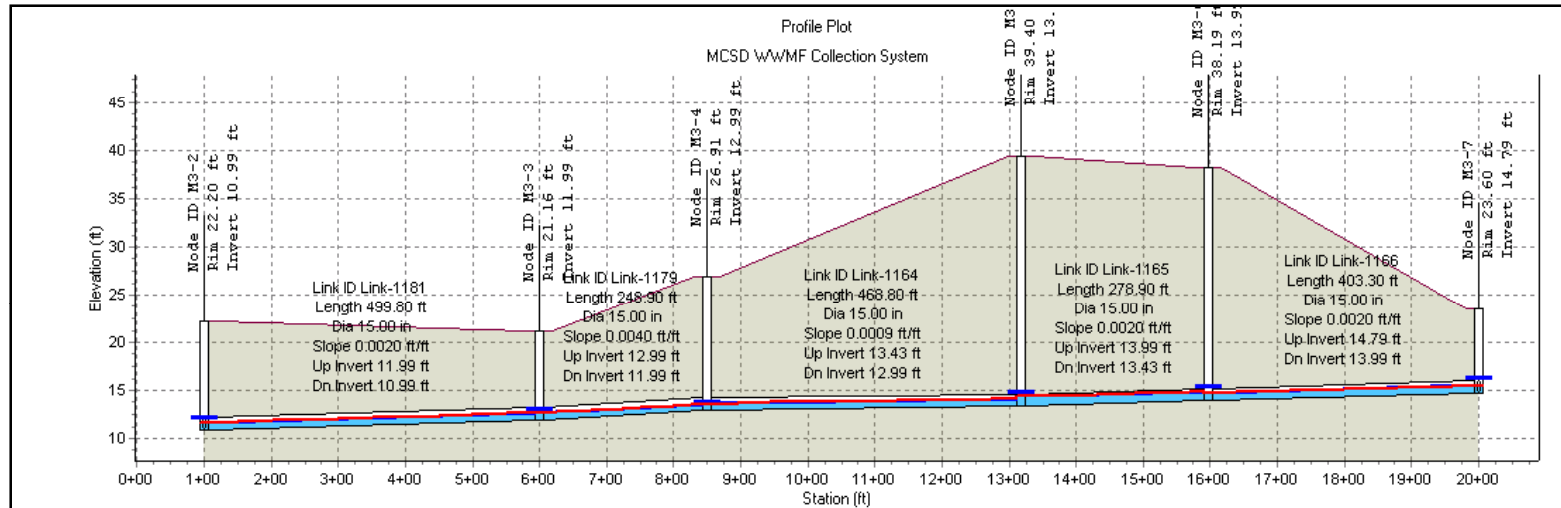
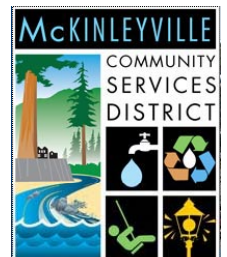


# McKinleyville Community Services District



## Sewer Collection System Analysis Preliminary Results

Presented By:  
Lisa Stromme, P.E.  
July 20, 2011



**SN**

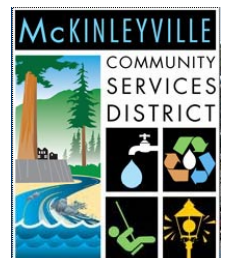
## Presentation Overview

SHN is developing a comprehensive flow model of the sanitary sewer collection system as part of the 20-year Facilities Plan process.

The sewer flow model is being used as an assessment tool to determine the anticipated impacts of various future growth scenarios on the sewer collection system.

The model results are still preliminary as we continue to calibrate and verify the model results this dry weather season.

Tonight we are presenting the preliminary findings of the collection system analysis based on the updated growth projections as provided by the County in May 2011.



# WWMF Capacity Overview

WWMF Components: Collection, Treatment and Disposal Systems

## Collection System

Limited by flow capacity in pipe network and pumping capacity at the lift stations.

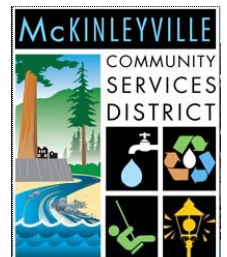
## Treatment System

Limited by treatment capacity and hydraulic capacity at the WWMF.

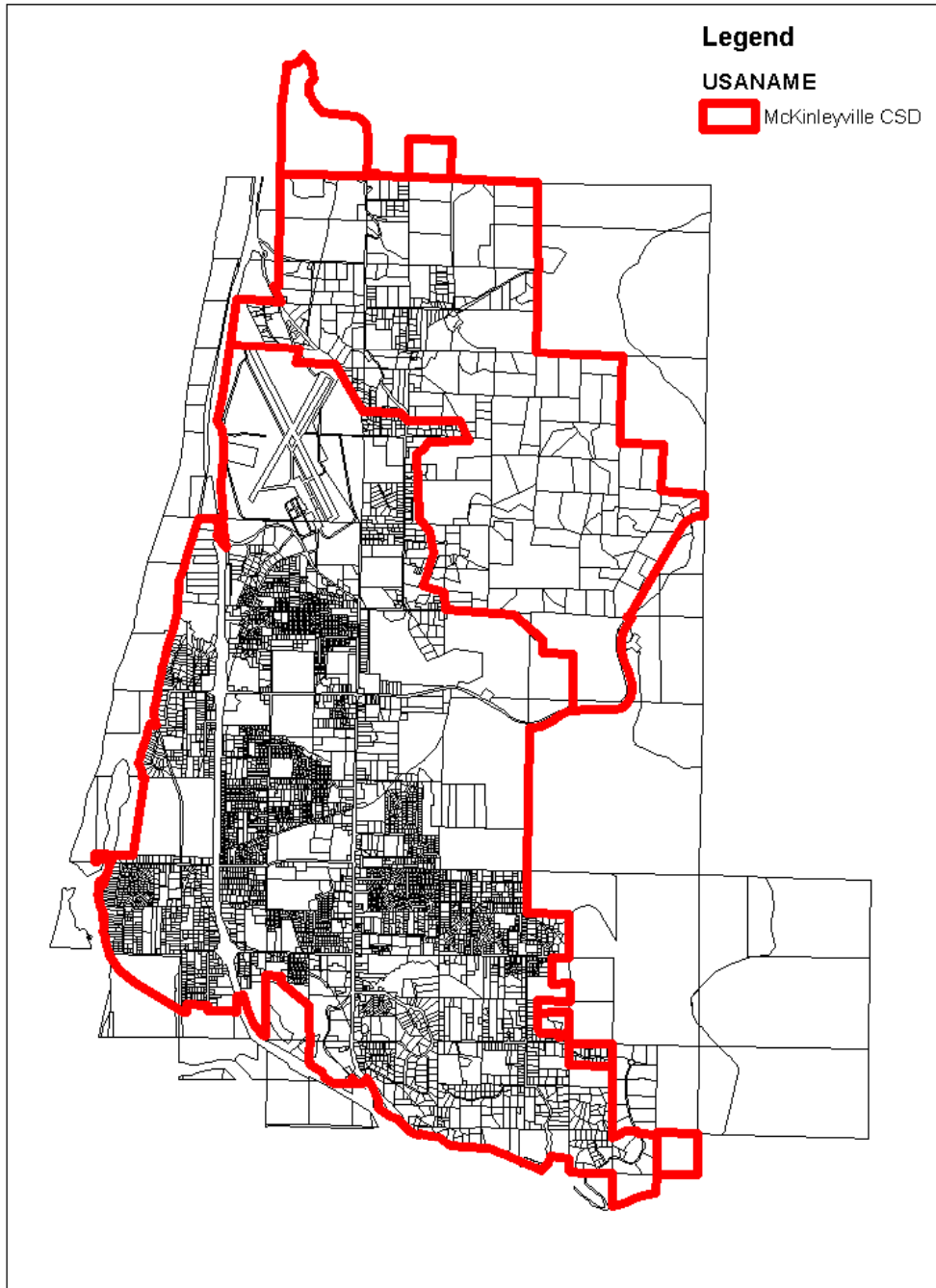
Design flow capacity = 1.6 MGD, Maximum flow capacity = 3.3 MGD

## Disposal System

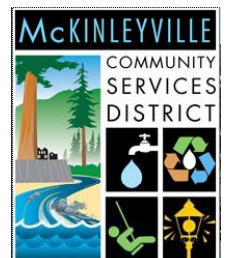
Limited by discharge season, river flow rates and land reclamation rates.



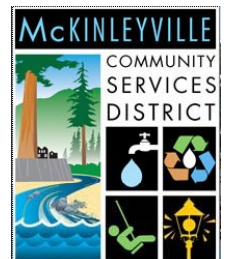
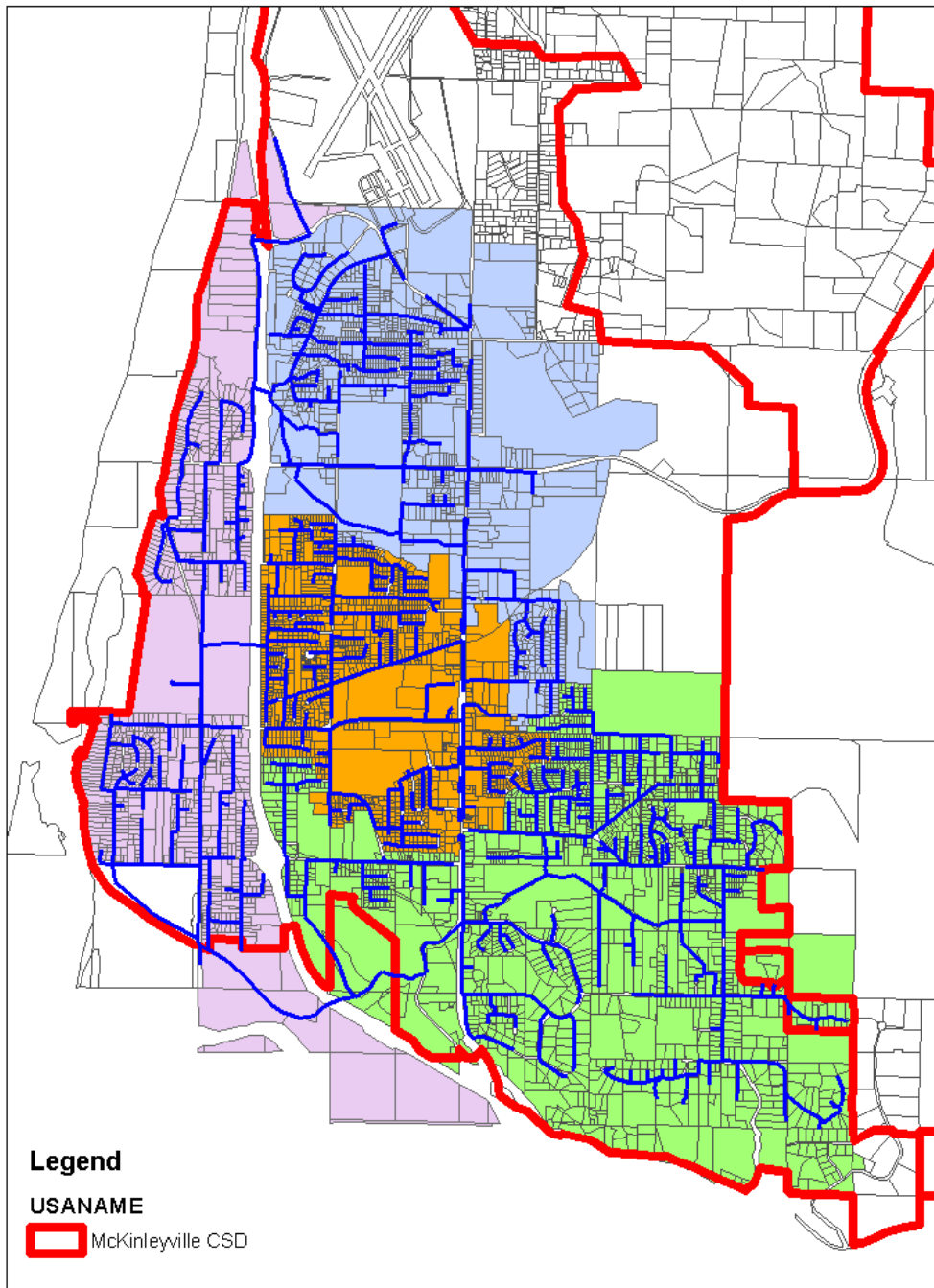
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# MCS County Defined Urban Service and Water Service Areas



# MCS Sewer Collection System Service Area



# County Growth Projections

In May 2011, SHN and Humboldt County staff provided an overview of different growth projections developed for the McKinleyville area.

ALT B DU

Development potential at expected density for Alternative B

BMAX-DU

Development potential at maximum density for Alternative B

ALT D DU

Development potential at expected density for General Plan

DMAX-DU

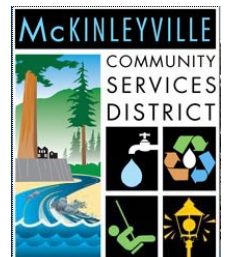
Development potential at maximum density for General Plan

MF-UNITS

Multifamily rezone development potential at expected densities

MF-MAX

Multifamily rezone development potential at maximum densities

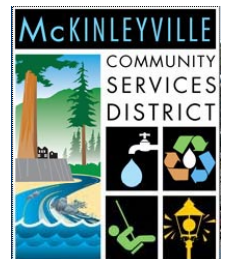


## County Growth Projections, continued

Following the May 2011 meeting, MCSD staff received a copy of the County's updated growth projections for the McKinleyville area on May 26, 2011.

