\$ 7	\$ 1,270
7	REMOVE EX CURB AND GUTTER	18	LF	\$ 10	\$ 180
STORM DRAIN IMPROVEMENTS					
8	18-INCH RCP	100	LF	\$ 150	\$ 15,000
9	60 W x 38 H HERCP	517	LF	\$ 325	\$ 168,025
10	48-INCH RCP	278	LF	\$ 300	\$ 83,400
11	30-INCH RCP	80	LF	\$ 215	\$ 17,200
12	60 W x 38 H FES	1	LF	\$ 15,000	\$ 15,000
13	TYPE R INLET, 5 FT	1	EA	\$ 7,500	\$ 7,500
14	TYPE R INLET, 10 FT	1	EA	\$ 9,000	\$ 9,000
15	FLAT TOP MANHOLE, 8 FT DIA	2	EA	\$ 12,500	\$ 25,000
16	ASPHALT PAVING (6" DEPTH)	181	SY	\$ 40	\$ 7,258
17	CONCRETE CURB AND GUTTER	8	LF	\$ 60	\$ 480
18	WATERLINE LOWERING	1	EA	\$ 5,500	\$ 5,500
Subtotal Capital Improvement Costs				\$354,813	
Construction Subtotal				\$439,968	
ADDITIONAL PROJECT COSTS					
Engineering		20%		\$ 87,994	
Legal / Administrative		5%		\$ 21,998	
Contract Admin / Construction Management		10%		\$ 43,997	
Contingency (25%)		25%		\$ 109,992	
Total Project Costs				\$703,949	

WELLINGTON STORMWATER MP - SADDLEBACK EAST 10YR ALT
TOWN OF WELLINGTON
ICON ENGINEERING
9/30/2022



BID ITEM NO.	DESCRIPTION OF BID ITEM	TOTAL QUANTITY	PAY UNIT	UNIT Cost	TOTAL COST
GENERAL					
1	DEWATERING (2%)	1	LS	\$ 70,395	\$ 70,395
2	MOBILIZATION (5%)	1	LS	\$ 175,988	\$ 175,988
3	TRAFFIC CONTROL (2%)	1	LS	\$ 70,395	\$ 70,395
4	UTILITY COORDINATION / RELOCATION (10%)	1	LS	\$ 351,975	\$ 351,975
5	STORMWATER MANAGEMENT / EROSION CONTROL (5%)	1	LS	\$ 175,988	\$ 175,988
Subtotal Additional Capital Improvement Costs				\$	844,740
CHANNEL IMPROVEMENTS					
6	CHANNEL IMPROVEMENTS	4,693	LF	\$ 750	\$ 3,519,750
Subtotal Capital Improvement Costs				\$	3,519,750
Construction Subtotal				\$	4,364,490
ADDITIONAL PROJECT COSTS					
Engineering		20%		\$	872,898
Legal / Administrative		5%		\$	218,225
Contract Admin / Construction Management		10%		\$	436,449
Contingency (25%)		25%		\$	1,091,123
Total Project Costs				\$	6,983,184

WELLINGTON STORMWATER MP - CO RD 66 10YR ALT
TOWN OF WELLINGTON
ICON ENGINEERING
9/30/2022



BID ITEM NO.	DESCRIPTION OF BID ITEM	TOTAL QUANTITY	PAY UNIT	UNIT Cost	TOTAL COST
GENERAL					
1	DEWATERING (2%)	1	LS	\$ 23,356	\$ 23,356
2	MOBILIZATION (5%)	1	LS	\$ 58,389	\$ 58,389
3	TRAFFIC CONTROL (2%)	1	LS	\$ 23,356	\$ 23,356
4	UTILITY COORDINATION / RELOCATION (10%)	1	LS	\$116,778	\$ 116,778
5	STORMWATER MANAGEMENT / EROSION CONTROL (5%)	1	LS	\$ 58,389	\$ 58,389
Subtotal Additional Capital Improvement Costs				\$	280,266
REMOVALS					
6	REMOVE EX ASPHALT	41	SY	\$ 7	\$ 287
STORM DRAIN IMPROVEMENTS					
7	CHANNEL IMPROVEMENTS	1,425	LF	\$ 750	\$ 1,068,750
8	4' W x 3' H RCBC	61	LF	\$ 1,100	\$ 67,100
9	CONCRETE HEADWALL, WINGWALL, AND HANDRAIL	2	EA	\$ 15,000	\$ 30,000
10	ASPHALT PAVING (6" DEPTH)	41	SY	\$ 40	\$ 1,640
Subtotal Capital Improvement Costs				\$	1,167,777
Construction Subtotal				\$	1,448,043
ADDITIONAL PROJECT COSTS					
Engineering		20%		\$	289,609
Legal / Administrative		5%		\$	72,402
Contract Admin / Construction Management		10%		\$	144,804
Contingency (25%)		25%		\$	362,011
Total Project Costs				\$	2,316,870

WELLINGTON STORMWATER MP - CO RD 68 10YR ALT
TOWN OF WELLINGTON
ICON ENGINEERING
9/30/2022



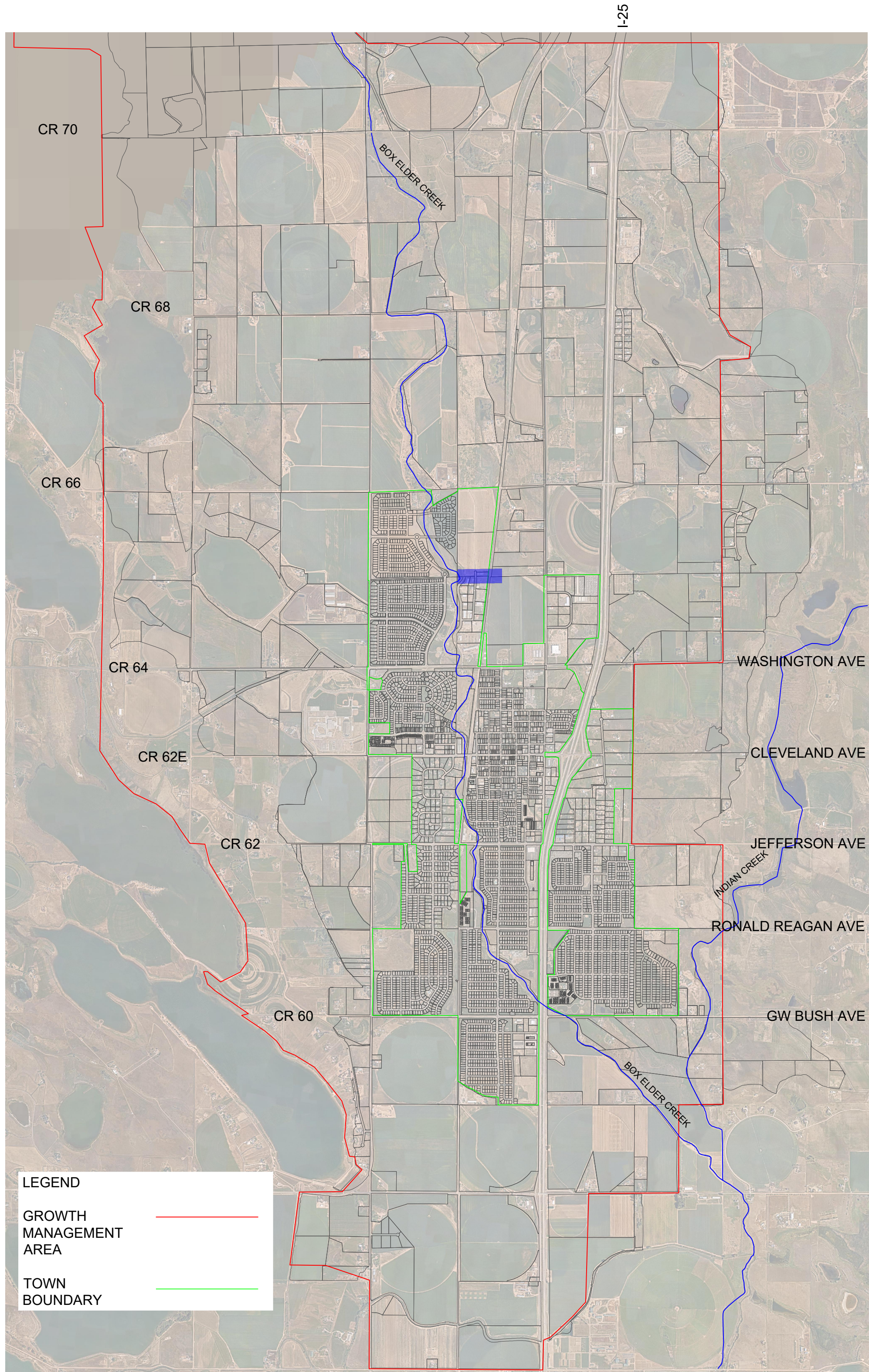
BID ITEM NO.	DESCRIPTION OF BID ITEM	TOTAL QUANTITY	PAY UNIT	UNIT Cost	TOTAL COST
GENERAL					
1	DEWATERING (2%)	1	LS	\$ 49,899	\$ 49,899
2	MOBILIZATION (5%)	1	LS	\$124,746	\$ 124,746
3	TRAFFIC CONTROL (2%)	1	LS	\$ 49,899	\$ 49,899
4	UTILITY COORDINATION / RELOCATION (10%)	1	LS	\$249,493	\$ 249,493
5	STORMWATER MANAGEMENT / EROSION CONTROL (5%)	1	LS	\$124,746	\$ 124,746
Subtotal Additional Capital Improvement Costs				\$	598,783
REMOVALS					
6	REMOVE EX ASPHALT	57	SY	\$ 7	\$ 399
STORM DRAIN IMPROVEMENTS					
7	CHANNEL IMPROVEMENTS	3,163	LF	\$ 750	\$ 2,372,250
8	4' W x 4' H RCBC	75	LF	\$ 1,200	\$ 90,000
9	CONCRETE HEADWALL, WINGWALL, AND HANDRAIL	2	EA	\$ 15,000	\$ 30,000
10	ASPHALT PAVING (6" DEPTH)	57	SY	\$ 40	\$ 2,280
Subtotal Capital Improvement Costs				\$	2,494,929
Construction Subtotal				\$	3,093,712
ADDITIONAL PROJECT COSTS					
Engineering		20%		\$	618,742
Legal / Administrative		5%		\$	154,686
Contract Admin / Construction Management		10%		\$	309,371
Contingency (25%)		25%		\$	773,428
Total Project Costs				\$	4,949,939