The updates included a revision to the growth projections as identified in the existing General Plan (Alternative D) and under the proposed General Plan Update (Alternative B).

The data was updated to include additional growth allocation in McKinleyville based on the proposed multi-family property rezoning as discussed in the County's recent Draft Supplemental Environmental Impact Report (DSEIR).



## County Growth Projections, continued

The combined data set includes four different growth projections, identified as follows.

### BMID-MF

Development potential at expected density for Alternative B with MF rezone parcels at expected density substituted

### BMAX-MF

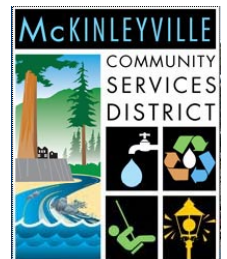
Development potential at maximum density for Alternative B with MF rezone parcels at maximum density substituted

### DMID-MF

Development potential at expected density for General Plan with MF rezone parcels at expected density substituted

### DMAX-MF

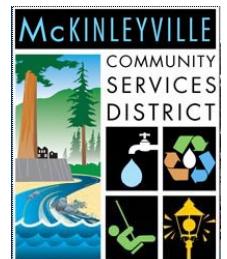
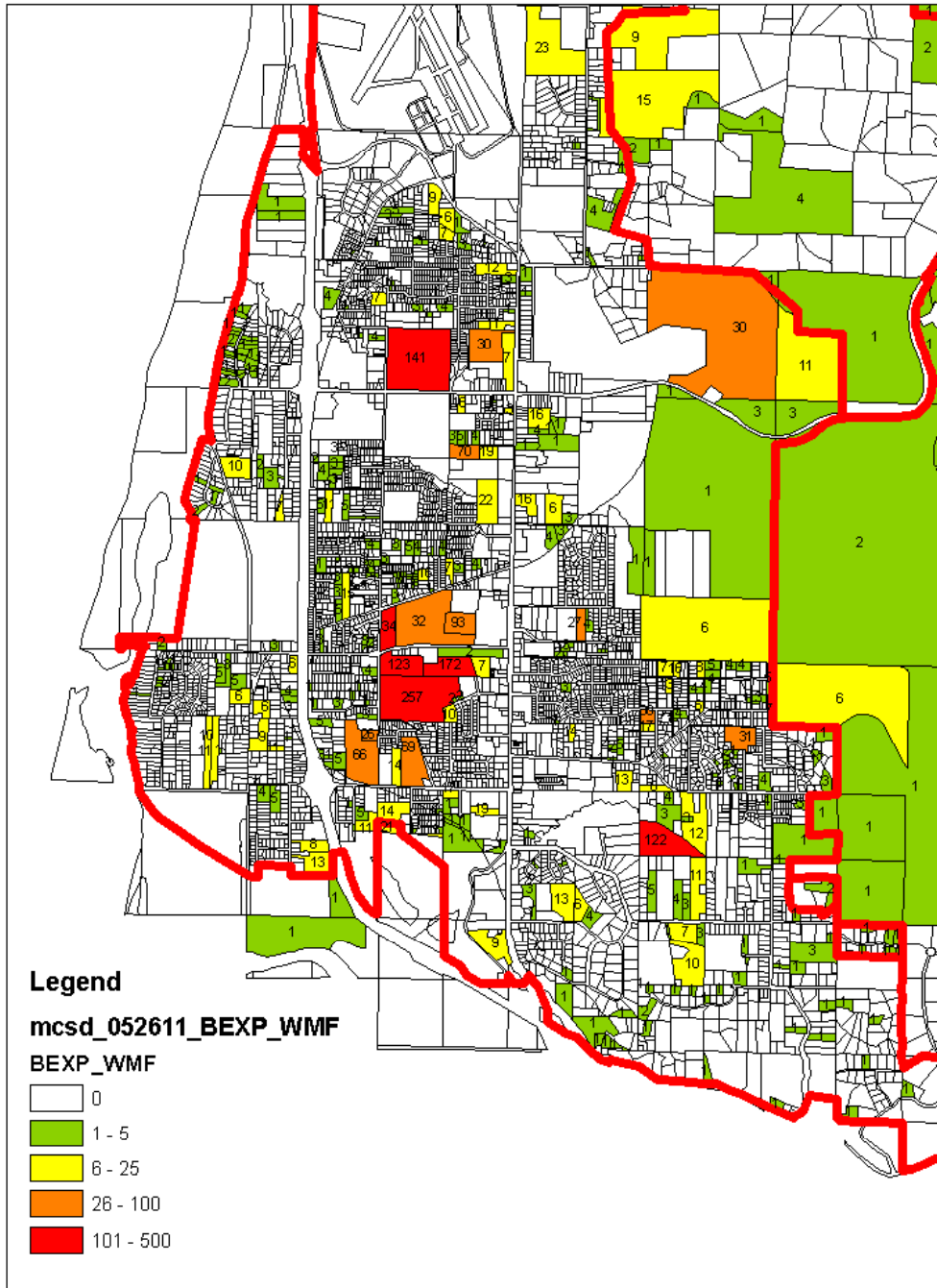
Development potential at maximum density for General Plan with MF rezone parcels at maximum density substituted





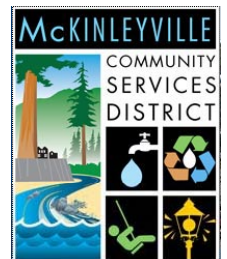
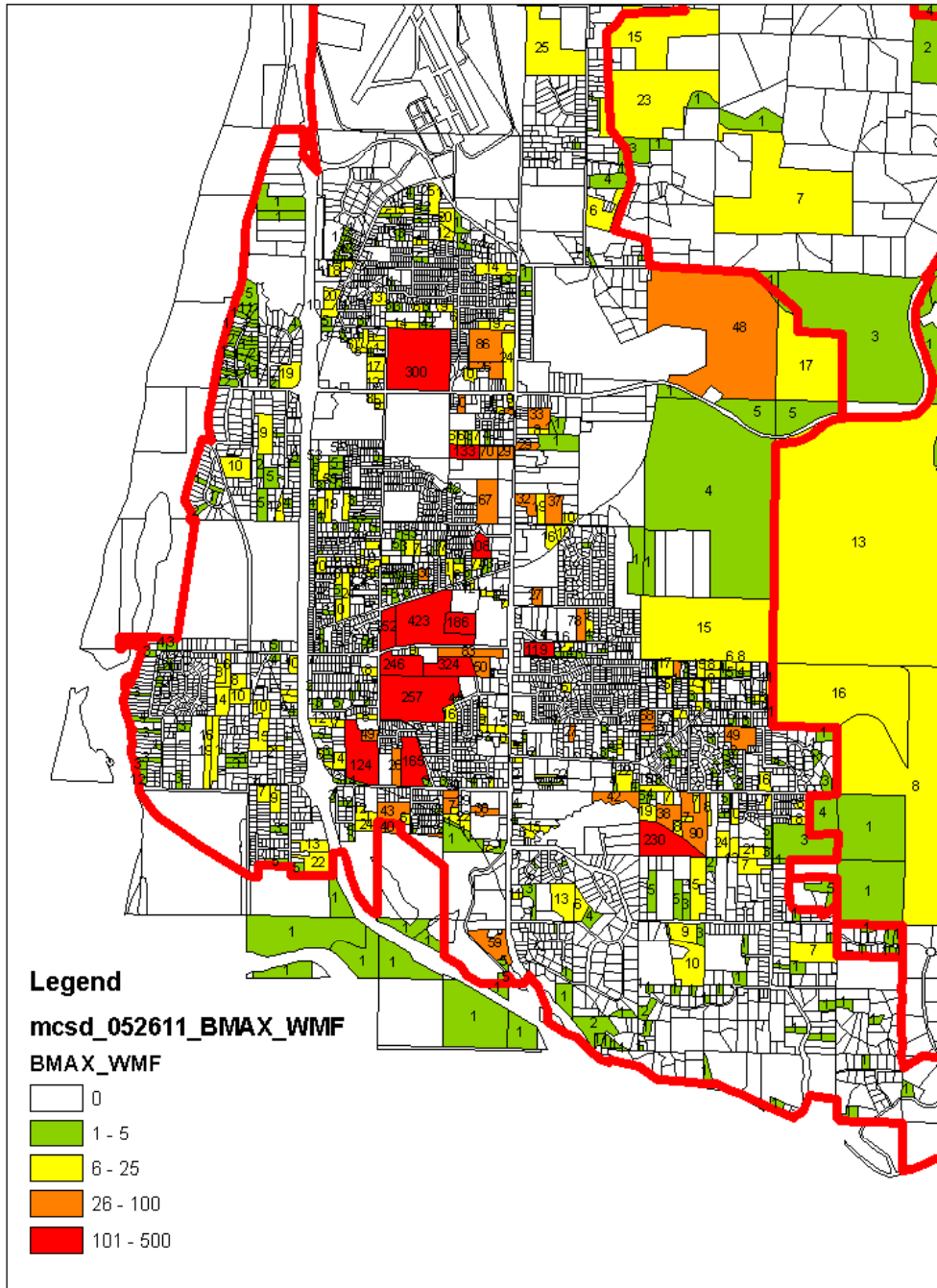
# B MID MF

Development potential at expected density for Alternative B with MF rezone parcels at expected density substituted



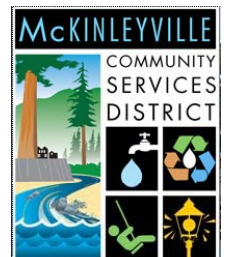
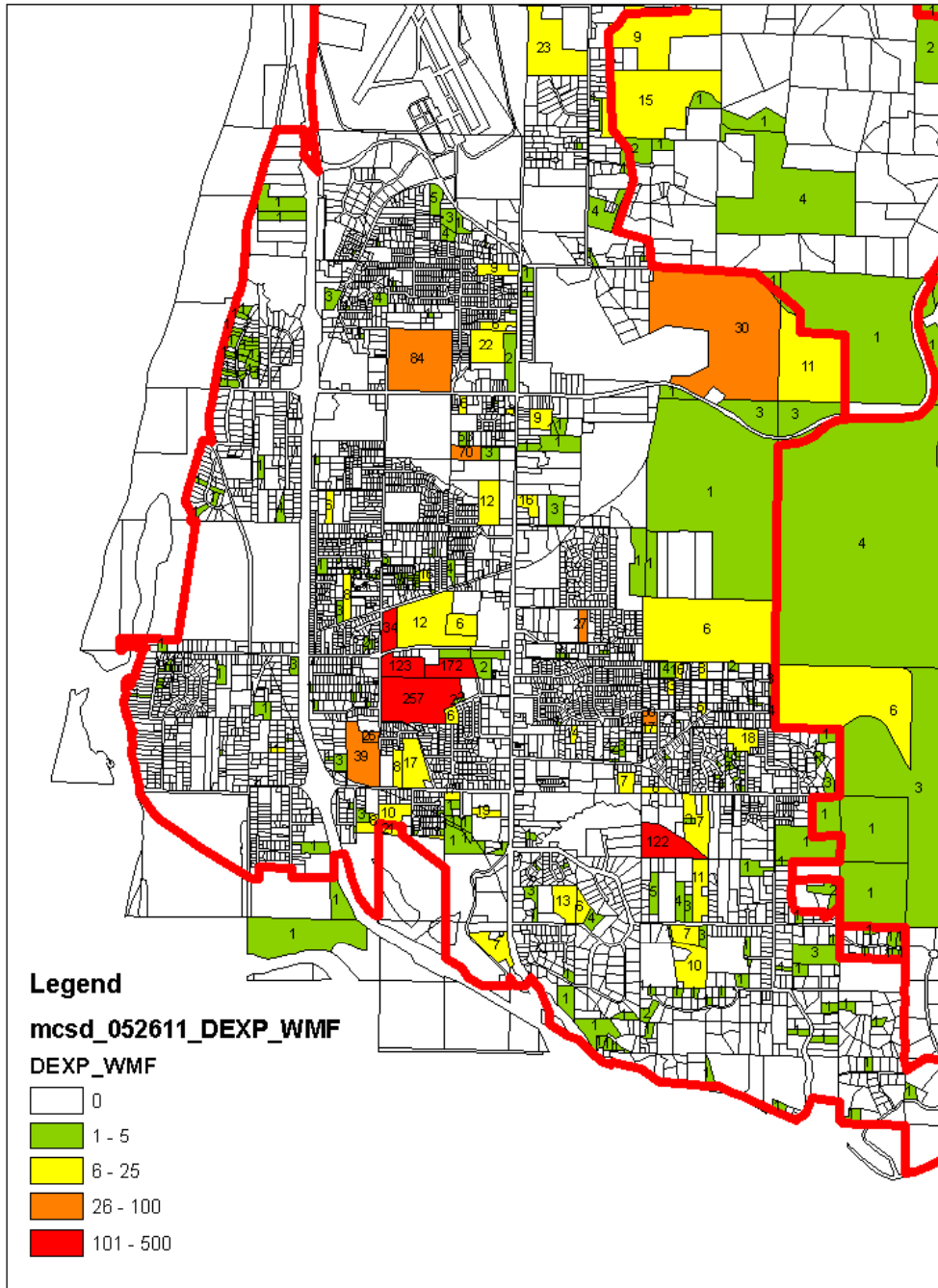
# B MAX MF