WELLINGTON STORMWATER MP - MERIDIAN POND 10YR ALT
TOWN OF WELLINGTON
ICON ENGINEERING
9/30/2022

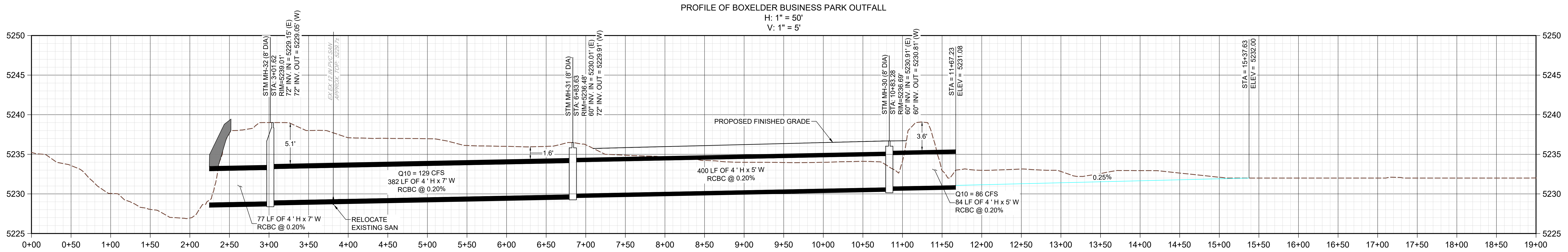
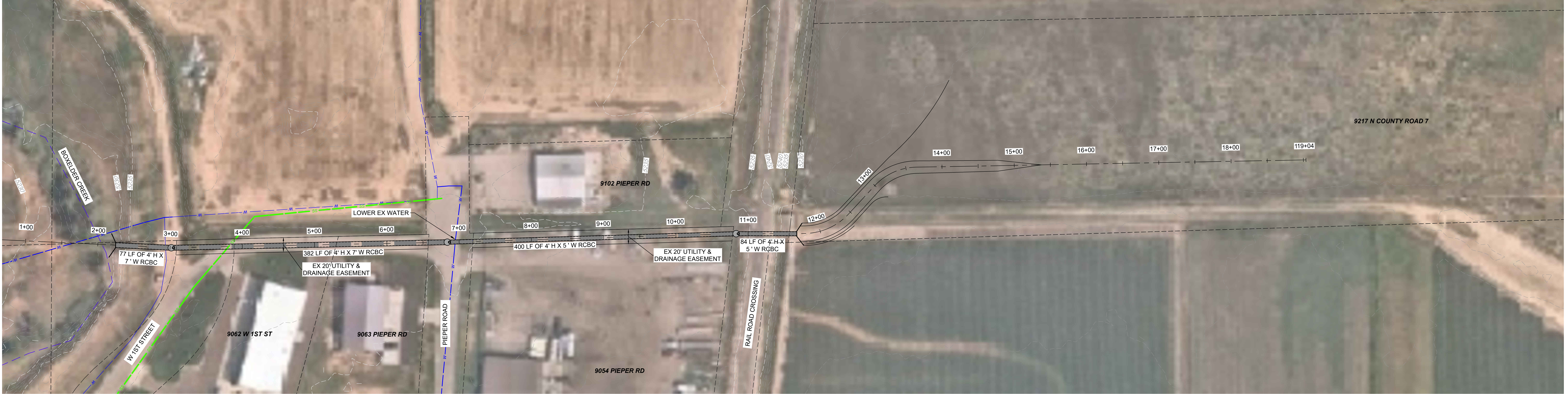


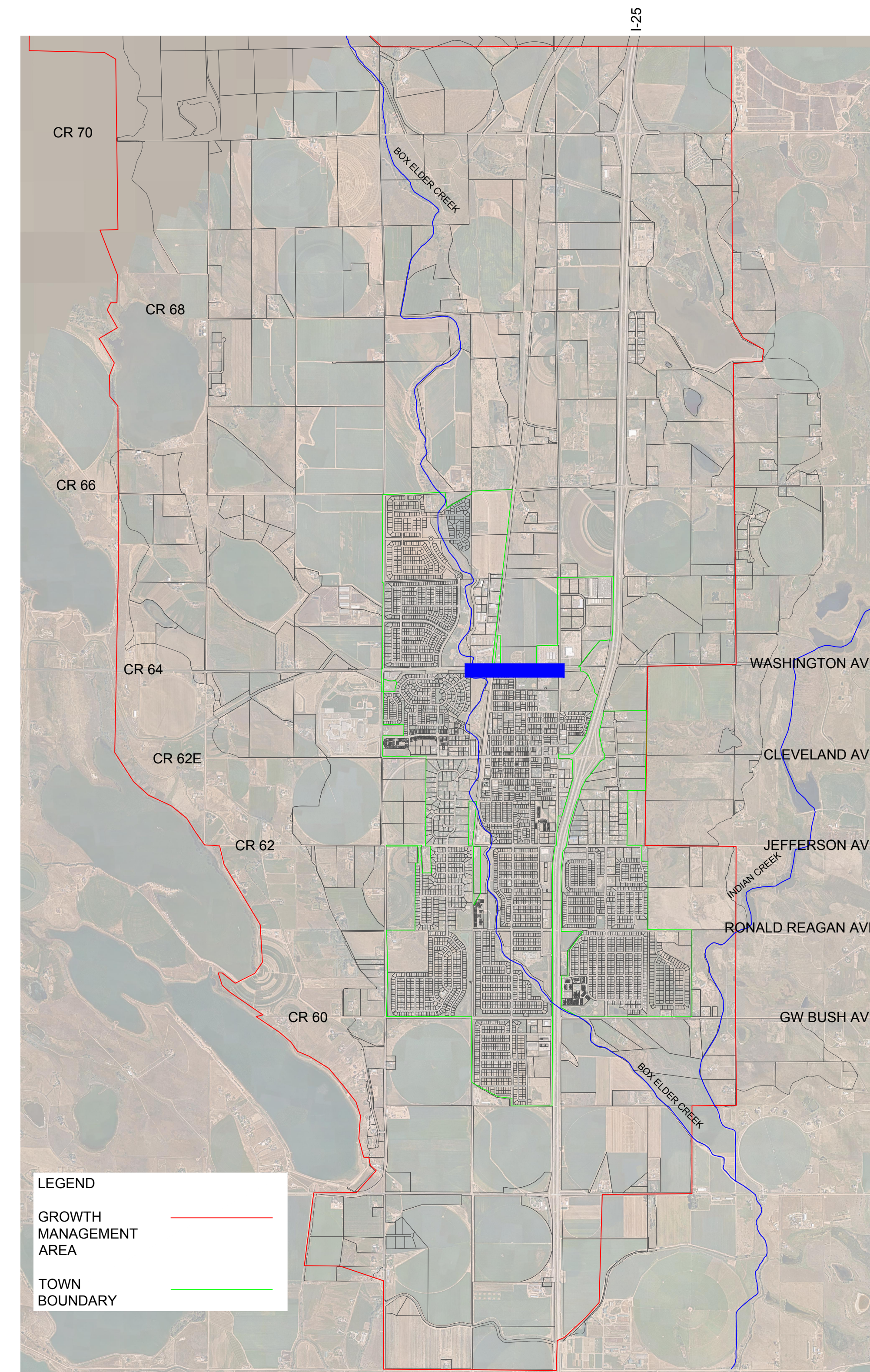
BID ITEM NO.	DESCRIPTION OF BID ITEM	TOTAL QUANTITY	PAY UNIT	UNIT Cost	TOTAL COST
GENERAL					
1	DEWATERING (2%)	1	LS	\$ 86,094	\$ 86,094
2	MOBILIZATION (5%)	1	LS	\$ 215,236	\$ 215,236
3	TRAFFIC CONTROL (2%)	1	LS	\$ 86,094	\$ 86,094
4	UTILITY COORDINATION / RELOCATION (10%)	1	LS	\$ 430,472	\$ 430,472
5	STORMWATER MANAGEMENT / EROSION CONTROL (5%)	1	LS	\$ 215,236	\$ 215,236
Subtotal Additional Capital Improvement Costs				\$	1,033,133
REMOVALS					
6	REMOVE EX ASPHALT	1,884	SY	\$ 7	\$ 13,191
STORM DRAIN IMPROVEMENTS					
7	CHANNEL IMPROVEMENTS	5,409	LF	\$ 750	\$ 4,056,750
8	42-INCH RCP	29	LF	\$ 275	\$ 7,975
9	42-INCH FES	2	LF	\$ 11,750	\$ 23,500
10	48-INCH RCP	105	LF	\$ 300	\$ 31,500
11	48-INCH FES	4	EA	\$ 12,000	\$ 48,000
12	RAILROAD BORING	47	LF	\$ 1,200	\$ 56,400
13	ASPHALT PAVING (6" DEPTH)	1,884	SY	\$ 40	\$ 75,378
Subtotal Capital Improvement Costs				\$	4,304,719
Construction Subtotal				\$	5,337,851
ADDITIONAL PROJECT COSTS					
Engineering		20%		\$	1,067,570
Legal / Administrative		5%		\$	266,893
Contract Admin / Construction Management		10%		\$	533,785
Contingency (25%)		25%		\$	1,334,463
Total Project Costs				\$	8,540,562