Development potential at maximum density for Alternative B with MF rezone parcels at maximum density substituted



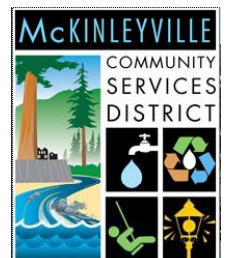
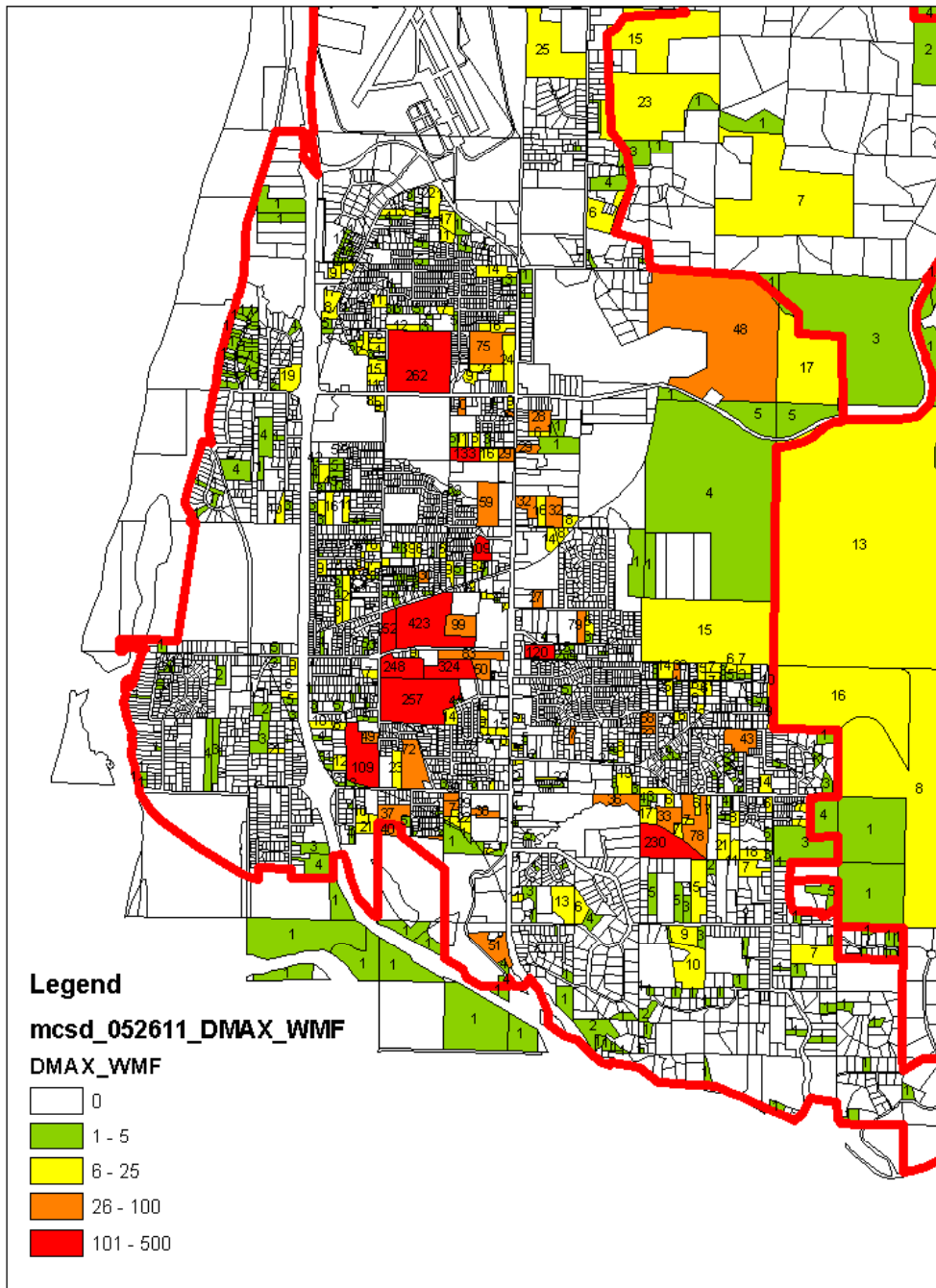
# D MID MF

Development potential at expected density for General Plan with MF rezone parcels at expected density substituted



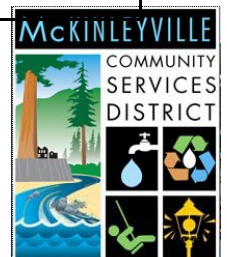
# D MAX MF

Development potential at maximum density for General Plan with MF rezone parcels at maximum density substituted



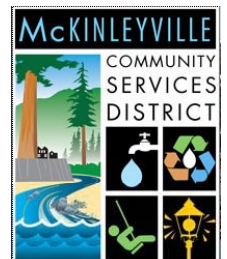
## Growth Projections - General Plan/GP Update

General Plan Update Growth Projections May 2011				
Name	Description	Total Units Proposed	Units Proposed within Service Area	Anticipated Flow Increase (GPD) (180 gpd/unit)
ALT B DU	development potential at expected density for Alternative B	2,172	1,974	355,320
BMAX-DU	development potential at maximum density for Alternative B	6,365	6,041	1,087,380
ALT D DU	development potential at expected density for General Plan	1,307	1,100	198,000
DMAX-DU	development potential at maximum density for General Plan	5,297	4,971	894,780



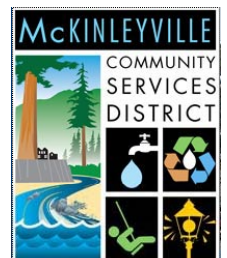
## Growth Projections - Multi-Family Rezone

Multi-Family Rezone Growth Projections May 2011				
Name	Description	Total Units Proposed	Units Proposed within Service Area	Anticipated Flow Increase (GPD) (180 gpd/unit)
MF-UNITS	Multifamily rezone development potential at expected densities	794	794	142,920
MF-MAX	Multifamily rezone development potential at maximum densities	1,513	1,513	272,340



## Growth Projections - GP Update with Multi-Family

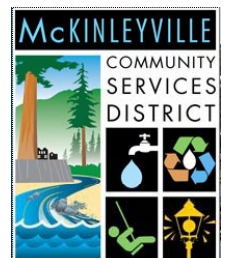
General Plan Update with Multi-Family Rezone Growth Projections May 2011				
Name	Description	Total Units Proposed	Units Proposed within Service Area	Anticipated Flow Increase (GPD) (180 gpd/unit)
BMID-MF	development potential at expected density for Alternative B with MF rezone parcels at expected density substituted	2,760	2,562	461,160
BMAX-MF	development potential at maximum density for Alternative B with MF rezone parcels at maximum density substituted	7,222	6,898	1,241,640





# Growth Projections - General Plan with Multi-Family

General Plan with Multi-Family Rezone Growth Projections May 2011				
Name	Description	Total Units Proposed	Units Proposed within Service Area	Anticipated Flow Increase (GPD) (180 gpd/unit)
DMID-MF	development potential at expected density for General Plan with MF rezone parcels at expected density substituted	2,057	1,850	333,000
DMAX-MF	development potential at maximum density for General Plan with MF rezone parcels at maximum density substituted	6,291	5,965	1,073,700





# Collection System Model Overview

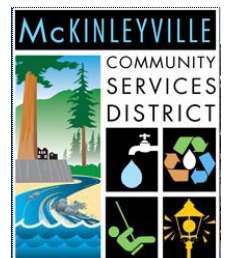
Software: Autodesk Storm and Sanitary Analysis 2011

Data Input: GIS database of the collection system

Dry-weather Flow: Existing land use based allocation

Wet-weather Flow: Rainfall derived infiltration and inflow (RDII)

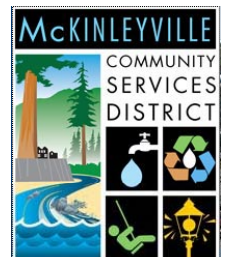
Direct Flow (Growth Induced): Based on county projections



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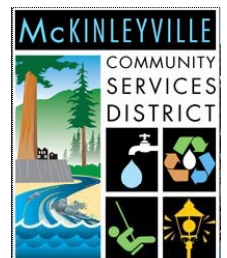
# Dry Weather Flow Allocation

Summary of Dry Weather Flow Allocation for Collection System Model			
Land Use Type	Equivalent Residential Unit (ERU) Allocation	ERUs	Total Flow (GPD) (180 gpd/ERU)
Single Family Residential	Direct (1:1)	4,141	745,380
Multi-Family Residential	0.56 x Number of Units	746	134,280
Commercial	Based on 90% of water usage	380	68,400
<b>Total</b>	---	<b>5,267</b>	<b>948,060</b>



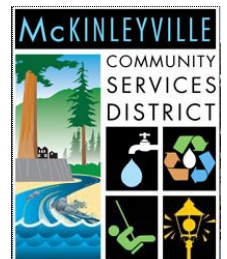
## Wet Weather Flow Allocation

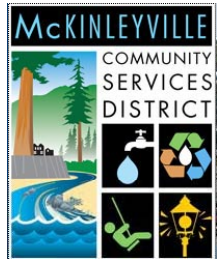
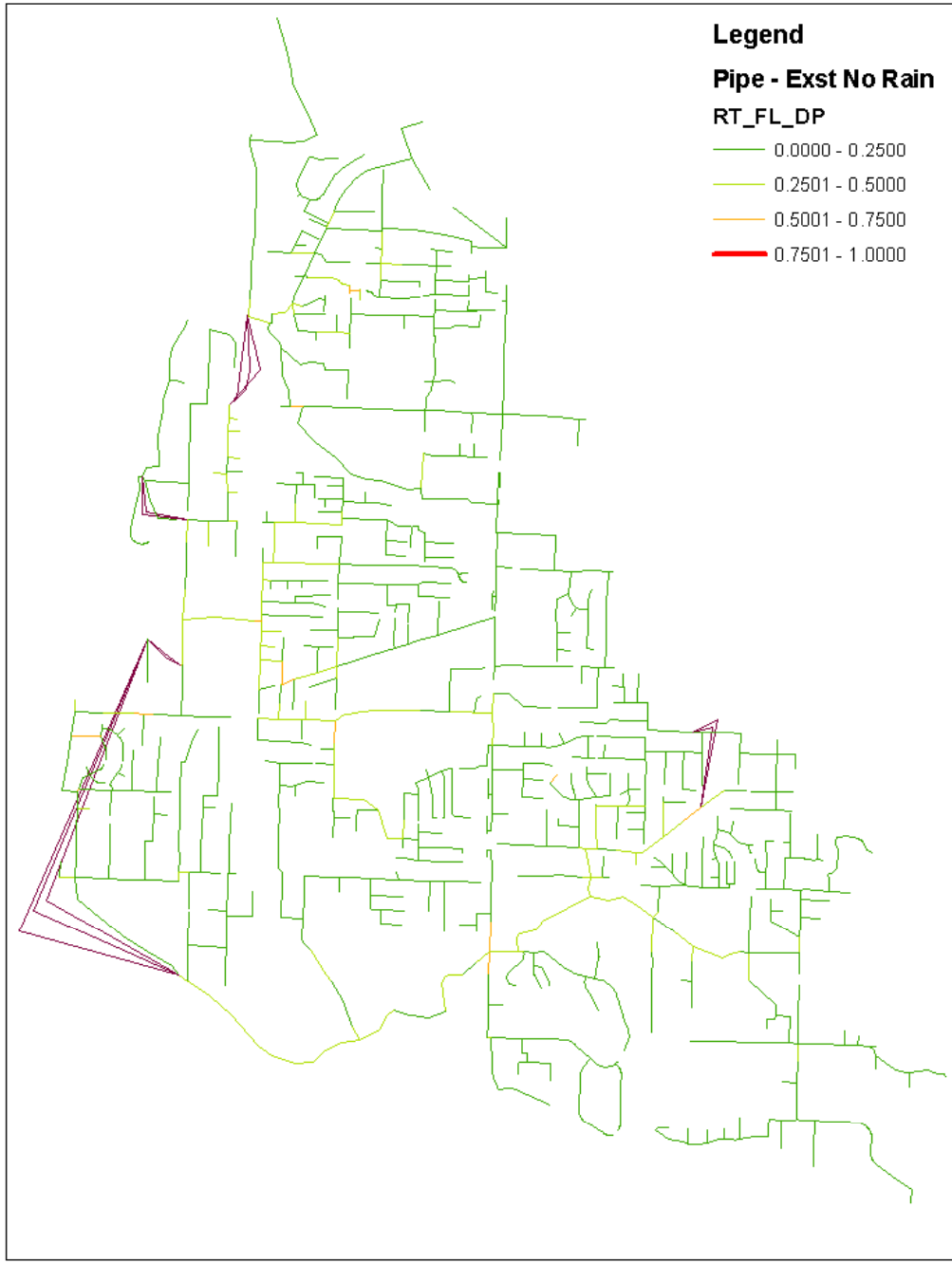
Summary of Wet Weather Flow Allocation for Collection System Model			
Return Interval	Rainfall (inches)	Rainfall Derived Infiltration and Inflow (MGD)	Total Flow (MGD)
None	0	0.00	0.95
2-Year	3.5	0.84	1.79
5-Year	4.5	1.10	2.05
100-Year	6.9	1.72	2.67

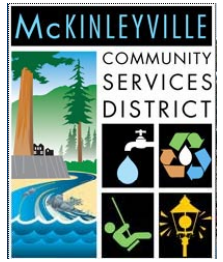
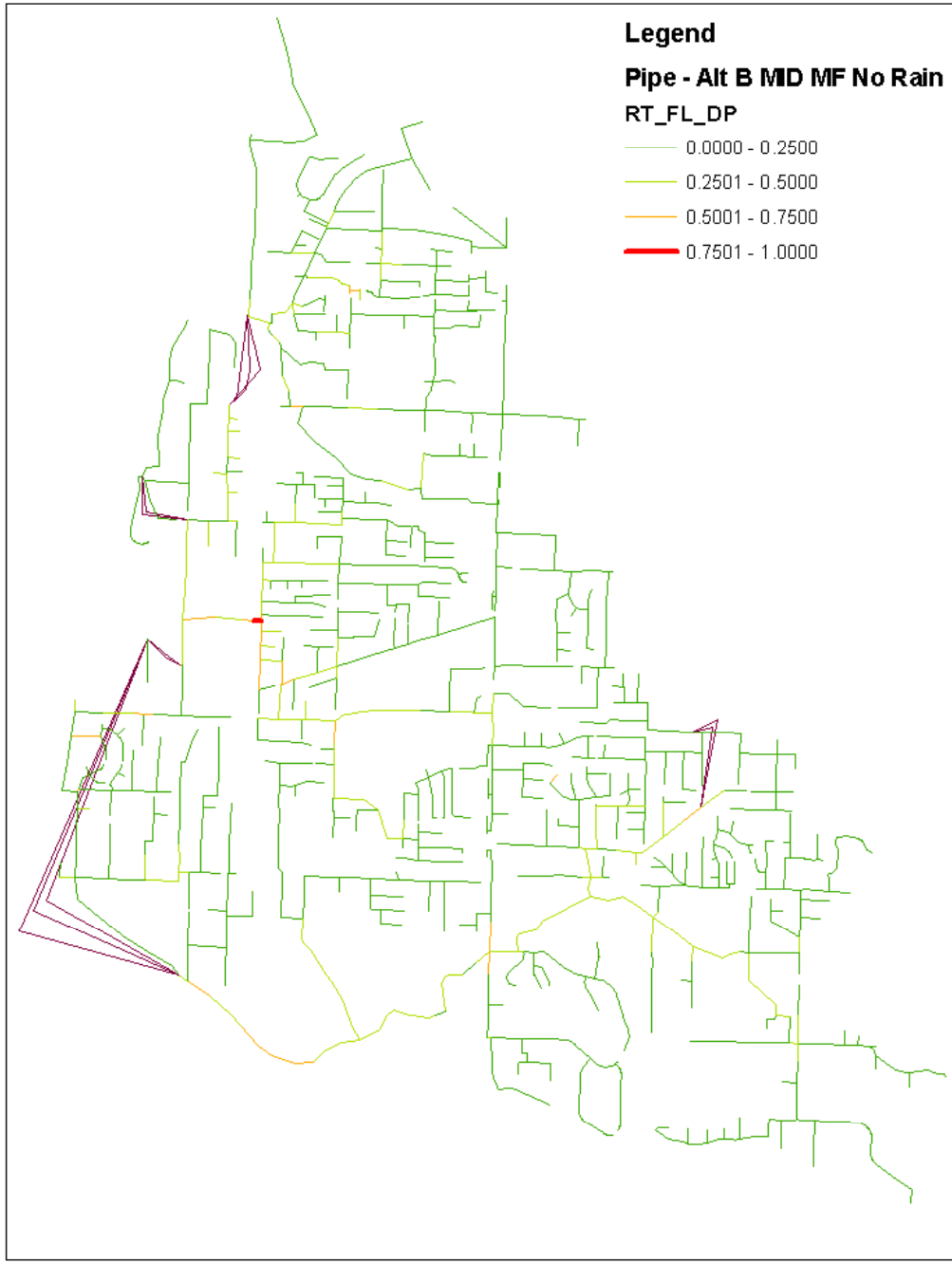


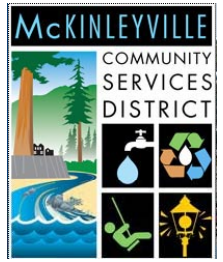
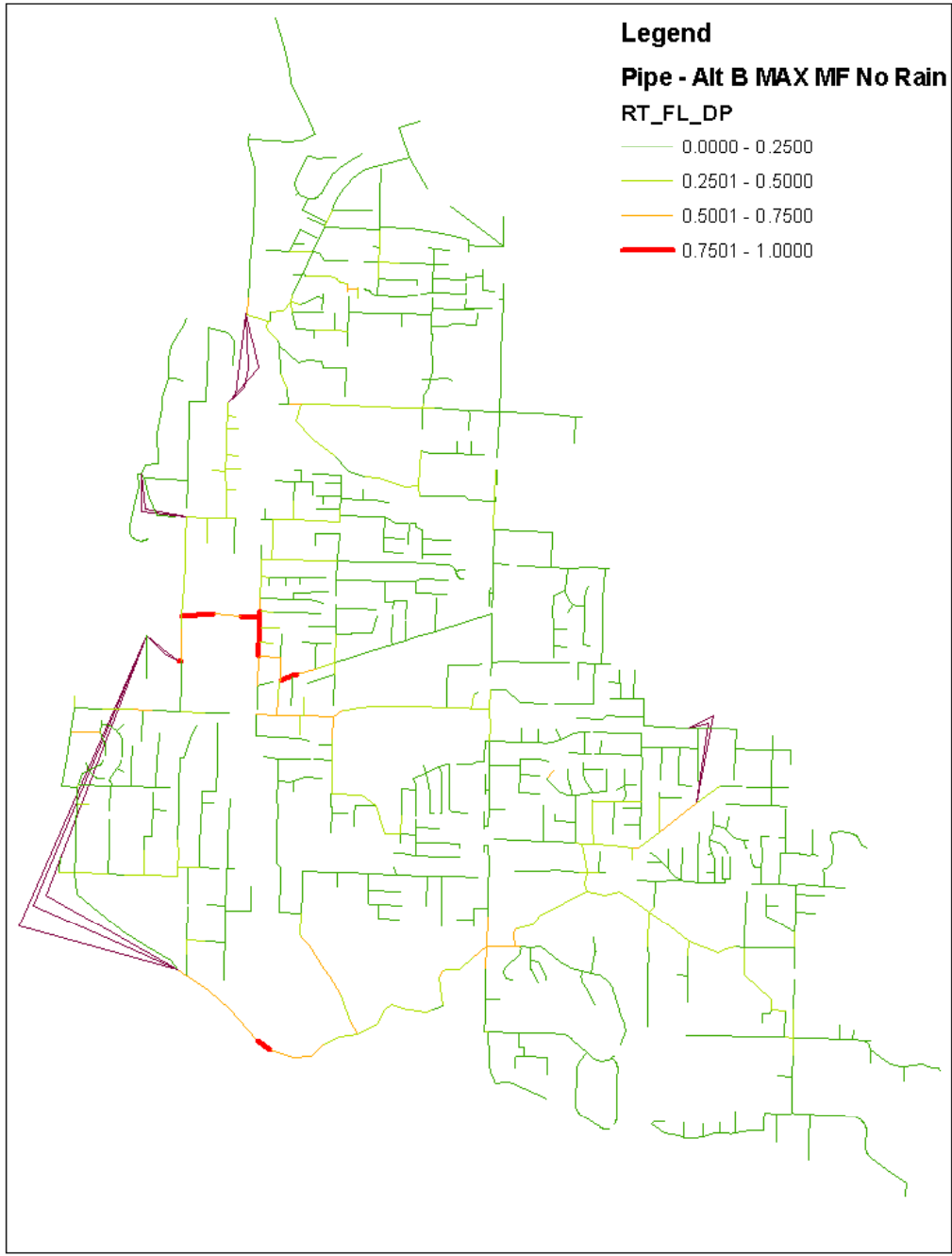
## Direct Flow Allocation (Growth Induced)

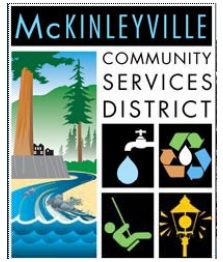
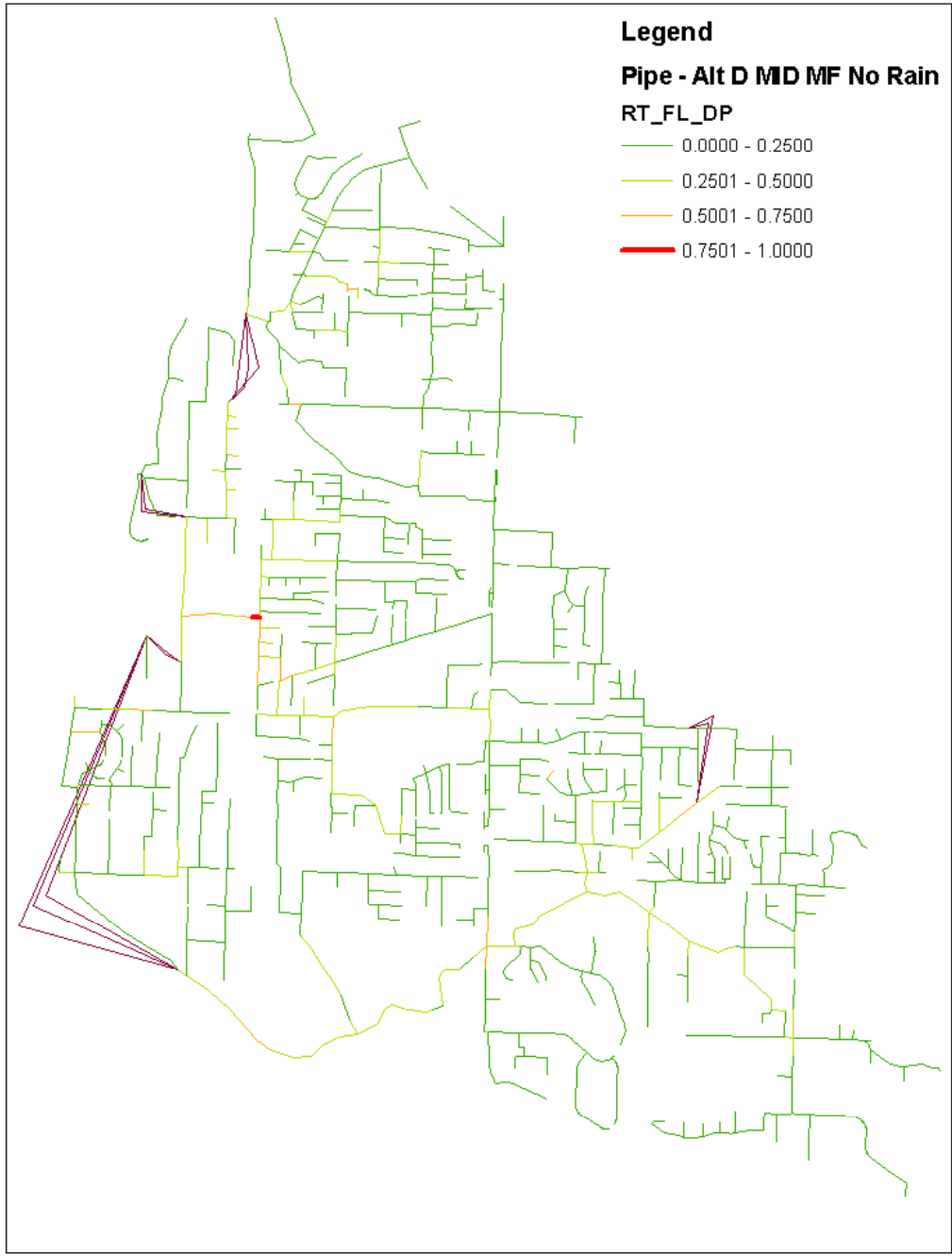
Summary of Total Flow with Growth Induced Direct Flow Allocation				
Return Interval	BMID-MF (MGD)	BMAX-MF (MGD)	DMID-MF (MGD)	DMAX-MF (MGD)
(Direct Flow)	0.46	1.25	0.34	1.08
None	1.42	2.20	1.29	2.03
2-Year	2.26	3.04	2.13	2.87
5-Year	2.51	3.30	2.39	3.13
100-Year	3.13	3.92	3.01	3.75