APPENDIX D - CONCEPTUAL DESIGN INFORMATION

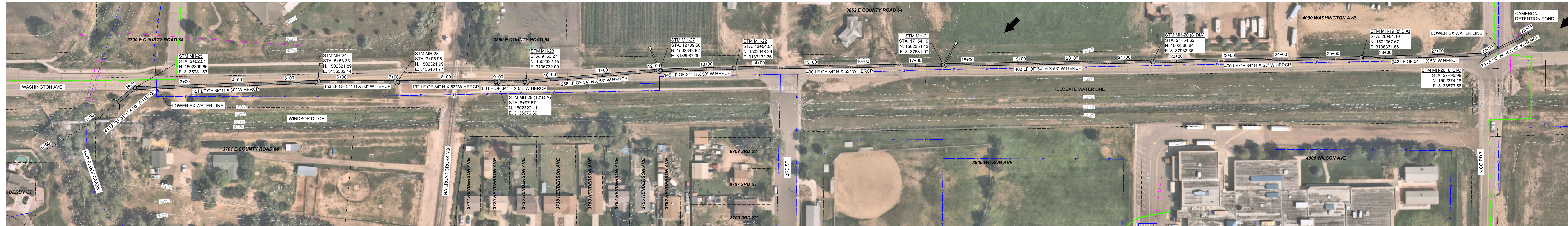


WELLINGTON STORMWATER MASTER PLAN
BOXELDER BUSINESS PARK OUTFALL
CONCEPTUAL DESIGN

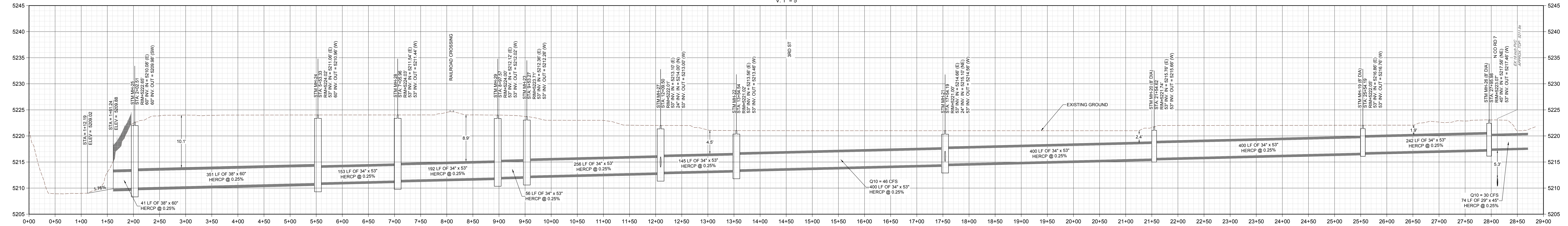


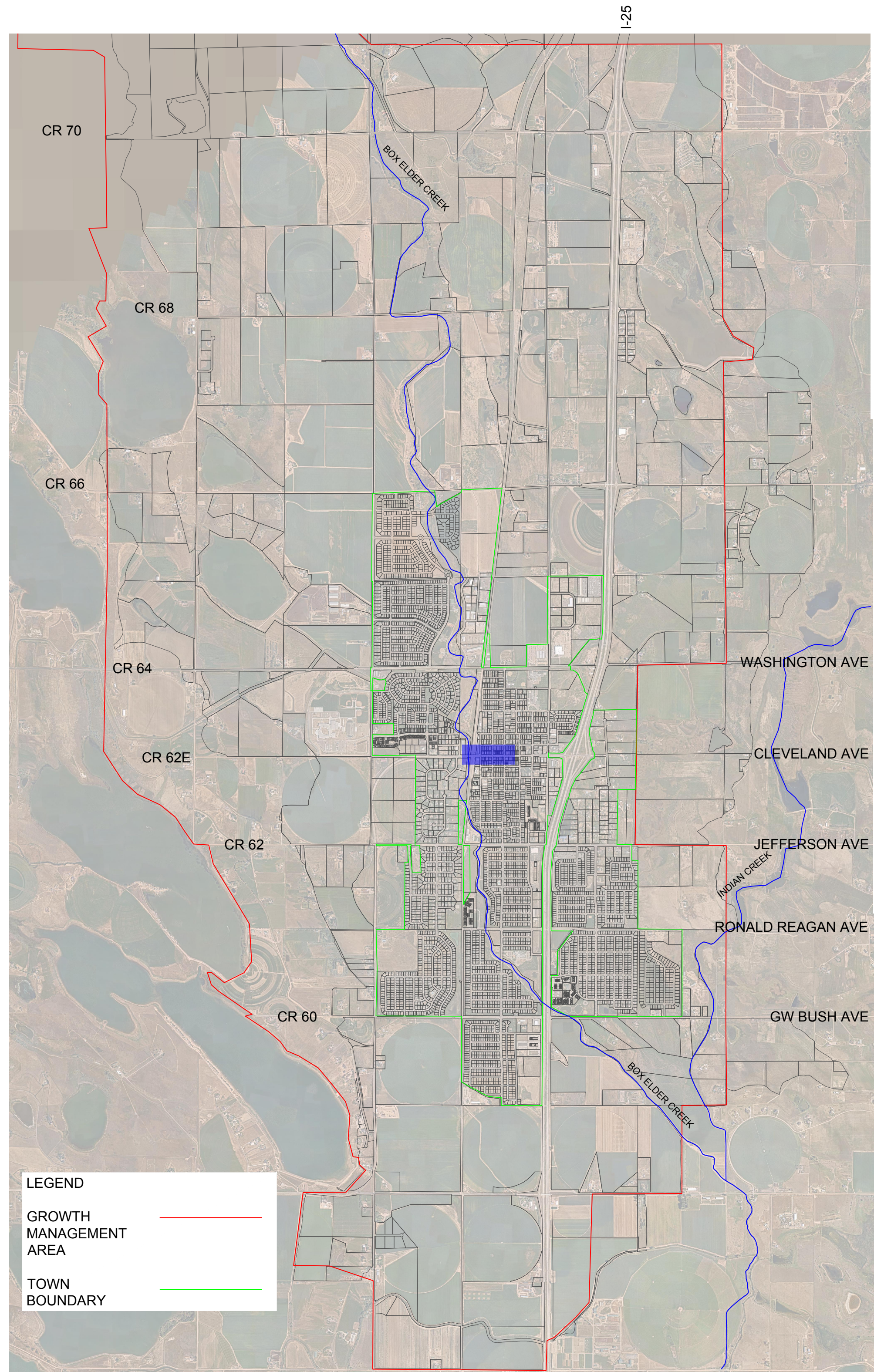


WELLINGTON STORMWATER MASTER PLAN
WASHINGTON AVE - FLOOD MITIGATION ALTERNATIVE - 10YR