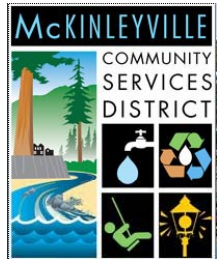
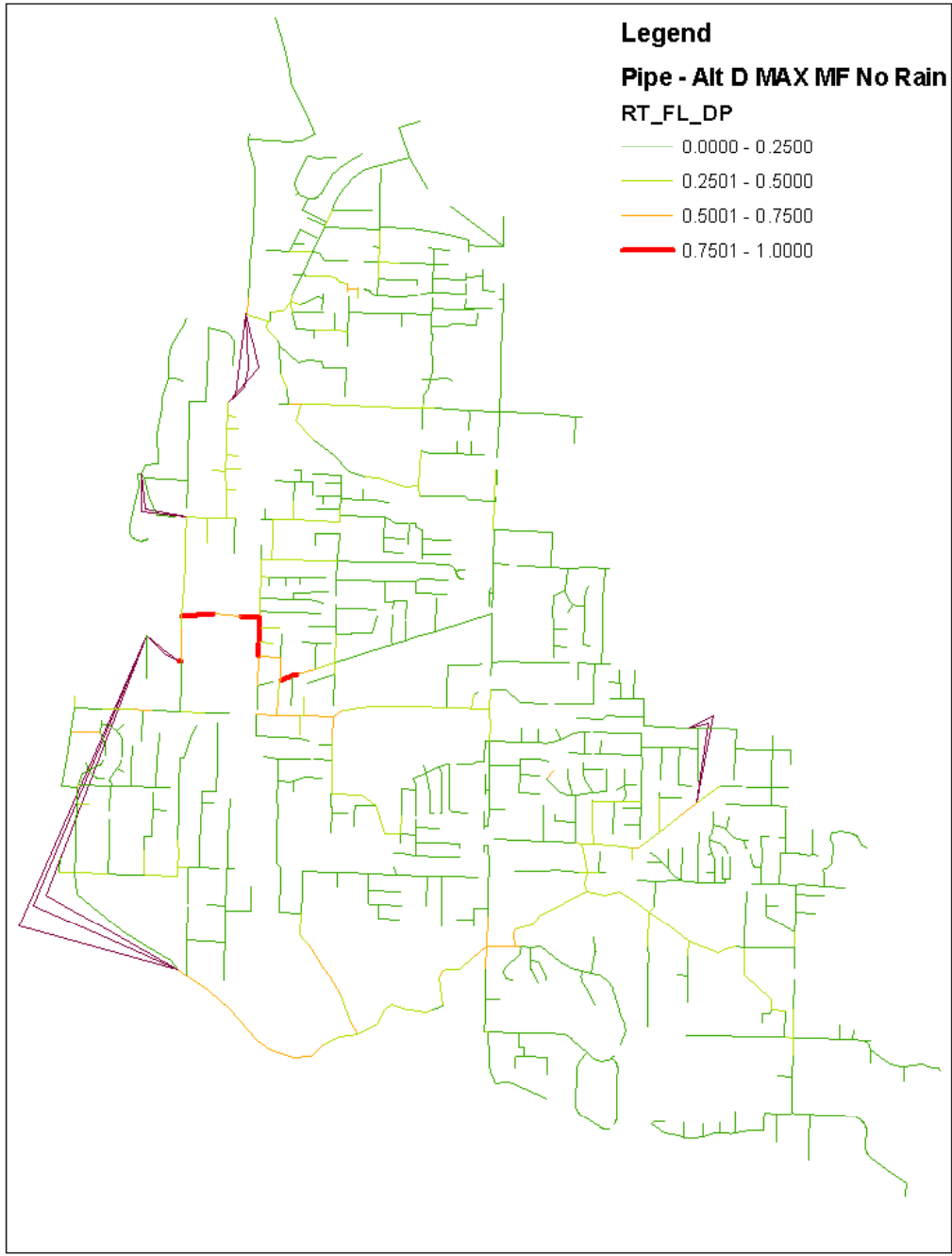


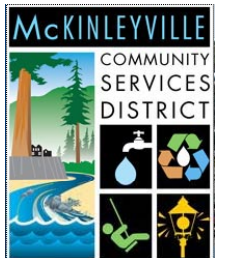
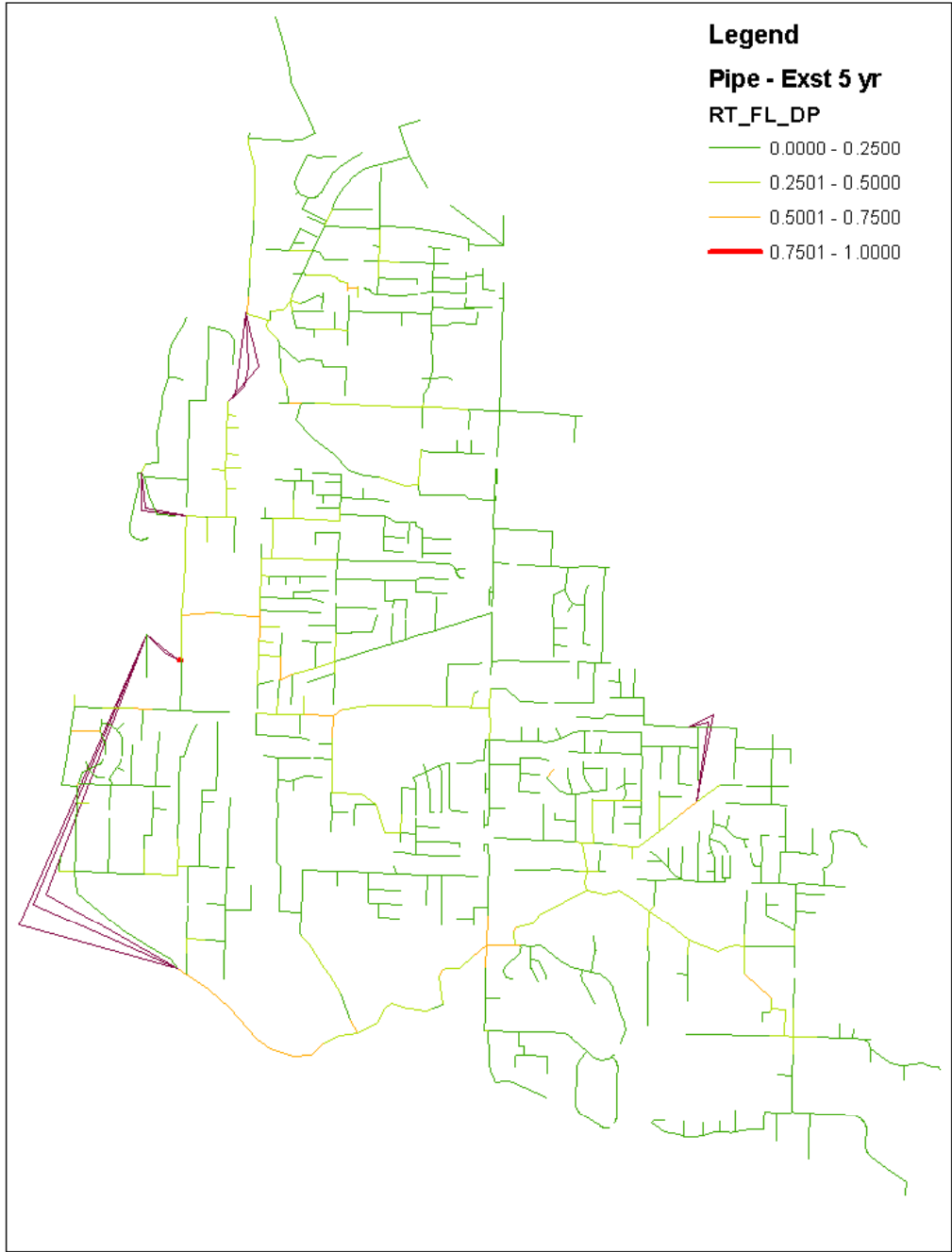


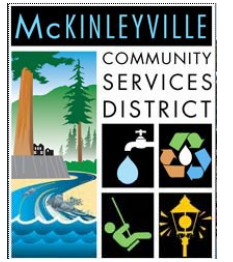
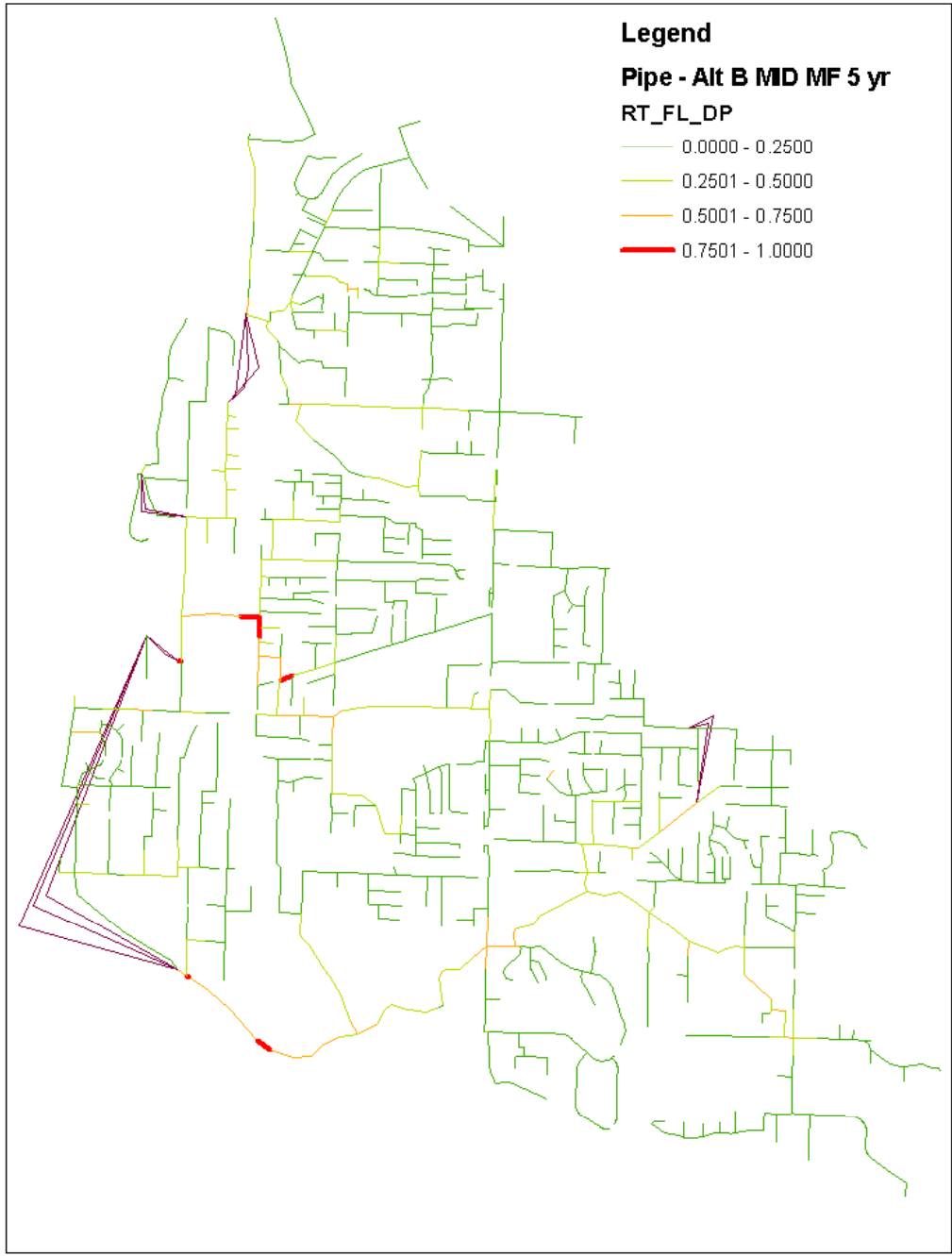