CONCEPTUAL DESIGN

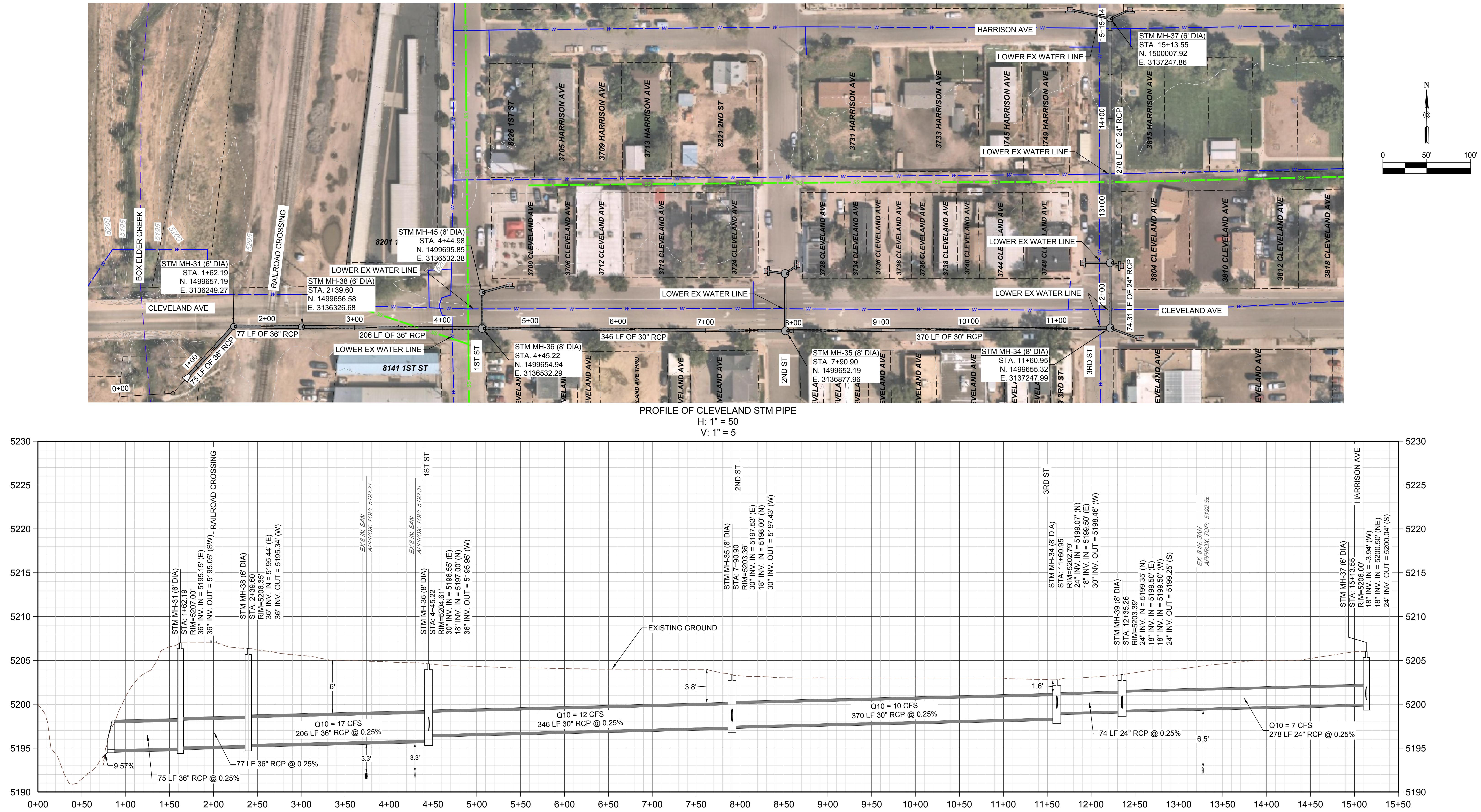


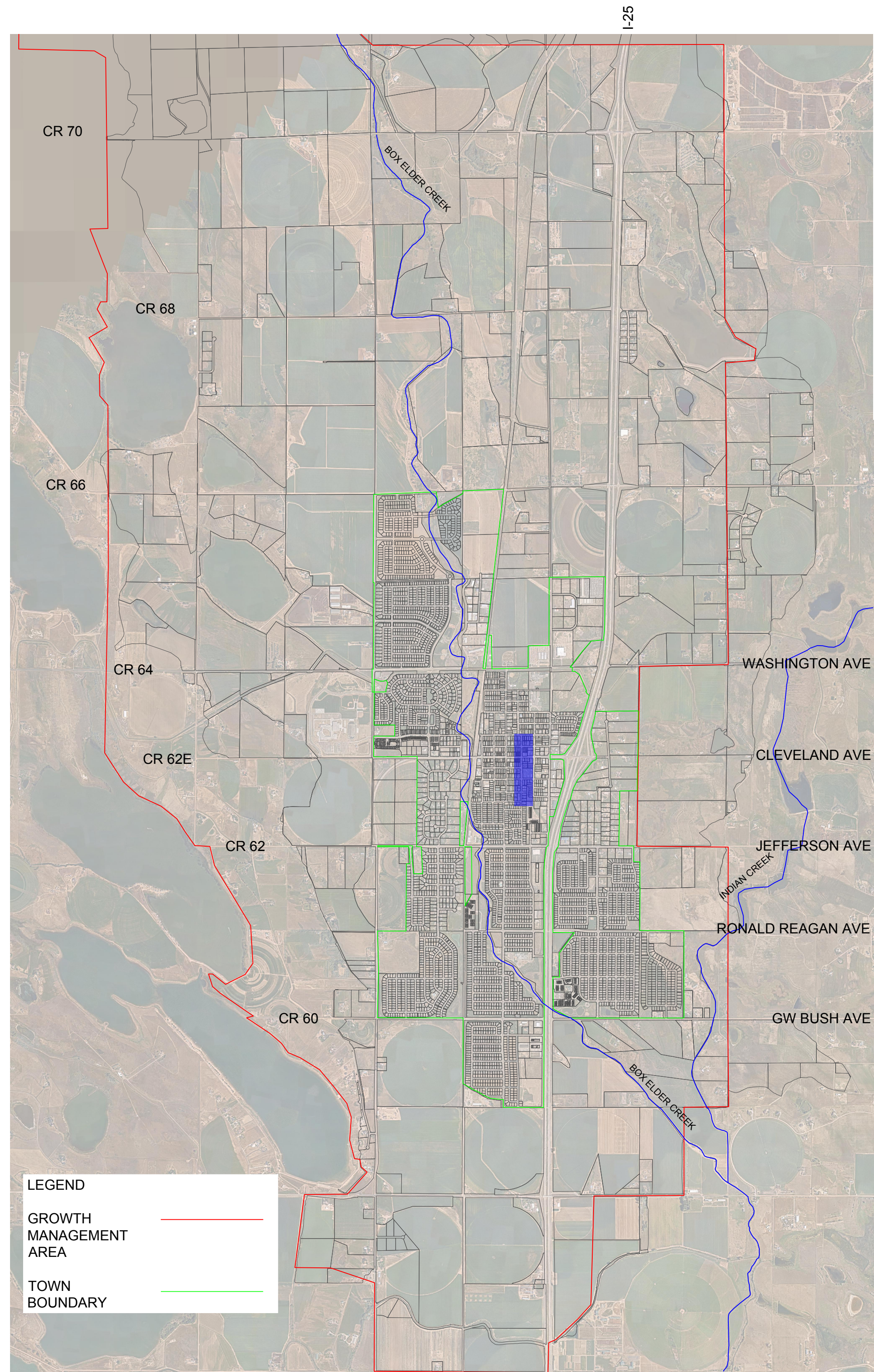
PROFILE OF WASHINGTON AVE
H: 1" = 50'
V: 1" = 5'



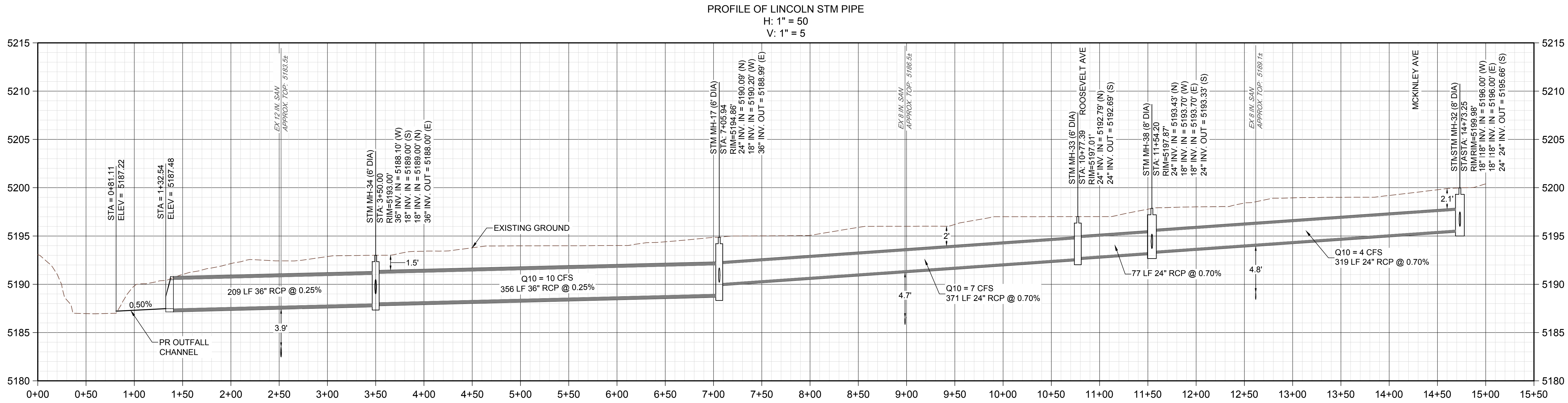
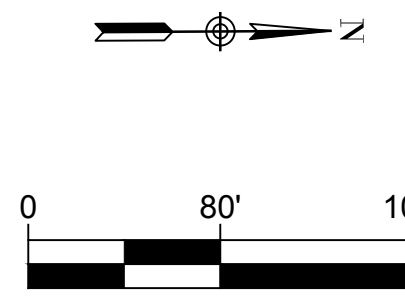
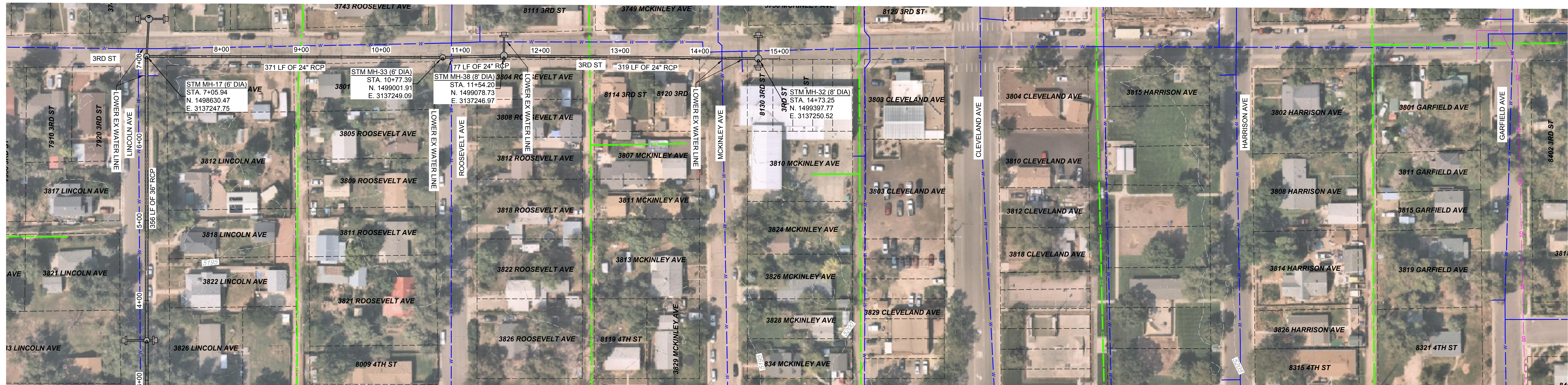
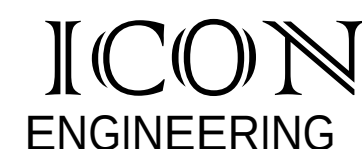