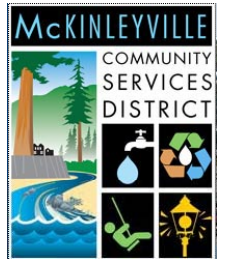
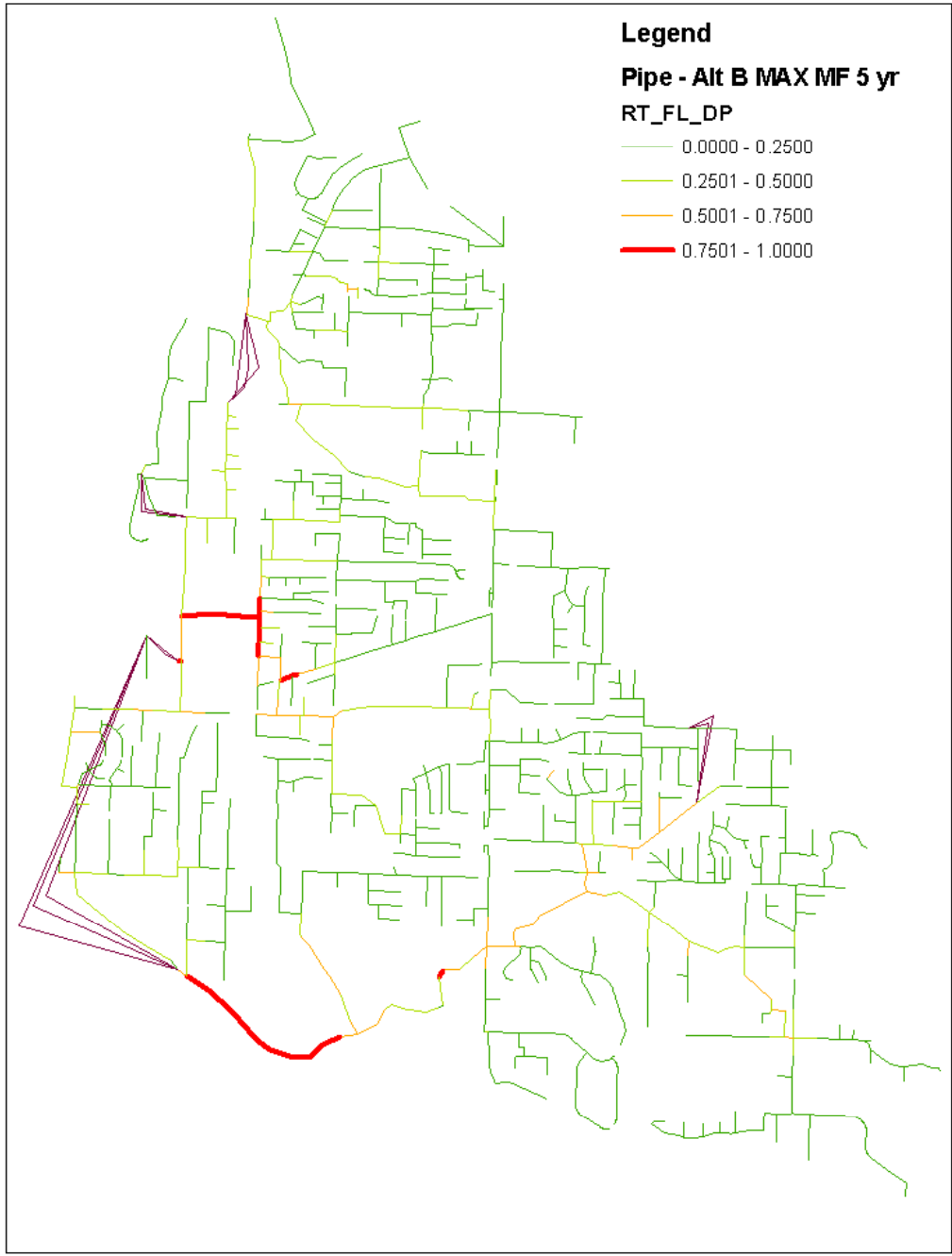


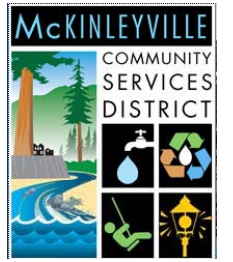
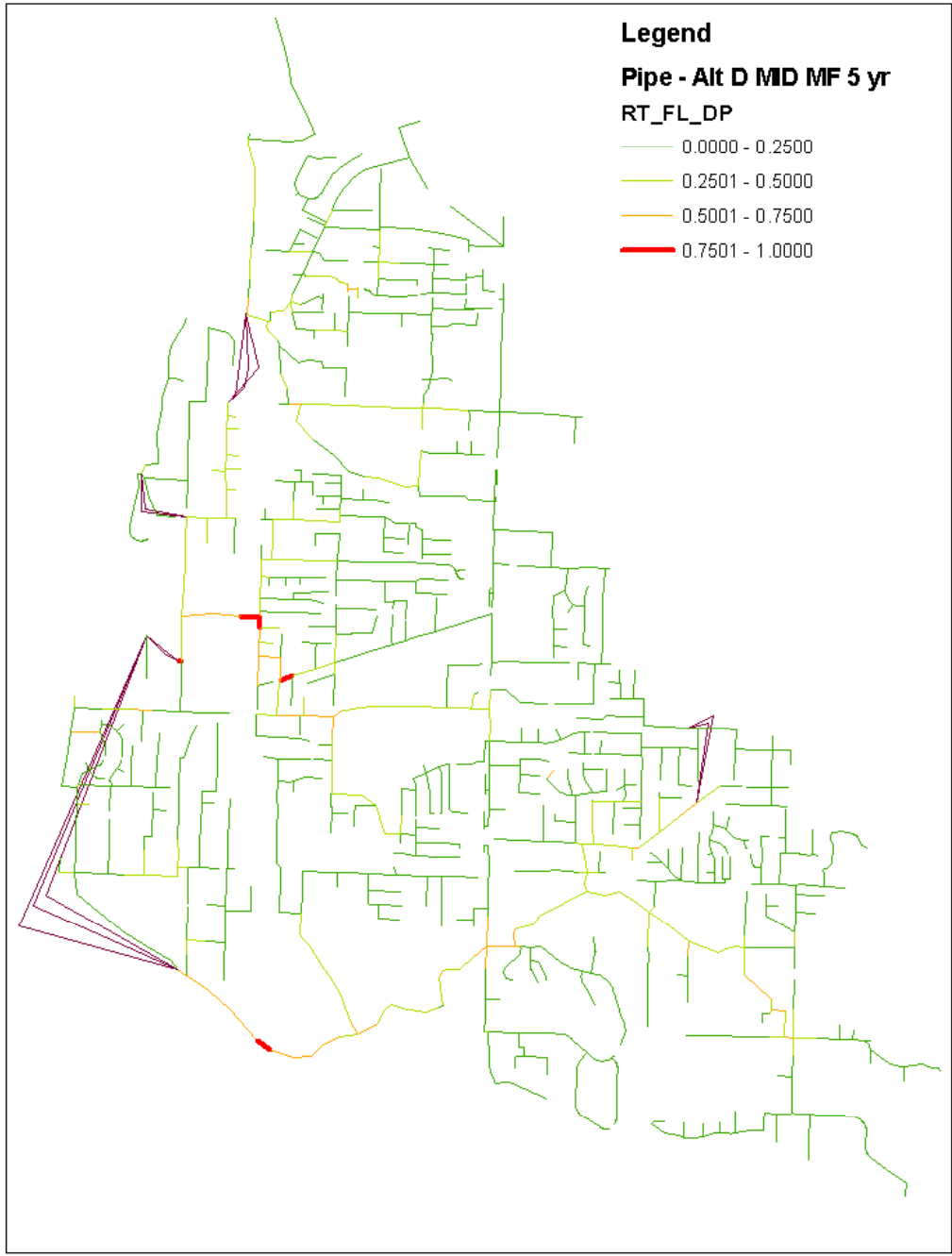


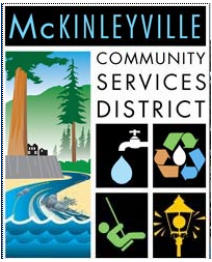
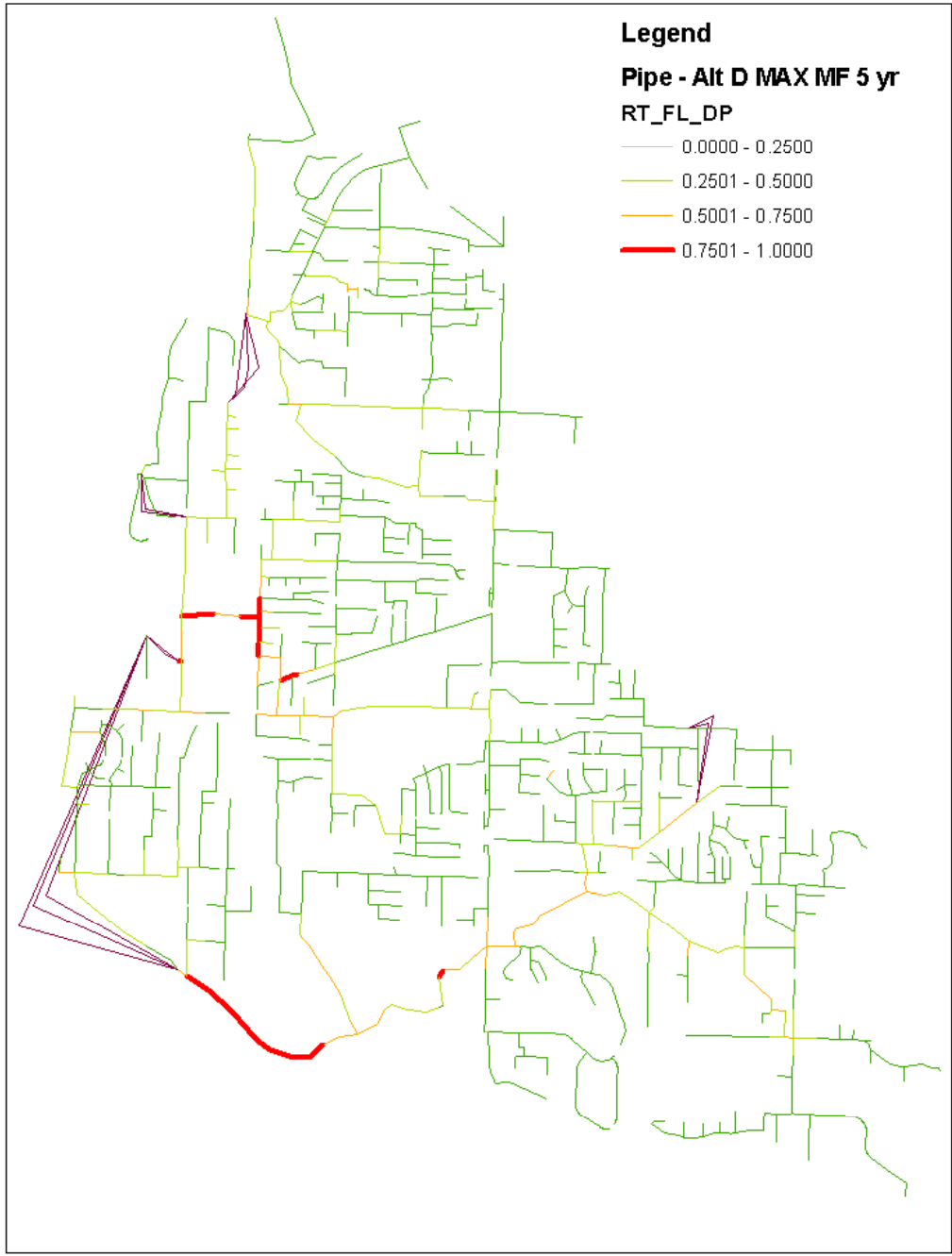


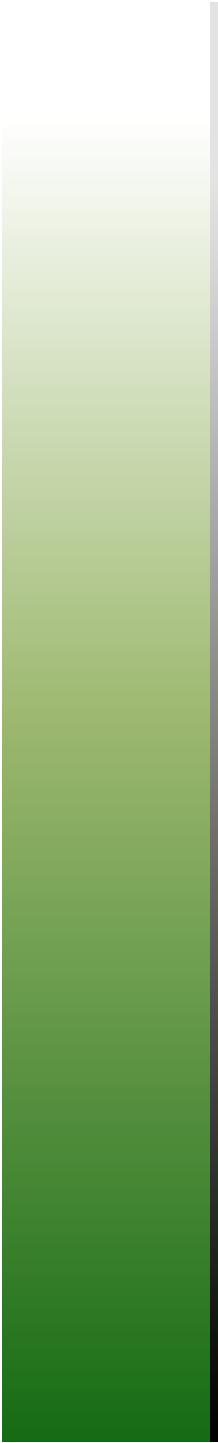
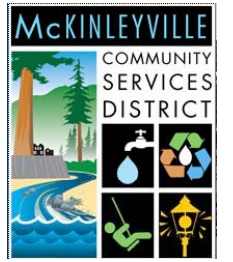
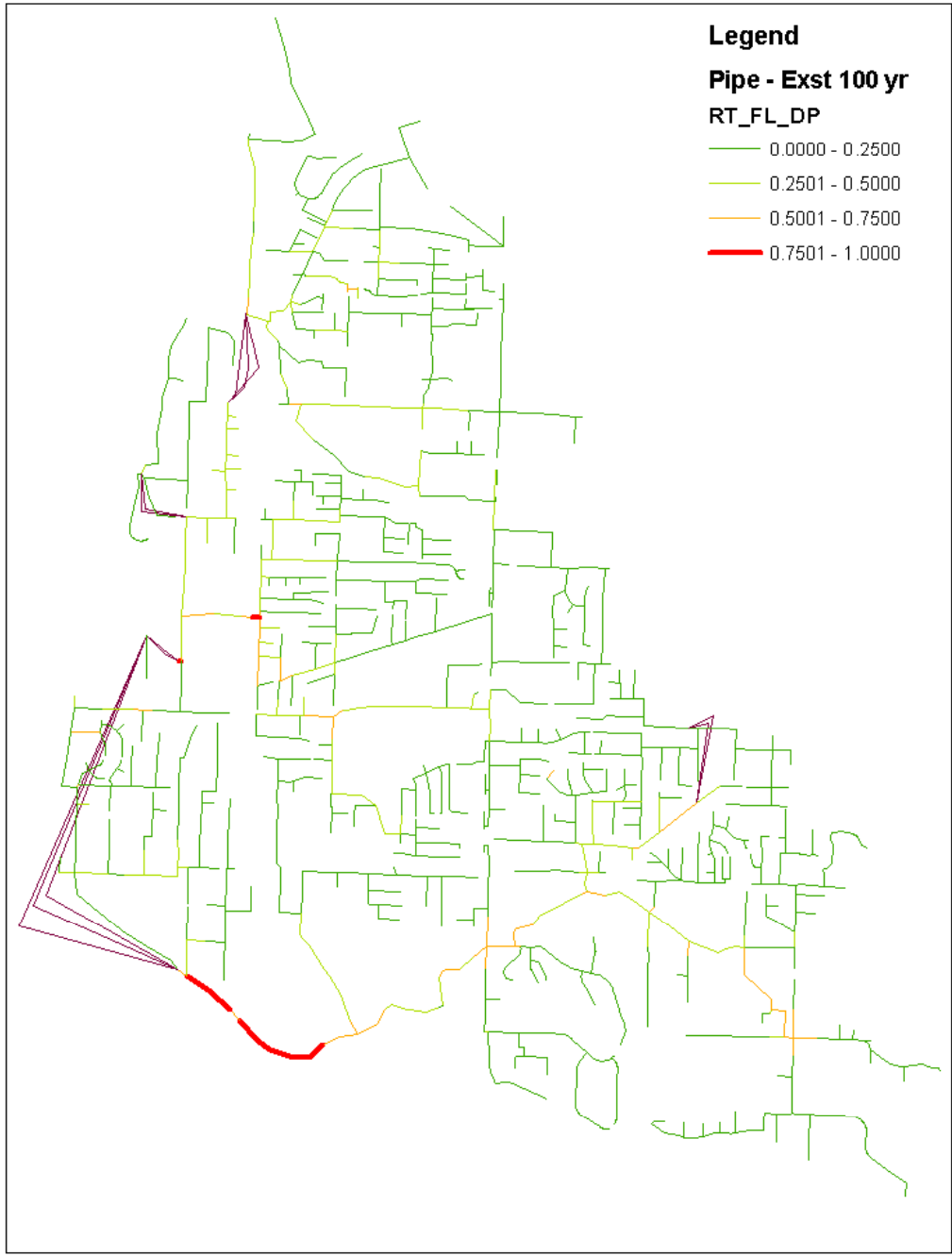