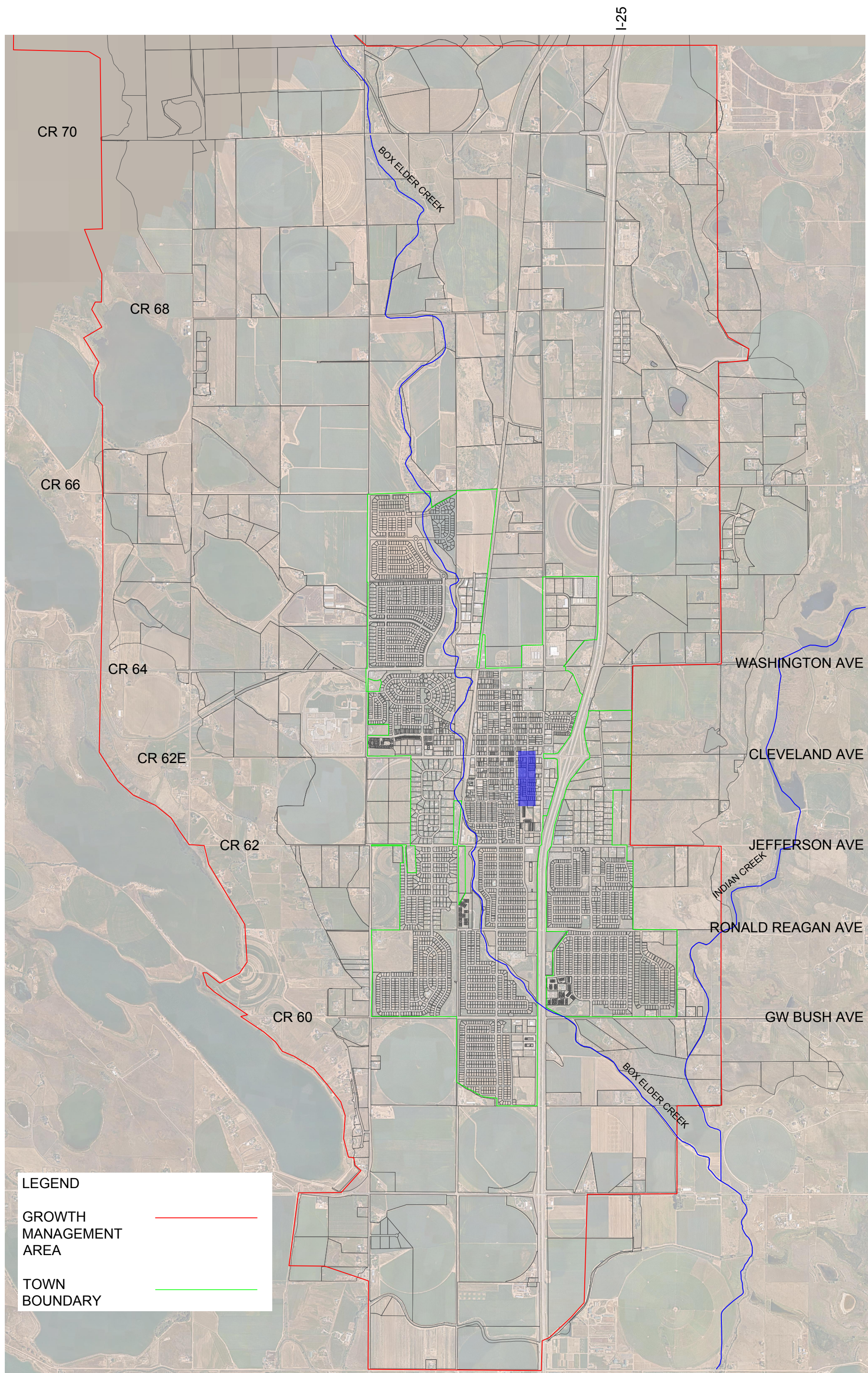
WELLINGTON STORMWATER MASTER PLAN
CLEVELAND AVE - FLOOD MITIGATION - 10-YR ALTERNATIVE
CONCEPTUAL DESIGN



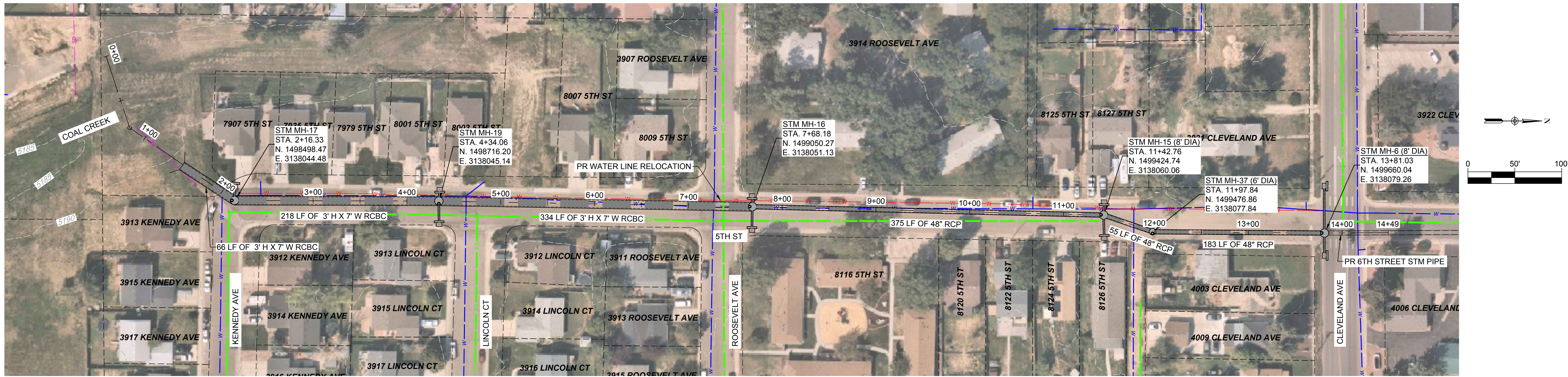
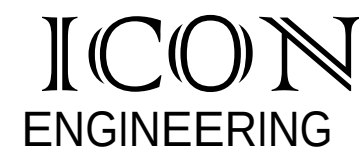