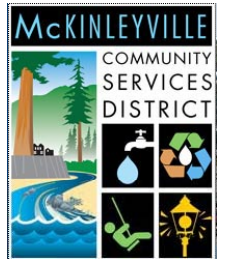
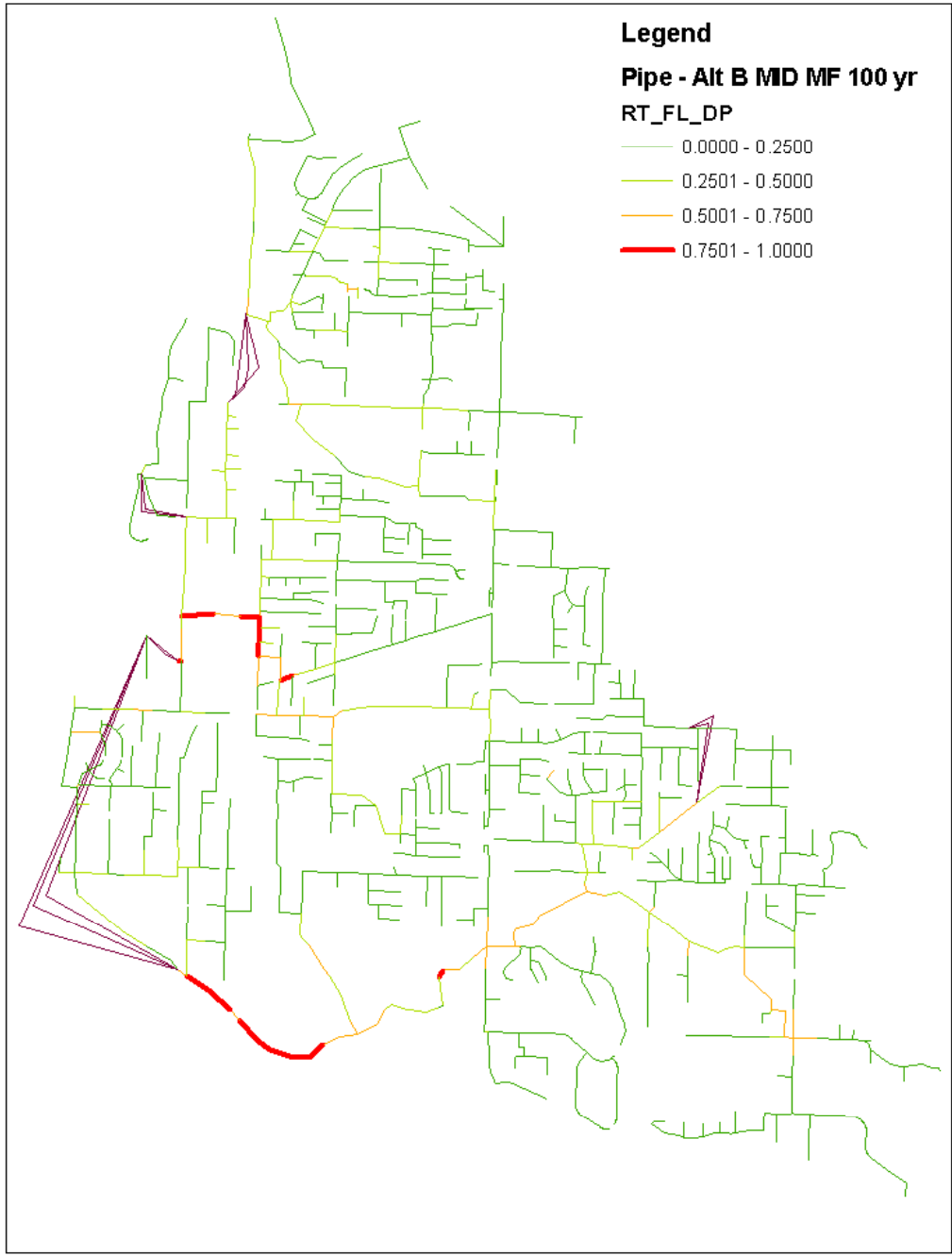




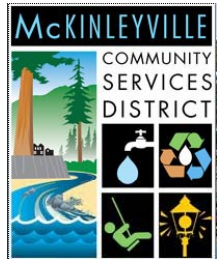
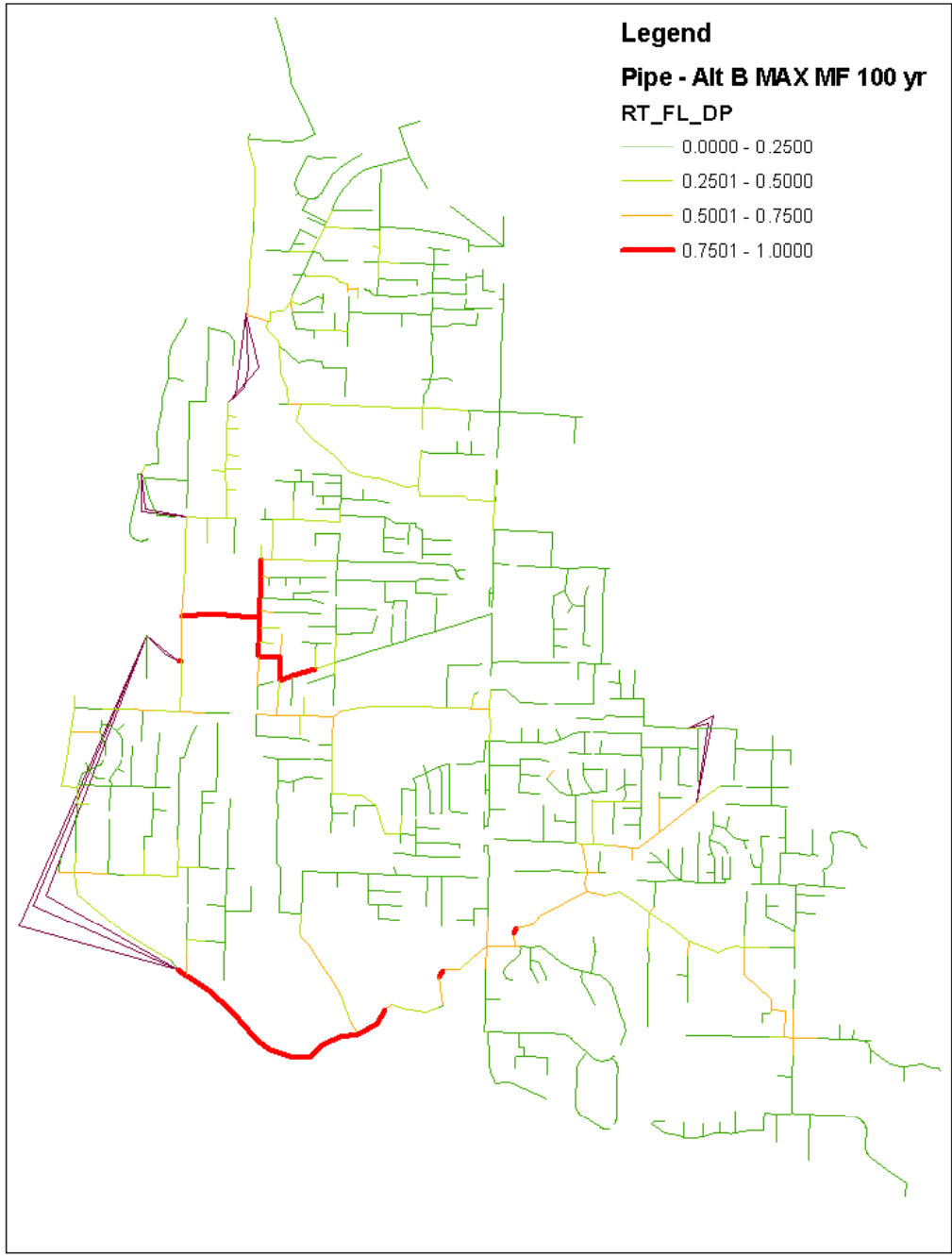


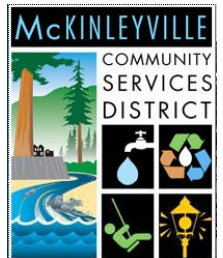
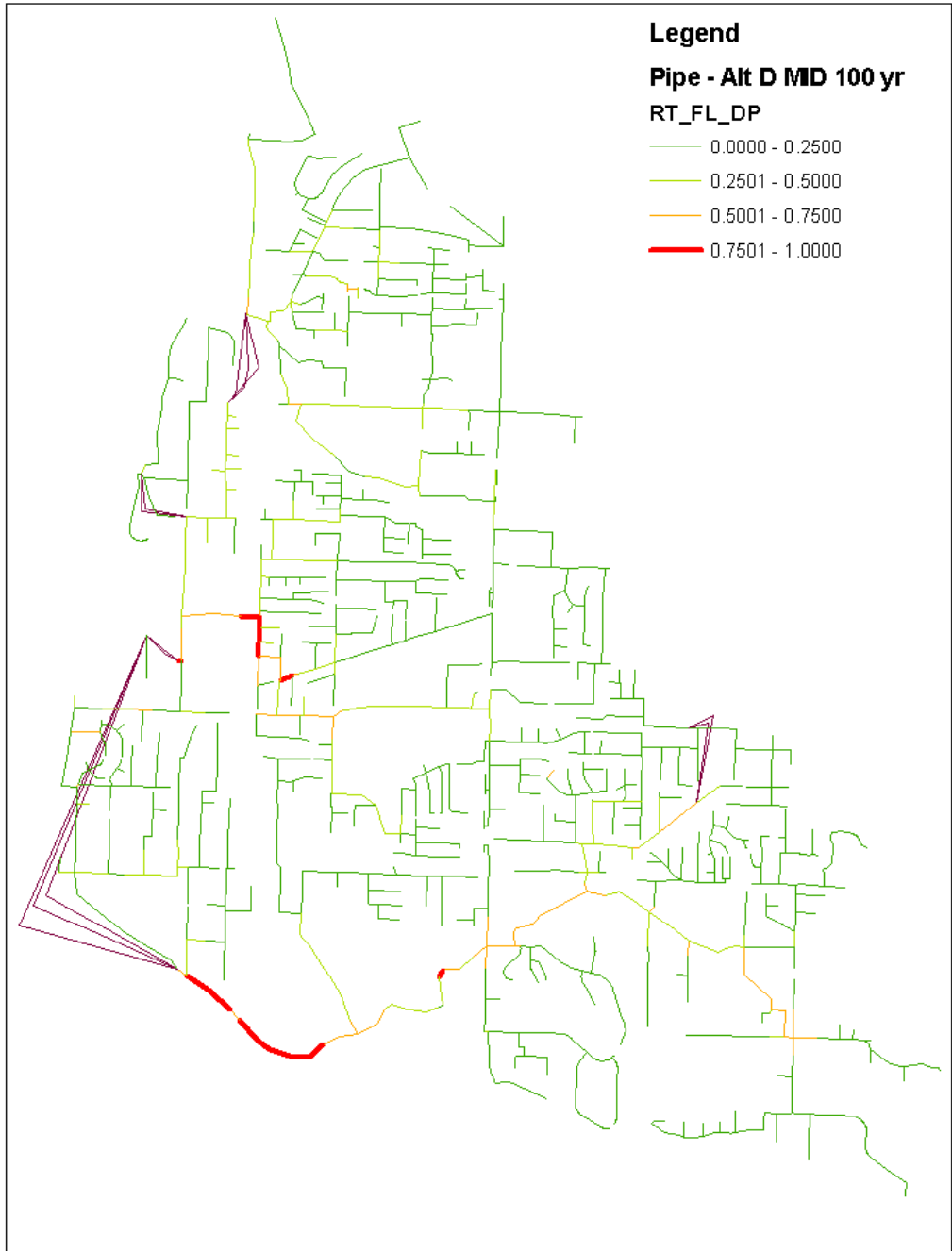