WELLINGTON STORMWATER MASTER PLAN
LINCOLN AVE - FLOOD MITIGATION ALTERNATIVE - 10YR
CONCEPTUAL DESIGN

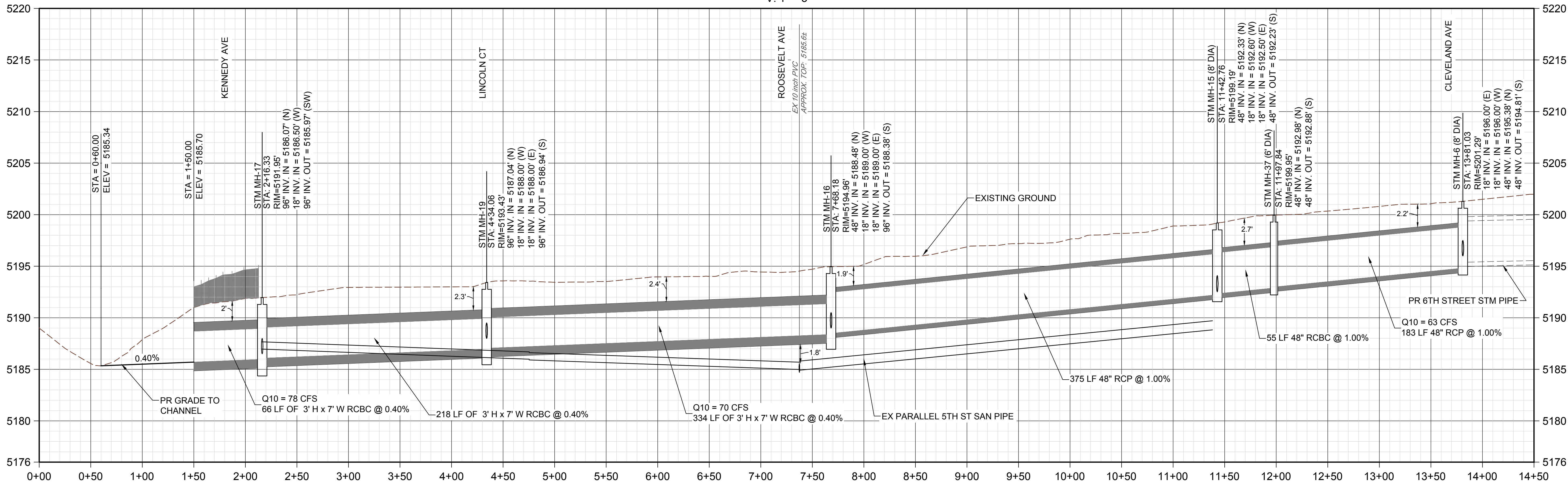


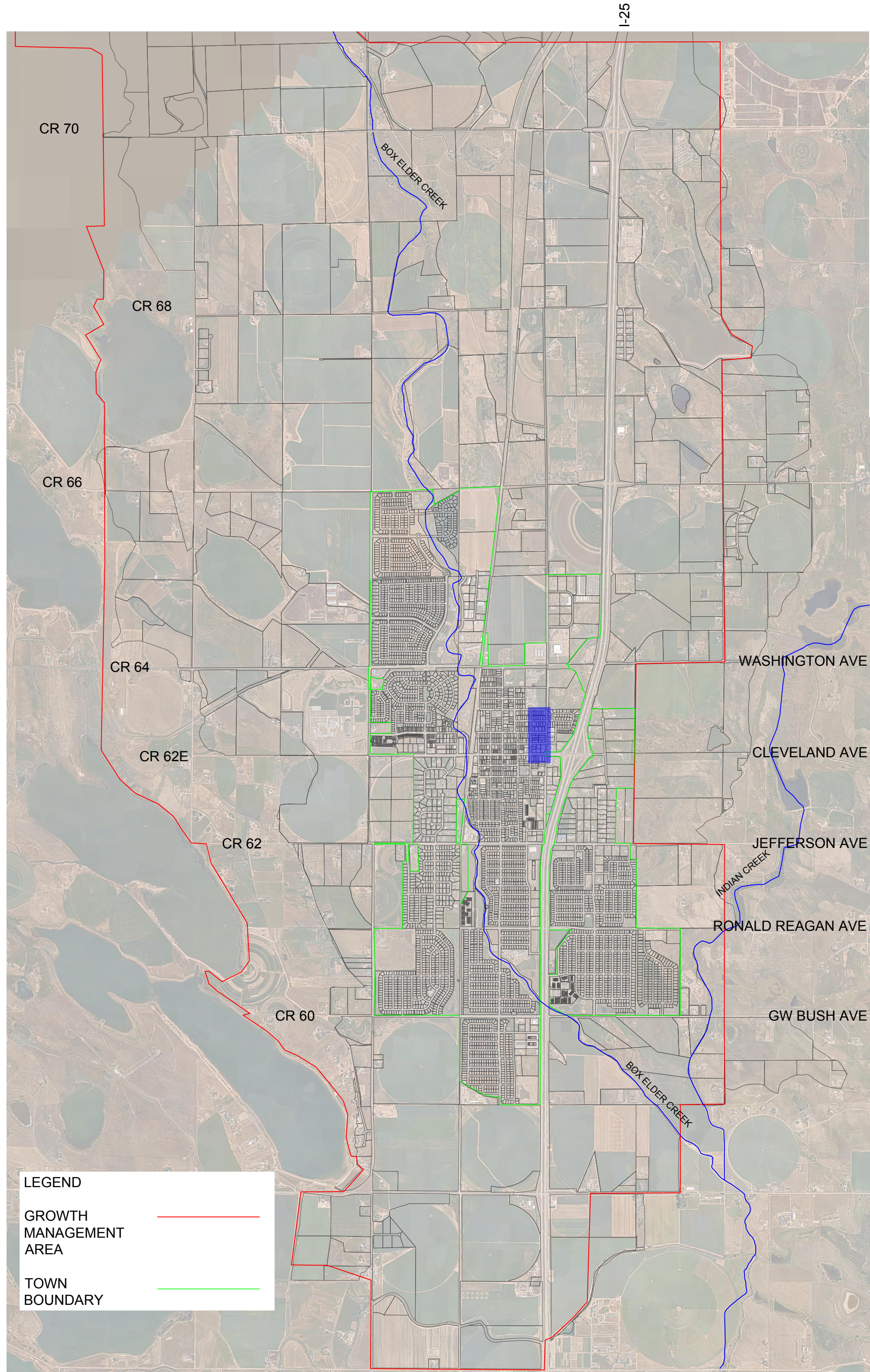


WELLINGTON STORMWATER MASTER PLAN
S 5TH ST - FLOOD MITIGATION ALTERNATIVE - 10YR
CONCEPTUAL DESIGN

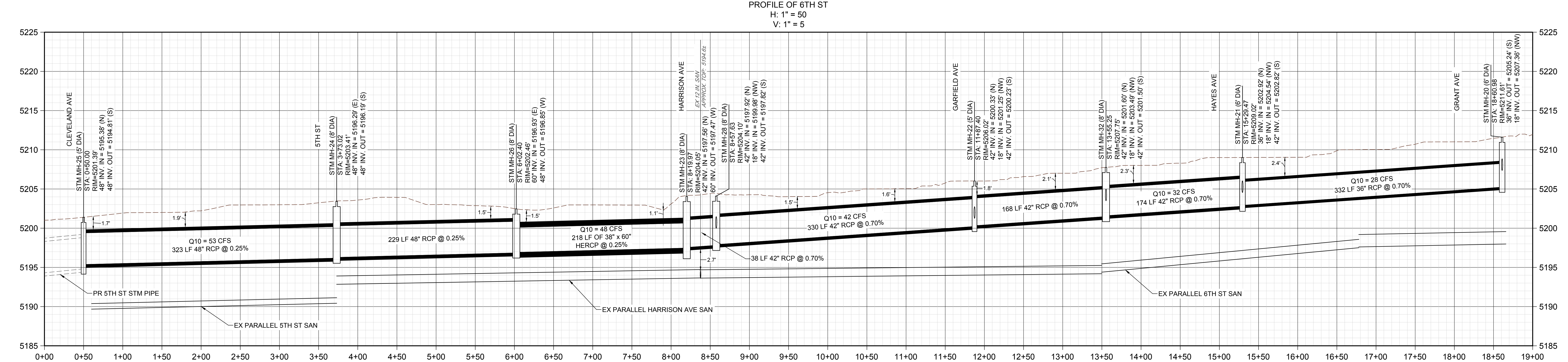
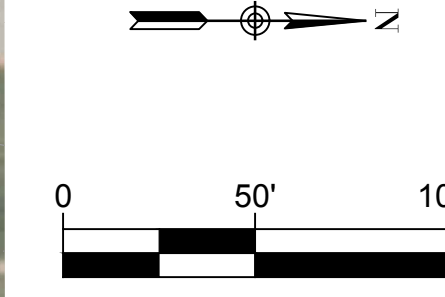
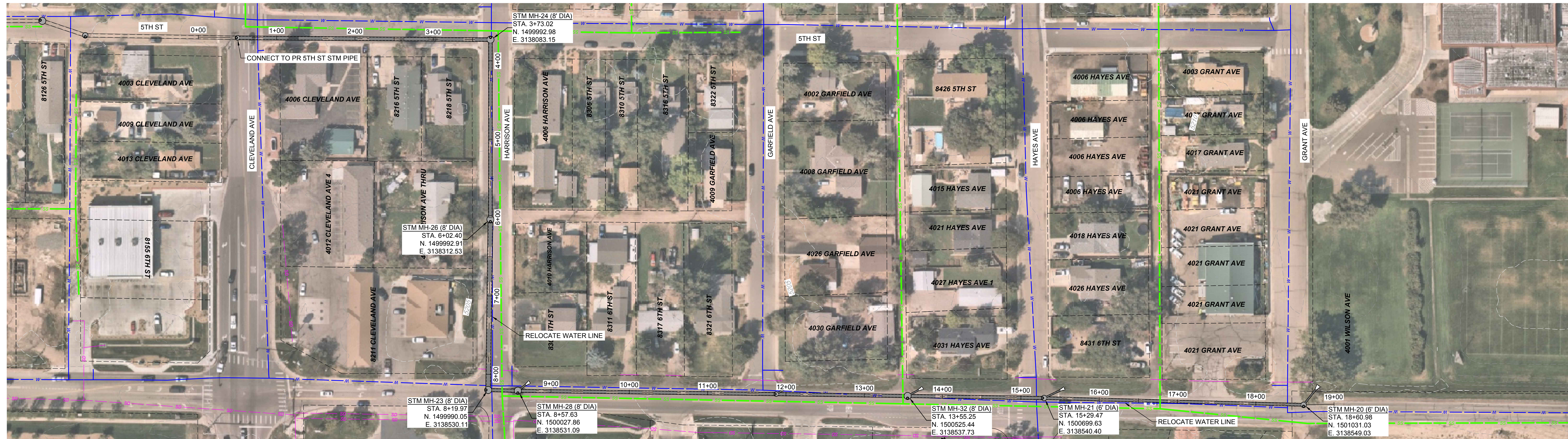