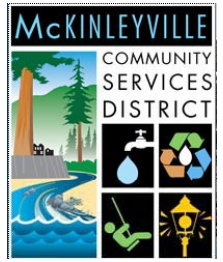
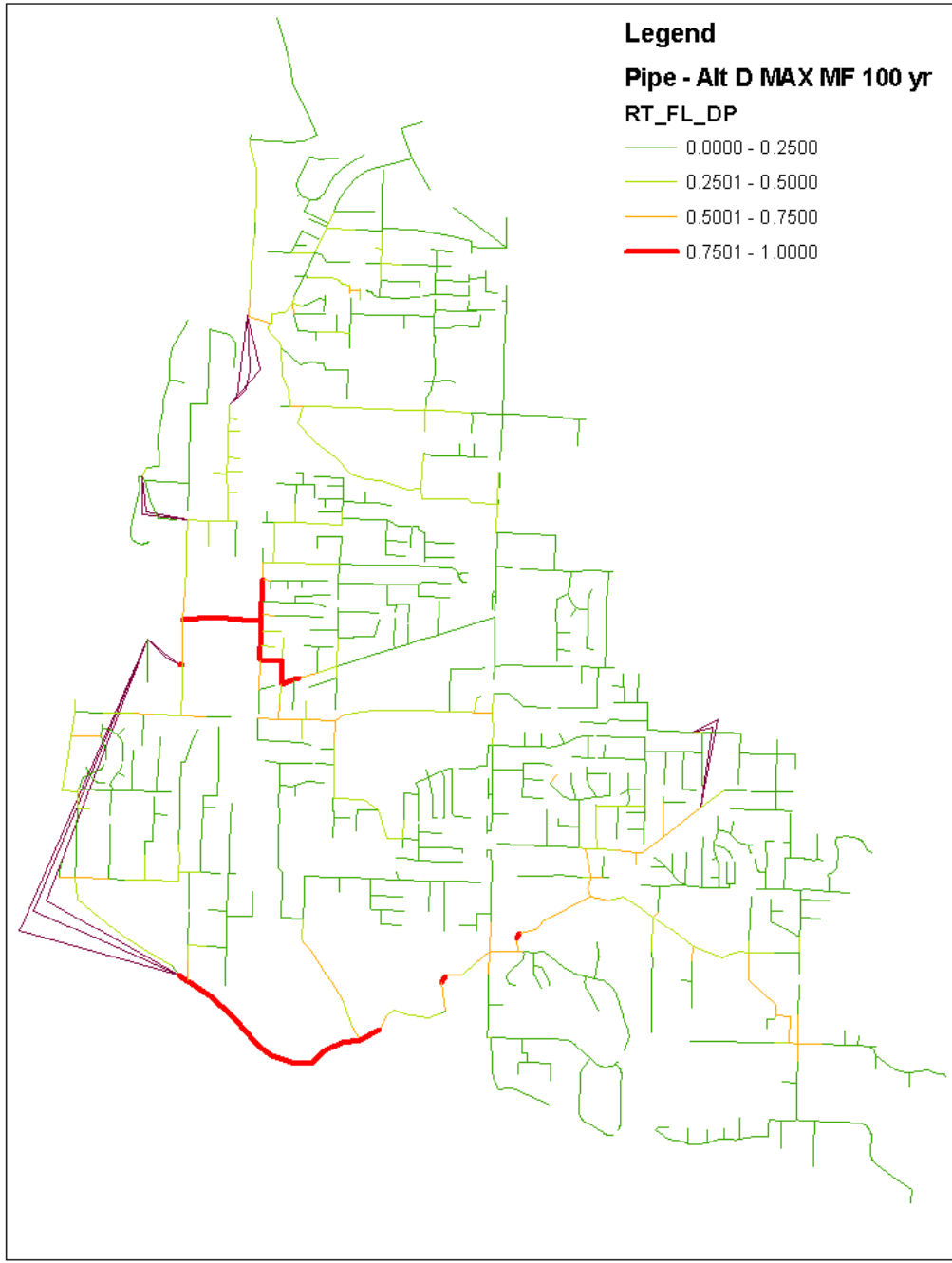












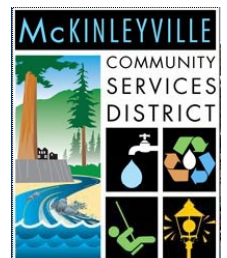
## Summary of Impacts

Anticipated flows under the projected growth conditions, with rainfall derived infiltration and inflow included, have the potential to exceed the maximum flow capacity of the WWMF (3.3 MGD).

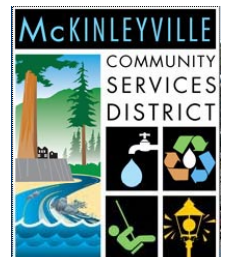
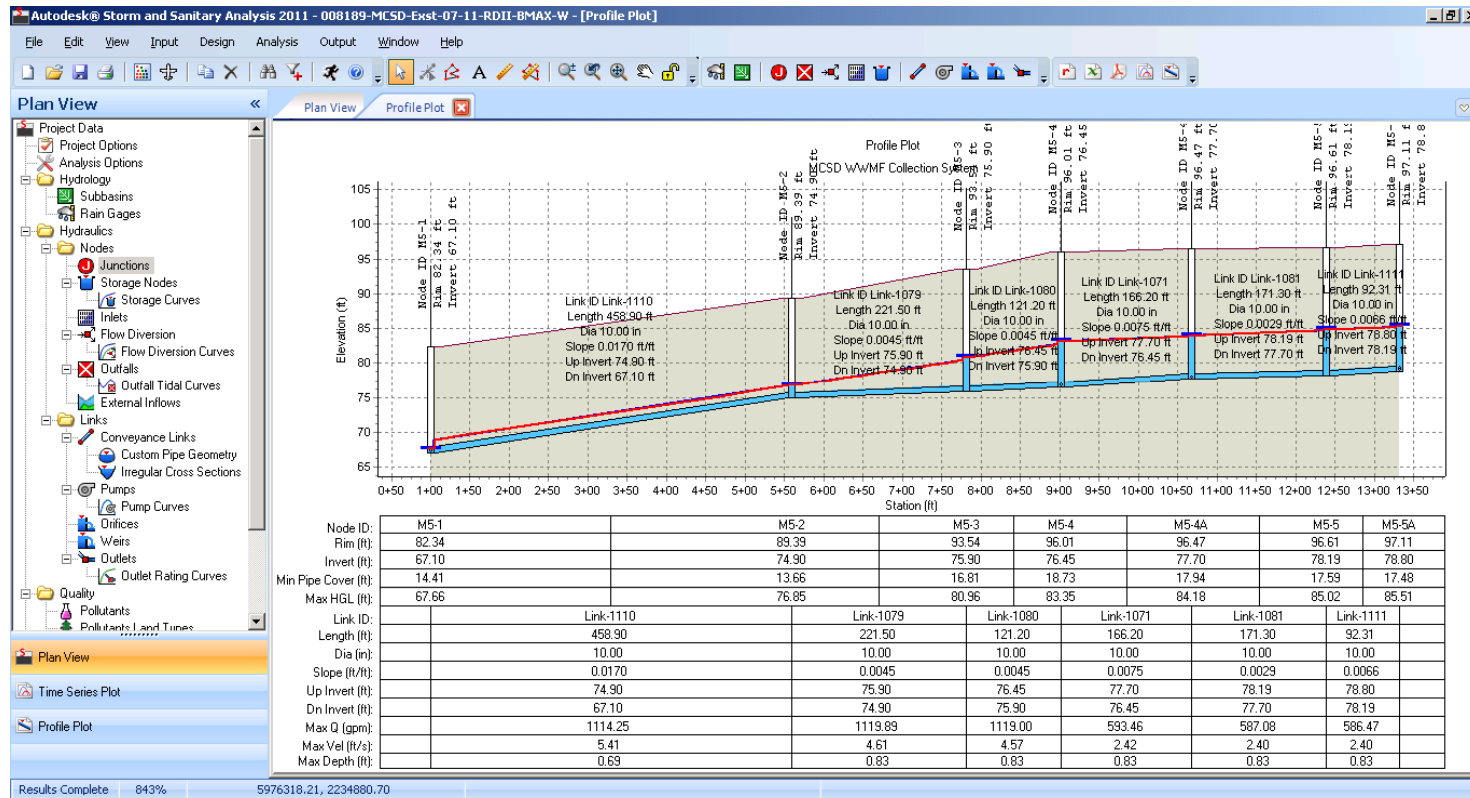
The increased flows also have the potential to exceed the capacity of the existing collection system and the existing disposal system.

There are two general locations in the sewer collection system that may be impacted by additional growth in McKinleyville – near the central and the south Highway 101 undercrossing locations.

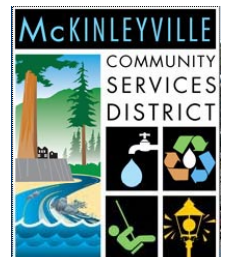
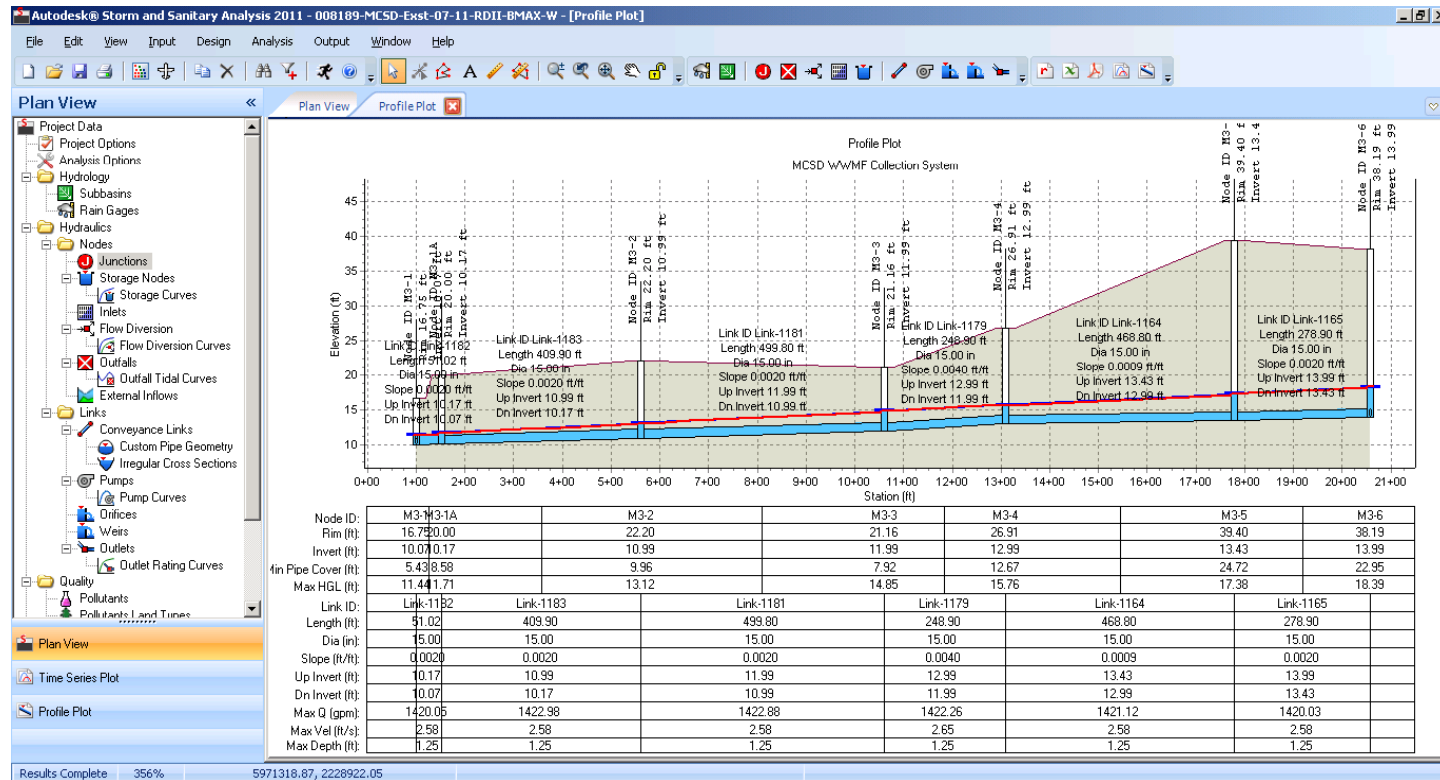
Further refinement of the collection system model will be completed once additional dry weather flow data is collected and the model is calibrated and verified for existing conditions.



# Capacity/Surcharge Location - Line 5 (Central)



# Capacity/Surcharge Location - Line 3 (South)



# Questions?