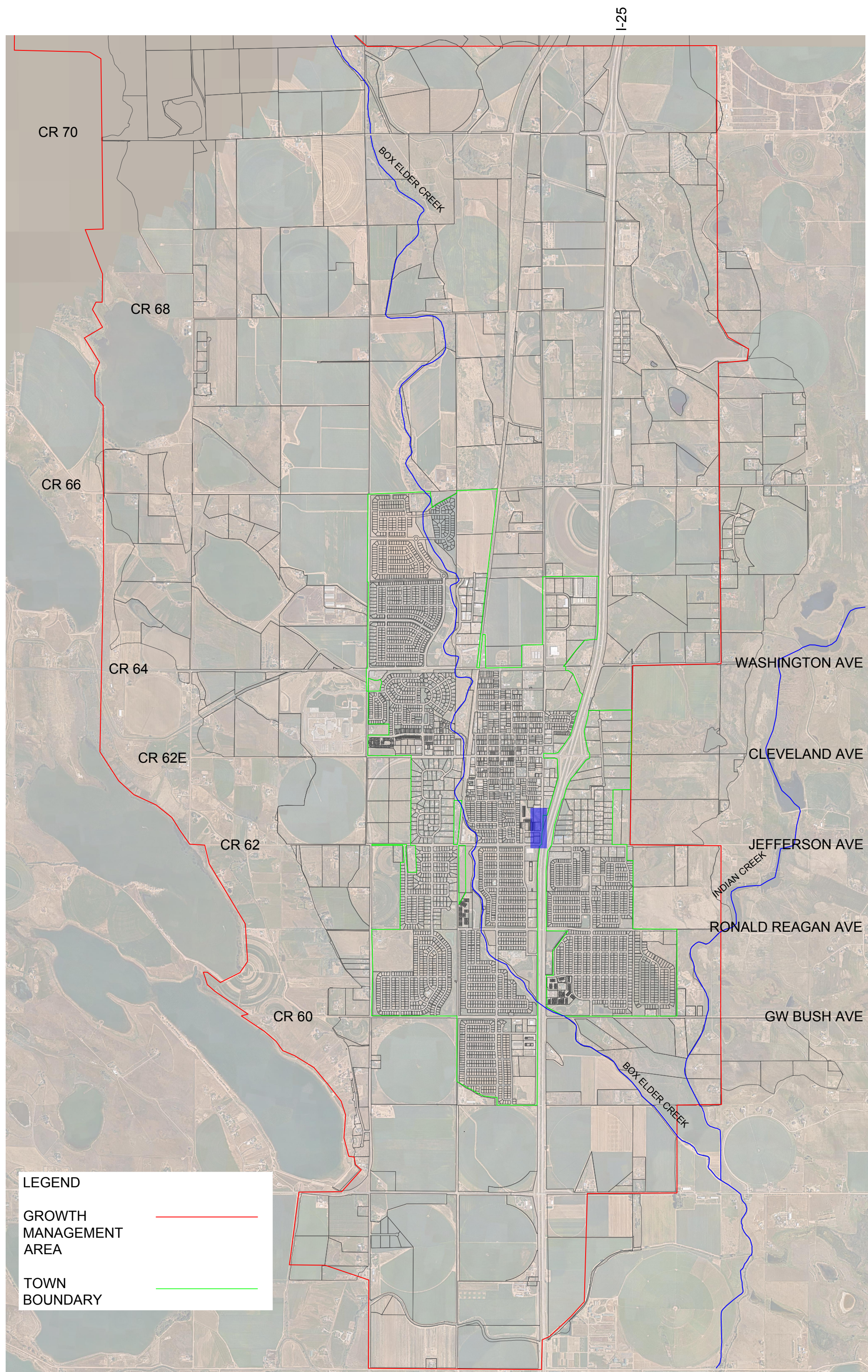
PROFILE OF S 5TH ST
H: 1" = 50
V: 1" = 5



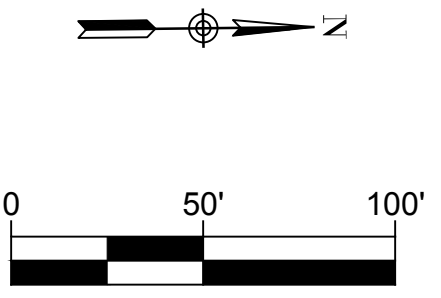
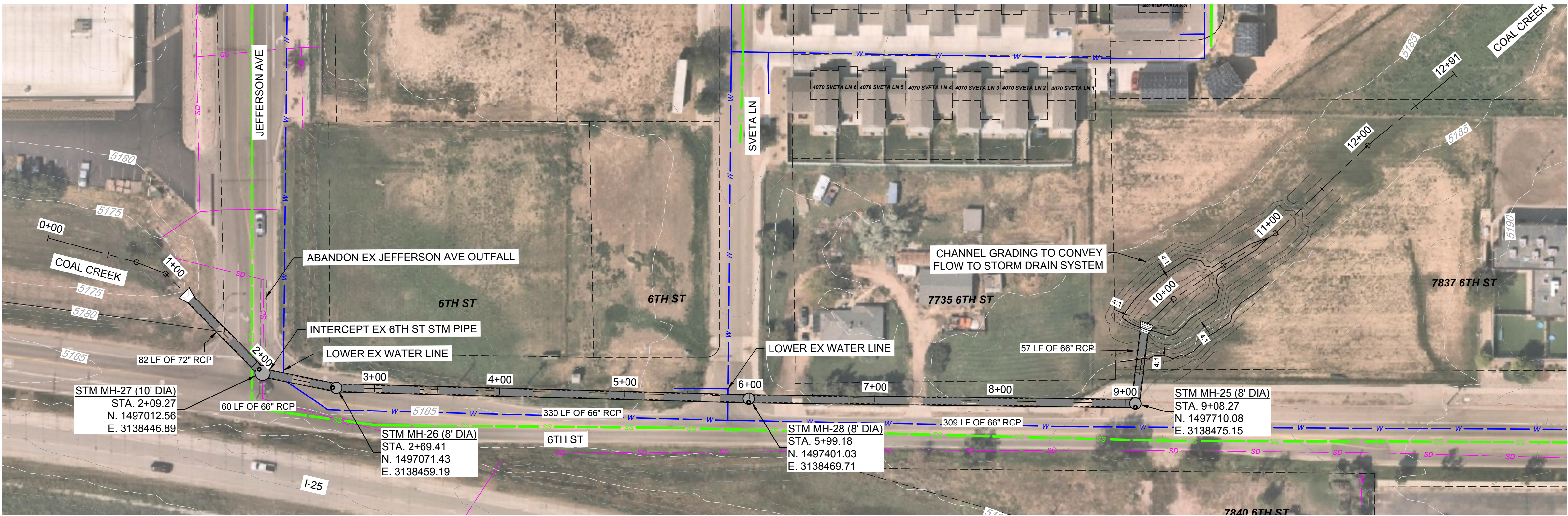


WELLINGTON STORMWATER MASTER PLAN
N 6TH ST - FLOOD MITIGATION ALTERNATIVE - 10YR
CONCEPTUAL DESIGN

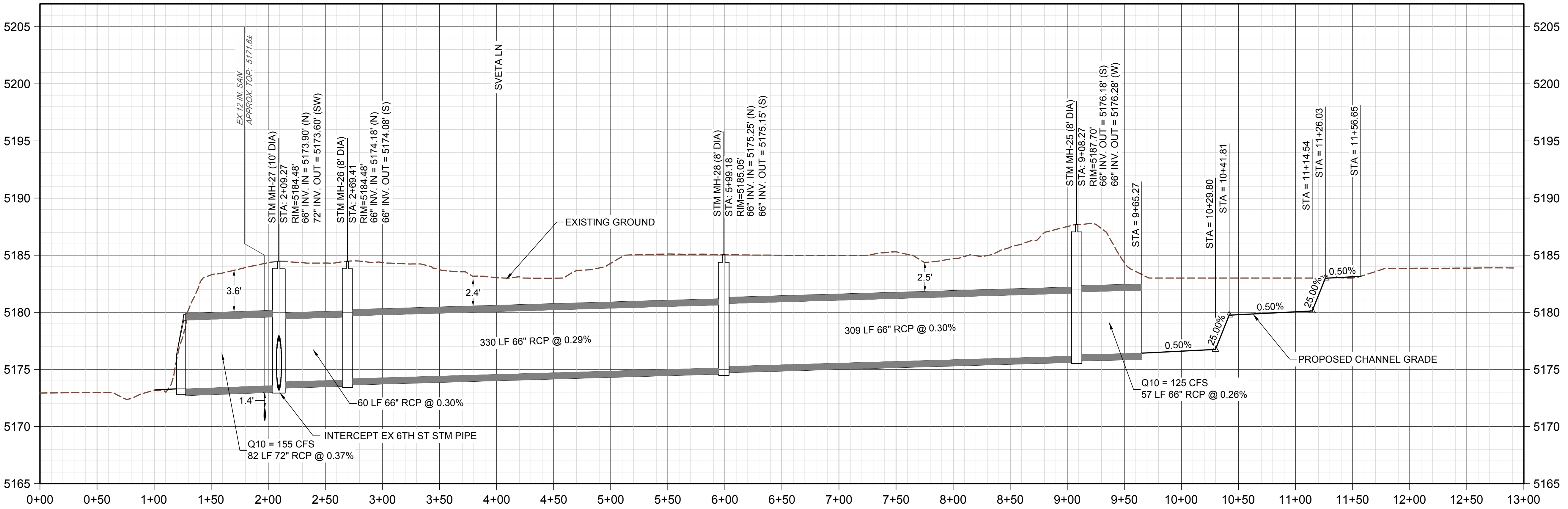


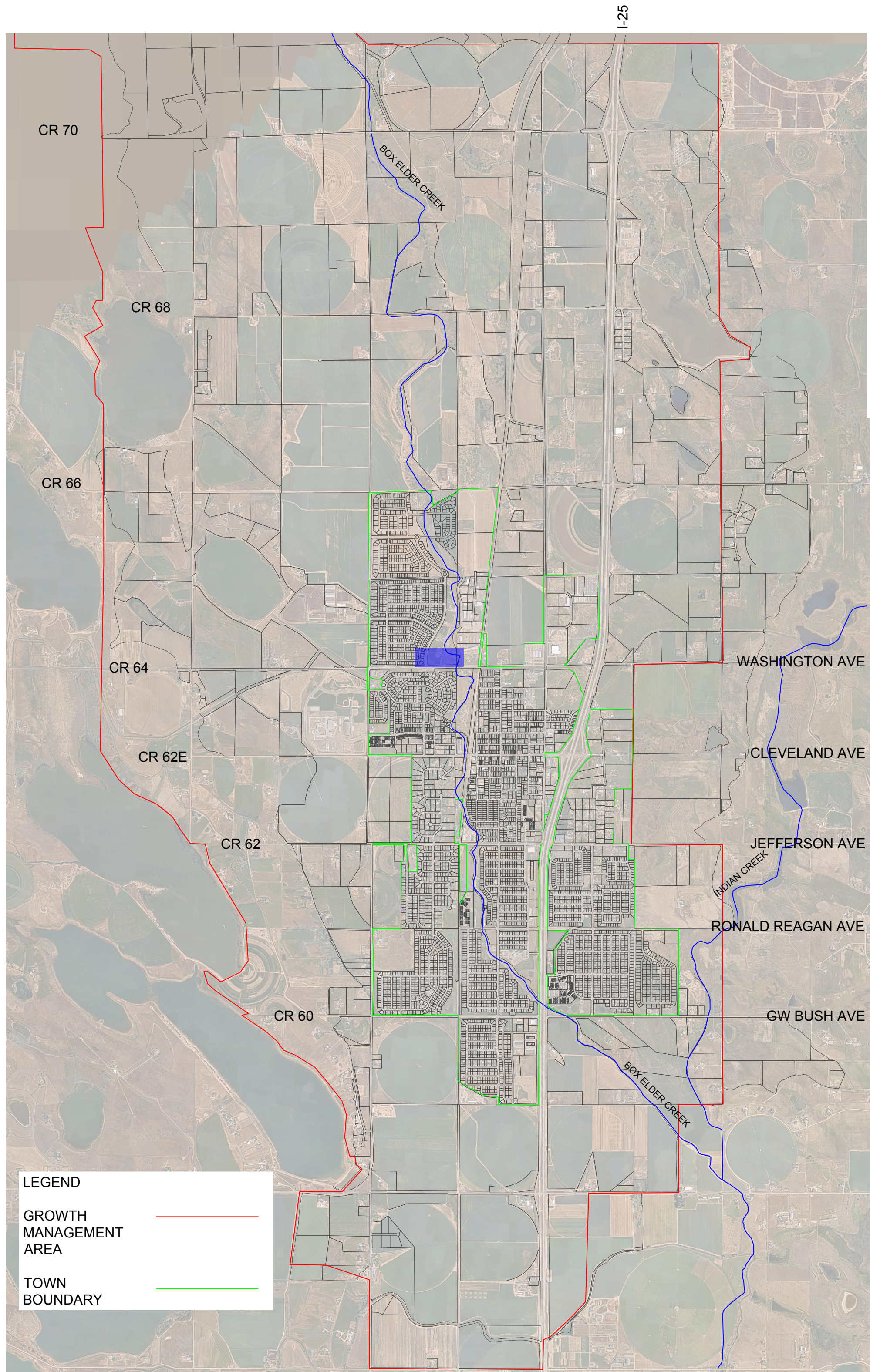


WELLINGTON STORMWATER MASTER PLAN
COAL CREEK - FLOOD MITIGATION ALTERNATIVE - 10YR ALT
CONCEPTUAL DESIGN

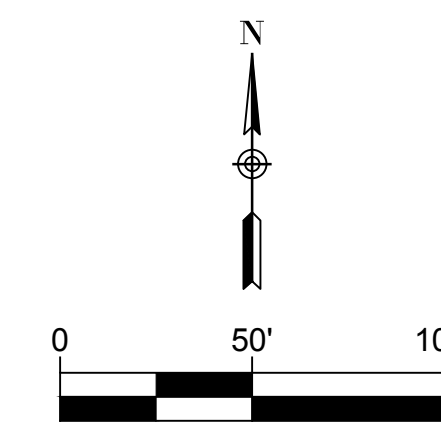
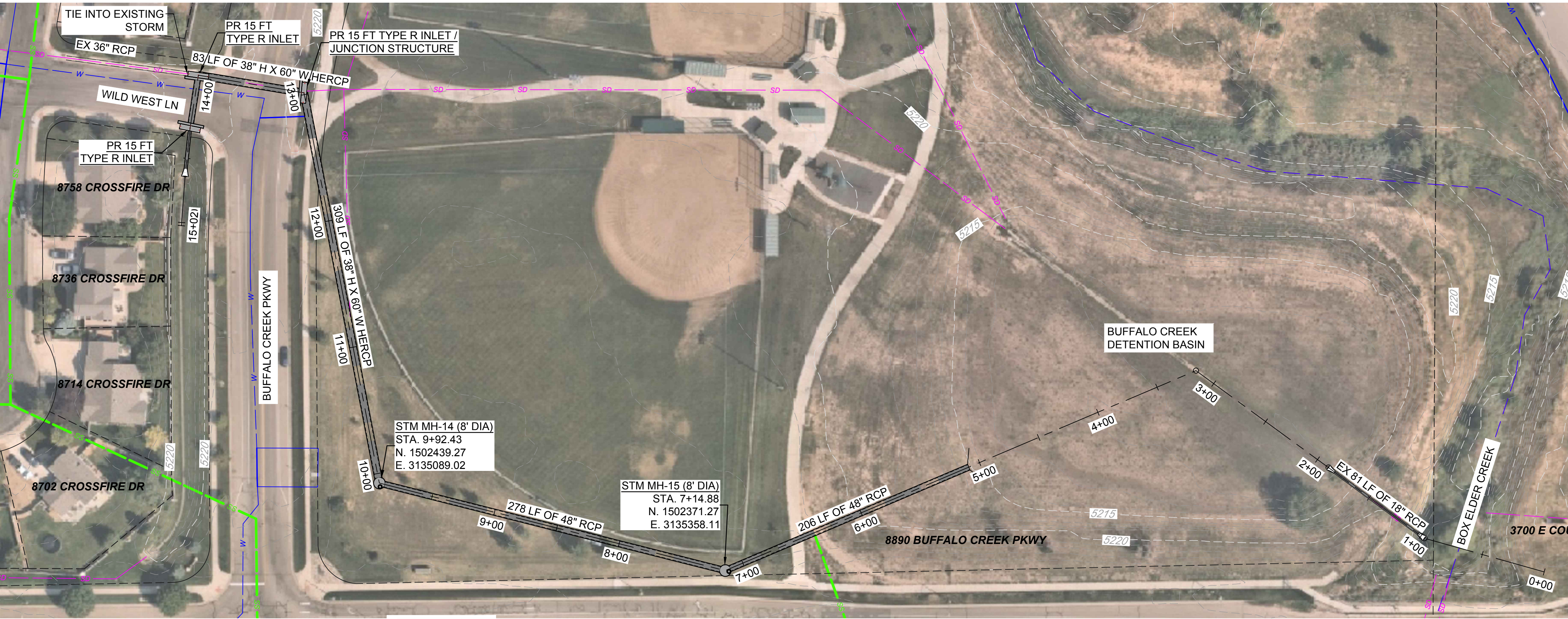


PROFILE OF COAL CREEK
H: 1" = 50
V: 1" = 5





WELLINGTON STORMWATER MASTER PLAN
BUFFALO CREEK / WELLINGTON COMMUNITY PARK
CONCEPTUAL DESIGN



PROFILE OF WELLINGTON COMMUNITY PARK
H: 1" = 50'
V: 1" = 5'

